HOW DO LEGAL AND REGULATORY FRAMEWORKS OF LIBERALIZED ELECTRICITY MARKETS INFLUENCE THE PROMOTION OF RENEWABLE ENERGY?

LESSONS FOR AUSTRALIA FROM INTERNATIONAL CASE STUDIES

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ABSTRACT

The decarbonization of the stationary energy sector is crucial for reducing greenhouse gas emissions in Australia and across the world. Renewable energy as alternative means of generating electricity provides a key component of the transition to a low carbon society. Yet, successful transition depends not only on the development of suitable renewable technology, but also on the ability of regulatory frameworks to support and adopt this technology.

In Australia, Germany and the United Kingdom, electricity provision is governed by regulatory frameworks, which provides for competitive retail and wholesale electricity markets and regulated electricity networks. This thesis critically examines the capacity of these regulatory frameworks to integrate renewable energy.

Drawing on systems conceptions of electricity and ideas of regulatory space, this thesis comparatively assesses the role of law in Australia, UK and Germany in creating and sustaining market solutions for electricity supply, arguing that these systems have operated to the detriment of renewable energy. Legal frameworks have co-developed and therefore ‘fit in’ with fossil fuel-based infrastructure. Hence existing legal frameworks for electricity provision lock-in out-dated generation profiles and institutional frameworks, thereby limiting the uptake of renewable energy and retarding transition to low carbon energy systems.

The thesis contends that overcoming this lock-in to promote the transition to a renewable energy-based electricity sector requires targeted regulatory reform. Drawing on experiences from Germany and the United Kingdom, it finds that reforms need to include the integration of sustainability concerns into the legal frameworks of the electricity market. It also requires network and market regulation, which provide specifically for the different requirements of renewable energy. Finally, reforms to introduce whole-of-system planning into regulatory frameworks for the electricity system will be necessary.

It is shown that because liberalized electricity markets inherently further existing generation and network profiles, they will not achieve these changes without governmental intervention. The thesis argues that reforms will require a reengagement of the state in
directing and planning the electricity system, in other words, choosing a new path. While the re-conception of a decarbonized Australian electricity system can take different forms, the thesis provides a foundation for considering where legal reform will be necessary to support this process.
DECLARATION

This is to certify that:

(i) the thesis comprises only my original work towards the degree of Doctor of Philosophy, except where indicated in the Preface;

(ii) due acknowledgement has been made in the text to all other material used; and

(iii) the thesis is less than 100,000 words in length, exclusive of the front matter, diagrams, tables, maps, bibliographies and appendices.

Signed:
PREFACE

Aspects of this thesis have previously been published in the journal article and book chapter listed below:

Lee Godden and Anne Kallies, ‘Electricity Network Development: New Challenges for Australia’ in Marta Roggenkamp et al, *Energy Networks and the Law* (OUP, 2012) 292 (50 per cent contribution of each author);

I would like to thank both of my supervisors, Lee Godden and Jacqueline Peel, for their support, encouragement and their patience. They have not only provided excellent supervision, but also invaluable opportunities for presenting and publishing my work.

My research has been greatly influenced by participating in an Interdisciplinary Research Project on Solar Power and Regulation at the University of Melbourne. Many thanks to my fellow team members - Fiona Haines of the School of Social and Political Sciences, Roger Dargaville and Dylan McConnell of the Melbourne Energy Institute and Peter Christoff of the School of Land and Environment for many great discussions.

A special thanks also goes to Lisa Caripis and Stephanie Niall, my colleagues in the Melbourne Law School Centre for Resources, Energy and Environmental Law. Both were often the first port of call for testing out ideas and reading and commenting on parts of the thesis – their contribution has been invaluable.

A special thank you needs to go to my friend Catherine Smith for making time to proofread the final thesis.

Finally, I am very grateful to my husband and my children for bearing with me through the long process of finalizing this thesis.
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<tr>
<td>ACCC</td>
<td>Australian Competition and Consumer Commission</td>
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<tr>
<td>ACER</td>
<td>Agency for the Cooperation of Energy Regulators</td>
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<td>AEMA</td>
<td>Australian Energy Market Agreement</td>
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<td>AEMC</td>
<td>Australian Energy Market Commission</td>
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<td>AEMO</td>
<td>Australian Energy Market Operator</td>
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<tr>
<td>AER</td>
<td>Australian Energy Regulator</td>
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<tr>
<td>BERR</td>
<td>Department for Business, Enterprise and Regulatory Reform</td>
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<td>BETTA</td>
<td>British Electricity Transmission and Trading Agreements</td>
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<tr>
<td>CEER</td>
<td>Council of European Union Energy Regulators</td>
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<td>CEBB</td>
<td>Central Electricity Generating Board</td>
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<td>CfD</td>
<td>Contracts for Difference</td>
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<td>CoAG</td>
<td>Council of Australian Governments</td>
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<td>CPM</td>
<td>Carbon Pricing Mechanism</td>
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<td>CPRS</td>
<td>Carbon Pollution Reduction Scheme</td>
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<td>CUSC</td>
<td>Connection and Use of System Code</td>
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<tr>
<td>DECC</td>
<td>Department of Energy and Climate Change</td>
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<td>DGES</td>
<td>Director General of Electricity Supply</td>
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<tr>
<td>ECJ</td>
<td>European Court of Justice</td>
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<td>ECSC</td>
<td>European Coal and Steel Community</td>
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<td>Abbreviation</td>
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<tr>
<td>EEC</td>
<td>European Economic Community</td>
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<tr>
<td>ENTSO–E</td>
<td>European Union Network of Transmission System Operators for Electricity</td>
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<tr>
<td>ERGEG</td>
<td>European Union Regulators Group for Electricity and Gas</td>
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<tr>
<td>ESD</td>
<td>Ecologically Sustainable Development</td>
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<td>EU</td>
<td>European Union</td>
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<tr>
<td>Euratom</td>
<td>European Atomic Energy Community</td>
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<td>FiT</td>
<td>Feed–in Tariff</td>
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<td>GEMA</td>
<td>Gas and Electricity Markets Authority</td>
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<td>IRA</td>
<td>Independent Regulatory Agencies</td>
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<td>ISO</td>
<td>Independent Systems Operator</td>
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<td>ITO</td>
<td>Independent Transmission Operator</td>
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<tr>
<td>MCE</td>
<td>Ministerial Council for Energy</td>
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<td>MRET</td>
<td>Mandatory Renewable Energy Target Scheme</td>
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<td>NEC</td>
<td>National Electricity Code</td>
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<td>NECA</td>
<td>National Electricity Code Administration</td>
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<td>NEL</td>
<td>National Electricity Law</td>
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<td>NEM</td>
<td>National Electricity Market</td>
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<td>NEMMCO</td>
<td>National Electricity Market Management Company</td>
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<td>NEO</td>
<td>National Electricity Objective</td>
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<td>NER</td>
<td>National Electricity Rules</td>
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<td>NETA</td>
<td>New Electricity Trading Agreements</td>
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<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>NFFO</td>
<td>Non–Fossil Fuel Obligation</td>
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<tr>
<td>NGC</td>
<td>National Grid Company</td>
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<tr>
<td>NGET</td>
<td>National Grid Electricity Transmission plc</td>
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<tr>
<td>NGMC</td>
<td>National Grid Management Council</td>
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<tr>
<td>NREAPS</td>
<td>National Renewable Energy Action Plans</td>
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<tr>
<td>OFFER</td>
<td>Office for Electricity Regulation</td>
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<tr>
<td>Ofgem</td>
<td>Office for Gas and Electricity Markets</td>
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<tr>
<td>OFTO</td>
<td>Offshore Transmission Owners</td>
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<tr>
<td>ORER</td>
<td>Office of the Renewable Energy Regulator</td>
</tr>
<tr>
<td>REC</td>
<td>Renewable Energy Certificate</td>
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<tr>
<td>RET</td>
<td>Renewable Energy Target Scheme</td>
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<tr>
<td>RIIO</td>
<td>Revenue = Incentives + Innovation + Output</td>
</tr>
<tr>
<td>ROC</td>
<td>Renewable Obligation Certificate</td>
</tr>
<tr>
<td>SCER</td>
<td>Standing Council on Energy and Resources</td>
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<tr>
<td>SENE</td>
<td>Scale Efficient Network Extension</td>
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<tr>
<td>SEVC</td>
<td>State Electricity Commission Victoria</td>
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<tr>
<td>TEU</td>
<td>Treaty on European Union</td>
</tr>
<tr>
<td>TFEU</td>
<td>Treaty of the Functioning of the European Union</td>
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<tr>
<td>UNFCCC</td>
<td>United Nations Framework Convention on Climate Change</td>
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CHAPTER I: INTRODUCTION

Australia faces major challenges addressing the fossil fuel dependence of its electricity system. Renewable energy – electricity generated from a variety of renewable sources\(^1\) – is an important component of the transition to a low carbon society that will be necessary in dealing with climate change. The stationary energy sector\(^2\) is especially greenhouse gas emissions-intensive,\(^3\) and emissions from this sector are a major contributor to human-induced climate change.\(^4\) Different countries have adopted a range of approaches to encourage the uptake of renewable energy. In Australia, this has involved specific laws\(^5\) grafted onto an existing regulatory framework that provides for a liberalized electricity market.\(^6\)

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\(^1\) This thesis uses the term, ‘renewable energy’ synonymously with ‘electricity generated from renewable sources’. This thesis follows the definition of eligible renewable energy sources in s 17(1) of the *Renewable Energy (Electricity) Act 2000* (Cth) which include hydro, wave, tide, ocean, wind, solar, geothermal-aquifer, hot dry rock, energy crops, waste, agricultural waste, waste from processing of agricultural products, food waste, food processing waste, bagasse, black liquor, biomass-based components of municipal solid waste; landfill gas, sewage gas and biomass-based components of sewage; and any other energy source prescribed by the regulations. As another example, the International Panel on Climate Change defines renewable energy as ‘any form of energy from solar, geophysical or biological sources that is replenished by natural processes at a rate that equals or exceeds its rate of use.’ Sources include ‘biomass, solar energy, geothermal heat, hydropower, tide and waves and ocean thermal energy, and wind energy’, Intergovernmental Panel on Climate Change, *Renewable Energy and Climate Change* (Special Report 2011) 172. This definition is wider, as it does not only include energy to generate electricity, but also thermal energy and mechanical energy.

\(^2\) The energy sector also includes transport and fugitive emissions. The stationary energy sector is comprised of electricity generation and direct combustion subsectors. See for definitions, Australian Government, Department of Climate Change and Energy Efficiency, ‘Stationary Energy Emissions Projections’ (2012) 1.


\(^4\) There is now scientific consensus that anthropogenic greenhouse gas emissions are a major contributor to a changing climate, see, eg, Intergovernmental Panel on Climate Change, *Climate Change 2013: The Physical Science Basis* (5\(^{th}\) Assessment Report, Summary for Policy Makers, 2013), or Katherine Richardson et al, *Climate Change, Global Risks, Challenges and Decisions* (Synthesis Report, Copenhagen 2009) 8-10.

\(^5\) The central support instrument is the Renewable Energy Target Scheme, enshrined in the *Renewable Energy (Electricity) Act 2000* (Cth) and supporting legislation, see in detail ch 3, III.

\(^6\) Electricity market liberalization has dominated the governance discourse for electricity supply in many countries around the world. It is centred on the introduction of competitive wholesale and retail electricity markets, to be achieved by replacing vertically integrated electricity utilities with unbundled, corporatized or privatised entities. Further features include electricity network regulation and third party access rules for electricity networks. For a detailed theoretical background of these developments, see ch 2, II A. The different ways Australia, the United Kingdom and Germany have liberalized their electricity markets are detailed in
This thesis investigates the role of law in Australia’s liberalized electricity market framework and its influence in shaping how renewable energy is integrated into the electricity system. The thesis questions the ability of current market frameworks to instigate large-scale, long-term change to generation and network patterns. It does this by evaluating the legal responses to renewable energy in electricity systems in Australia, the UK and Germany. It argues that law in this area has formed part of a techno-institutional complex that – far from enabling renewable energy generation – locks in carbon-intensive generation and network configurations. The thesis’ analysis confirms that old patterns of electricity supply ‘are not easily altered’, even in the face of new demands for low carbon modes of generation. As the existing market governance framework for electricity was introduced to a mainly fossil fuel-based industry structure, it is not responsive to the requirements of renewable energy. This situation hinders the uptake of alternative sources of electricity generation based on renewable energy.

The thesis identifies several barriers to integrating renewable energy successfully into the existing electricity system. Most prominently these include: (1) the reliance of the liberalized electricity market on narrow market objectives, and (2) the legal and regulatory framework for network access and development that operates to the detriment of renewable generators. In Australia, the ability to address these barriers is further limited by the constitutionally enshrined split between state and federal governments.

This thesis relies on systems conceptions of electricity supply to conduct its analysis, applying insights from theories on socio-technical systems to legal research. In systems

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7 The term ‘techno-institutional complex’ is adopted from Gregor Unruh’s seminal paper, ‘Understanding Carbon Lock-In’ (2000) 28 Energy Policy 817, which will be explained in more detail in chapter 2.
8 The term ‘network configurations’ here describes lay out of the electricity transmission and distribution networks, the poles and wires, which connect generators and end users.
10 The term socio-technical system has been used by Frank Geels, ‘Understanding System Innovation’ in Boelie Elzen, Frank Geels and Ken Green (eds), System Innovation and the Transition to Sustainability (Edward Elgar, 2004) 19 and Rolf W Küneke and John Groenewegen, 'Challenges for Readjusting the Governance of Network Industries' in Rolf W Küneke, John Groenewegen and Jean-Francois Auger (eds),
conceptions, legal and regulatory frameworks are but one of several elements that comprise an electricity system. Technological characteristics, existing infrastructure and user expectations are part of the system, comprising a ‘techno-institutional complex’ and influence its ability to change. Systems conceptions of electricity provision, while well established in social science research, have so far not been used in legal analysis. Here, they are not only utilized to build a framework for the analysis; they also provide a different way of understanding the problem of integrating renewable energy into existing electricity systems. Legal research has a central role both; in identifying law’s role in the lock-in of fossil fuel-based generation, and also in leveraging change towards energy system transformation. A systemic viewpoint changes the angle of inquiry to question the role of law in creating and sustaining liberal market solutions for electricity supply to the detriment of renewable energy. Institutionalist theories of regulation, especially ideas of regulatory space, are further used to refine the legal analysis of the role of law within electricity markets. They directly address the interaction between the different private and public actors involved in delivering electricity through a market system and especially the role of law in facilitating and directing roles and responsibilities of these actors.

In order to identify how law contributes to and exacerbates the lock-in effect perceived in Australia and how it can be overcome, the thesis utilizes comparative research, drawing on the experiences from the United Kingdom (UK) and Germany in facilitating renewable energy in a liberalized market framework. Comparative law is generally seen as instrument to better understand one’s own system, as well as to seek solutions to its problems. It is here used to validate the Australian experience, and to draw on the lessons learned from the

The Governance of Network Industries: Institutions, Technology and Policy in Reregulated Industries (Edward Elgar, 2009) 1. See on terminology and definitions, ch 2, I A.

11 All socio-technical systems conceptions have the interrelationship of different elements, institutional and physical, in common.

12 Unruh, above n 7, 817.


experience in the UK and Germany. In this fast-moving field, the legal analysis in this thesis includes developments up to 31 December 2014.

The thesis comes at a time of an extraordinary degree of rolling back of climate and renewable energy support in Australia. Under the former Gillard/Rudd Labor government, renewable energy support was considerably extended\(^\text{16}\) and a carbon-pricing scheme was introduced.\(^\text{17}\) The current Coalition government, elected in 2014 has abolished the carbon pricing scheme,\(^\text{18}\) and is seeking to cut several schemes providing financial to renewable energy projects.\(^\text{19}\) The centerpiece of Australian renewable energy support – the Renewable Energy Target Scheme – has been subject to several reviews, and its future remains uncertain.\(^\text{20}\) In this respect, Australia is moving against a global trend that increasingly sees transformations towards decarbonized electricity systems as central to energy policy.\(^\text{21}\)

While it is acknowledged that political will to make regulatory changes is a precondition for further action on climate change and renewable energy, the thesis looks beyond the present backward stance of Australia’s government. Even though the political environment in Australia is currently hostile to the goal of pushing electricity market reform towards a low carbon energy system, as greenhouse gas emissions grow and climate change impacts manifest, pressures for transition to low carbon energy system are only likely to grow. Australia cannot afford to be left behind.

\(^{16}\) See in detail ch 3, I 2.
\(^{17}\) Ibid.
\(^{18}\) *Clean Energy Legislation (Carbon Tax Repeal) Act 2014* (Cth).
\(^{19}\) Such as the Clean Energy Finance Corporation, see Clean Energy Finance Corporation (Abolition) Bill 2014 (Cth) and the Australian Renewable Energy Agency, see Australian Renewable Energy Agency (Repeal) Bill 2014 (Cth).
BACKGROUND

A The Australian Challenge

Emissions from the electricity sector are the single most important source of greenhouse gas emissions in Australia. Renewable energy is therefore a central part of any strategy to decarbonize the electricity sector. Technologically, an electricity generation profile based on 100 percent renewable energy is already possible.

Different modelling exercises have been undertaken in Australia, both on an academic and government level, to identify the technology mix and electricity network layout that is necessary to achieve generation based on 100 per cent renewable energy. Strikingly, all of these models identify the need for specific generation and network configurations in order to achieve a high percentage of renewable energy.24 This requires the extension, as well as the targeted augmentation of existing electricity networks. The reasons for this are related to some specific technological requirements of renewable energy. These include the fact that much of the most mature renewable technology, especially wind and solar, is intermittent. Unlike the constant electricity output of a coal-fired plant, it is a truism that the sun does not always shine and the wind does not always blow. It is therefore necessary to find a specific technology mix that allows a stable and reliable electricity supply based on renewable energy.27 Additionally, a highly interconnected grid heightens the stability of electricity supply based on intermittent sources of electricity. Further network development requirements are based on the fact that wind and sun are a natural occurrence

22 See Australian Government, above n 3.
25 See, eg, Melbourne Energy Institute, above n 23, from 87; AEMO, above n 24, from 19.
26 Intermittent is ‘a description of a generating unit whose output is not readily predictable, including, without limitation, solar generators, wave turbine generators, wind turbine generators and hydro-generators without any material storage capability’, National Electricity Rules (version 71) (‘NER’), ch 10 glossary.
27 AEMO, above n 24, from 35.
and such resources for electricity generation can only be harnessed where they are found.\textsuperscript{29} The present network layout, however, connects the existing predominantly fossil fuel generation technology\textsuperscript{30} with the end users. As the technology modelling shows, access to new renewable generation, facilitated by network investment, will be a key ingredient of large-scale transformation.\textsuperscript{31}

B The Legal Environment for Renewable Energy in Australia

Since 2001, a wide range of legal measures has been introduced in Australia to support renewable energy. These include, centrally, the Renewable Energy Target Scheme (RET),\textsuperscript{32} which aims to achieve 20 per cent of Australia’s electricity generation from renewable energy by 2020.\textsuperscript{33} State-based feed-in-tariff (FIT) Schemes,\textsuperscript{34} now mostly abolished, have also helped to lift the deployment of renewable energy in the Australia. Between 2001, when the RET was first introduced, and 2012, the renewable energy capacity in Australia almost doubled.\textsuperscript{35} The main legal instrument aimed at decarbonizing the electricity sector, the now abolished Carbon Pricing Mechanism, only supported the deployment of renewable energy indirectly, by putting ‘a price on greenhouse gas emissions in a way that encourages investment in clean energy’.\textsuperscript{36}

\textsuperscript{29} As the members in Synergy Wind Pty Ltd v Wellington SC [2007] VCAT 2454 at [14] expressed it: ‘Put another way, just like quarries or mines, WEF’s cannot be located anywhere. There are specific location requirements that must be met to gain the best wind supplies.’
\textsuperscript{30} In Australia predominantly coal-based, for a generation profile on Australia see ch, 3 I A.
\textsuperscript{31} See, eg, Australian Energy Market Operator, ‘100 percent Renewables Study: Draft Modelling Outcomes’ (Executive summary, 24 April 2013) 12-13, identifying major renewable sources in Australia, many of which are remote to the existing grid, and the necessary new network infrastructure to connect these to the consumer.
\textsuperscript{32} The main part of the scheme is legislated through Renewable Energy (Electricity) Act 2000 (Cth).
\textsuperscript{33} Expressed as a numerical target of 41,000GWh, see Renewable Energy (Electricity) Act 2000 (Cth) s 40.
\textsuperscript{34} Feed-in-tariff schemes provide for guaranteed return for electricity fed into the network. In Australia they are limited to small-scale generation installations and have been cut back severely in the recent years, for Victoria, see, eg, Electricity Industry Act 2000 (Vic) div 5A.
\textsuperscript{35} From 10 650 megawatts (MW) in 2001 to around 19 700 MW in 2012, see Climate Change Commission, Renewable Energy Target Review (2013) ch 2, at [1].
\textsuperscript{36} Clean Energy Act 2011 (Cth) s 3(d)(i).
These instruments to support renewable energy are held to be expressly external to the electricity market. They provide an additional source of income to renewable generators, and generate demand for renewable energy. However, it is the legal and regulatory frameworks of the National Electricity Market (NEM), which determine questions of access to the market, network development and network planning, which will be crucial to achieving a high percentage of renewable energy in the electricity market.

The legal frameworks underpinning electricity provision have undergone fundamental change in Australia and other comparable jurisdictions in Europe and North America, often based on neo-liberal economic concepts. While initially, electricity was provided by integrated and typically state-based monopolies, in the 1980s and 1990s market frameworks with competitive and regulated components became the leading governance model in Australia and elsewhere. Significant changes to the institutional framework of electricity provision accompanied this development, with the aim of creating competitive national markets. This resulted in the creation of the NEM as a cooperative national arrangement under the auspices of the Council of Australian Governments (CoAG). The NEM encompasses the legal and regulatory frameworks creating and managing a
liberalized wholesale and retail electricity markets as well as regulating transmission and distribution networks.\textsuperscript{43}

Renewable generators – latecomers to the electricity system – participate in the NEM. The regulatory frameworks for the NEM therefore crucially influence their successful introduction of renewable energy to the electricity system. As the Climate Change Authority found, ‘wholesale market rules can affect the way renewable energy competes with other forms of generation, while network regulation can influence the cost and availability of access for renewable generation connecting to the grid’.\textsuperscript{44}

In Australia, the NEM frameworks disadvantage renewable energy considerably. For example, regulatory objectives in the Australian market framework are based on efficiency and reliability concerns only.\textsuperscript{45} These regulatory parameters do not currently take into account concerns for a more sustainable energy sector. Additionally, the \textit{National Electricity Rules}\textsuperscript{46} do not provide for development of the market to specifically support network access or network planning to support renewable energy. Instead, the existing network configuration is considered sufficient to connect new generation investment to the degree driven by the RET.\textsuperscript{47} However, a large-scale reconfiguration of network and generation profiles will be necessary if the share of renewable energy in the electricity sector is to continue to grow beyond the short-term target of 20 per cent of electricity from renewable sources.

\textsuperscript{43} The \textit{National Electricity Law (NEL)} contained in sch 1 of the \textit{National Electricity (South Australia) Act 1996} (SA), applicable in all states and territories participating in the National Electricity Market through enabling legislation. Specific market and network rules are contained in the \textit{NER}; subordinate legislation made under the \textit{NEL}.


\textsuperscript{45} See National Electricity Objective, \textit{National Electricity Law}, s 7. See in more detail at ch 3, II B 1.

\textsuperscript{46} \textit{NER}.

\textsuperscript{47} See, eg, AEMO, ‘National Transmission Network Development Plan’ (2012) at 3, stating that ‘there is generally sufficient capability in the main transmission network for new generation to connect at locations which allow for growth avoiding the need for significant new transmission investment’.
Questions of access to the electricity market that is enabled through network development and planning, have become areas of major reform in other jurisdictions.

For example, in Germany and the UK, which form the focus of comparative analysis in this thesis, there is evidence of an increasing re-evaluation by governments of the ability of liberalized market models to deliver a transition to a generation profile based on a high renewable percentage in a timely fashion. Increasingly legal reform for targeted, centralized network planning and development, as well as a degree of generation planning, can be observed in an attempt to integrate renewable energy into their electricity systems.48

The German Renewable Energy Act,49 apart from enshrining generous financial support for renewable energy, also contains network access and augmentation provisions specifically for renewable energy, effectively providing a separate framework of network access for renewable energy. Network planning for renewable energy, is also increasingly addressed through new laws.50 This takes account of the inherent unsuitability of the existing network layout for a high uptake of renewable energy.

The UK, too, has introduced network regulatory regimes to address the specific requirements of renewable energy, especially for offshore wind investment,51 but also in regard to network charging52 and planning.53 The introduction of a sustainability objective to guide the decision-making of the market regulator in the Energy Act 2008 (UK) was driven by policy commitments to a low carbon energy future.54 In contrast, the UK Renewable Obligation, a target scheme similar to the RET in Australia, will be phased out, because it has not been sufficient to drive renewable energy investment.55

48 See, eg, Energy Industry Act 2005 (Germany) §§12a-12 e. In more detail see chs 5-6, respectively.
49 Renewable Energy Act 2014 (Germany).
50 Such as the Grid Extension Acceleration Act 2011 (Germany), see in detail ch 6.
51 Enshrined in the Electricity (Competitive Tender for Offshore Transmission Licences) Regulations 2010 (UK).
53 Ofgem, ‘Guidance on the Strategic Wider Works arrangements in the electricity transmission price control, RIIO-T1’ (October 2013) 1.
55 Electricity Act 2013 (UK).
Electricity Act 2013 further opens up the opportunity for targeted electricity generation planning.56

These legislative initiatives from comparative jurisdictions to integrate renewable energy into the electricity system in a timely manner, stand in contrast to Australia’s continued adherence to a regulatory model emphasizing market-external instruments. This situation points to a general need for Australia to re-evaluate the capacity of its liberalized electricity market to drive necessary changes to the electricity system through price-based instruments alone.

II THESIS CONTENTION AND APPROACH

This thesis contends that legal and regulatory frameworks for electricity markets in Australia will need to account for the specific needs of renewably generated electricity to assist in the timely transition to a low carbon energy system. The existing legal and regulatory frameworks for electricity markets in Australia perpetuate fossil fuel dependence of the electricity system, which existing renewable energy support through the Renewable Energy Target Scheme alone will not be able to address. Instead, targeted reform of electricity market legal frameworks is necessary to overcome systemic disadvantages for renewable energy.

To show these dependencies and the ways to overcome them, the thesis needs to identify firstly the role of law in electricity market frameworks and secondly how legal and regulatory frameworks for electricity markets take account of the needs of renewable energy. Specifically this requires attention to the following:

- How and why does current legislation for electricity markets lock-in fossil fuel dependence in the electricity system?
- How does this lock-in impact the uptake of renewable energy?
- How can identified barriers to renewable energy in the electricity system be addressed?

56 Through Contracts of Difference, see ch 5, III B.
The thesis relies on a two-pronged approach to show the lock-in of fossil fuel dependence and its impact on renewable energy.\(^5\) It firstly frames the difficulties for introducing renewable energy to the electricity system from a socio-technical systems perspective; one that takes account of the different elements of the wider electricity system. The role of law specifically in markets is then further identified applying the concept of ‘regulatory space’ to the electricity market regulatory framework. This concept identifies the electricity market as an arena where different public and private actors interact, and to which law determines the ‘terms of entry’. Secondly, this thesis employs this framework in a comparative context that examines legal and regulatory models in other leading renewable energy law jurisdictions, namely Germany and the UK, in order to show how other countries have addressed similar challenges.

For each of the country case studies, electricity market development is traced to show the systemic embeddedness of fossil fuel dependence in the electricity systems’ legal and regulatory frameworks. The main legal support instruments for renewable energy are then analyzed to determine the degree to which they address inherent disadvantages.

As law is here viewed in this context as part of a socio-technical system, unique to each country, the thesis does not attempt to provide a blueprint for legal reform in Australia through the adoption of German or UK solutions.\(^5\) Instead it presents findings that can inform Australian legal reform, by identifying patterns and trajectories of legal change that have supported or hindered the integration of renewable energy in these comparison countries. These findings can be used as a starting point for future legal reform for Australia.

\(^5\) Details of the analytical framework and the comparative approach will be introduced below at III and further developed in ch 2.

\(^5\) Legal transplants, their challenges and opportunities have been extensively studied, see, eg, the classic work of Otto Kahn-Freund, ‘On Uses and Misuses of Comparative Law’ (1974) 37 Modern Law Review 1; or newer, and with extensive further references, Michele Graziadei, ‘Comparative Law as the Study of Transplants and Reception’ in Mathias Reimann and Reinhard Zimmermann (eds), The Oxford Handbook of Comparative Law (Oxford University Press, 2006) 442.
III BEYOND EXISTING RESEARCH: A NEW THEORETICAL APPROACH

A Existing Research and Gaps

The existing legal research on the role of law in facilitating renewable energy uptake in Australia focuses largely on describing or critiquing existing measures such as the RET. Other literature has a narrow concentration on instrument design, for example, comparing feed-in-tariffs with target schemes. Instrument interaction provides a further focus of existing research. For example, Prest argues that emissions trading schemes should coexist with, and not replace renewable energy deployment laws, because deep and rapid cuts of emissions cannot be achieved by carbon trading alone. Prest and others also assert that feed-in-tariff schemes are the superior choice of renewable energy support in Australia, because of their higher effectiveness and lower cost. Several authors discuss design faults and weaknesses of the RET. These include the negative impacts of the (now abandoned) solar multiplier, the existence and impact of a cap and an end date on creating a viable industry, and the impact of supporting least-cost renewable energy on promoting a diverse generation portfolio. Some of this literature is purely descriptive of the existing


64 Buckman and Diesendorf, above n 62.
instruments. There is also a smaller body of research dealing with planning law issues, such as siting of specific renewable energy projects including wind farms.

However, little legal research has been directed to questioning the role of law in the electricity market frameworks and its ability to support or hinder renewable energy integration. There has been some engagement of legal scholars in Australia with the question of whether sustainability objectives should become part of regulatory decision-making. The impact of reforms delegating technology choice and network planning to network and generation businesses and the implications for the legal and regulatory framework, however, has been less of a focus. Nonetheless issues of access to networks, and thus to the market, and the relative disadvantage of renewable energy under the current legal frameworks, are of clear policy significance in Australia. Such factors were key issues identified by government consultants and parliamentary committees. There is also a growing body of international scholarship questioning the ability of liberalized electricity

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67 The problem of adapting especially transmission investment and planning to renewable energy while pointed out by several commentators from other disciplines, see, e.g., Iain MacGill, Hugh Outhred and Karel Nolles, ‘Some Design Lessons from Market-Based Greenhouse Gas Regulation in the Restructured Australian Electricity Industry’ (2006) 34 Energy Policy 11.


69 With the exception of Lee Godden and Anne Kallies, ‘Electricity Market Developments: New Challenges for Australia’ in Martha M Roggenkamp et al (eds), Energy Networks and the Law (Oxford University Press, 2012) 292, who found that transmission network regulation in Australia did not support non-market public interest outcomes, such as supporting a high degree of renewable energy.

70 McLennan Maganasik Associates, ‘NEM Failures and Governance Barriers to New Technologies’ (1 July 2008), Final Report to Garnaut Climate Change Review.

markets to promote renewable energy\textsuperscript{72} or transitions more generally.\textsuperscript{73} Such studies usually build on country experiences with attempting to substantially raise renewable energy.\textsuperscript{74} However, very few studies have been undertaken from a legal perspective.

\textbf{B A New Analytical Framework to Address the Role of Law in Liberalized Electricity Markets}

This thesis provides the first sustained academic analysis of whether, and if so how, the legal and regulatory frameworks of the Australian electricity market aid or prevent transition to an electricity system which relies on renewable energy.\textsuperscript{75} It addresses the role of law in contributing to the lock-in of an outdated electricity system. It thereby targets a gap in legal research that has not yet been addressed in detail, but will be crucially important for transitioning to a decarbonized electricity sector. In Australia and elsewhere, the electricity market framework clearly challenges the ability to integrate renewable energy into the electricity system. The evidence from other countries shows that addressing this process requires considerable legal reform.

There are different theoretical conceptualizations of the legal and regulatory frameworks of electricity markets that can be used to investigate the role of law in facilitating renewable energy uptake in liberalized markets. The following sections provide an overview of these framing concepts, while recognizing that each is a simplified understanding of a complex reality.\textsuperscript{76}

\textsuperscript{73} See, eg, Mitchell and Woodman, above n 13.
\textsuperscript{75} Parts of the research undertaken in the course of the degree have been previously published, see especially, Anne Kallies, ‘The Impact of Electricity Market Design on Access to the Grid and Transmission Planning for Renewable Energy in Australia: Can Overseas Examples Provide Guidance?’ (2011) 2 \textit{Renewable Energy Law and Policy} 147; Godden and Kallies, above n 69.
\textsuperscript{76} A more detailed exploration of these concepts will be undertaken in ch 2, II and III.
1 The Standard Liberal Market Model

The current governance frameworks for electricity supply, built around competitive electricity markets, are based on neo-liberal concepts of economics.\textsuperscript{77} They align to a greater or lesser degree with a theoretical ‘ideal’ model - the standard liberal market model.\textsuperscript{78} In this conception, electricity can be treated in the same manner as any other commodity. The natural monopoly nature of networks is not considered to prevent a competitive market.\textsuperscript{79} Instead, for the network parts of the industry, a competitive market is mimicked through network regulation. Market frameworks for electricity, according to this concept, have been introduced on the basis that private entities can and will provide this public utility service more efficiently, which is in the interest of the consumer.\textsuperscript{80} Accordingly, the companies make technology decisions and ‘the market decides’ on the most advantageous investment. The role of law in enabling and facilitating the market is considered to be largely technical, i.e. facilitating a set of preconditions for the market.\textsuperscript{81}

The market constitutive role of law in neoliberal theory is built around ‘freely negotiated contractual obligations between juridical individuals in the market place.’\textsuperscript{82} Otherwise, legal intervention is only considered necessary to provide efficient instruments for addressing market failure.\textsuperscript{83} Typical examples of market failure identified by the proponents of the liberal market model in regard to electricity markets include the need for economic regulation of networks.\textsuperscript{84} Support for renewable energy is usually addressed in the context of the market failure to address carbon emissions of fossil fuel-based
generation.\textsuperscript{85} The manner in which the market and its institutions are set up in law is not questioned under this conception.

However, these models, it can be argued, are based on an artificial distinction between the market and the state.\textsuperscript{86} The market is considered as the private sphere. The state has a limited role in (public) regulation, which is only warranted under narrow circumstances.\textsuperscript{87} Thinking about law in a context of market failure only, disregards the important role of law in setting up this market. The fact that the electricity market itself is a form of regulation\textsuperscript{88} to 'pursue public policy objectives',\textsuperscript{89} is overlooked. In practice, different hybrid forms\textsuperscript{90} of public and private elements of the market are prevalent in electricity supply.\textsuperscript{91} For example, an industry participant may be unbundled and corporatized, but not privatized,\textsuperscript{92} or the state may be a part owner of some parts of the industry.\textsuperscript{93} Large privatized actors, such as network companies and big energy retailers, are now the main suppliers of the essential service of electricity. They are 'carry[ing] out functions of an essentially public character'.\textsuperscript{94} These features blur the distinction between public and private spheres. The way in which the market itself is set up is a form of regulatory framework and therefore, warrants closer academic attention than it receives in the standard market model.


\textsuperscript{86} In more detail see ch 2, II B 3.

\textsuperscript{87} Ibid.

\textsuperscript{88} See, eg, Mitchell and Woodman, above n 13, 582.


\textsuperscript{91} For the different models of restructuring see chs 3, 5, 6.

\textsuperscript{92} This is the case, for example in some of the Australian states, see ch 3.

\textsuperscript{93} For example one of the biggest German utilities, the EnBW Energie Baden-Württemberg AG has the Land Baden Wuertemberg and a consortium of municipalities and regional authorities as its main shareholders; for more details on the structure of the German industry see ch 5.

\textsuperscript{94} Hancher and Moran, above n 14, 273.
2 Alternative Models and the Role of Law

Alternative models of electricity supply are provided by a socio-technical systems understanding of electricity, which accepts that law is part of, and has co-developed with the elements of a techno-institutional complex,\(^95\) comprising technical and institutional elements. These models are associated with the concepts of path dependence and lock-in,\(^96\) based around the central premise that ‘history matters’,\(^97\) because the interaction of all elements explains the overall system development.

Taking a systems view of electricity provision, considerably shifts the focus of legal research. It means that such research accepts that the legal and regulatory framework of the electricity market is not technologically-neutral, but enshrines a particular generation and network profile. Thus, the market framework itself becomes the subject of the analysis. Research shifts from a focus on the best instrument design, which is dominating current legal research, to examining how the law is integral to setting up and controlling electricity market frameworks to enshrine particular technology patterns. Another significant research focus is on what factors are necessary to overcome these patterns.\(^98\)

3 Regulatory Space and the Role of Law in Electricity Markets

While academic literature based on systems conceptions of electricity usually lists law as one institutional factor in the techno-institutional complex,\(^99\) these analyses, not being jurisprudential in nature, do not expressly identify how legal and regulatory frameworks can be a barrier to the uptake of renewable energy. This thesis draws on institutionalist

\(^{95}\) Seminal, Unruh, above n 7.
\(^{96}\) Ibid, with further sources.
\(^{98}\) For a general and comprehensive discussion on the role of law from a regulatory perspective see, Bronwen Morgan and Karen Yeung, *An Introduction to Law and Regulation* (Cambridge University Press, 2007).
\(^{99}\) See, egs, Mitchell and Woodman, above n 13, 572; Unruh, above n 7.
theories of regulation, especially the concept of regulatory space, to refine its analysis of the role of law in market frameworks. This allows for the penetration of the concept of ‘the market’, recognizing that, unlike what is claimed in neo-liberal market concepts, the electricity market is created by and reliant on law. This change of perspective shifts attention to the role of law in creating, sustaining and managing these markets.

The ‘turn to markets’ for the more efficient provision of essential services, contrary to general conceptions around the minimal state, did result in the proliferation of law and regulation. Law and regulation has been necessary, firstly, to set up the markets’ institutional structure and secondly to ensure that they continue to fulfill their public tasks. For electricity this is driven by essential service requirements for universal and efficient electricity supply. As a result, much of the academic literature engaging with the role of law or, more widely, regulation, within electricity systems is regulatory literature.

Regulatory theory enables a more comprehensive view of the role of law as ‘just one strand, albeit a particularly significant one, in a web of regulatory institutions’. Institutionalist theories of regulation provide a foundation for capturing important institutional dynamics, such as the interaction between regulators and network businesses in regard to network planning. These theories accept that distinctions between public and private actors and interests have become increasingly distorted. This aligns with the analyses that identify a proliferation of actors and an increasing use of hybrid forms of governance arrangements, especially in the area of electricity supply. Of particular

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100 Morgan and Yeung, above n 98, ch 2 in their investigation on law and regulation, distinguish three theories of regulation, public interest, private interest and institutionalist theories; see also Robert Baldwin and Martin Cave, Understanding Regulation: Theory, Structure and Practice (Oxford University Press, 1st ed, 1999) 18.
104 Morgan and Yeung, above n 98, 53.
relevance is the image of regulatory space by Hancher and Moran.\textsuperscript{106} These authors depict regulation as embedded in larger systems and institutional dynamics, i.e. the interactions between different actors in a regulatory arena.\textsuperscript{107} Such a model resonates with the implications of a systems conception of electricity provision. Factors determining the dimensions of regulatory space include ‘specific political, legal and cultural attributes’ of ‘particular national settings’.\textsuperscript{108} While Hancher and Moran do not specifically write on technical systems, their model is expansive enough to encompass technological elements as part of the dimensions of regulatory space.

In this thesis the concept of regulatory space is applied in a sector-specific manner\textsuperscript{109} to the electricity industry and its market-based regulatory and legal framework. Under this conception, consideration of the role of law in shaping possibilities for renewable energy integration shifts from technical questions of regulatory design, to the question of ‘who gains entry [into the regulatory arena] and on what terms’.\textsuperscript{110} These ‘terms of entry’ in law, are therefore a central focus of the analysis. The concept also directs attention to the ‘shifting powers within and between institutional actors inside the common regulatory space’.\textsuperscript{111} Mapping these shifts in power relationships from a legal perspective allows identifying the role of law in regulatory change.

\textit{C Comparative Legal Research}

The analytical framework developed in the thesis is applied in a comparative context, addressing the electricity market regulatory frameworks of Australia, Germany and the UK. There are a number of purposes comparative legal research can seek to achieve, such as harmonizing laws, providing solutions to particular legal problems, or it can be employed

\begin{footnotesize}
\textsuperscript{106} Hancher and Moran, above n 14, 271.
\textsuperscript{107} Ibid.
\textsuperscript{108} Ibid 277.
\textsuperscript{109} An option Hancher and Moran foresee, ibid.
\textsuperscript{110} Ibid 282.
\textsuperscript{111} Ibid 278.
\end{footnotesize}
for classification purposes. A further, and here prominent reason is to provide insights into the Australian legal approach to renewable energy. Comparative research can ‘provide a sharper image of individual systems’. It contributes ‘to a better understanding of one’s own, national law through the contrasts and the greater range of information it provides’. It is here utilized to provide insight into the challenges renewable energy faces in the Australian liberalized electricity market, by comparing how other countries have addressed similar challenges. Electricity market legal frameworks can differ greatly from country to country, depending on their resource base, historical developments and the political and institutional conditions. Comparison can help to understand whether regulatory structures embedding electricity markets are the result of country-specific conditions. While the choice of case studies for comparison is explained below, the comparative legal research methodology and its ‘fit’ with comparing electricity market regulatory frameworks will be developed in detail in chapter 2.

A central aspect of comparative legal study is the selection of case studies. While comparability, i.e. a degree of commonality is often cited as required for a comparison, ultimately, what is deemed ‘comparable’ is determined by ‘the aims of the specific comparative study’.

This thesis contends that legal and regulatory frameworks for electricity markets in Australia will need to acknowledge the specific needs of renewably generated electricity to assist in the timely transition to a low carbon energy system. These frameworks, it is contended, contribute to a lock-in of unsustainable patterns of electricity generation and supply, which will require targeted regulation to overcome them. In the chapters that follow, Australia’s situation provides the starting point for the analysis. The choice of case

114 Glenn, above n 112, 69.
115 See, eg, Eberlein and Doern, above n 102, 9-10.
116 See, eg, Dannemann, above n 113, 407.
studies therefore needs to be measured against the comparability of a particular country situation with that of Australia. This chapter has already alluded to the common elements of different electricity systems. They deliver an essential service, they are based on common technology, and, at least in most western countries, their governance systems are based on liberalized markets. These commonalities provide an initial foundation for the choice of case studies.

Germany and the UK, like Australia, are developed countries, which have liberalized their electricity markets. Like Australia, they have traditionally depended overwhelmingly on fossil fuel for their electricity needs. They therefore faced a similar challenge in transitioning to a less carbon-intensive electricity system. Unlike Australia, both the UK and Germany have committed to, and are in a process of, decarbonizing their electricity sectors.

However, the integration of renewable energy into their respective electricity systems has met with varying success. The legal and regulatory frameworks adopted in each jurisdiction have played an important role in either supporting or posing barriers to the uptake of renewable energy. The choice of UK and Germany as case studies serves to illustrate specific challenges electricity sector reform in Australia will face.

The development of the UK electricity market and the reception of renewable energy in this market make an excellent case study for comparison with the Australian context. Electricity market deregulation in Australia followed the UK example, and many of its initial regulatory frameworks mirrored UK law. These similarities in the course of electricity market reform in the two countries help to make the different trajectories for renewable

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118 The question of comparability often alludes to factors such as ‘cultural, political and economic components of a society, as well as the particular relationship that exists between the State and its citizens, its value system and its particular conception of the individual and the world in general’, as well as being in similar stages of ‘legal evolution’, see, eg, Peter de Cruz, *Comparative Law in a Changing World* (Routledge-Cavendish, 3rd ed, 2007) 226-27.

119 Other comparative case studies that are often drawn on in the Australian context include the US. However, electricity market liberalization in the US has been patchy, because the ‘most significant reform decisions [were left] to the states. As a result, many US states have introduced only limited liberalization reforms in wholesale markets without fundamental electricity sector restructuring’, Paul L Joskow, ‘Lessons Learned from Electricity Market Liberalization’ (2008) 29(2) *The Energy Journal* 9.

120 See, eg, Damien Cahill and Sharon Beder, ‘Regulating the Power Shift: the State, Capital and Electricity Privatisation in Australia’ (2005) 55 *Journal of Australian Political Economy* 5.
energy integration visible. Likewise, the UK’s Renewables Obligation and its enabling legislation is based on the same principle as the principal Australian regulatory instrument, the RET. Recent reforms in the UK that move away from the RET-type model, and instead emphasize reform of network regulation, show that electricity market reform is necessary to transition successfully to renewable energy.

Germany is widely acknowledged as a leader in supporting sustainable energy transitions. It has already managed to integrate substantial amounts of renewable energy into its electricity market, with a positive outlook for accelerating this process further in the near future. Of special interest for the Australian context is the fact that Germany, too, is a federal state. In both countries constitutional frameworks are relevant to establishing the roles of different levels of government in electricity market regulation. The differences and impacts of state/federal interaction on renewable energy regulation will further illuminate the Australian situation.

While there are many important similarities between the Australian, UK and German electricity systems, one fundamental difference is that both the UK and Germany are member states of the European Union (EU). EU law plays an increasingly important role in its member states’ energy law and policy, with European directives providing the main source of new law in this area. The influence of the EU on electricity system regulation in member countries, is introduced and explained in chapter 4.

D Significance of the Thesis

This thesis seeks to provide a more holistic approach for investigating the role of law in the design of electricity market frameworks and how law participates in locking-in unsustainable patterns of electricity use or can support transitions. As has been shown earlier in this chapter, comprehensive legal research into this problem has not been undertaken. Yet, understanding and addressing the constraints renewable energy faces can only be understood if the wider systemic constraints are taken into account.
An analysis from a socio-technical systems perspective allows firstly, for a contextual analysis of the role of law in supporting energy transitions. It provides analysis beyond a narrow focus on instrument choice and design. The thesis significantly extends the focus of existing literature by bringing to the fore the important role of law in creating, enabling and managing electricity markets.

Secondly, a successful energy system transition requires an interdisciplinary research effort, which can draw together insights from technology studies, political science, economics and law. The thesis seeks to contribute to the interdisciplinary work undertaken in regard to energy scenario modelling in Australia, and economic analysis of electricity market development. Investigating the role of law and regulation in ‘constructing markets and controlling them’ enhances these studies and provides additional data to these analyses. It will thereby add to the development of interdisciplinary energy transition research in the Australian context. The analytical framework developed in this thesis can also be built on when analyzing other elements of an energy transition, such as energy efficiency measures, storage solutions and carbon pricing, which likewise will have to overcome lock-in of traditional patterns.

E Limits of the Analysis

A system conception of the electricity system can provide a framework for the analysis of the whole of the electricity sector, its regulatory framework and the various measures that can aid an energy transition to a decarbonized electricity system. In this thesis the focus is

121 See above at I A.
123 Barton, above n 89, 17.
124 See, eg, Melbourne Sustainable Society Institute, Melbourne University Renewable Integration Laboratory <http://www.sustainable.unimelb.edu.au/files/mssi/Melbourne-University-Renewable-Energy-Integration-Laboratory.pdf> 3, on the factors that need to be addressed in computer modelling for energy transition.
125 Projects that take an interdisciplinary approach to energy transitions and seek to combine social science and technology research include the German Helmholtz Association’s, Alliance Energy Trans (2015) <http://www.energy-trans.de/english/index.php>, see also Facilitating the Photovoltaic Revolution <http://www.law.unimelb.edu.au/staff/events/files/Facilitating-the-photovoltaic-revolution.pdf>.
on one, central element of energy transitions, that of successfully supporting renewable energy. This limitation is on the one hand one of necessity – energy system transition will have multiple elements and an analysis of the full range of the potential options would be beyond the scope of a thesis. On the other hand, and in Australia especially, renewable energy resources are abundant, and a very large contribution of renewables will be an indispensable part to any future decarbonized system. The framework developed in this thesis can be extended to assess other policy options and their ‘fit’ with the electricity system.

As acknowledged, supporting renewable energy is part of a range of other policy options aimed at decarbonizing the electricity sector. These include centrally carbon pricing and demand-side solutions, such as energy efficiency measures or support for small-scale renewable energy, which lower electricity demand and therefore the use of fossil fuel, as well as energy storage integration, which has the potential to support and complement a transition towards a renewable energy-based electricity system, because it can provide a technical solution to the problem of intermittency of renewable resources. Emissions performance standards can also impact the viability of fossil fuel generators. Carbon pricing, especially, is often considered to be the most cost-effective way to reduce emissions in the electricity sector. While carbon pricing has now been abolished in Australia, in Germany and the UK, the European EU Emissions Trading Scheme applies and requires covered industries to reduce their emissions gradually through a cap and trade mechanism. While not designed to support renewable generators specifically, carbon pricing can make fossil fuel generation more expensive and thereby indirectly support renewable energy. However, in this thesis the aim is to show how system-inherent barriers for renewable energy are perpetuated through electricity market legal and regulatory frameworks and to what degree support instruments acknowledge and address

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126 For a full list of feed-in-tariff schemes in the Australian states, see ch 3, n 52.
129 See ch 4, I B.
130 In detail see European Commission, ‘The European Emissions Trading System’ (Factsheet, October 2013).
131 A ‘positive but limited incentive’ to deploy renewable energy under a high carbon price scenario has been shown for example, by Pablo del Rio Gonzalez, ‘The Interaction Between Emissions Trading and Renewable Electricity Support Schemes (2007) 12 Mitigation and Adaptation Strategies for Global Change 1363, 1370.
these barriers. Carbon pricing does not address infrastructure constraints for renewable energy or the suitability of electricity market frameworks to support renewable energy. The thesis therefore limits its analysis of renewable energy support measures to the main instruments employed in Australia, Germany and the UK. In chapter 7, the potential for consumer-scale renewable energy supply - especially through rooftop solar - to lead to a major re-conception of the way Australia uses electricity will be flagged as a future research direction.

IV Chapter Overview

Chapter 2 further develops a framework for a legal analysis of supporting renewable energy in the electricity system. This conceptual framework will guide the analyses in the case study chapters 3-6.

The chapter first provides an understanding of law as an element of a socio-technical system. This necessitates the comprehension of the wider system, its norms and its physical properties and how they have influenced and continue to influence legal frameworks. The chapter therefore introduces the concept of socio-technical systems and its implications, especially of path dependence and lock-in of existing patterns of electricity generation and networks. Turning to the role of law in the electricity sector, specifically, the chapter addresses the evolution and the theoretical underpinnings of the current liberalized electricity market. The different ways of conceptualizing the role of law in these market frameworks already introduced above at III B are further developed and critiqued. Drawing on regulatory literature the chapter shows that the ‘turn to the market’ for regulating the electricity system, has been accompanied by a limited conception of the role of law in liberalized electricity markets.¹³² Systems conceptions instead direct attention to a central role of law in managing and perpetuating these market solutions to the detriment of renewable energy. The concept of regulatory space, introduced above at III B 3, is refined to provide a detailed look at the shifts in regulatory power associated with market

¹³² Littlechild, above n 85.
liberalization and the introduction of renewable energy. Finally, comparative legal research methods, traditionally based on an isolation of law from policy and politics, are adapted in this chapter to take account of the embedded legal frameworks as part of a techno-institutional complex. The comparison therefore extends beyond the analysis of the utility of legal support instruments, to include the complex regulatory environments of electricity supply and its dynamics. The legal and regulatory framework of the electricity market, its evolution and actor dynamics become the object of the comparison.

Australia’s lack of attention to the role of electricity market legal and regulatory frameworks in locking-in unsustainable patterns of electricity supply provides the starting point of the thesis. Drawing on the framework developed in chapter 2, chapter 3 analyses the Australian National Electricity Market, its evolution and the barriers it provides to renewable energy uptake. While the RET has been relatively successful in supporting the deployment of renewable energy, the chapter identifies the lack of targeted network planning and access rules for renewable energy as a major barrier to large-scale change in Australia. It also shows that the state-based, fragmented history of the electricity system in Australia lives on in its infrastructure and its institutional framework, hampering transformative change. Australia’s example shows the systemic nature of the challenges to renewable energy.

Comparative analyses of alternative regulatory models for facilitating renewable energy integration in a liberalized electricity market are presented in chapters 5 (examining the UK) and chapter 6 (examining Germany). Preceding the review of the UK and German systems, chapter 4 introduces the EU legal framework for electricity services and renewable energy. Supra-national, EU energy and environmental law is now a key driver of legal change in EU member states including the UK and Germany. This has led, on the one hand, to the introduction of liberalized markets for energy across the EU zone, driven by three market liberalization directives. On the other hand, EU legislation has also

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facilitated the introduction of stringent renewable energy targets, which in turn have accelerated the rate of reform in European countries and have been a major driver for UK reforms. Chapter 4 thus provides the supra-national legal context for understanding how renewable energy and electricity market reforms have unfolded in the UK and Germany.

Chapter 5 turns to the British electricity market developments and the UK’s response to renewable energy challenges. The chapter chronicles the development of a liberalized electricity market in the UK, which forms the leading market model for many jurisdictions, including Australia. The challenge of incorporating renewable energy, driven by EU renewable energy and emissions reduction targets, has led to subsequent changes in the UK regulatory frameworks, both for the electricity market and the market external support instruments. An increasing extension of the responsibilities of the regulator, Ofgem, beyond economic regulation, has been supported by the introduction of environmental objectives and new avenues for state intervention into the regulatory process in regard to environmental issues. An increase of targeted regulation of electricity market framework in the form of increasingly planned approaches to support renewable energy can be identified, culminating in the recent Energy Act 2013 (UK). The range of reforms in the UK, which signify a substantial turn away from the former stance of ‘market fundamentalism’ show how a decarbonization of the electricity system requires considerable targeted legislation to overcome locked-in patterns of unsustainable electricity supply.


See Cahill and Beder, above n 120.


Chapter 6 details the situation in Germany, which has been very successful in lifting its percentage of renewable energy in its electricity market. Unlike the UK, however, Germany was reluctant to introduce liberalized markets for electricity, only reforming its electricity market following EU directives for market liberalization. The German renewable energy legislation\textsuperscript{140} early on contained special access and network augmentation rules for renewable energy and has also always provided differentiated support for renewable energy. When electricity market reform started in 1998, \textit{lex specialis} rules for renewable energy were kept in place. However, the rapidly increasing amount of renewable energy in the networks now necessitates a rethink of the current electricity network configuration. As a result, increasingly stringent targeted network planning legislation can be seen, with legislative attention shifting from support for single plant access to whole-of-system planning. The chapter demonstrates that renewable energy generators not only need special support in electricity market frameworks, but also that system wide planning for specific patterns of electricity supply will be needed for a low carbon energy future.

In chapter 7, the results of the analysis of each of the country approaches are summarized and related to the concept of regulatory space. Distinct themes of how regulatory frameworks of electricity systems need to adapt and change in response to the renewable energy challenge emerge from the country case studies and are consolidated here. Shifting architectures of the regulatory space are associated with a growing role for system planning, separate roles for renewable generators and an increasing limitation to free commercial decision-making for fossil fuel generators. For Australia, this chapter concludes, a major reconsideration of the current separation of renewable energy support from electricity market frameworks is required. The chapter shows, though, that legal reform to the national electricity market legal and regulatory frameworks will face uniquely Australian barriers, grounded in the national solution for the National Electricity Market. Keeping in mind these constraints, the chapter concludes that ultimately electricity system transformation requires the choice of a new path by legislators; comprising considerable targeted reform of market frameworks for renewable-friendly network access, investment and planning as well as sustainable decision-making objectives for market regulators.

\textsuperscript{140} Currently \textit{Renewable Energy Act 2014} (Germany).
Chapter 2: The Role of Law in Electricity Markets: Theory and Methodology

Chapter 2 develops the analytical framework of this thesis.

As the previous chapter highlighted, a significant gap exists between research modelling economic and technological development of the electricity system, and the ability of the legal and regulatory frameworks to support the change identified in these models. Legal research that analyses the nature of the support for renewable energy has, for the large part, concentrated on policy instruments to address market externalities.

In contrast, this thesis frames the legal barriers that renewable energy faces in liberalized electricity markets as a systemic challenge. Examination of these barriers, therefore, requires an analytical framework that can take account of the systemic nature of electricity provision and its ramifications for law. Electricity provision is a complex issue, with multiple factors affecting legal and regulatory frameworks for the sector. Awareness of these factors, and the way they have co-developed and continue to interact with legal frameworks, is a necessary precondition to developing an analytical framework for investigating the role of law.

In part I, the chapter introduces systems conceptions of electricity and discusses their implications for research on renewable energy. Law and regulation here is conceived as an institutional element of the electricity system. The other interdependent parts of the electricity system are its technological elements, but also the values and norms informing the system. All elements in the system interact with each other and influence the opportunities for change; a characteristic which can result in lock-in and path dependence.\(^1\)

This lock-in of old patterns can at the same time ‘lock-out’ renewable technologies,

because they do not easily fit into a system that has developed to suit a different technology.²

Part II focuses on the legal and regulatory framework of the electricity market and its evolution. Australia, the UK and Germany have introduced electricity market reforms that resulted in similar, albeit not identical, governance frameworks. While each of the reform experiences is different (a subject explored in the country chapters 3-6), congruent basic principles and institutions of this worldwide reform movement can be identified. Part II discusses these developments, their impact on electricity market legal and regulatory frameworks and their underlying theoretical conceptions.

Part III expands on these different theoretical approaches to examine the role of law in these new liberalized market frameworks, introduced in chapter I.³ The dominant theoretical approach to electricity market legal and regulatory frameworks is the standard liberal market model,⁴ which has developed in economic science alongside reforms that restructuring the electricity sector. It is argued here that the standard liberal market model does not capture the complexity of electricity market legal frameworks as interdependent parts of an electricity system. Instead, a socio-technical systems perspective can change the focus of the enquiry to question the role of law in perpetuating systemic patterns. This focuses the research on barriers and opportunities for renewable energy inherent in current electricity market frameworks.

Building on this analysis, part IV develops a novel analytical framework based on a socio-technical systems conception, to set parameters for legal research from a systemic perspective. This framework specifically addresses the role of law in market legal

³ Ch 1, III B.
⁴ Initially the term was coined by Stephen Littlechild, in a lecture on ‘Electricity: Regulatory Developments around the World’ (The Beesley Lectures on Regulation Series XI, IEA/LBS, London 9 October 2001). It has since been used by different authors to describe a set of best practice elements of market reform, see, eg, Paul Joskow, 'Introduction to Electricity Sector Liberalization' in Fereidoon Sioshansi and Wolfgang Pfaffenberger (eds), Electricity Market Reform: An International Perspective (Elsevier, 2006) 1, see in more detail below at III B.
framework. It draws on the concept of regulatory space, to unpack the idea of ‘the market’, its participants and its relationship with the law. This allows the acknowledgement of the systemic influences shaping the regulatory space, its multiple participants and their interactions.

Finally, in part V, the chapter adapts comparative legal research methodology for this contextual and regulatory theory informed framework. This requires a widening of the comparison to include the regulatory environment of the current electricity markets.

I SYSTEMS CONCEPTIONS AND THE ELECTRICITY SECTOR

In this thesis, a socio-technical systems understanding is used to depict law as one of many factors influencing the design of an electricity market governance framework. The systems model is based on the co-development and interdependence of technological, social and institutional elements. System understandings of law have also been developed in regulatory literature. For example, Teubner’s influential analysis develops a view of society as being comprised of different self-referential systems, such as law, politics and regulated sub-systems. In this thesis law is conceptualized not as separate system, but as part of a bigger system, which includes not only social norms and laws, but also technological elements such as infrastructure. This allows an appreciation of the interplay of the regulatory framework with the physical limits, which the existing infrastructure poses to reform, and with the public expectations in regard to electricity supply. The ability of market mechanisms to change entrenched patterns of generation and networks is, in this discourse, linked to a broader understanding of electricity supply as a system.

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5 Which is often pitted as opposed to regulation, see, eg, Stephen Littlechild, 'The Market Versus Regulation' in Fereidoon P Sioshansi and Wolfgang Pfaffenberger (eds), Electricity Market Reform: An International Perspective (Elsevier, 2006), xvii.

A The Theory of Socio-Technical Systems

System conceptions of infrastructure industries based on co-development of institutional and technological factors are now well established in social science research. Building on systems conceptions established in science and technology studies, evolutionary economists and science historians have developed systems understandings of industry development, innovation and transitions. The construct of Large Technical Systems was first described by Hughes. Large Technical Systems conceptions rely on the co-development and interdependence of different components, such as infrastructure and organizations. Similar concepts have been developed in evolutionary economics. For example, Rip and Kemp use the term ‘technological regimes’ to describe, ‘a complex of engineering practices, production process technologies, product characteristics, skills and procedures, ways of handling relevant artifacts and persons, ways of defining problems – all of them embedded in institutions and infrastructures’.

While continuing to be centered on technology, definitions of socio-technical systems move away from Hughes original conception of Large Technical Systems. Hughes’ systems were bounded by the reach of the system operator. Newer systems conceptions reach beyond these limitations of system operation and include additional elements such as policy and user expectations. In these concepts, technology becomes one of several elements of a system.

7 See, eg, Frank Geels, 'Understanding System Innovation' in Boelie Elzen, Frank W Geels and Ken Green (eds), System Innovation and the Transition to Sustainability (Edward Elgar, 2004) 19; Rolf W Künneke and John Groenewegen, ‘Challenges for Readjusting the Governance of Network Industries’ in Rolf W Künneke, John Groenewegen and Jean-Francois Auger (eds), The Governance of Network Industries: Institutions, Technology and Policy in Reregulated Industries (Edward Elgar, 2009) 1, 6; Catherine Mitchell and Bridget Woodman, ‘Regulation and Sustainable Energy Systems’ in Robert Baldwin et al (eds), The Oxford Handbook of Regulation (The Oxford University Press, 2010) 572; and further sources below.
9 Hughes lists specifically for ‘electrical light and power systems’: physical artifacts, especially infrastructure, but also organisations, regulatory laws and natural resources; ibid 45.
11 Hughes, above n 8, 47.
Energy systems, with their heavy reliance on infrastructure, their complex and centralized management, and their politically sensitive nature, are particularly suited to analysis by a systems approach. Different authors from a variety of academic disciplines accordingly have used systems perspectives. While they define the boundaries of energy systems in different ways, all of the conceptions contain physical and institutional elements. Osofsky and Wiseman, for example, distinguish interdependent physical, regulatory and market elements in their tripartite model of the US energy system.\textsuperscript{12} Mitchell and Woodman, focusing on the UK, talk about an energy system as ‘consisting of complex, interrelated configurations of social and institutional factors as well as technologies which have evolved together to provide a service’.\textsuperscript{13} Unruh, in his seminal work on carbon lock-in in the energy sector, distinguishes three basic elements: ‘the physical capital of the technological system itself, the private organizations and/or public institutions that build and operate the system, and the larger societal institutions in which the system is embedded’.\textsuperscript{14} He terms these systems \textit{techno-institutional complexes}.\textsuperscript{15} Elzen et al, writing more generally on transition pathways to sustainability, talk of \textit{socio-technical systems}, comprising ‘a cluster of elements, including technology, regulations, user practices and markets, cultural meanings, infrastructure, maintenance networks and supply networks.’\textsuperscript{16} Correljé and de Vries do not explicitly call their model a system, but build an analytical framework for evaluating the differences in electricity market designs in different countries based on a ‘path-dependent interaction between political, economic and physical factors’.\textsuperscript{17} Künneke and Groenewegen distinguish technology, institutions and policy elements in their dynamic model of technological, socioeconomic systems of network industries.\textsuperscript{18} They distinguish informal institutions, such as norms and values, formal institutions such as constitutions, laws and

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\textsuperscript{12} Hari M Osofsky, and Hannah J Wiseman, 'Dynamic Energy Federalism' (2013) 72(3) \textit{Maryland Law Review} 773, 780 ff.

\textsuperscript{13} Mitchell and Woodman, above n 7, 579; see also Frank W Geels, \textit{Technological Transitions and System Innovations} (Edward Elgar, 2005).

\textsuperscript{14} Unruh, above n 1, 826.

\textsuperscript{15} Ibid.

\textsuperscript{16} Boelie Elzen, Frank W Geels and Ken Green, 'General Introduction' in Boelie Elzen, Frank W Geels and Ken Green (eds), \textit{System Innovation and the Transition to Sustainability} (Edward Elgar, 2004), 1, 3.


\textsuperscript{18} Künneke and Groenewegen, above n 7, 6, fig 1.
\end{flushleft}
regulation and, finally institutional arrangements, which they list as organizations, contracts and hybrids.\textsuperscript{19}

The following figure by Künneke and Groenewegen depicts the different elements that make up a systems model for network industries, with the arrows clarifying interdependencies of the system elements.

![Diagram of a dynamic model of technological, socioeconomic systems](image)

\textit{A dynamic model of technological, socioeconomic systems}

Fig 1: Künneke and Groenewegen’s ‘Dynamic model of technological, socioeconomic systems’\textsuperscript{20}

All these conceptions share in common an interrelationship of institutional and technical elements. This distinguishes socio-economic systems theories from institutional theory, which has been used by many researchers in the electricity markets area.\textsuperscript{21} Institutionalism

\textsuperscript{19} Ibid.
\textsuperscript{20} Ibid.
\textsuperscript{21} See, eg, for electricity market reform, Eberhard Bohne, 'Conflicts between National Regulatory Cultures and EU Energy Regulations' (2011) 9 \textit{Utilities Policy} 255, 257 drawing on actor-centred institutionalism; Mez and Midtun using institutional isomorphism, see Lutz Mez and Atle Midtun, 'The Politics of Electricity Regulation' in Atle Midtun (ed), \textit{European Electricity Systems in Transition: A Comparative Analysis of
and more recently new or neo-institutionalism, are theories that address the interaction between institutional processes and social systems, especially in regard to their ability to change. This body of research shares the core ideas of embeddedness and path dependence with socio-technical systems conceptions. While institutionalism lacks the technology focus of a socio-technical systems perspective, it can nevertheless help to address the interdependence of the institutional components of the system. The thesis draws on insights from institutional and neo-institutional theory where appropriate in the country studies considered in chapters 3-6.

B Implications of Systems Perspectives

Socio-technical systems are characterized by a high degree of complexity, which is the result of the system-inherent co-evolution, interdependence and embeddedness of the different elements of the system. One central implication of adopting a systems conception of electricity is that technological change depends on the relationship of technology with other, institutional and policy systems elements. This interdependence leads to ‘stability

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Policy and Regulation in Western Europe (Elsevier Science, 1997) 307, 322-3; Eberlein and Doern relying inter alia on historical institutionalism in Burkard Eberlein and G Bruce Doern, 'German and Canadian Multi-Level Energy Regulatory Governance: Introduction, Context and Analytical Framework' in G Bruce Doern and Burkard Eberlein (eds), Governing the Energy Challenge: Canada and Germany in a Multi-Level Regional and Global Context (University of Toronto Press, 2009) 1, 17. In regard to renewable energy policy, historical institutionalism has been used by Stefes to frame his argument, see, Christoph H Stefes, 'Bypassing Germany's "Reformstau": The Remarkable Rise of Renewable Energy' (2010) 19(2) German Politics 148; and Lauber has based his research on discursive institutionalism, eg, Volkmar Lauber and Elisa Scheller, ‘The Struggle over Support Schemes for Renewable Electricity in the European Union: a Discursive-institutionalist Analysis’ (2011) 20(4) Environmental Politics 508.

24 See, eg, Walter W Powell, and Jeannette Anastasia Colyvas, 'New Institutionalism' in Clegg and Bailey, ibid 976.
26 See below at I B.
and inertia’.

Socio-technical systems are susceptible to path dependency and therefore lock-in of unsustainable patterns of electricity supply.

Path dependency was initially developed as a concept in economic literature, standing as an alternative to neoclassical economic theory, which sees economic decisions as being made in a rational fashion. Path dependence concepts describe the potential influence of chance on economic systems and how a ‘minor or fleeting advantage or a seemingly inconsequential lead for some technology, product, or standard can have important and irreversible influences on the ultimate market allocation of resources, even in a world characterized by voluntary decisions and individually maximizing behaviour.’

Path dependency has now taken a much wider meaning of ‘history matters’. This is especially so in electricity systems, where history matters not only because it ‘shapes our expectations and our reactions to events’, but also ‘because its legacy lives on physically’. The way existing electricity generation and network infrastructure is aligned with fossil fuel generation vividly demonstrates this.

Further developing the idea of path dependence, Arthur showed for the case of competing technologies, how ‘dynamically, increasing returns can cause the economy gradually to lock itself in to an outcome not necessarily superior to alternatives, not easily altered, and not entirely predictable in advance.’ Unruh and others have later applied this concept of ‘lock-in’ to energy systems to explain why change to a more sustainable system was not

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28 The term is also used in historical institutionalism, to describe how particular decision rules, institutional structures, political alignments, and similar variables [that] reinforce political actors once they have started down a particular policy path; Frank N Laird and Christoph Stefes, ‘The Diverging Paths of German and United States Policies for Renewable Energy: Sources of Difference’ (2009) 37(7) Energy Policy 2619, 2627.
29 Neo-classical economic theory assumes that ‘individuals are rational maximisers of their satisfaction’, Stephen Bottomley and Stephen Parker, Law in Context (Federation Press, 2nd ed, 1997) 285; with more detail and sources from 278-88.
31 See David, above n 1, for a review.
33 Arthur, above n 1, 128.
easily forthcoming.\textsuperscript{34} Lock-in refers to the ‘locking-in’ of ‘fossil fuel-based technological systems through path dependent processes… arising through a combination of systematic forces that perpetuate fossil fuel-based infrastructure’.\textsuperscript{35} Rip and Kemp describe the difficulties for new technologies to succeed in a preexisting system, as such technologies:

must compete with existing technologies that, unlike the new technologies, have benefited from scale and learning economies and from institutional adaptations. The diffusion of new technologies is connected not only with improvements in the technology compared to competing technologies, but also with the costs and availability of complementary technologies and with institutional changes in organization, ideas, norms, and values.\textsuperscript{36}

Current fossil fuel-based electricity systems have co-evolved with interdependent networks of industry, users, financing institutions and educational institutions. The so-called \textit{carbon lock-in} of the existing generation profile at the same time locks out new low carbon technologies such as renewably energy technologies.\textsuperscript{37} Centrally for the purpose of this thesis, the institutions involved in the system, which includes law, can greatly exacerbate lock-in.\textsuperscript{38}

In summary, a systems understanding helps to depict the role of law as being one of many interdependent elements that determine the governance of electricity. Law is a formal institutional element of the system that has co-developed with other elements of the systems. Conceptualizing the role of law as part of a socio-technical system raises awareness that market systems designed within these path dependent structures are not technology-neutral. It suggests that opportunities for transitioning to a different energy system will not just depend on designing the ‘best’ legal instrument. Instead, successful law reform for energy transition necessitates an understanding of the physical, institutional and economic set-up, which the system embodies.

\textsuperscript{35} Unruh, above n 1, 817.
\textsuperscript{36} Rip and Kemp, above n 10, 328.
\textsuperscript{37} Unruh, above n 1, 818-9.
\textsuperscript{38} Ibid 825.
One implication of adopting a systems perspective to investigate electricity is that systems are specific to their home country.39 The institutional framework for each system has co-developed with country-specific political, physical and economic conditions. This has consequences for the comparability of different systems.40 However, electricity technology, as well as the essential service norms of electricity supply, are similar in all of the comparative case studies. These technical and normative commonalities ground a comparative analysis of the elements of each regulatory system and how they have shaped renewable energy integration. The following sections introduce the technical and normative elements of the electricity system, providing a basis for the discussion of the role of law in the creation, maintenance and change of electricity systems in part II and III of this chapter.

C Characteristics of the Electricity System

1 Technical Elements

The question of integrating renewable energy into the electricity system is partly a technical one. New technologies for power generation challenge the technological generation and network infrastructure of the existing system.

Stationary electricity can be generated from a range of fuels and transported to its user via high voltage transmission lines, which ‘carry electricity long distances’, and distribution lines, which ‘carry low voltage electricity to the consumer.’41

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39 See, eg, Mitchell and Woodman, above n 7, 575.
40 See also below at IV.
Electricity supply that relies on these interlocking technologies is a technologically sophisticated undertaking. Electricity cannot be stored once it is dispatched into the grid.\textsuperscript{42} It must be produced at the same time it is consumed.\textsuperscript{43} This leads to a need to balance supply and demand constantly, as electricity lines can only carry a certain amount of electricity without getting damaged.\textsuperscript{44}

Another unique technical feature of the electricity system is the high interdependence of the system. Damage to any part of the network can affect other parts immediately.\textsuperscript{45} Access rules for generators and users necessary to ensure system security need to be closely regulated. So-called ‘ancillary services’ must be in place ‘to manage the power system safely, securely and reliably.’\textsuperscript{46} These services maintain important technical characteristics of the system, including standards for frequency, voltage, network loading and system

\textsuperscript{44} Ibid 63-4, see also Markard and Truffer, above n 27, 614.

Fig 2: Australian Energy Market Operator, \textit{An introduction to the national electricity market} (July, 2010) 3.
restart processes. Technical requirements of the system are subject to detailed regulation to ensure that no user damages the system and all new generation is safely connected.

Electricity infrastructure involves a long-term investment with accordingly long-term ‘pay-back’ periods, as the costs of putting in place the necessary long-lasting infrastructure, such as generation facilities, and transmission and distribution lines, are high. The need to balance supply and demand constantly also leads to a long planning horizon for electricity provision in all its aspects. In particular, the crucial network development of transmission and distribution lines that connect generation and end users needs to be regulated in a way that responds to changes on the demand side, with new generation and network infrastructure being built to match this demand. The crucial dependence of society on reliable electricity provision also leads to a need for back-up generation, or reserve capacity. Thus, ‘whereas, in other industries, the future can be very disjointed from the past, that is not so in the energy sector. Many of the assets in place now were built a long time ago, and new assets may last for decades to come’. Legal models for governing electricity markets will have to account for the ongoing impact of existing infrastructure and incorporate long-term planning.

As a whole, the technology of the electricity system has not changed substantially since electrification. While market liberalization has tended to emphasize an institutional

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47 Ibid.
48 The area of ancillary services will have to play an important role in the integration of renewable energy sources into electricity systems, and is therefore increasingly discussed by researchers, see, eg, Jenny Riesz and Iain MacGill, ‘Frequency Control Ancillary Services – Is Australia a Model Market for Renewable Integration?’ (Proceedings of the 12th International Workshop on Large-scale Integration of Wind Power into Power Systems, London, October 2013).
52 See below, I C 2 for more detail on the essential service character of electricity supply.
54 Helm, above n 32, 5.
separation of the providers of the different interlocking technologies, technology development continues to be ‘based on integrated system planning’. Constant and centralized management of supply and demand necessitates ‘centralistic control’ for dispatching electricity. While initially undertaken by integrated utilities, which controlled all technological aspects of the system, post-liberalization system operators had to be introduced to provide this service.

Intermittent renewable energy sources, such as wind and solar, pose considerable technical challenges to the ability of a centralized grid network to integrate them. The comparator countries, Australia, Germany and the UK, still rely to a large degree on fossil fuel generators, which produce a constant flow of electricity. In contrast, much of the most mature renewable technology, especially wind and solar, are intermittent generators, that is, they do not provide a steady output of electricity. Managing the intermittency of renewable energy sources will therefore become an important task for the legal and regulatory frameworks for electricity supply.

Renewable energy challenges not only expectations of constant generation but also and centrally the traditional configuration of the electricity grid. The challenge to integrate renewable energy into the electricity grid is a multilevel one. It concerns not only the current grid configuration, but is also important for the future planning horizon for renewable energy. The current grid layout connects the existing mostly fossil fuel-based generators with the users of electricity, that is, the private and industrial customers. Renewable energy generators are mostly newcomers, having to access a grid network that was not created to take account of their specific location or the intermittent nature of renewable generation. Unlike fossil fuel generators, who can have their fuel transported to

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55 Through unbundling, see below at II A.
57 Ibid 251-2.
58 See also below, at II A.
59 For generation profiles see chs 3, 2, 6 at I A, respectively.
60 The National Electricity Rules define a generator as intermittent if their ‘output is not readily predictable’ ch 10.
the place of generation, \footnote{The worldwide trade in coal, one of Australia’s major export products, and oil, two of the major sources of electricity generation, shows the ease and normality of transporting fossil fuels.}{62} renewable energy mostly \footnote{For solar, wind, hydro, tidal and wave, though not for biomass-generated electricity.}{63} needs to be harnessed were it is found. The question of grid planning, therefore, is an especially pertinent one for renewable electricity, and is discussed in detail in chapters 3-6 of the thesis.

\section*{2 Norms of the Electricity System: The Essential Service Character of Electricity Supply}

Together with technology that can reliably and constantly provide electricity, electricity systems embed user expectations of uninterrupted electricity supply. Electricity provision is, at least in developed countries, considered an ‘essential service’. An early definition identified ‘[a]n essential service [as] one the stoppage of which inflicts hardship upon the community.’ \footnote{United Kingdom, \textit{Parliament Debates}, House of Commons, 17 May 1927, vol 206, 1120.}{64} While the definition of what constitutes an essential service has changed over time – many services we consider essential now, such as telecommunications, electricity and water services were considered luxuries when they first became available – there is little dispute that electricity provision falls under the definition today. \footnote{In Victoria, for example, the Essential Service Commission is responsible for the following services considered essential: electricity, gas, ports and rail freight industries, water and sewerage services.}{65} Blackouts – power outages for a particular area – can bring modern life, reliant on electricity for diverse functions such as lighting, heating, transport, traffic control, computing and life support in hospitals, to a standstill. This critical reliance leads to an inherent imbalance between demand and supply, as demand is relatively inflexible in response to undersupply. \footnote{Beder, above n 45, 9-10. The potential of demand side response facilitated through smart meters is a pertinent one and the paradigm of inflexible demand may be challenged through new technology, see, eg, Productivity Commission, \textit{Electricity Network Regulatory Frameworks} (2013) ch 9.}{66} Rapidly rising electricity prices or even blackouts thus have significant political implications.

The government can provide essential services either directly or through private providers; the latter situation is increasingly common after market reform. \footnote{For privatisation as element of electricity market reform, see below at II A.}{67} With community interests and the social and economic wellbeing of all purportedly at the center of essential service
provision, there is considerable disquiet as to how much control over service delivery
should be delegated to the private sector. Modern states are caught between a push to
privatize for perceived efficiency gains and the need to ensure that essential services are
still reliably provided by the market. Before liberalization, whether electricity provision
was under state or private control, usually an exemption from competition law was granted
in return for low stable rates and comprehensive provision. With electricity market reform
came the need to ensure that private or corporatized market players continued to take
account of the essential service character of electricity provision.

It is for this reason that the electricity sector is regulated to ensure provision to all
customers and at reasonable prices, whether service provision is in public or private
hands. Law and regulation provide a tight framework for the liberalized market to ensure
that reliability, accessibility and price, the core norms of the electricity system, are
achieved. This leads to strict reliability requirements for the technical elements of the
electricity system, but also shapes objectives in the legal and regulatory system. Essential
services objectives remain the main priority of energy systems.

In most developed countries energy security, which expresses these priorities, is
consequently a lead term of energy policy. While the term embodies a range of different
aspects, such as ‘reliability of supplies, the resilience of supply infrastructure to attack or
natural disaster, the supply of affordable fuels and the extent of national self-sufficiency’,
all of these link back to the centrality of not ‘letting the lights go out’.

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68 See, eg, Beder, above n 45, 1-2.
69 For the situation pre-market reform see chs 3, 5, 6 at II A 1, respectively.
71 Iain MacGill and Stephen Healy, ’Is Electricity Industry Reform the Right Answer to the Wrong Question? Lessons from Australian Restructuring and Climate Policy’ in Sioshansi (ed), above n 61, 615, 617.
The introduction of liberalized markets, as discussed in more detail in the next section, added new norms to the system. Haines and McConnell identify ‘metanorms of competition and efficiency’ that have been introduced on top of the essential service ‘legacy norms’. 75 Arguably, a commitment to a more sustainable electricity system is an emerging further norm for electricity systems, 76 which is expressed in different degrees in the different electricity systems that are investigated. In the legal and regulatory frameworks applicable to electricity systems, norms are most readily visible in legal objectives or purposive provisions that describe the overall goals of the system or the objectives that regulators must meet. Exactly which norms have been embedded in law and regulation of the electricity systems for each of the country case studies, and how law and regulation provides the framework to manage tensions between competing objectives, will be examined further in chapters 3-6.

II Evolution of Legal and Regulatory Framework of the Electricity System: Market Reform and Theoretical Perspectives

Both technical and normative elements are apparent in the legal and regulatory framework of the electricity system. The following section discusses the origin and development of these frameworks, their current basis in a market perspective, and the theoretical approaches to electricity regulation and provision that they embody.

Legal and regulatory frameworks provide the formal institutional element of the electricity system. Electricity in western countries is now predominantly delivered through a governance system relying on a mixture of markets and regulation. This was the result of extensive reforms starting in the 1980s. While the country case study approach adopted in this thesis allows a more nuanced account of the actual events and the drivers of change leading to electricity market liberalization in different jurisdictions, there are common elements that define this movement. Underlying the reforms were changing perceptions of

76 Ibid 19.
the role of the state in the delivery of essential services. The dominant model of market reform, the standard liberal market model, was premised upon a withdrawal of the state from the market, except for a limited engagement in cases of market failure. As shown in chapter 1, this narrow perspective is reflected in much of the academic research on renewable energy in electricity markets. It is argued here that a system perspective allows a wider perspective and a re-evaluation of the use of the electricity market as a regulatory instrument.

In order to understand this role of the electricity market and to provide the wider theoretical context for these developments the following sections introduce the concepts and developments that are part of market reform.

A Electricity Market Reform: From Integrated Utilities to a Liberalized Market

For technical reasons electricity was initially generated at the locality where it was consumed.77 Only the advent of the grid - the network of power lines to transport electricity - made it viable to distribute power to a large number of users over great distances. Both, electricity generation and grid infrastructure, however, required major investments. For a long time it was also technically impossible to integrate different generators into the same grid.78 At this stage, electricity provision was often in private or municipal hands. However, as electrification proceeded it was seen as increasingly impractical to rely on many dispersed entities to produce and distribute electricity. This led to an increasing concentration of electricity provision in the hands of few big utilities in order to capture economies of scale.79

Over time, electricity production and supply came to be seen as a ‘natural monopoly’. A ‘natural monopoly’ is one where ‘the entire demand within a relevant market can be

77 Philipson and Willis, above n 70, 35.
78 Ibid 261, 266.
79 Economies of scale are ‘the factors which make it possible for larger organizations or countries to produce goods or services more cheaply than smaller one’, John Black, Nigar Hashimzade and Gareth Myles, A Dictionary of Economics (Oxford University Press, 4th ed, 2013).
satisfied at the lowest cost by one firm, rather than by two or more’.

Initially all the functions of electricity provision were considered to be natural monopolies. However, an unregulated natural monopoly provides the monopolist industry with an incentive to demand monopoly prices. This was politically not feasible for an essential service, such as electricity, which is expected to be delivered universally and at a reasonable cost. Practically this led to the introduction of vertically integrated regulated monopolies in the electricity industry, which often were state-owned. These utilities were exempted from competition law restraints and operated regional or state monopolies under tight regulation. In return they guaranteed reliable and affordable service, as expected from an essential service. The utilities were responsible for decision-making in regard to planning and investment across the system in their designated area, secured by either public ownership or regulatory review. Electricity prices were set to cover the cost of the utilities, an approach called ‘rate of return’ or ‘cost of service’ regulation. This highly planned approach allowed for managing matching generation and network development, an issue that is now problematic for renewable generators.

From the 1980s onwards market reform movements aiming at efficiency gains through introducing competitive markets began to dominate the governance discourse for electricity supply. This led to a fundamental change in the way electricity was regulated in the major developed economies. Significant changes to the institutional framework of energy

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81 Today, only electricity networks continue to be viewed as natural monopolies, because of the large investment costs necessary to provide the infrastructure, whereas generation and retail can be provided by many actors.
82 Although, there are differences in detail. Thus, while Victoria had a single vertically-integrated state-owned electricity commission, in NSW only transmission and generation were integrated, with distribution and retail of electricity carried out via area franchises, for an overview see Mike Roarty, ‘Electricity Industry Restructuring: The State of Play’ (Research Paper No 14, Parliamentary Library, 1998).
83 See experience in the comparative case studies in chs 3, 5, 6 at II A 1, respectively.
86 See above at I C 1.

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provision were the result, with the aim of creating competitive national markets. These changes included, in most cases, 88

- **unbundling**, that is the factual separation of the different functions of electricity provision, especially of generation and retail functions from the network functions, i.e. transmission, distribution and retail; 89

- unbundling can be, but has not always been accompanied by a move towards *corporatization* and ultimately *privatization* of the electricity market segments, where they were state-owned initially; 90

- **third party access** - the opening of the grid to allow new competitors to participate in the energy market;

- introduction of *competitive markets* in the wholesale and generation sectors; and

- **incentive regulation** 91 of transmission and distribution networks.

The changes were based on neo-liberal concepts of economics – electricity could be treated as any other commodity and its natural monopoly nature did not prevent a competitive market. 92 Instead, so the theory indicated, for the networks a competitive market could be mimicked through network regulation. 93 Instead of competition through suppliers competing for consumers, regulation provided competition ‘by proxy’. 94

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89 As the General Electricity Generating Board in England and Wales or State Electricity Commissions in Australia; in contrast in Germany many of the utilities where private or publicly owned.

90 See International Energy Agency (IEA), *Lessons from Liberalized Electricity Markets* (2005) 31; although privatization has remained patchy, for more detail see country chapters.

91 As opposed to traditional cost-of-service or rate-of-return regulation. Incentive regulation relies on the regulator specifying a regulatory goal for the network operator, such as a certain degree of network reliability, and an estimated budget to achieve this goal, see in detail, Productivity Commission, above n 66, 129.

92 See, eg, Cameron, above n 87, 354-5.


The process of liberalization has been accompanied by a proliferation of actors in electricity supply. Instead of one integrated utility providing all functions of electricity supply, there were now four separate functions with separate actors for each function. Regulators became decision-makers for the regulated parts of the market. In Europe the continuing integration of electricity markets of member states added further institutional levels of decision-making.⁹⁵

Market liberalization, with its focus on allowing new entrants into generation, has been shown to change generation profiles and has been the driver for investment especially in natural gas generation in the UK.⁹⁶ For Australia, the introduction of a competitive electricity market has resulted in a shift towards an increasing reliance on coal as the fuel that has the lowest short-term marginal cost.⁹⁷ Overall though, generation profiles of electricity systems have changed little following this period of reform. Critically, investment in renewables has not been driven by these reforms. Instead electricity market reform has led to an increase in emissions.⁹⁸ This outcome, it has been suggested, is due to a narrow reliance on efficiency gains which favours the cheapest and not the most sustainable form of electricity.⁹⁹ Hamilton and Dennis show that market reform has ‘promoted short-term cost minimisation instead of economic efficiency’.¹⁰⁰ True ‘economic efficiency’, they claim, cannot be achieved ‘without accurate estimates of the size of the externalities known to exist in the market’,¹⁰¹ in this case the long-term impacts of electricity generation on the environment.¹⁰²

In a liberalized market, generators, including those generating renewable energy, make commercial decisions on how to invest in their businesses. These decisions are bounded by

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⁹⁵ See ch 4.
⁹⁶ See, eg, Australian Government, Bureau of Resources and Energy Economics, Energy in Australia 2012 (2012) 12, fig 21, or the so-called ‘Dash for Gas’ occurring after market reform in the UK, ch 5, II B.
⁹⁸ Ibid 15; also Rosemary Lyster and Adrian Bradbrook, Energy Law and the Environment (Cambridge University Press, 2006) 114 with additional sources.
¹⁰⁰ Hamilton and Denniss, above n 97, 15.
¹⁰² Ibid 21.
a legal framework that is designed to ensure that the system’s objectives are achieved. As Mitchell and Woodman point out, ‘liberalized electricity markets have been designed by regulators whose primary interest is controlling prices, and the most effective way of achieving this in short term in an established system is through exploiting the characteristics of the dominant technologies rather than seeking to change them.’\textsuperscript{103} The current system is thus not technology-neutral but rather skewed towards a specific, generation profile, in most countries based on fossil fuels.

\textbf{B The Wider Theory Context: Neoliberalism and the Regulatory State}

These specific developments in the electricity system can be seen as part of a larger movement towards reconsidering the role of the state in the provision of a range of essential services, be it water, health care, electricity or telecommunications.\textsuperscript{104} Neoliberal ideas of ‘privatisation, deregulation… and a diminishing public sphere’\textsuperscript{105} have driven reform of essential services provision. Market frameworks for electricity have been introduced because private entities were expected to provide this public service more efficiently with competition as a driver.\textsuperscript{106} While legal and regulatory frameworks continue to reflect the essential service nature of electricity provision through market objectives that demand safe, reliable and low cost supply of electricity, efficiency has become the guiding principle of the sector.\textsuperscript{107}

\begin{footnotesize}
\begin{itemize}
  \item[103] Mitchell and Woodman, above n 7, 582, (citations omitted).
  \item[104] For further reading, see Rolf W Künneke and Matthias Finger (eds), \textit{International Handbook of Network Industries: The Liberalization of Infrastructure} (Edward Elgar, 2011) and Christoph Hermann and Jörg Flecker (eds), \textit{Privatization of Public Services} (Routledge, 2012), both provide multiple examples of liberalization and privatization in both network industries, such as water, electricity, gas, telecommunications, rail and ports; as well as healthcare.
  \item[105] John Braithwaite, \textit{Regulatory Capitalism} (Edward Elgar, 2008) 5.
  \item[106] IEA, above n 90, 15.
  \item[107] Ibid.
\end{itemize}
\end{footnotesize}
1 The Regulatory State

In the neo-liberal conception, the new role of the state is one of ‘steering’ rather than ‘rowing’. This phrase neatly encapsulates the idea that policy decisions should be separate from service delivery. While originally electricity supply was, in many cases, a direct state responsibility, now private actors dominate the sector. Their activities are bounded by a legal and regulatory framework that emphasizes ‘government at a distance’. ‘[T]he state is no longer seen as competent to directly provide certain public goods, yet it is still – as a ‘regulator’ – responsible for their provision on a private basis’. This shift from a ‘provider’ to a ‘regulatory’ state can be clearly seen in electricity reform.

The ‘turn to markets’ for the more efficient provision of essential services has not led to a decreased role for law in the electricity system. Rather such reforms have resulted in the proliferation of law and regulation, firstly, to set up the institutional structure of the market, and secondly, to ensure that these markets continue to fulfill their public tasks, such as requirements for universal and efficient supply. The increase of regulation in the public services sector, even though seemingly at odds with the neo-liberal agenda of less rather than more state, is a well-described phenomenon. Thus, while in theory electricity sector reform was driven by neoliberal ideas of a minimal state, in practice it has been accompanied by increased regulation and a different, but arguably not lesser, role of the state.

109 Ibid 35.
110 This term and that of ‘governing economic life at a distance’ was first used by Peter Miller and Nikolas Rose, ‘Governing Economic Life’ (1990) 19(1) Economy and Society 1.
114 On the changed role of government in liberalized markets for electricity see IEA, above n 90, 14-18.
2 Conceptualizing Regulation in Market Frameworks

Academic commentary on the new patterns of regulation focused on the concept of the ‘regulatory’ state, and the switch in its function from ‘rowing to steering’. In its understanding of ‘regulation’, this thesis draws on the oft-cited definition of Braithwaite, who conceives regulation as a ‘large subset of governance that is about steering the flow of events, as opposed to providing and distributing’. The term regulation is narrowed here to concentrate on ‘the aggregate efforts by state agencies to steer the economy’. Wider theories of regulation, as ‘all mechanisms of social control’ are increasingly important, and their validity is acknowledged. However, in line with the purpose of analysis, this thesis will concentrate on legal frameworks employed to steer the provision of electricity in a liberalized market.

It is possible to characterize two different aspects of steering: ‘regulation of markets’ and ‘regulation through markets’.

Electricity markets have been designed to take over the function of the state as the provider of electricity. Regulation therefore is occupied with the creation of the market, the setting up of ‘a substructure of rules and other institutional and normative devices’, without which the market could not function. These devices can be market-constitutive or concerned with continued policing of the market, to ensure ‘a level playing field’.

Firstly, and in a wider sense, the electricity market and its associated legal and regulatory frameworks become regulatory tools – the state steers electricity provision through the use

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116 Osborne and Gaebler, above n 108, 25.
117 Braithwaite, above n 105, 1.
118 See Jordana and Levi-Faur, above n 112, 3.
119 Ibid. Note here, that while especially in Europe, supranational, ie non-state, regulation becomes increasingly important, European law in regard to electricity markets still requires nation state level implementation, see also ch 4, I D.
120 Julia Black also agrees that a narrower or wider conceptualisation depend on the purpose of the analysis, Julia Black, ‘Critical Reflections on Regulation’ (Discussion Paper, DP 4, Centre for Analysis of Risk and Regulation, London School of Economics and Political Science, 2002) 22.
122 Ibid.
of liberalized markets. While markets usually ‘are created by actors within the market’,\(^\text{123}\) when used as a regulatory tool, ‘outsiders define and design the market and establish the rules and the players function according to the rules laid out’.\(^\text{124}\) Markets are now increasingly employed as regulatory tool in environmental and resource management law.\(^\text{125}\) For example, both Emissions Trading Schemes and Renewable Energy Target Schemes rely on created markets to achieve public interest outcomes. Similarly, the electricity market has been used as regulatory tool to more efficiently provide an essential service – electricity.

Secondly, and in a narrower sense, legal and regulatory frameworks provide for the regulation of the electricity market – they are ‘concerned with the continued policing of the market’. They ensure that the electricity market achieves its purpose of safe, secure and universal supply. This includes the economic regulation of electricity network businesses to ensure that they do not abuse their monopoly position or price controls in the retail market.

3 The Public-Private Divide and Markets as Regulatory Instruments

Accepting that electricity markets constitute regulation through markets also has implications for ideas of separate public and private spheres, which have dominated economic and legal discourse.\(^\text{126}\) The move towards market mechanisms, rather than state provision of essential services, has been accompanied by a distinct shift of the boundaries between what is public and what is considered the private realm. Conceptions based on economic theory draw a hard line between the public and the private realm. The division is one of ‘the market versus regulation’,\(^\text{127}\) with the market seen as being in the private sphere and regulation as part of the greatly diminished public sphere.

\(^{123}\) Pfaffenberger, above n 50, xxxv, xxxvi.
\(^{124}\) Ibid.
However, accepting that the market is an instrument of regulation cuts across this artificial public-private divide. As has been described above, electricity provision was initially considered to be a public exercise, mostly undertaken by state-owned utilities. The essential service character of electricity supply continues to live on in the regulatory frameworks of the electricity markets. Yet, post liberalization of the electricity sector, it is mostly private actors, with private profit interests, operating across the industry. These actors, though, perform ‘public’ functions, such as ensuring universal supply. Large firms, which dominate the electricity sector, occupy a position between the public and the private: ‘their decisions on investment, employment and output have important allocational and distributional implications, which resonate in the “public sphere”, they thus ‘carry out functions of an essentially public character’.128 As will be shown in chapters 3, 5 and 6, especially network businesses are continuing to provide the public functions of safe, secure and reliable electricity supply, and the regulatory regimes are designed to achieve these public policy goals through private actors. In sum, it can be argued that depicting the state as ‘the public’ versus the market as ‘the private’ is not valid in the electricity sector, with different hybrid forms of public and private being prevalent.129

The contradiction between an ‘economics derived’ conception of the market as private and the reality of the market as not only being regulated but also itself constituting regulation and thus inherently straddling the public and the private sphere, is apparent in different conceptions of the role of law in supporting renewable energy.

128 Mitchell and Woodman, above n 7, 275.

129 For example, in some of the Australian states, network owners have not been privatized, see ch 3; one of the biggest German utilities, the EnBW Energie Baden-Württemberg AG has the Land Baden Wuertemberg and a consortium of municipalities and regional authorities as its main shareholders; for more details on the structure of the German industry see ch 6, II C; also on hybrid markets, A Correljé and L de Vries, ‘Hybrid Electricity Markets: The Problem of Explaining Different Patterns of Restructuring’ in Fereidoon Sioshansi (ed), Competitive Electricity Markets: Design, Implementation and Performance (Elsevier, 2008) 65.
III The Role of Law in the Electricity Market: Comparing Economic Theory and Systems Conceptions

The significance of state regulation and hence the role of law in ‘market’ frameworks is wider than often acknowledged. Three distinct levels of law have a part in the ‘steering’ characteristic of activity in the electricity sector.

Constitutional legal frameworks determine which level of government is responsible for creating regulatory frameworks for the electricity sector. Constitutional structures ‘establish[es] the institutions that serve as authoritative source of law and endow the them with legislative power’. Constitutional law, and its impact on institutional frameworks is in this sense meta-regulatory; it provides for the regulation of these institutions.

The term meta-regulation is often used to describe steering mechanisms that enhance the self-regulatory capacity of organizations. However, as McHarg rightly points out, conceiving meta-regulation as ‘regulating the regulators’ is also covered by the term. In Parker’s words, ‘meta-regulation can also entail any form of regulation … that regulates any other form of regulation.’ While Parker gives examples such as legal regulation of self-regulation, non-legal methods of ‘regulating’ internal corporate self-regulation and the regulation of national law-making by transnational bodies, clearly, the term expands to include constitutional structures. As Braithwaite and Parker find, ‘a constitution is an institution designed to foster what we call institutional meta-regulation’. In federal states such as Germany and Australia, constitutional structures determine the respective scope of the legislative powers of the federal and the state governments for energy and

130 See below at III A, for narrow conceptions of the role of law in market frameworks.
133 See, eg, Christine Parker, ‘Meta-Regulation: Legal Accountability for Corporate Social Responsibility’ in Doreen McBarnet, Aurora Voiculescu and Tom Campbell (eds), New Corporate Accountability: Corporate Social Responsibility and the Law (Cambridge University Press, 2009) 207.
135 Parker, above n 133, 211.
136 Ibid.
137 Braithwaite and Parker, above n 132, 283.
environmental law. In Australia, a historically narrowly conceived role for the Commonwealth in the *Australian Constitution* has led to the development of extra-constitutional, intergovernmental arrangements for issues that require solutions beyond state borders, such as the creation of the National Electricity Market. In Germany, the wider reach of federal powers as enshrined in the constitution allows for a federal legislation for both electricity markets and environmental concerns. In the UK, constitutional structures determine the degree of devolution between the different countries that make up the nation state of the UK. European Union Law, too, enshrines a ‘quasi federal’ structure of competences which reflects the interaction and tensions between nation state and supranational regulation. European law thus provides a further layer of regulation to the German legal and regulatory frameworks for electricity markets and renewable energy. As will be shown in chapters’ 4, 5 and 6, EU law has been a defining driver for liberalizing electricity market reform in the EU member states. At the same time, EU target setting for renewable energy has provided considerable momentum for regulatory reform, especially in the UK.

A second meta-regulatory layer in legal frameworks governing electricity markets involves law operating in a strategic, directive role. Law gives legal expression ‘to general objectives of the regulatory regimes’. In the electricity context, these objectives include the ‘legacy norms’ of accessibility and security of supply, but also newer objectives of economic efficiency. General systems objectives are expressed legally through institutions, general rights, powers and obligations. Regulatory objectives, binding renewable energy and carbon reduction targets, and the concrete governance frameworks for developing market rules and regulations, all fall within this category of law. This law determines the

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138 In detail see ch 3, I C, II A2.
139 In detail ch 6, I C.
140 In detail ch 5, I C.
142 See also ch 4, I C.
143 McHarg, above n 134, 292.
144 Ibid.
orientation, and the possible reorientation of a regulatory regime.\textsuperscript{145} McHarg sees this level of law as the ‘greatest independent contribution’ to achieving sustainability in the electricity systems, because it has the functions of ‘reinforcing and maintaining political commitment … providing a means of coordinating dispersed regulatory capacities and … balancing requirements of regulatory certainty and flexibility’.\textsuperscript{146} As renewable energy needs to compete with established technologies, which have co-developed with institutions and social expectations, these means of reorienting the regulatory regime have a central part in overcoming systemic constraints.

Finally, law is involved in these regimes as enabling specific regulatory instruments. As noted, proliferation of regulation has been one outcome of the turn to the regulatory state.\textsuperscript{147} This is also apparent in the legal frameworks for electricity markets. Thus, law is necessary to enable and police the market. It sets up structures for market access rules, network price controls, and licensing regimes for electricity market participants. Law in this instrumental role also provides for specific regulatory intervention to support renewable energy.

All three levels of law are interlinked. Thus, for example, setting the level of government that is responsible for electricity provision, in turn determines the institutional frameworks for the electricity market. Target and objective setting at the strategic level influences the choice of legal instruments to achieve these targets. Godden and Peel illustrate these interactions in regard to environmental law, approaching

\begin{quote}
    law as a factor in the creation and maintenance of particular political and state (i.e. government systems, which in turn provide the backdrop for the emergence and operation of environmental laws and the actors who shape, reform and implement those laws.\textsuperscript{148}
\end{quote}

In the following sections, the ability of the two theoretical approaches, the standard liberal market model and the systems approach, are contrasted in regard to the way in which they conceptualize and address the role of law within electricity market legal frameworks.

\textsuperscript{145} Ibid.
\textsuperscript{146} Ibid 292-293.
\textsuperscript{147} Above II B 1.
\textsuperscript{148} Godden and Peel, above n 125, 63.
A The Standard Liberal Market Model and the Role of Law

Based on increasing evidence of market reform across the world, Littlechild, a strong proponent of liberal market models for electricity, defined the standard or textbook model for electricity reform.\textsuperscript{149} It has become a defining benchmark for assessing electricity market reform in economics. The model contains a number of elements, which have since been further developed by other authors, such as Joskow\textsuperscript{150} and Newbery.\textsuperscript{151} The central elements of the model include:

- \textit{privatization} to enhance performance and reduce the ability of the state to use these enterprises to pursue costly political agendas;
- \textit{vertical separation} of competitive and regulated monopoly sectors to facilitate competition and regulation;
- \textit{horizontal restructuring} to create an adequate number of competing generators and suppliers;
- designation of an \textit{independent system operator} to maintain network stability and facilitate competition;
- creation of voluntary energy and ancillary services \textit{markets and trading arrangements}, including contract markets and real-time balancing of the system;
- application of regulatory rules to promote \textit{access to the transmission network} and incentivize efficient location and interconnection of new generation facilities; and
- creation of \textit{independent regulatory agencies} with adequate information, staff and powers, and duties to implement incentive regulation and promote competition.\textsuperscript{152}

\textsuperscript{149} See above n 4, later refined in Littlechild, ‘Market versus Regulation’, above n 5, xvii.
\textsuperscript{150} Joskow, ‘Introduction’, above n 4, 1.
\textsuperscript{152} As well as: \textit{Unbundling of retail tariffs} and rules to enable \textit{access to the distribution networks} in order to promote competition at the retail level; specification of \textit{arrangements for supplying customers} until retail competition is in place; and provision of \textit{transition mechanisms} that anticipate and respond to problems and support the transition rather than hinder it.
Following this list of elements, Littlechild also expressly added, ‘Do nothing more. At least, the need to avoid excessive government and regulatory involvement is one of the lessons to be learned.’\textsuperscript{153} The last sentence is telling. ‘Do nothing more’, perpetuates the idea that, other than market creation according to an ideal set of model elements, and regulation to ‘to promote access to the transmission network and incentivize efficient location and interconnection of new generation facilities’, no further state intervention should be undertaken. Instead, regulation, in the narrow sense of price regulation of monopolies, was considered only necessary ‘to hold the fort until competition arrives’.\textsuperscript{154}

Establishing a market framework would lead to a technology-neutral electricity supply system,\textsuperscript{155} where the most efficient technologies will be supported over less efficient technologies.\textsuperscript{156}

State intervention in this model hence should be kept to a minimum and only be used to address market failure.\textsuperscript{157} One instance of market failure is the existence of natural monopolies in electricity networks. This, according to the model, provides the justification for economic network regulation. Accordingly, economic regulators’ decision-making frameworks are trying to mimic competition by ensuring third party access and basing decision-making on efficiency.\textsuperscript{158} The competitive market structure prevalent today, has been custom-designed to enhance competition under the premise that ‘competition is the best regulator’.\textsuperscript{159} The other instance of market failure that justifies intervention, is the socialized environmental costs of fossil fuel generation.\textsuperscript{160} These become an \textit{externality} in

\textsuperscript{153} Littlechild, ‘Market versus Regulation’, above n 5, xvii.
\textsuperscript{155} See, eg, Australian Government, \textit{Energy White Paper} (2012), stating as a central electricity market policy principle that 'energy market design should not give preference to particular technologies or fuel types', 110.
\textsuperscript{156} IEA, above n 90, 3.
\textsuperscript{157} Littlechild, ‘Beesley Lecture’, above n 4.
\textsuperscript{158} See, eg, Australian Government, above n 155, expressly limiting government intervention to clear direction to markets and ‘effective regulation and targeted support to address identified areas of market failure’, 37.
\textsuperscript{160} IEA, above n 90.
the language of market liberalism. Externalities are ‘costs or benefits not reflected in prices’.  

Littlechild proposed a very limited set of market design principles. While these have been used as benchmarks to assess and compare electricity market reform, economic theory has since moved beyond a ‘one size fits all’ solution to market reform. Economic researchers such as Pfaffengerer or Correlje and de Vries have pointed out that market design and the success of introducing different elements of reform depends on exogenous factors, including physical, political and economic factors.

While economic theory, and especially institutional economics, increasingly recognizes the importance of institutional factors in market design, the role of law in designing and defining these market frameworks, and the impact this has on the ability of new technology to be supported, is rarely addressed. The role of law in liberal economists’ concepts concentrates on the ‘the underpinning of economic relations by recognition and enforcement of property rights.’ Where regulation as impingement on the market is necessary, law also has a secondary role as a ‘vehicle of regulation’. This ‘instrumentalist’ view of law in regulation is common to many accounts of economic regulation, including that of electricity market regulation. It relies on regulation being

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162 For example, Pollitt poses the question if the ‘standard model’ can successfully be implemented in states with a centralized government, Michael Pollitt, ‘Liberalization and Regulation in Electricity Systems: How can we get the balance right?’, in Fereidoon Sioshansi (ed), Competitive Electricity Markets: Design, Implementation and Performance (Elsevier, 2008) xxxi.
163 See, eg, Correlje and de Vries, above n 17, 65; also Pfaffenger, above n 50.
165 Although the idea of regulation through markets has been addressed by legal scholars, eg, Laura MacGregor et al, above n 154, this has not been applied in the context of supporting renewable energy in a liberalized electricity market.
166 Terence Daintith, ‘Regulation’ in Richard Buxbaum and Ferenc Mádl (eds), International Encyclopedia of Comparative Law (Mohr Siebeck, 1997) vol XVII, 10, 16.
167 Ibid.
169 See IEA, above n 90.
‘a means to an end: that of maximizing general welfare, conceived in terms of maximizing allocative efficiency.’

A result of relying on economic analysis of the role of law is the failure to apply any legal, political, or social analysis, and a mere instrumental conception of law as a neutral technology for implementing policy choices. Another result, in some hands, is the failure to understand the role of law and regulation in constructing markets and controlling them.

Thus, as Heller and Victor identified, while the gap between neo-liberal ideas and the practice of market reform is recognized, and has been attributed to institutional factors. They argue that:

nearly all scholarship has treated them as a residual category. Studies that have given attention to these factors are usually anecdotal and suffused, typically, with view that politics, law and institutions are barriers to be cleared before launching the real work of designing markets in accord with the standard model – obstacles on the path to the shining city. … Indeed, these factors appear to be the dominant ones in explaining the actual pace and character of market reforms in the electric power system in developing countries.

Much legal research on renewable energy implicitly accepts the dichotomy between markets and regulation as separate private and the public spheres by concentrating on external instruments and adopting the language of market failure. As has been shown in chapter 1, legal research, as well as political discourse, emphasize the role of law in addressing market failure, and not in designing these markets. Thus legal literature that analyses the level of support for renewable energy overwhelmingly concentrates on support instruments such as the RET, their design, and the interaction with other climate change policies such as emissions trading. It focuses, as has policy, on design questions of market external instruments, which perpetuates the public/private divide underlying the role of law.

171 Barton, above n 159, 17.
in the standard liberal market model. The impact of reforms delegating technology choice and network planning to network and generation businesses and the implications for the legal and regulatory framework has been less of a focus.

Thus, the influence of the meta-regulatory role of law in setting up market frameworks, determining their objectives and institutional frameworks, both in constitutional and statutory law, is not acknowledged. The role of these constituted electricity markets and their legal and regulatory frameworks in locking-in fossil fuel-based electricity systems, is overlooked in analyses based only on instrument design and price of technology.

B Systems Conceptions as an Alternative

Analyzing law as an element of a socio-technical system requires a different form of inquiry to that accepting a narrow role of law in market frameworks by taking assumptions from economics. The starting point for this inquiry sees the legal and regulatory frameworks of electricity markets as an institutional element of the electricity system that has co-developed with multiple other elements. The question for investigation thus becomes, what are the system-inherent barriers for renewable energy? In other words, what is the electricity system that has co-developed with the extant legal and regulatory frameworks?

The emphasis of a systems approach is on the elements of constituting and managing the electricity market. These elements include the meta-regulatory law identified above as constitutional law\(^\text{173}\) and also the laws ‘regulating the regulators’ in order to direct and (re)orient the system. Instead of assessing whether legal support instruments for renewable energy are designed efficiently, they need to be assessed on whether they can overcome system-inherent barriers.

Currently, the electricity system in Australia, and in many other countries, is fossil fuel-dependent. This dependence is supported by all elements of the electricity system. Fossil

\(^{173}\) Indeed, Künneke and Groenewegen, above fig 1, expressly list ‘constitutions, laws and regulations’ as formal institutional systems elements.
fuels constitute a reliable source of energy that can provide electricity cheaply and reliably. The existing technology and infrastructure have co-developed with these energy sources. As Maria van der Hoeven, the executive director of the International Energy Agency, said recently in regard to coal:

No fuel is as responsible for powering the economic growth that has pulled billions out of poverty in the past decades…. Coal is abundant and geopolitically secure, and coal fired plants are easily integrated into existing power systems.¹⁷⁴

She goes on to point out that continued use of coal is unsustainable, and that there is a multilevel challenge to change the system to be renewable energy-based.

The strong path-dependence of the electricity system is a result of the close interrelation of all systems’ elements, encompassing ‘capital-intensive infrastructure, a broad range of technical components and technologies and a variety of actors and institutions’.¹⁷⁵ Unless a new technology is easily integrated into the existing system, law will have to target its integration to overcome systemic lock-in. In other words, in an existing system, ‘if governments or societies desire a new technology, they must not only construct its artefacts but also create a transition path toward it.’¹⁷⁶

Taking a systems view towards electricity is based on the acceptance that the legal and regulatory framework of the electricity market is not technology-neutral, but enshrines a particular generation and network profile. The question therefore shifts from the identification of the best instrument design to address externalities, to how the law in setting up and policing these electricity market frameworks enshrines particular technology patterns. The question for designing policy instruments such as emissions trading or renewable energy support schemes also shifts to assessing their ability and suitability to address these systematically and hence institutionally enshrined patterns.

¹⁷⁵ Markard and Truffer, above n 27, 609.
¹⁷⁶ Rip and Kemp, above n 10, 354.
Viewing electricity supply as a system also means that beyond addressing the barriers that the existing system poses for renewable energy, the increasing uptake of renewable energy will have system implications. These, in turn, necessitate adaptation and responsiveness of the legal and regulatory frameworks. The system itself will therefore change with the increasing uptake of renewable energy.

Law has a central role to play either in locking the current system in its old path, or in creating a new transition path, which predominantly relies on renewable energy. The following section expands on how a legal analysis can take account of the systemic nature of electricity.

**IV Using Systems Conceptions of Electricity to Clarify the Role of Law in Market Frameworks**

The existing conceptions of socio-technical systems give little guidance on how to identify the role of law within a system that relies on a market governance framework. This thesis therefore refines its analysis by drawing on institutional theories of regulation, in particular the concept of regulatory space. This provides a novel analytical tool to investigate the role of law in market frameworks, building on a socio-technical systems conception of the electricity system.

The thesis here draws on Morgan and Yeung’s analytical framework for a legal approach to regulation.177 Morgan and Yeung, similarly to Baldwin and Cave’s ordering, identify different theories of regulation in regard to the role of law, encompassing public and private interest theories of regulation as well as institutionalist theories regulation.178 They seek to provide a richer account of the possible role of law in regulation by directing attention to the ‘political and constitutional context in which regulation is embedded’.179 The role of

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179 Morgan and Yeung, above n 177, 4.
law is not so much concerned with ‘directly controlling the pursuit of regulatory goals, [but rather] emphasizing non-legal organizational and systemic dynamics as crucial to regulatory trajectories.’

Institutionalist regulatory theory can capture the uneasy position that energy regulation inhabits between the private sphere of commercial business and the public sphere of ensuring the necessary state control of an essential service. Morgan and Yeung identify two main factors that are common to institutionalist views of regulation. These are the opportunity to capture institutional dynamics and the acceptance that the distinctions between public and private actors and interests become increasingly distorted.

A Regulatory Space and the Role of Law

A particular institutionalist theory of regulation that can be usefully adapted to examining the role of law in electricity systems is the concept of regulatory space. This concept resonates with the systemic embeddedness of electricity because it acknowledges the influence ‘history, national culture and organizational dynamics’ may have on regulatory dynamics. The concept of regulatory space describes the arena in which regulation for a particular issue – in this case electricity supply – happens. It relies upon a notion of non-hierarchical, de-centered regulation, shared by private and public actors. The ‘range of regulatory issues subject to public decision’ defines the ‘regulatory space’ that can be

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180 Ibid 76.
181 Morgan and Yeung, similarly to Baldwin and Cave’s ordering, identify different theories of regulation in regard to the role of law, encompassing public and private interest theories of regulation as well as institutionalist theories regulation; above n 177, 16ff.
182 Morgan and Yeung, above n 177, 53.
184 Morgan and Yeung, above n 177, 60.
occupied by different participants in regulation.\textsuperscript{186} How the ‘power and influence’ within this space is allocated, is determined ‘by legal tradition and by a wide range of social, economic, and cultural factors’.\textsuperscript{187} Hancher and Moran claim that ‘the character of a legal culture mediates the regulatory process, fixing the scope of regulatory space and influencing who gains entry and on what terms’.\textsuperscript{188}

For some, the regulatory space concept seems too open-ended to provide a foundation for legal inquiry, with commentators critiquing the vague terminology of ‘legal culture’,\textsuperscript{189} and the limited guidance the concept provides to the legal scholar seeking to define law’s relation to regulation.\textsuperscript{190} Over time, however, the concept has been used to complement legal and regulatory inquiry by a range of authors.\textsuperscript{191} As Scott argues, ‘[t]he ‘regulatory space’ metaphor draws attention to the fact that regulatory authority and responsibility are frequently dispersed between a number of organizations, public and private.’\textsuperscript{192} Gunningham uses the concept to describe the changing composition of actors employed in regulation as part of the changing role of the state from rowing to steering.\textsuperscript{193} Chowdhury and Wessel refine the concept to identify the way legal rules ‘shape this legal space and determine the architecture, general principles and the actors that perform important regulatory functions under the legal rules’.\textsuperscript{194}

This thesis concentrates on the question of how law as embedded in a socio-technical system determines ‘who gains entry and on what terms’. The question of how law allocates power to actors, and how it expresses values within the regulatory space determined by the

\textsuperscript{186} Hancher and Moran, above n 183, 277.
\textsuperscript{187} Ibid 291.
\textsuperscript{188} Ibid 282.
\textsuperscript{192} Scott, above n 185, 331.
\textsuperscript{193} Gunningham, above n 191, 199-200.
\textsuperscript{194} Nupur Chowdhury and Ramses A Wessel, 'Conceptualising Multilevel Regulation in the EU: A Legal Translation of Multilevel Governance?' (2012) 18(3) European Law Journal 335, 351.
wider electricity system, are central to this enquiry. This analysis can make visible the constraints the legal and regulatory framework – as an institutional element of the electricity system – has on renewable energy. Because of the systemic nature of electricity supply, gaining entry to the electricity system is a physical as well as regulatory question. Regulatory space concepts can take account of these constraints.

B Liberalized Electricity Markets and Regulatory Space

A range of public and private actors now participates in the delivery of electricity supply. Split responsibilities between government and independent regulators, as well as the new range of different industry participants make for a complex ‘regulatory space’. This resonates with a blurring of the distinction between public and private sphere that has been recognized as central to the liberalization of the electricity market. Indeed, Hancher and Moran device the concept of regulatory space precisely because economic regulation in modern capitalist states does not obey the public-private dichotomy.\(^\text{195}\)

Because the technology of the electricity system has remained largely intact, the interdependent and dynamic relationship between the actors involved becomes especially important. All parts of the system are technically interdependent.\(^\text{196}\) The decisions of each of the actors in the regulatory space are accordingly also interdependent and thus limit the range of possible actions they can take.

How ‘power and influence’ are allocated within this space depends on how law frames entry conditions and also on how meta-regulatory law, such as the constitutional legal framework, enables and shapes regulatory space. Meta-regulatory law is accordingly part of this space and defines its ‘architecture’. In the case of Germany, where the constitution includes a constitutional principle to protect the environment, it also informs the general principles governing the regulatory space.

\(^{195}\) Hancher and Moran, above n 183.
\(^{196}\) See above at I C 1.
How exactly the roles and responsibilities have been distributed between different actors, especially what tasks have been delegated to private actors and what tasks remain with the state, and how law directs decision-making by the regulators, impact upon the uptake of renewable energy within market frameworks.

Additionally, a range of other issues constrains the impact of these laws. Parker and Braithwaite refer to the concept of regulatory space as capturing ‘how the intended effects of regulation are modified and mediated by social customs and structural realities’.

While law thus prescribes the roles and responsibilities, the wider electricity system, its infrastructure and norms can constrain its impact. This resonates with the socio-economic systems conception employed in this thesis, which does view law as one of many interdepending elements making up the electricity system.

V Adapting Comparative Legal Research

The framework, described above, derived from systems conceptions and regulatory theory is applied comparatively to the law and regulation of electricity systems in Australia, Germany and the UK in the following chapters 3-6. This section describes the nature of comparative research and its capacity to inform a system-based approach to the analysis of electricity market regulation.

Comparative research features prominently in the description of the impacts of electricity market reform on different countries, as well as different renewable energy support instruments. Yet, it is mostly economics and policy and regulatory literature, which

has dominated comparative studies in the energy sector. In regulatory studies especially, a comparative approach is a common instrument for academic analysis,\textsuperscript{202} and a number of comparative regulatory studies have engaged with the area of renewable energy and electricity markets.\textsuperscript{203}

In contrast, targeted comparative legal research has been focused mostly on renewable energy support instruments,\textsuperscript{204} or climate mitigation measures.\textsuperscript{205} Electricity market legal frameworks and their impact on the ability to integrate renewable energy into the electricity system have received limited attention in comparative legal studies.\textsuperscript{206} While some legal comparative works mention the electricity market challenges of integrating renewable energy, they do not go beyond a description of the legal frameworks.\textsuperscript{207}

One reason for this lack of comparative focus may be that comparing regulatory frameworks challenges traditional comparative legal research methods.

\textsuperscript{200} Such as Jamasb and Pollitt, above n 88, and Joskow, ‘Lessons Learned’, above n 198.
\textsuperscript{201} Such as Midttun or Eberlein and Doern, both above n 21.
\textsuperscript{202} See, eg, Levi-Faur’s review of four different comparative approaches to the study of regulation, ‘The Comparative Research Designs in the Study of Regulation: How to Increase the Number of Cases Without Compromising the Strengths of Case-Oriented Analysis’ in Jordana and Levi-Faur (eds), above n 111.
\textsuperscript{203} See, egs, Doern and Eberlein and Midttun. Both above n 21.
\textsuperscript{205} See, eg, Oschmann, who compares climate change legislation in Australia and Germany with the aim ‘to compare how the Australian and German federal legal systems are currently addressing and prospectively might address the transformation of their energy sectors’. He does not, however, address electricity market law and regulation, but instead investigates different instruments for climate mitigation; Volker Oschmann, \textit{Energy in Transition: A Comparative Analysis of the Australian and German Legal Frameworks for the Decarbonization of the Energy Sector in Response to Climate Change} (LLM Thesis, University of Western Australia, 2011).
\textsuperscript{206} With the notable exception of Cantley-Smith, who provides a comparison of sustainable decision-making in the electricity market of Australia and the UK concentrating on the objectives of regulators; Rowena Cantley-Smith, ‘Regulatory Uncertainty in the NEM: Sustainable Decision Making and Climate Change Law’ in Rowena Cantley-Smith and Diana Bowman, (eds) \textit{Green Power: An Environmental Audit of the National Electricity Market} (Research Publication, 2009) 53.
Comparative legal research is a long-established and well-recognized method of legal research\textsuperscript{208} and has its own methods and questions that determine what is compared and how comparisons should be undertaken.

A wide range of literature is available discussing ‘comparative law’ or ‘comparative legal research’.\textsuperscript{209} Much of it is phrased in terms of different legal traditions or families, the most prominent of which are common law and civil law.\textsuperscript{210} Comparative legal research is not, however, necessarily based on the large-scale comparison of legal cultures. Micro-comparison relates to the study of certain aspects of different legal systems, such as institutions or certain branches of national law as well as the ‘ideological, socio-legal and economic bases of those systems.\textsuperscript{211}

Functionality and comparability lies at the center of much of the classic methodology in comparative legal research, comparing rules or institutions, which fulfill a similar function in different societies.\textsuperscript{212} The context of history, culture, and economy has to be taken into account in the analysis, and indeed, omission of extra-legal factors in comparison is considered a classic pitfall in comparative legal study.\textsuperscript{213} Nonetheless, traditional comparative legal research has remained relatively narrowly focused on legal concepts. The ‘broad mainstream of comparative law today is careful to distance itself from the work of governance and the choices of political life.’\textsuperscript{214} It is this isolation of law from policy and politics that makes the application of traditional comparative method an uncomfortable fit with the relative fluidity of regulation and regulatory law.

\textsuperscript{208} The ‘birth’ of comparative law as a legal discipline was a 1900 congress in Paris. Konrad Zweigert and Hein Kötz, \textit{An Introduction to Comparative Law} (Tony Weir trans, Oxford University Press, 3\textsuperscript{rd} ed, 1998) 2 [trans of: \textit{Einführung in die Rechtsvergleichung auf dem Gebiete des Privatrechts} (first published 1969)].


\textsuperscript{210} Standard works taking this approach include, René David and John Brierley, \textit{Major Legal Systems of the World Today} (Stevens, 3\textsuperscript{rd} ed, 1985) 17 ff; John Henry Merry Man and Rogelio Pérez-Perdomo, \textit{The Civil Law Tradition: An Introduction to the Legal Systems of Europe and Latin America} (Stanford University Press, 3\textsuperscript{rd} ed, 2007); Zweigert and Kötz, above n 208, from 63.

\textsuperscript{211} de Cruz, above n 209, 234, with further sources.

\textsuperscript{212} Classic, Zweigert and Kötz, above n 208, 16.

\textsuperscript{213} de Cruz, above n 209, 230.

There is very little comparison of regulation or governance systems available from a legal perspective. This is due to several reasons. Comparative legal studies continue to be set up along subject areas of law. Taking a systemic view of the electricity sector and the role of law in facilitating renewable energy cuts across several traditional subject areas of law. For example, the regulatory regimes that give access to network infrastructure are sector-specific regimes under competition law, decision-making objectives of regulators can be addressed under the heading of administrative law, specific instruments to support renewable energy are discussed under the headings of climate law or environmental law. Clearly then, there is a fragmented but not a systemic view.

The lack of legal comparative studies also echoes the lack of legal engagement with regulation of electricity markets in general. It reflects the artificial separation of the public and the private sphere, identified earlier in this chapter, and is reinforced by an emphasis on economic concepts in legal research of electricity markets. These deficiencies led some authors, such as Daintith, to find that regulation was not suited for the comparative legal analysis of the relations of state, law and economy, because he considered the use of the term ‘regulation’ as too inconsistent and not able to be detached ‘from the legal concepts which should be the object, not the starting point of ... comparative analysis’. Daintith instead suggests a comparative analysis built on comparing policy instruments used in regulation.

Scholarship in comparative legal research has since moved beyond the narrow concepts of functionality to more flexible concepts of comparison. As a result, multiple methodological approaches to comparative legal research exist and ultimately legal

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215 See, eg, the catalogue of subject areas addressed in Mathias Reimann and Reinhard Zimmermann (eds), The Oxford Handbook of Comparative Law (Oxford University Press, 2006) from 869, addressing eg contract law, tort law, property law, family, constitutional law.
219 Godden and Peel, above n 125, 375.
220 Daintith, 'Regulation', above n 166, 10.
221 Ibid.
scholarship can identify the relevant approach that best suits the enquiry made.\textsuperscript{223} Comparative legal research has also ‘widened its ambit’ beyond private law and a ‘recourse of comparative lawyers to social science methods and approaches’ has been noted.\textsuperscript{224} In particular, ‘institutional arrangements for legally framing the economy’ have become a frequent subject of comparative legal research.\textsuperscript{225}

The wide acceptance of regulatory theory in legal scholarship provides an argument that comparing from a regulatory perspective is a legitimate approach in comparative legal research. Comparative legal research in the context of regulation means not only comparing specific laws or legal instruments employed to address a particular problem, but extends the comparison to include regulatory frameworks for markets in recognition of the complex regulatory environment and its dynamics. The inherent interdisciplinarity of the subject matter of energy regulation, situated in a cross-section of law, economics and policy studies, adds to the need to employ a regulatory perspective to comparison.

Zumbansen, in his call to apply a regulatory perspective to comparing European Corporate Law Regulation, states that there are

Distinct challenges arising in the area of comparative legal research where the analytical lens is not wide enough to capture the complex structure of such ‘semi-autonomous’ fields as they are emerging along functionally differentiated, organizational and regulatory areas.\textsuperscript{226}

It is this widening of the analytical lens, which is inherent in a systems perspective. It extends analysis beyond that of legal doctrine. Instead of stripping the regulatory environment away to compare one specific aspect or instrument to support renewable energy, the regulatory framework itself, its genesis and actor dynamics, becomes the object

\textsuperscript{223} Ibid, 561; see further for the aim of comparative study in this thesis ch 1, III C.
\textsuperscript{224} Antonia Bakardjeva Engelbrekt and Joakim Nergelius, ‘Introduction’ in Antonia Bakardjeva Engelbrekt and Joakim Nergelius (eds), \textit{New Directions in Comparative Law} (Edward Elgar, 2009) xiii, xiv/xv.
\textsuperscript{225} Ibid xv.
\textsuperscript{226} Peer Zumbansen, “‘New Governance’ in European Corporate Law: Regulation as Transnational Legal Pluralism” (2009) 15(2) \textit{European Law Journal} 246, 269. The ‘semi-autonomous’ relates to the social norms influencing and co-evolving with his study subject of European Corporate Law Regulation, Zumbansen’s point, however, can be made about any field of enquiry where law and regulation are embedded in a ‘complex regulatory environment’, 250.
of comparison. This resonates with the implications of systems conceptions for legal research.

VI Conclusion

This thesis does not set out to provide a research template for systemic change. System innovation literature has set up frameworks that attempt to capture the complexity of systemic transitional change in large technical systems. Here, instead, the depiction of electricity supply as a system, serves to help conceptualize the nature of the problem and to illustrate the shortcomings of the liberal market model.

This has implications for the analysis in the comparative studies undertaken in chapters 3-6.

Path dependence, as introduced above, is a central concept in a social-technical systems conception. It helps to understand that ‘it is sometimes not possible to uncover the logic (or illogic) of the world around us except by understanding how it got that way’. The following chapters 3 to 6, recounting the country-specific experiences for Australia, the UK and Germany respectively, will therefore provide a historical perspective of the development of the legal and regulatory frameworks for renewable energy in the electricity markets. They will also take into account technical, political and social systems elements and their influence on the legal and regulatory frameworks as formalized institutional elements of the system.

Rather than a legal instrument-based comparison to supporting renewable energy, this thesis accepts that a successful introduction of renewable energy into the electricity system is reliant on multiple factors of technological, institutional and normative nature that shape a complicated regulatory space. Within the regulatory space influenced by the system, law defines and prescribes the roles and responsibilities of the actors and thereby opens

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227 Geels, above n 7, from 20 with extensive literature review.
229 Ch 4 addresses the EU law and legislation regarding renewable energy and electricity markets upfront, as both the UK and Germany are member states of the EU.
230 See ch 1, III B.
decision-making spaces. All layers of law, meta-regulatory and instrumental, shape the regulatory space, and therefore influence ‘who gains access and on what terms’. As this chapter has shown, for renewable energy access to the socio-technical system of electricity supply is a physical as well as institutional question. The question is therefore, whether and how the legal frameworks can address the inherent systemic disadvantage for renewable energy.

Questions for the analysis of the current legal and regulatory frameworks for electricity markets in this thesis therefore include:

  a. How do constitutional legal frameworks influence the ability of government to shape and determine legal and regulatory frameworks?

  b. How does meta-regulatory law define the architecture and general principles of regulatory space by setting up institutions and objectives of the electricity market legal frameworks?

  c. Who participates in the regulatory space and how does law delineate their rights and responsibilities?

This framework provides the basis of the analysis in chapters 3, 5 and 6 concerning renewable energy integration in the electricity systems of Australia, the UK and Germany. The comparison emphasizes the similarities and differences in the institutional design of electricity market regulation. It highlights particularly the question of network regulation and the institutional design in regard to networks, which was isolated as one of the electricity market inherent barriers to higher renewable energy uptake in chapter 1.
CHAPTER 3: AUSTRALIA

In Australia, the National Electricity Market (NEM) in its current form has been in place for more than 15 years. Yet, the way Australia generates, transports and consumes electricity has been remarkably stable since electrification. Renewable energy sources, while increasingly taken up in Australia, remain a marginal source of electricity generation.

The physical component of the Australian electricity system continues to be reliant on large fossil fuel plants, usually geographically close to a resource, such as a coalmine. These generation facilities are linked to the major load centres by the electricity network and since electrification have reliably delivered electricity to a large percentage of Australians. The institutional component of the system, enshrined in the electricity market laws and regulations, is characterized by clearly defined roles for all market participants and a reliance on market mechanisms and efficiency concerns for future investment. The market framework is designed to be technology-neutral, that is, it should not distinguish between different sources of generation.

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1. Australia’s electricity generation remains reliant on existing fossil fuel sources and the associated infrastructure. While overall electricity demand has grown, the growth in renewable energy has not surpassed the growth in fossil-fuel sourced electricity. Coal and the associated network infrastructure continue to provide the bulk of Australia’s electricity. See, eg, Australian Government, Department of Industry, Energy White Paper: Issues Paper (2013) 35.


5. In detail below at II.


7. One of the market design principles in the NEM is ‘the avoidance of any special treatment in respect of different technologies used by market participants’, National Electricity Rules (Version 71) cl 3.1.4 of the (NER).
Uptake of renewable energy, while still a small part of the Australian generation profile, has been supported through both the federal Renewable Energy Target Scheme (RET) and a range of state feed-in-tariff schemes. The impact of the short-lived carbon price will be harder to measure.

Importantly, however, so far these measures have not led to a large-scale transformation of the way electricity is supplied and consumed in Australia. The measures aim at addressing the higher cost of generation of renewable energy, but do not challenge the barriers for renewables inherent in the electricity market governance framework. Instead they work within its confines. The barriers this poses to a substantial uptake of renewable energy are becoming increasingly apparent. They interplay with other challenges to the system, especially current price rises due to network infrastructure investment. At the same time, and for the first time since the current governance system was put into place, there is falling electricity demand. Together these factors mean that Australia faces serious difficulties in its efforts to transform its energy system to be more sustainable.

Australia’s experience with incorporating renewable energy into its electricity system provides the starting and the end point of this thesis. This chapter will set out the challenge renewable energy poses to the Australian electricity system and assess how well Australian legal frameworks are equipped to manage this challenge. Australia so far has resisted changes to its electricity market legal and regulatory frameworks, instead preferring to rely on market-external instruments to support renewable energy. This chapter will show how these instruments do not sufficiently address the systemically enshrined disadvantage renewable energy faces in the electricity system. This first substantial country case study of

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9 See, eg, *Electricity Industry Act 2000 (Vic) ss 40 f-40 nc; Electricity Supply Act 1995 (NSW)* and the *Electricity Supply (General) Regulation 2001 (NSW)*.
11 For details on parliamentary committee and consultant reports addressing this issue, see chapter 1, fns 70/71.
12 Electricity price rises in the last years are predominantly due to network cost rather than the much malign carbon price, see Australian Energy Regulator, *State of the Energy Market 2013 (2013) 131*.
13 Ibid 20 ff.
the thesis will provide the starting point for analyzing whether renewable energy requires targeted re-regulation of electricity market legal and regulatory frameworks and what barriers the legal framework of the liberalized electricity market provides for renewable energy.

Part I introduces the physical characteristics and the policy context for the Australian electricity system. In line with the socio-technical systems conception developed in chapter 2, this part illustrates the constraints other system elements pose to legal frameworks. Part II of the chapter concentrates on the development of the legal and regulatory frameworks as formal institutional elements of the Australian electricity system. It adopts a historical perspective to take account of the co-development of the legal and regulatory frameworks with other system elements. The resulting framework, designed to enable a liberalized electricity market, is described and analyzed in regard to its suitability for integrating renewable energy. The concept of regulatory space is used to emphasize the relative position of renewable energy in the liberalized market. In part III of this chapter, the main support measure for renewable energy in Australia, the federal Renewable Energy Target Scheme, is introduced and its ability to support systemic change is addressed. The chapter confirms that systemic lock-in of unsustainable generation and network patterns occurs in Australia, which is not sufficiently addressed by existing renewable energy support instruments.

I The Australian Electricity System: Context and Policy Drivers

A Resources and Physical System Characteristics

Australia is a vast country with abundant resources of both fossil fuels and renewable energy. However, the existing patterns of electricity infrastructure, i.e. generation facilities and the accompanying network infrastructure, follow the Australian settlement

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15 Including wind, solar, geothermal, wave, tidal and biomass resources, ibid.
pattern along the eastern coast. The bulk of network infrastructure remains interconnected within state borders, a legacy of initial system development on a state, rather than a federal level, with limited interconnection across state borders. As a result, Australia’s existing grid is unique compared to most developed countries. It is long and linear, stretching 5000 kilometers along the eastern coast of Australia, and providing power to six state jurisdictions and most of Australia’s population. This makes it the largest alternating current system in the world.

This particular infrastructure layout, together with the existing generation facilities, represents the physical part of the Australia’s electricity system. It provides a considerable barrier to renewable energy, because existing network infrastructure is, in many cases, not close to renewable energy sources. Additionally the lack of interconnection hinders better integration of renewable energy. The current physical system reflects historical development patterns, which also continue to live on in the current national regulatory framework for electricity markets, as will be shown in more detail below.

B Policy Development and Drivers

Energy policy development in Australia has taken place on state, federal and intergovernmental levels. Support for renewable energy is closely connected with the threat of climate change, felt acutely in a land of extreme weather events and droughts. The

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16 The Western Australian and Northern Territory electricity systems are not part of the NEM. They remain physically separate and have their own regulatory arrangements which are not subject of this analysis. More detail can be found at the website if the Western Australian Economic Regulation Authority, *Electricity* <https://www.erawa.com.au/electricity> and Northern Territory Government, ‘Northern Territory Market Reform’ (Information Paper, February 2014).
17 Below at II A 1.
19 Ibid.
20 Ibid, see also Australian Energy Market Operator, ‘100 percent Renewables Study: Modelling Outcomes’ (July 2013).
21 A highly interconnected grid provides more stability and can accommodate more intermittent renewable energy sources. This is also a major driver of European interconnection initiatives such as The North Seas Countries' Offshore Grid Initiative (2014) <https://www.entsoe.eu/about-entso-e/system-development/the-north-seas-countries-offshore-grid-initiative-nscogi/>.
domestic fuel source aspect of energy security\textsuperscript{22} – a major concern and policy driver for example for Germany, which is less endowed with conventional energy sources\textsuperscript{23} – is therefore not a driving force for transitioning to a low carbon energy system in Australia. At the same time this means that much of the climate mitigation policy commitments undertaken by Australia have been driven by international climate policy rather than national concerns.\textsuperscript{24} Unlike in the UK and in Germany, where, in line with EU policy, an increasing convergence of energy security, environmental and market objectives can be observed,\textsuperscript{25} climate concerns have not driven major changes to the energy market development in Australia. Thus, while in Germany electricity market reform has been undertaken in light of environmental concerns\textsuperscript{26} and British electricity market development is increasingly responding to environmental and especially renewable energy demands,\textsuperscript{27} Australia’s policy development continues to separate market developments, based on microeconomic reform, from sustainability issues.

Intergovernmental arrangements on competition policy developed through the Council of Australian Governments (CoAG)\textsuperscript{28} have been the major driver for policy change.\textsuperscript{29} Federal Energy White Papers in 2004\textsuperscript{30} and 2012,\textsuperscript{31} and 2015\textsuperscript{32} did not question the ability of the electricity market to engender a transition to a cleaner energy future. This view is further entrenched through the legislative frameworks for electricity markets, which rely on a

\textsuperscript{22} For energy security see also ch 2, I C 2.
\textsuperscript{23} See ch 6, I A-B.
\textsuperscript{25} Also chs 4-6, I B.
\textsuperscript{26} Ch 6, I B.
\textsuperscript{27} Ch 5, I B.
\textsuperscript{28} The Council is an intergovernmental forum comprised of the Prime Minister, State and Territory Premiers and Chief Ministers and the President of the Australian Local Government Association, see Council of Australian Governments, \textit{About CoAG} (2012) <https://www.coag.gov.au/about_coag>. For its development and role in shaping energy policy in Australia see in more detail below at I C, II A.
\textsuperscript{29} Below at II A.
national cooperative, inter-governmental arrangement. This means that policy change necessitates agreement between all Australian governments, state and federal.

International climate policy commitments, contained in the *United Nations Framework Convention on Climate Change* (UNFCCC) and especially the *Kyoto Protocol*, have been important in the development and implementation of instruments directly or indirectly supporting renewable energy. These instruments include the RET, the Carbon Pricing Mechanism and state feed-in-tariff schemes. While a founding member of the UNFCCC, Australia only ratified the *Kyoto Protocol* following a change of government in 2007. Before that the conservative Howard government was committed foremost to economic growth for Australia, started by the Hawke Government with its aggressive deregulatory policies that also drove electricity market reform. Central to Australia’s stance towards the *Kyoto Protocol* was the perception that reducing emissions should not come at a cost to Australia’s economy. The first climate change policy introduced by an Australian government, the 1997 package ‘Safeguarding the Future: Australia’s Response to Climate Change’, was therefore built around a ‘no regrets’ approach, based on voluntary action as well as a suite of research and development measures. It is this sentiment, – with economic growth as the foremost policy target –, which also defined Australia’s role in the *Kyoto Protocol* negotiations (resulting in a very favourable target for Australia) and the

33 More below at II A.
37 For a full account of Australia’s role in climate policy development on the international stage in the Howard Years, see, eg, Guy Pearse, *High and Dry* (Penguin Group, 2007).
39 ‘No regrets’ measures are defined as ‘a measure that has other net benefits (or, at least no net costs) besides limiting greenhouse gas emissions’ Australian Greenhouse Office, *Greenhouse Challenge: Evaluation Report* (Canberra, 1999) 12.
41 Australia was one of the few developed countries that could actually increase its emissions above the 1990 baseline scenario.
long refusal of Australia to ratify the Protocol. While, owing to public pressure, the Howard government finally acknowledged human-induced climate change, it emphasized Australia’s unique situation: an economy based on abundance of fossil fuels and a population expected to continue to grow rapidly. ‘Uniform target proposals’, were therefore considered ‘unfair’ and likely to ‘impose a disproportionate, even devastating, burden’ on Australia. While the modelling that the Howard government based its stance on has since been shown to be flawed, it was this sentiment that informed the drafting of the first RET.

The Howard government introduced the Mandatory Renewable Energy Target Scheme (MRET), the predecessor of the current RET, in 2000. It had a very low target of an additional 2 per cent of electricity from renewable sources by 2010. When the target was achieved earlier than expected, the federal government refused to extend the scheme. State governments, driven by concerns about the continuing viability of burgeoning renewable energy industries, stepped into the political vacuum on climate and renewable energy policy and introduced a range of schemes targeting greenhouse gas emissions. Only the Victorian scheme, which involved a MRET-style market mechanism, though, was directly targeted at supporting renewable energy. Other schemes, such as the now closed New South Wales Greenhouse Gas Abatement Scheme, a baseline and credit emissions trading scheme, aimed at reducing greenhouse gas emissions in the electricity sector, but did not specifically support renewable energy. It supported lowest-cost reduction of emissions,

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42 Howard, above n 38.
43 Ibid.
44 Ibid.
45 Lyster and Bradbrook, above n 40, 81-83
46 See also below at III A 1.
47 The New South Wales Greenhouse Gas Abatement Scheme (GGAS) (Electricity Supply Act 1995 (NSW)), the Victorian Renewable Energy Target (VRET) (Victorian Renewable Energy Act 2006 (Vic)), the Australian Capital Territory Greenhouse Gas Reduction Scheme (Electricity (Greenhouse Gas Emissions) Act 2004 (ACT)), the Queensland 13% gas scheme (Electricity Act 1994 (Qld)).
50 Unlike a cap and trade scheme, such as the European Emissions Trading Scheme, or the Carbon Pricing Scheme, a baseline and credit scheme, sets a baseline of expected emissions, and requires the surrender of abatement certificates for any emissions above this baseline, whereas below baseline emissions can generate tradeable abatement certificates; details on the design of the NSW scheme can be found in Independent Pricing and Regulatory Tribunal NSW, NSW Greenhouse Gas Reduction Scheme: Strengths, Weaknesses and Lessons Learned (2013).
resulting in a wide range of abatement projects undertaken.\textsuperscript{51} From 2004, a range of state schemes for small-scale renewable energy installations were introduced.\textsuperscript{52} Most of these have now been closed or considerably cut down.\textsuperscript{53}

In July 2007, with public opinion beginning to crescendo on the issue of climate change, the Howard government published its first Climate Change Policy.\textsuperscript{54} This policy did not significantly change the approach of the Australian government to renewable energy, with mostly research and development funding proposed to support renewable energy.\textsuperscript{55} Instead, an emissions trading scheme was considered as a ‘least-cost solution’ to achieve long-term emissions reduction.\textsuperscript{56}

The federal government’s attitude to climate change and renewable energy substantially changed with the incoming Labor government of Kevin Rudd, elected in the 2007 federal

\begin{footnotesize}
\textsuperscript{51} Including, eg, ‘the building of new low-emissions-intensive generation plant, the greater use of existing low-emissions power plant, and efficiency improvements to existing power stations; the building of smaller generation and cogeneration plant fuelled by waste methane from landfill, sewerage and putrescible waste; the capture and combustion of waste coal mine gas; improvements in fuel efficiency and production processes at large industrial sites; tree planting and maintenance projects on farming land.’ See ibid 5.

\textsuperscript{52} In Victoria, feed-in-tariffs were first introduced in 2009, with different schemes with changing rates and scopes, such as the Standard, Premium and Transitional Feed-in-Tariffs, contained in the \textit{Electricity Industry Act 2000} (Vic) ss 40f-40n. All of these schemes are now closed; for new applicants a feed-in-tariff of a minimum of 8 cents per kWh is available for systems with less than 100kW size. The NSW Solar Bonus Scheme was introduced in 2010, contained in the \textit{Electricity Supply Act 1995} (NSW) and the \textit{Electricity Supply (General) Regulation 2001} (NSW), has been closed to new customers since 2011. Small-scale systems up to 10kW can still connect to the distribution network, \textit{Electricity Supply Act 1995} (NSW) s 15a, and retailers offer feed-in-tariffs with target ranges for tariffs provided by the Independent Pricing and Regulatory Tribunal. The Queensland Solar Bonus Scheme started in 2008. While tariffs were legislated at initially 44 ct per kWh, they have later been lowered to 8 cents per kWh, see \textit{Electricity Act 1994} (Qld) ss 44A and 55DB, and \textit{Electricity Regulation 2006} (Qld) ss 30AA, AB, \textit{Electricity Act 1996} (SA). The ACT opened a scheme in 2008, \textit{Electricity Feed-in (Renewable Energy Premium) Act 2008} (ACT), but closed it to new customers in 2011. Retailers continue to offer solar buyback or feed-in-tariff schemes. A government subsidy scheme which provided feed-in-tariffs for residential renewable energy by the WA government was opened in 2010, but closed for new entrants in 2011. Currently, solar energy buy-back schemes are offered by retailers. Tasmania did not introduce a legislated scheme, but the single state-owned energy retailer and distributor Aurora Energy offers a solar buy back scheme, <http://www.auroraenergy.com.au/Your-Home/Electricity/Rates-and-charges/Solar-rates-and-charges>. Similar arrangements are offered by the Northern Territory retailer PowerWater <http://www.powerwater.com.au/customers/save/photovoltaic_pv_solar_systems>. An overview is also available at Parliament of Australia, Parliamentary Library, Feed-in tariffs (21 December 2011).

\textsuperscript{53} Ibid.

\textsuperscript{54} Australian Government, \textit{Our Economy, Our Environment, Our Future} (2007).

\textsuperscript{55} Ibid 13-14.

\textsuperscript{56} Ibid 7.
\end{footnotesize}
elections. Early in the term of the Rudd government, a host of activities was undertaken in regard to climate change mitigation in general. Following its ‘Clean Energy Future’ policy, the new government ratified the Kyoto Protocol, expanded the RET and attempted to introduce an emissions trading scheme in form of the Carbon Pollution Reduction Scheme (CPRS); an undertaking that ultimately failed in the Senate.59 The Labor government under Julia Gillard, who replaced Rudd as Prime Minister in 2009, managed to implement the Carbon Pricing Mechanism (CPM), an emissions trading scheme with an initial fixed-price period.60 It also implemented a ‘green bank’, the Clean Energy Finance Corporation, and introduced a dedicated Climate Change Authority as advisory body to the government charged with reviewing central climate change policies.62

The CPM embedded an unconditional target of 5 per cent emissions reduction compared to 2000 levels by 2020.

Australia committed to a target range of emissions reductions, partially conditional on other states’ commitments. In detail this included commitments to reduce its greenhouse gas emissions:

- by 25 per cent on 2000 levels by 2020 if the world agrees to an ambitious global deal capable of stabilizing levels of greenhouse gases in the atmosphere at 450 ppm CO2-eq or lower;
- unconditionally by 5 per cent below 2000 levels by 2020; and
- by up to 15 per cent by 2020 if there is a global agreement which falls short of securing atmospheric stabilization at 450 ppm CO2-eq and under which major

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58 Carbon Pollution Reduction Scheme Bill 2009 (Cth).
59 Commonwealth, Parliamentary Debates, Senate, 30 November 2009, 9602-3. The Prime Minister subsequently decided to delay the scheme, see Prime Minister Kevin Rudd, ‘Press Conference: Prime Minister’s Courtyard’ (Media Release, 4 May 2010).
60 See Clean Energy Act 2011 (Cth).
62 See Climate Change Authority Act 2011 (Cth).
developing economies commit to substantially restrain emissions and advanced economies take on commitments comparable to Australia's.\textsuperscript{63}

This target range enjoyed bipartisan support until recently.\textsuperscript{64} The current conservative Coalition government, elected in September 2013, has since indicated that it now only supports the unconditionally committed 5 percent emissions reduction.\textsuperscript{65} It has now repealed the CPM.\textsuperscript{66}

The current federal government is attempting to abolish the Australian Renewable Energy Agency\textsuperscript{67} and the Clean Energy Finance Corporation,\textsuperscript{68} both of which are organizations that support renewable energy projects. It has also introduced legislation to parliament to abolish the Climate Authority.\textsuperscript{69} While the RET scheme continues, the government has recently undertaken a review of its merits,\textsuperscript{70} with an emphasis on the impact the scheme has on electricity affordability and on the competitiveness of Australian industry.\textsuperscript{71} In place of the CPM, the government has implemented a ‘Direct Action’ policy based on paying for lowest cost abatement from a range of mitigation activities.\textsuperscript{72} The legislation makes no reference to renewable energy or addressing the stationary energy sector emissions.\textsuperscript{73}

The current political situation, with a swing of the pendulum away from climate mitigation in general, will not be conducive to deep reforms of the way Australia generates and uses electricity. This is further exacerbated by the split in constitutional responsibilities for energy regulation, addressed in the following section. As Godden has pointed out in regard


\textsuperscript{64} Climate Institute, ‘Coalition Commitments to 5 – 25 per cent Emissions Reduction Targets’ (Media Brief, 5 September 2013).


\textsuperscript{66} Clean Energy Legislation (Carbon Tax Repeal) Act 2014 (Cth).

\textsuperscript{67} Australian Renewable Energy Agency (Repeal) Bill 2014 (Cth).

\textsuperscript{68} Clean Energy Finance Corporation (Abolition) Bill 2014 (Cth).

\textsuperscript{69} Climate Change Authority (Abolition) Bill 2013 (Cth).


\textsuperscript{71} Greg Hunt, Minister for the Environment and Ian MacFarlane, Minister for Industry, ‘Review of the Renewable Energy Target’ (Joint media release, 17 February 2014).


\textsuperscript{73} Carbon Credits (Carbon Farming Initiative) Amendment Act 2014 (Cth).
to Australian climate policy in general, a ‘whole of government integrated response to climate change and national solutions may not be able to be met in a legal system that has traditionally been fragmented along state/federal lines’.\(^{74}\) In contrast, one of the advantages for Germany and the UK is that their constitutional legal framework allows such an integrated approach.\(^{75}\)

**C Constitutional Constraints for Regulating Renewable Energy and Electricity Markets**

Constitutional constraints are at the centre of the ability to address national challenges, such as the transformation of the electricity system.

As meta-regulatory law they provide legislative power to different levels of government in a federal state. Constitutional structures therefore determine the ability of different levels of government to shape the regulatory space according to their institutional competences. It is also an important element of the wider system of energy supply. Constitutional constraints have crucially influenced the specific development of the electricity market in Australia, as described further below.

Australia, like Germany, is a federal state. Six state governments and the federal government share responsibilities according to the *Australian Constitution*. Similar to Germany, exclusive federal powers\(^ {76}\) to legislate can be distinguished from concurrent or shared powers.\(^ {77}\) They are subject to s 109 of the *Constitution*, stating that where federal

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\(^{75}\) See chs 5-6 at I C.

\(^{76}\) Such as exclusive powers in regard to the seat of the federal government, defence or minting coin, see *Australian Constitution* ss 52, 90, 114, 115.

\(^{77}\) Listed in s 51 of the *Australian Constitution*. 
law is inconsistent with state law, federal law prevails.\textsuperscript{78} In principle, the states are responsible for all matters that are not enumerated as exclusively federal Constitution.\textsuperscript{79}

Under the Australian Constitution there is no express federal power with respect to the environment, energy or climate change. The federal government has so far relied on various heads of powers, such as trade and commerce, taxation, corporations and external affairs\textsuperscript{80} to legislate in the area of environment, renewable energy and climate change. The federal government’s power to legislate for corporations, as well as the trade and commerce power, could arguably cover the field of electricity market legislation. This is supported by the High Court finding in the \textit{Tasmanian Dams Case} as early as 1983 that a corporation developing a hydroelectricity scheme in the Franklin River was subject to these powers.\textsuperscript{81} However, unlike the German electricity market framework, the Australian National Electricity Market of today is based on a national cooperative arrangement, rather than a federal constitutional powers approach.

The preference for cooperative intergovernmental arrangements in many economic fields of regulation in Australia reflects the lack of a general economics clause in the concurrent powers in the Constitution.\textsuperscript{82} As a potential proxy for such a power, the nationhood power, which extends to

matters incidental to the execution of any power vested by this Constitution in the Parliament or in either House thereof, or in the Government of the Commonwealth, or in the Federal Judicature, or in any department or officer of the Commonwealth\textsuperscript{83}

has been interpreted narrowly by the High Court.\textsuperscript{84} It does not confer a general power over economic matters, even where this is in the national interest. Instead, an existing head of

\begin{footnotesize}
\textsuperscript{78} While not so far contentiously discussed in the area of renewable energy, there is complex case law that governs conflicts. Tests developed by the High Court of Australia apply to resolve potential conflicts between state and federal, for an overview see Tony Blackshield and George Williams, \textit{Australian Constitutional Law and Theory} (Federation Press, 4\textsuperscript{th} ed, 2006) ch 9.
\textsuperscript{79} \textit{Australian Constitution} s 107.
\textsuperscript{80} \textit{Australian Constitution} ss 51 (i), (ii), (xx), (xxix).
\textsuperscript{81} \textit{Commonwealth v Tasmania} (1983) 158 CLR 1.
\textsuperscript{82} Cf Germany, \textit{Grundgesetz für die Bundesrepublik Deutschland} [Basic Law of the Federal Republic of Germany] at 74(1) No 11, which puts ‘the law relating to economic matters’, including energy under concurrent legislation; see also ch 6, I C.
\textsuperscript{83} \textit{Australian Constitution}, s 51 (xxxix).
\end{footnotesize}
power needs to be found if federal legislation is to be attempted. In the words of Chief Justice Barwick in *Victoria v Commonwealth*,

… no specific power over the economy is given to the Commonwealth. Such control as it exercises on that behalf must be effected by indirection through taxation, including customs and excise, banking, including the activities of the Reserve Bank and the budget, whether it be in surplus or in deficit. The national nature of the subject matter, the national economy, cannot bring it as a subject matter within Commonwealth power.85

These limitations of the national development of the economy, have given rise to extensive cooperative arrangement in areas where the national interest needs to be achieved. CoAG and under its apex, ministerial councils, provide the forum for the development of ‘national’ legislation outside the constitution, a process that has been termed ‘executive federalism’.86

As will be seen, the history of creating a national market for electricity in Australia is interwoven with the development of CoAG as the forum for cooperative arrangements among governments in the national interest.87 CoAG was created in May 1992, following several ‘Special Premiers’ conferences88 initiated by Prime Minister Hawke, to address Australia’s international competitiveness. Electricity market development, which will be detailed in the following section II, featured as an early issue within these conferences. The current framework is based on such a cooperative national arrangement.

Different institutional and legal arrangements underpin renewable energy regulation. Renewable energy support is mostly supported by federal legislation and electricity market legislative frameworks are based in cooperative arrangements under the auspices of CoAG. State governments, however, have continued to implement their own legislative schemes

84 *Victoria v Commonwealth* (1975) 134 CLR 338.
85 Ibid 362 per Barwick CJ.
for renewable energy support, primarily feed-in tariffs, in this area.\textsuperscript{89} This make an integration of both concerns into a coherent energy policy more complicated than in a unitary state, such as the UK, or a federal state, such as Germany, where clear constitutional powers allow the provision of legislation on all aspects of energy policy by one level of government.

\section*{II The Australian Electricity System: Legal Frameworks}

This section explains the evolution and current shape of the legal frameworks for the Australian electricity system.

Initially, in Australia, the states had their own electricity systems, which were not physically interconnected.\textsuperscript{90} The legacy of this separate development lives on the current system, both physically, and in the legal framework for the National Electricity Market (NEM).

A national framework was slow to develop due to both historical patterns of system development and to constitutional constraints. Following a historical overview of the development of the legal elements of the electricity system, this section will turn to the current national regulatory framework. Employing the concept of regulatory space, the section will identify the architecture and actor relationships in the National Electricity Market to show how renewable energy is disadvantaged.

\textsuperscript{89} A potential constitutional inconsistency between the operation of the state feed-in-tariff schemes and the federal Renewable Energy Target Scheme has never been problematized. On the contrary, the federal legislative has confirmed that there is no substantial correspondence between the Renewable Energy Target Scheme legislation and the state feed-in-tariffs, see Explanatory Memorandum, Renewable Energy (Electricity) Amendment Bill 2009 (Cth) at [41].

\textsuperscript{90} Note, the Western Australian system remains separate and is not a subject of this thesis.
A The Development of the Legal Frameworks of the Electricity System: Historical Overview

1 Electrification and Early Developments

Electrification in Australia started in the late 19th century with several electricity companies generating and distributing electricity on a small-scale in the capital cities. Most of these companies were either privately or municipally owned. Following World War II, these small-scale enterprises began to be taken over by state-owned utilities. There were different drivers for this development. These included the belief in economies of scale for larger electrification projects but also in a particular role of government in ‘promoting economic development, social welfare; employment; equity; justice and community interests’. There was some diversity between the different states in the institutional models for electricity supply. Generally vertical integration and centralized planning and operation of electricity generation and supply was the preferred model for the electricity sector until market reform in the 1990s.

The industry developments in the State of Victoria are discussed as a typical example of regulatory development in Australia before national legal and regulatory frameworks of the NEM became important. While entirely unregulated at first, the Victorian Government enacted legislation to regulate electricity supply as early as 1896. The Electric Light and Power Act 1896 (Vic) addressed a range of issues, such as health and safety issues; but also

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93 King and Maddock, above n 92, 21.
94 Sharma, above n 91, 1094.
95 Thus, for example the Victorian State Electricity Commission was responsible for all functions of the electricity sector, (generation, transmission, distribution and retail); in NSW the State Electricity Commission was responsible for generation and transmission, while distribution and retail was provided by council owned distributors, Mike Roarty, ‘Electricity Industry Restructuring: The State of Play’ (Research Paper No 14, Parliamentary Library, Parliament of Australia, 1998).
96 For the other states see ibid. For NSW also see, Duncan Macdonald and Mark Bray, ‘Preparing for the National Electricity Market: The NSW Electricity Industry’ in Peter Fairbrother, Michael Paddon, and Julian Teicher (eds), Privatisation, Globalisation, and Labour (Federation Press, 2002) 78.
97 Electric Light and Power Act 1896 (Vic) (No 1413) (later replaced by the nearly identical Electric Light and Power Act 1915 (Vic) (No 2645)).
that new electricity lines were only constructed under local government council orders, long-term supply contracts were preferred, and where supply for an area was provided, everyone was entitled to supply at a uniform charge.\textsuperscript{98} The latter demonstrates an early understanding of electricity supply as an essential service. The Act also provided preferential rights to councils to purchase electricity companies after long-term supply contracts were running out.\textsuperscript{99} The result was increasing public ownership of all aspects of electricity supply by the late 1940s.\textsuperscript{100} As Abbott points out, in Australia all infrastructure development early on was seen to be the responsibility of the government because private business did not step in to the extent needed due to lack of funding in the Australian capital markets and the lack of expertise.\textsuperscript{101} Following World War I, institutional development moved away from council provision of electricity to a more centralized role through the creation of a body of three ‘Electricity Commissioners’,\textsuperscript{102} which took on the former council responsibilities under the \textit{Electric Light and Power Act 1915} (Vic).\textsuperscript{103} In addition it was tasked with developing ‘a coal mining and electrical undertaking’ in Morwell.\textsuperscript{104} Two years later the State Electricity Commission Victoria (SEVC) replaced the Electricity Commissioners.\textsuperscript{105} The main incentive for these changes was to create a brown coal industry in Victoria in order to have access to cheap electricity and wean the state away from NSW black coal.\textsuperscript{106} However, a further function of the commission was to ‘inquire and report to the Minister as to steps which… would secure ultimate co-ordination and unification of all State or other electrical undertakings in Victoria’ – foreshadowing the later national scheme. The commission was also tasked to secure ‘safe, economical and effective supply of cheap energy’\textsuperscript{107} – objectives, which continue to be retained in the current framework.

\textsuperscript{98} Ibid s 38.
\textsuperscript{99} \textit{Electric Light and Power Act 1915} (Vic) (No 2645) s 43.
\textsuperscript{100} Abbott, above n 91, 25.
\textsuperscript{101} Ibid.
\textsuperscript{102} Through the \textit{Electricity Commissioners Act 1918} (Vic) (no 2996).
\textsuperscript{103} \textit{Electricity Commissioners Act 1918} (Vic) (no 2996) s 9; and \textit{Electricity Light and Power Act 1915} (Vic).
\textsuperscript{104} \textit{Electricity Commissioners Act 1918} (Vic) (no 2996) s10.
\textsuperscript{105} Through the \textit{State Electricity Commission Act 1920} (Vic) (No 3104).
\textsuperscript{107} \textit{State Electric Commission Act 1920} (Vic) (No 3104).
State-based monopolies, such as the State Electricity Commission of Victoria, ‘operated discrete electricity supply regimes and were solely responsible for the generation, transmission and delivery of electricity to all end users.’  

With technical advances, local grid systems were increasingly integrated to state-wide systems. Yet, for a long time, these systems remained physically separate and ‘[e]ach state governed its electricity industry exclusively according to its priorities, e.g., promoting the use of state resources, creating employment within the state, ensuring complete independence from other states for meeting electricity needs of the state.’

Australia-wide regulation only became necessary once the separate state networks started to connect. The first regulation on an inter-state level was the legislation regarding the Snowy Mountains Scheme, the *Snowy Mountains Hydro Electric Power Act 1949*. The Scheme was implemented in 1949 to generate and supply power to the ACT and also for defense purposes. The Snowy Mountains Scheme Authority, a statutory authority, was put into place to manage the scheme. This included all aspects of the scheme, including construction, generation, transmission and maintenance.

Apart from this scheme, however, by the 1980s the electricity industry in Australia still relied on separate state-owned and run utilities. The infrastructure patterns of connecting the large population centres with the each of the state’s resources still dominate today. This was accompanied by a governance framework unique to each state, with ‘contrasting technical standards and benchmarks, voltage systems, structures and governance philosophies’.

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109 Sharma, above n 91, 1094.
110 *Snowy Mountains Hydro Electric Power Act 1949* (Cth), preamble.
111 Ibid s 17.
112 Thus, main transmission lines run, for example, from the black coal-based generators in the Hunter Valley to Sydney; from the brown coal-based generators in La Trobe Valley Victoria to Melbourne and from the big hydroelectric schemes in Tasmania to Hobart, see map of infrastructure in AEMO, ‘Introduction’, above n 3, 25.
113 Sharma, above n 91, 1094.
states for electricity, which is also reflected in the choice of a national cooperative, rather than federal, scheme for the current electricity market stretching along the east coast of Australia. Nevertheless, both the physical system, but also non-commercial consumer expectations of a safe, secure and reliable as well as affordable electricity supply, were already in place, and continue to live on in the current system.

2 Electricity Market Reform: Changing Perceptions of the Role of Government

This centralized and integrated model of state-based provision of electricity was increasingly called into question in the 1980s. Inefficiencies expressed through overinvestment in ‘generating capacity, overstaffing, inflexible pricing and lack of accountability’ plagued the state-based model.

Initially, attempts to make state-owned industries more efficient were made at state level. These included corporatization of public utilities, to achieve greater efficiency and accountability, and, in some states, administrative separation of generation segments from transmission. While considerable efficiency gains were made, reforms did not address the basic structure of the industry.

Starting in the early 1990s, a nationally-based electricity system was developed, framed as part of a general move towards microeconomic reform. Microeconomic reform, is concerned with governments initiating change to institutional structures with the aim of improving the economic efficiency with which the resources available within the Australian

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114 Ibid.
116 Sharma, above n 91, 1095.
117 See, eg, OECD, above n 115, 380.
118 Sharma, above n 91, 1095-6.
119 See OECD, above n 115, 381.
120 See also ch 2, II on the theoretical underpinnings of electricity market reform.
economy (both fabricated and natural) are utilised so that the overall material well-being of the community is enhanced.\textsuperscript{121}

Under the auspices of microeconomic reform, Australia saw widespread ‘deregulation’, which was characterized by reducing government intervention in private sector markets, through measures such as cutting back tariffs and state assistance.\textsuperscript{122} The ideological background for these measures was firmly based in neoclassical theory and was modelled on the UK electricity market reforms.\textsuperscript{123} The current market structure is the result of this national competition reform. It did not occur naturally, but was designed ‘using the tools of microeconomics’.\textsuperscript{124} Centrally, the ensuing regulatory framework was superimposed on the existing generation and infrastructure profile. It is therefore inherently biased towards fossil fuel-based, centralized electricity generation. Thus, while there was a distinct move from rowing to steering, with the market replacing state-run electricity supply, the new legal framework for the market inherited the other system elements, including generation and network infrastructure, and the consequent need for their centralized management, as well as user expectations. Renewable energy was not part of this system.

The following sections detail the evolution of the current market framework. They show how the process of introducing a national market for electricity has been largely independent from ‘green’ or sustainability issues, but instead has been based on efficiency concerns.

\textit{a Early Reform Attempts and Competition Policy Development}

The electricity industry reform process began with several interlinked developments. These included more general national competition policy reform, as well as state-level moves towards competitive wholesale electricity markets. This process was enabled by a new

\textsuperscript{121} Parliamentary Research Service, ‘National Competition Policy: Overview and Assessment’ (Research Paper No 1, Parliamentary Library, Parliament of Australia, 1994) (citation omitted).
\textsuperscript{122} John Quiggin, ‘Market-Oriented Reform in the Australian Electricity Industry’ (Research Paper, 2001) 1.
\textsuperscript{123} Ibid 2-3, see also John Quiggin, \textit{Great Expectations: Microeconomic Reform and Australia} (Allen & Unwin, 1996).
\textsuperscript{124} Stephen King, ‘Using Microeconomics to Protect Competition’ (2010) 43(2) \textit{Australian Economic Review} 217, 223.
emphasis on intergovernmental national solutions over state solutions for the economic
development of Australia through adoption of cooperative federalism approaches.

Strongly influential for electricity market reforms was the Industry Commission’s *Report
on Energy Generation and Distribution*, recommending the creation of a national electricity
market.\textsuperscript{125} The report found that the ‘electricity and gas sectors have not been performing to
their full potential’ and that ‘electricity and gas have not been supplied at least-cost’ due to
‘poor investment decisions leading to excess capacity and gross overstaffing during the
1980s’.\textsuperscript{126} The Commission also recommended that:

> utilities’ objectives should relate solely to commercial performance. Each utility should be
required to supply electricity or gas (but not both) in the most economically efficient
manner. This would overcome difficulties caused by current requirements to undertake non-
commercial functions. It would also eliminate potential conflicts of interest where utilities
regulate activities in which they themselves are involved. A simply stated commercial
objective would also avoid problems in accountability and performance monitoring which
can result from multiple and ill-defined objectives.\textsuperscript{127}

Two central tenets driving microeconomic reform in general can be isolated here; that of
‘least-cost’ and that of the ‘unfettered market’. The latter relates to the undesirability and
the alleged inability of markets to include objectives that are foreign to the market. This
idea resonates with the standard liberal market model approach.\textsuperscript{128} This separation of
objectives still continues to dominate electricity market developments in Australia today,
with only certain non-commercial objectives, such ‘safety, reliability and security’\textsuperscript{129}
of electricity supply, deemed suitable for electricity market development.

The Commission also recommended other ‘standard model’ measures, such as the
separation of ownership of the electricity industry into its functional parts, the

\textsuperscript{126} Ibid 1.
\textsuperscript{127} Ibid 4.
\textsuperscript{128} See ch 2, III A.
\textsuperscript{129} For the current electricity market objective see below at B I b.
corporatization and later privatization of the industry and provisions for open access to the grid.\textsuperscript{130}

Australian state and federal leaders agreed at the Special Premiers Conference in July 1991 that a National Grid Management Council (NGMC) was to be established, ‘to encourage and co-ordinate the most efficient, economic and environmentally-sound development of the electricity industry in eastern and southern Australia’ in order to ‘advanc[e] co-operation in the electricity industry, the absence of which has cost the nation dearly in terms of excessive generation capacity, inappropriate plant mix and inflexibility of fuel use.’\textsuperscript{131} This early commitment to ‘environmentally-sound development’, did not live on through further system evolution.\textsuperscript{132} The NGMC was supposed to open up grid access and encourage free trade in the wholesale sector, as well as to coordinate generation and transmission planning. It was also to ‘encourage the competitive sourcing of generation capacity and the use of demand management’.\textsuperscript{133} These measures were based in the sentiment that national efficiency and international competitiveness could be improved though microeconomic regulatory reform of the electricity industry.\textsuperscript{134}

The NGMC was the first of several independent bodies to drive regulatory reform in the electricity sector with the aim of creating a national market. Like CoAG, the NGMC was a state/federal-based forum. This reflected the separate development of state-based electricity systems, exacerbated by the split in constitutional responsibilities, as well as the necessity to move towards a national approach. The NGMC outlined the ‘rules, responsibilities and technical requirements for connecting to the National Grid’, and started to develop rules for a national electricity market.\textsuperscript{135}

National reform was accelerated by the 1993 Hilmer Report. This report on \textit{National Competition Policy} was initiated on the request of the Prime Minister in 1992.\textsuperscript{136} It had a

\textsuperscript{130} Ibid 24.
\textsuperscript{131} Special Premiers’ Conference, \textit{Communiqué} (Sydney, 30 July 1991).
\textsuperscript{132} Lyster and Bradbrook, above n 40, 128-9.
\textsuperscript{133} Special Premiers’ Conference, \textit{Communiqué} (Sydney, 30 July 1991).
\textsuperscript{134} Ibid.
\textsuperscript{135} Starting with a generator market, to be followed by a retail market as early as 1993, see National Grid Management Council, \textit{National Grid Protocol: First Issue} (December 1992).
\textsuperscript{136} Fred Hilmer (Chairman), \textit{National Competition Policy Review: Report} (1993) v.
very wide scope, covering areas such as anti-competitive conduct by firms, reforming regulation which unjustifiably restricts competition, restraining monopoly pricing behaviour, fostering ‘competitive neutrality’ between government and private businesses when they compete, and reforming the structure of public monopolies to facilitate competition.\(^\text{137}\)

Hilmer set Australia’s competition policy firmly on the road to ‘efficiency’, with economic efficiency seen ‘as the primary element of public benefit’.\(^\text{138}\) At the same time, the report made no attempt to reconcile environmental objectives with market objectives, even though Ecologically Sustainable Development (ESD) was a developing feature of policy at the same time.\(^\text{139}\) With the Hilmer report also came a different view on public utilities, which based a high level of confidence in the capacity of the market to resolve a ‘broad array of public concerns which have traditionally been responded to through regulatory initiatives’.\(^\text{140}\) While national competition policy was crucial for developing the current regulatory framework, state-level industry restructuring continued to occur in parallel.\(^\text{141}\) Especially in Victoria, but also in NSW and South Australia, the former integrated state utilities were disaggregated and corporatized during the first half of the 1990s.\(^\text{142}\) Victoria and NSW operated limited wholesale markets at this time.\(^\text{143}\) Victoria also privatized its electricity industry assets. Following suit, the Queensland electricity commission was disaggregated, and corporatized in 1997.

\(^{137}\) Ibid xvii.
\(^{138}\) Parliamentary Research Service, above n 121, iv.
\(^{140}\) Parliamentary Research Service, above n 121, 33.
\(^{141}\) Detailed accounts of the degrees of restructuring are available at Roarty, above n 95; Ann Rann, ‘Electricity Industry Restructuring – A Chronology’ (Background Paper 21, Parliamentary Library, Parliament of Australia, June 1998).
\(^{142}\) Enabling legislation included the *Electricity Industry Act 1993* (Vic); *Electricity Corporations Act 1994* (SA) and the *Electricity Supply Act 1995* (NSW).
\(^{143}\) See Rann, above n 141.
Restructuring reforms on state level to prepare for a national electricity market were agreed in CoAG meetings in 1993 and 1994. These included the agreements on:

- the structural separation of generation, transmission, distribution and systems operation;
- the ability for customers to choose their supplier;
- non-discriminatory access to the interconnected transmission and distribution networks;
- non-discriminatory entry for new generators or retailers supply; and
- abolishing legislative or regulatory barriers to interstate and/or intrastate trade.

Privatization was not part of the reform requirements, and mixed forms of public and private network and generation operations continue to exist in the industry.

b An Increasingly National Framework

Building on the efforts on state level, in 1996, the National Electricity Market (NEM) framework was established. The main piece of legislation governing the NEM is the National Electricity Law (NEL). The framework for the NEM is established through the National Electricity (South Australia) Act 1996, which is valid in all states through the operation of enabling legislation. Through this piece of legislation and delegated legislation, especially the National Electricity Rules (NER), all roles and responsibilities

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145 Council of the Australian Governments, Communiqué (19 August 1994) attachment A.
146 For an overview of the different ownership structures in the Australian electricity industry, see Productivity Commission, Electricity Network Regulatory Frameworks (2013) 93.
147 Contained in schedule 1 to National Electricity (South Australia) Act 1996 (SA).
148 Electricity (National Scheme) Act 1997 (ACT) s 5, Electricity – National Scheme (Tasmania) Act 1999 (TAS) s 6; Electricity – National Scheme (Queensland) Act 1997 (Qld) s 6; National Electricity (Victoria) Act 2005 (Vic) s 6; National Electricity (New South Wales) Act 1997 (NSW) s 6.
149 National Electricity (South Australia) Act 1996 (SA) s 34 and pt 7.
of market participants are defined. While generation and increasingly the retail functions of the market were opened to competition, the transmission and distribution components remain regulated monopolies. Economic regulation has been introduced to avoid monopoly pricing. The resulting framework is considered to be a success as measured against the standard liberalized market model.  

It has all the hallmarks of successful market reform, as defined by the standard model. Networks have been separated from generation and retail functions, third party access to networks is guaranteed, and incentive regulation applies to network developments. It has been emphasized by politicians and commentators that the NEM is a well-functioning ‘leading edge regulatory framework’ and ‘the most advanced electricity market in the world.’

Initially, the National Electricity Code, a code of conduct approved by all the relevant state and federal ministers, contained the market rules. The legal and regulatory framework for third party access to the newly created market was contained in Part IIIA of the Trade Practices Act 1974 (Cth) – a federal competition law. The responsibilities of the NGMC were transferred to the newly created National Electricity Market Management Company Ltd (NEMMCO), which was to manage the wholesale market. Code enforcement was the responsibility of another company, the National Electricity Code Administrator (NECA). The Australian Competition and Consumer Commission (ACCC) regulated the

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151 At III A.


154 According to National Electricity Law s 6, in schedule 1 to the National Electricity (South Australia) Act 1996 (SA) (‘NEL’).

155 A generic third party access regime to infrastructure, which continues to be contained in the now renamed Competition and Consumer Act 2010 (Cth) pt IIIA.

156 This government-owned company was established in May 1996 by the governments of NSW, Victoria, Queensland, SA and the ACT to operate the new wholesale market.

157 See National Electricity Code s 1.6.

158 NECA was formed by state governments, see NECA, Members Agreement (9 May 1996) and Memorandum and Articles of Association (9 May 1996). For responsibilities, see also National Electricity Code, s 1.5.
The market was overseen by the National Electricity Market Ministers Forum, which in June 2001 was replaced by the Ministerial Council on Energy (MCE) to ‘provide national oversight’ and also to set up an independent review of energy market directions.\textsuperscript{159} This review,\textsuperscript{160} finalized in 2002, recommended to the MCE a set of reforms especially in regard to the institutional design of the market. According to the review, the market at the time was characterized by overlapping responsibilities and inefficient regulation.\textsuperscript{162} The reforms were especially targeted to reduce government influence on the market. Although the reforms provided for a clear policy oversight role for the government, they opposed government involvement on an operational level.\textsuperscript{163}

Following this review, the MCE provided a report to CoAG in 2003, which contained recommendations to form two new statutory bodies, the Australian Energy Market Commission (AEMC) and the Australian Energy Regulator (AER) to replace NECA.\textsuperscript{164} In 2004, the Australian Energy Market Agreement, agreed between all Australian governments; set up the current institutional framework of the electricity and also the gas market.\textsuperscript{165} As a final change to the institutional framework, NEMMCO, the manager of the electricity market, was replaced by Australian Energy Market Operator (AEMO) in 2009.\textsuperscript{166} This change occurred following a CoAG agreement to establish a National Energy Market Operator ‘for both electricity and gas, encompassing a new national transmission planning function.\textsuperscript{167} A raft of amendments to the existing legislation enabled the new

\begin{flushleft}
\begin{enumerate}
\item[159] See, Roarty, above n 95.
\item[160] Council of Australian Governments, Communiqué (8 June 2001).
\item[162] Ibid, see key findings, 9.
\item[163] Ibid 80.
\item[166] See National Electricity (South Australia) (National Electricity Law – Australian Energy Market Operator) Amendment Act 2009 (SA).
\item[167] Council of Australian Governments, Communiqué (14 April 2007).
\end{enumerate}
\end{flushleft}
framework. Centrally, amendments introduced a new NEM Objective in s 7 of the NEL, which centered narrowly on efficiency concerns.

The move towards a single electricity system along the eastern seaboard of Australia was a gradual one. The enactment of national legislation signified the beginning of institutional unification of the separate state systems. Physical interconnection between the state-based systems was only improved gradually. Interconnection initially existed only via the Snowy Mountains scheme interconnecting Victoria and NSW. Other interconnectors were only added gradually, including:

- 1990, the Heywood interconnector, South Australia-Victoria;
- 2000, the Terranora interconnector (formerly Directlink), Queensland-NSW;
- 2001, the QNI interconnector, Queensland-NSW;
- 2002, Murraylink, South Australia-Victoria; and
- 2006, Basslink, Tasmania-Victoria.

By the end of the 2000s, the different state systems were not only physically interconnected, but also covered by a unified legal framework. The legal framework retains a strong connection to its state-based history, revealing the co-evolution of the law with the initially state-based electricity system. Not only are there limited interconnections between the states, but regional pricing and regional reliability standards continue to be supervised by state-based regulators. Network businesses also operate within former state borders. Technically, the way electricity is generated and transported remains wedded to the existing


169 In more detail below at II B 1 b.


171 Ibid.


patterns of generation and network infrastructure. As will be seen, this impacts on the way ‘power and influence’ is allocated in the regulatory space of the electricity system.

**B The Regulatory Space of the Australian Electricity System and Renewable Energy**

To investigate how renewable energy is supported within this system, this section relates the legislation involved in delivering the NEM to the concept of regulatory space. This reveals the constraints renewable energy faces in this multi-actor regulatory framework. As set out in chapter 2, this requires the investigation of ‘who gains entry and on what terms?’.

Chapter 2 concluded that legal analysis will have to include a focus on the influence of constitutional legal frameworks on the ability of government to shape and determine legal and regulatory frameworks. Constitutional structures have a double role in the analytical framework of this thesis. They determine the respective scope of legislative powers, and are in this regard meta-regulatory law.\(^{174}\) Together with policy development and the physical system elements, they also play a crucial part in the development of the socio-technical system of electricity supply. Australia’s constitutional constraints for system development have therefore been addressed above at I C.

This section will further deal with the role of meta-regulatory law, specifically in defining the architecture and general principles of regulatory space by setting up institutions and objectives of the electricity market legal frameworks. According to McHarg, law has a meta-regulatory role in providing the institutional design for regulatory change towards sustainability.\(^{175}\) The degree of integration between environmental and energy policy and how exactly the regulatory frameworks supports this pattern, influences the ability of regulatory frameworks to acknowledge the needs of renewable energy. It will further address the question of how law delineate the rights and responsibilities of the participants in the regulatory space and thereby determines the ‘terms of entry’. A similar structure will also be employed in the other two case studies.

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\(^{174}\) See also ch 2, III.

The Architecture and General Principles of Regulatory Space: The Meta-Regulatory Law of the National Electricity Market

The Institutional Structure of the Australian Electricity Market

A range of institutional actors participates in the regulatory space of the NEM. The legal framework prescribes clear tasks for all market participants and institutions, with minimal overlap between functions and clear objectives for decision-making.176

The following table summarizes the different institutions involved in the NEM and their functions:

**Table 1: Key institutions in the National Electricity Market**

<table>
<thead>
<tr>
<th>Institution</th>
<th>Function</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steering Committee on Energy and Resources (SCER)</td>
<td>Energy policy development</td>
<td>CoAG committee comprising all state, territory and federal energy and resources ministers. This committee is the primary policy maker, responsible for oversight of the legislative and regulatory framework of the NEM. Has the power to issue statements of policy principles to the AEMC.</td>
</tr>
<tr>
<td>Australian Energy Market Commission (AEMC)</td>
<td>Rule making and market development</td>
<td>Statutory authority ‘responsible for rule making and energy market development on a national level […] including in respect of the National Electricity Rules.’ Conducts the rule making process, as</td>
</tr>
</tbody>
</table>

176 Oakeshott, above n 6, 39.
177 Table adapted from Lisa Caripis and Lee Godden, ‘Legal and Regulatory Frameworks for a Transition to a Low Emissions Electricity Sector: Lessons from the Australian Experience’ in Pilar Moraga (ed) Energía, Cambio Climático y Sustentabilidad: Una mirada desde el Derecho (Thomson Reuters Chile, 2013) 193.
178 Formerly the Ministerial Council for Electricity (MCE).
180 Ibid recitals A.
181 NEL s 8.
well as energy market reviews for the SCER and provides policy advice to the SCER. Must comply with statements of policy principles as far as consistent with statutory duties.

| **Australian Energy Market Operator (AEMO)** | **Market operator that oversees and facilitates the wholesale market. It also has national planning function, which includes preparing, maintaining, and publishing a National Transmission Network Development Plan.** |
| **Australian Energy Regulator (AER)** | **Responsible for the economic regulation of the wholesale electricity market and transmission networks, and the enforcement of the National Electricity Law and the National Electricity Rules. Functions include the determination of the revenues that the transmission and distribution network service providers receive for infrastructure augmentation and extension.** |

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184 See NEL s 8.
185 See National Electricity (South Australia) (National Electricity Law–Australian Energy Market Operator) Amendment Act 2009 (SA); NEL s 49(2).
186 Established as part of the Australian Competition and Consumer Commission under Part IIIAA of the *Trade Practices Act 1974* (Cth), now *Competition and Consumer Act 2010* (Cth).
187 NEL s 15.
188 Ibid s 2, 15 and *NER* chs 6, 6A.
State institutions remain responsible for licensing regimes\(^{189}\) and transmission reliability standards\(^{190}\) in the market. These standards differ from state to state.

The market participants are the generators, transmission network service providers,\(^{191}\) distribution network service providers\(^{192}\) and the retail companies.

The law and regulatory frameworks of the NEM clearly provide the rules of interaction in the shared regulatory space. They ‘allocate the roles between rule makers, enforcers and bearers of sectional interests’,\(^{193}\) by prescribing the respective rights and responsibilities of market participants and institutions alike. These functions are prescribed in the *National Electricity Law (NEL)* and the National Electricity Rules (NER), as well as various standards and codes on a state level. In Australia, the market institutions have been designed to provide for a clear ‘arm’s length’ role for government. Their particular design, separating policy direction from rule-making, and rule-making from economic regulation does provide for this separation very effectively. Further below in this section, at 1c, the impact of this separation on the ability to integrate new high-level policy concerns, such as a sustainable energy system, is discussed.

\(b\) The Market Objective

The National Electricity Objective guides regulatory decision-making in the electricity market framework. The objective applies across a range of specific regulatory regimes engaging with the issues of grid access, augmentation and transmission planning. Objectives express general principles of the electricity system regulatory space. Other than

\(^{189}\) In most states, participants in the electricity industry require a licence issued by state regulators to operate, see *Electricity Act 1996* (SA) s15; *Electricity Act 1994* (Qld) ch 2; *Electricity Industry Act 2000* (Vic) div 3; *Electricity Supply Industry Act 1995* (Tas) pt 3; in NSW and ACT, only electricity distribution companies and retailers require a licence, see *Utilities Act 2000* (ACT) pt 3; *Electricity Supply Act* (NSW) s 14.

\(^{190}\) See in detail Productivity Commission, above n 146, in table Appendix F, 28.


\(^{192}\) Ibid, ‘owners and operators of the substations and the wires that transport energy from distribution centres to end use consumers’.

guiding and in Australia arguably limiting regulatory decision-making, regulatory objectives also have important symbolic functions. As found by McHarg in relation to regulatory objectives in the UK, the adaptation of these objectives to include sustainability duties signifies the expectation of change and impacts on regulatory practice.194

The current National Electricity Objective states:

The objective of this Law is to promote efficient investment in, and efficient operation and use of, electricity services for the long-term interests of consumers of electricity with respect to –

1. price, quality, safety, reliability, and security of supply of electricity; and

2. the reliability, safety and security of the national electricity system.195

Efficiency has been introduced as a ‘meta-norm’, while retaining the legacy norms of reliability, safety and security of supply. Policy objectives of the Australian Energy Market Agreement include a commitment to establishing a framework for further reform and to ‘address greenhouse emissions from the energy sector, in light of the concerns about climate change and the need for a stable long-term framework for investment in energy supplies’.196 However, the current lack of ‘green’ market objectives in the NEL creates a regulatory environment where decision-makers are not obligated to consider issues such as environmental sustainability. The lack of such an environmental objective has considerable impact on market development, by limiting it to the existing market objectives.

Several commentators have argued for the inclusion of an environmental objective in the National Electricity Objective.197 According to such arguments, this would allow for ‘environmental sustainability to be addressed by the institutions governing the market, the national planning body, governments and market participants as a central aspect of their decision-making’.198 In contrast, in the UK and in Germany sustainability concerns have

194 McHarg, above n 175, 293.
195 NEL, s 7.
196 AEMA 2.1.b (vi).
197 Cantley-Smith, above n 108, 26-7, 43; Parliament of Victoria, above n 191, 223.
198 Parliament of Victoria, above n 191, 222.
been integrated with other market objectives, which reflects the changing political attitude towards the purpose of the electricity market. The new challenges of climate change and environmental destruction associated with fossil fuel-based generation have led to a rethink of further objectives of electricity supply, dominantly that of environmental sustainability. While widely phrased ‘green’ objectives may be difficult to enforce, they can support change in regulatory practice.

c Avenues for Governmental Intervention

In Australia, SCER is responsible for policy development, AEMC for rule changes and AER for economic network regulation. The AEMC recently reinforced the rationale for this split in regulatory responsibilities, claiming it provides for clear accountability and objectives of the electricity market institutions. The government should be responsible for high-level policy, while regulators should narrowly focus on the efficient operation of the market. The integration of wider environmental policy and energy policy could be best achieved when, ‘decisions are taken in a transparent manner and after full consultation with all affected parties’.

Introducing ‘high-level policy’ into the electricity market framework is complicated by its institutional design and the influence of the market objective on market development. SCER, as a representative of state and federal governments, can guide market framework development by issuing statements of policy principle to the AEMC in regard to rule making or market reviews. However, the statements are self-limiting, because they have to be ‘consistent with the national electricity objective’. The market objective, however, is defined narrowly around efficiency and reliability concerns. Policy change to integrate environmental concerns with energy market policy therefore necessitates legal reform to change market objectives.

199 See ch 5, II D 1; ch 6, II C 1 b.  
201 Ibid 35.  
202 NEL, s 8.  
203 Ibid.
CoAG arrangements require the coordination of all levels of government, state and federal, to initiate change. While the split of responsibilities between regulatory decision-making on the one hand, and policy development on the other hand, is clearly provided in law, the actual act of energy policy-making lacks transparency and parliamentary scrutiny. The positioning of energy market frameworks under a national regime ensured the centralized control over the electricity system, but hinders its acknowledgment of other concerns, such as renewable energy. Interlinking the two is complicated in the CoAG framework, which disperses governmental responsibilities across a range of state and federal executive actors. In the UK and Germany, one level of government is responsible for environmental and energy legislation and integration can be supported within one level of government. The state/federal split of energy and environmental responsibilities in Australia denies this opportunity.

As a result, the general architecture and principles of the regulatory space of Australian electricity supply has been remarkably unresponsive to new challenges. They continue to support the status quo – a pattern of electricity supply that has not changed much over the last 50 years. This has flow on effects for the regulatory law governing the ‘terms of entry’ to the regulatory space.

2 Entry to the Regulatory Space of the Electricity System: The Challenge for Renewable Energy

a The Wholesale Market

The wholesale electricity market of the NEM is an energy only, pool market. That means that all electricity generated by registered generators has to be sold through a mandatory pool arrangement, managed and administered by AEMO. Because of limited interconnection between the former state systems, electricity is traded in five regions,

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204 This is a general problem with CoAG decision-making, which has an inbuilt democratic deficit. In detail see, Paul Kildea and Andrew Lynch, 'Entrenching “Cooperative Federalism”: Is It Time to Formalise Coag's Place in the Australian Federation' (2011) 39 Federal Law Review 103, 116-122.

205 NER cl 3.2. See also, AEMO, ‘Introduction’, above n 3, 24.
which align largely with the state borders. Generators have to submit the price they would like to sell their energy at through the pool, and AEMO balances and dispatches these offers according to demand. A spot-price market, to which offers of generators can be submitted in five-minute intervals, determines the regional clearing price, which all generators that are scheduled in a region receive. Unlike the UK and Germany, the NEM does not provide firm access rights for generators, instead generators are dispatched, ‘when two conditions are met: they are scheduled in the merit order and there is no relevant congestion on the network. Generators do not have an inherent right to be dispatched, nor do they have a right to be compensated when constrained-off.’

A new classification as semi-scheduled generator, introduced in 2008, allows intermittent generators to participate as competitors to other generators in the electricity wholesale market. Before that, these intermittent generators were classified as non-scheduled, which meant that they could not bid in the spot price market, but had to accept the price set by the market. The semi-dispatch classification requires the ability to control their output, so they can be dispatched as required to match demand, and in a way that has not impacts on network congestion and power system security by AEMO.

There is also a contract market, which allows market participants trading in forward financial products, and basically to hedge the risks of the volatile wholesale market price. On a technical level, participation in the wholesale market has not been problematic for renewable generators, unlike in the UK, where the current market arrangements disadvantage smaller and intermittent generators.

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207 Ibid 9.
208 Ibid 12.
209 AEMC, ‘Transmission Networks Framework Review’ (First Interim Report, November 2011) 57. However, a potential rule change to provide optional firm access has been flagged, AEMC, ‘Transmission Network Frameworks Review’ (Final Report, 2013) 19 ff.
210 National Electricity Amendment (Central Dispatch and Integration of Wind and Other Intermittent Generation) Rule 2008 No. 2, see also NER cl 2.2.7.
211 AEMC, ‘Rule Determination, National Electricity Amendment (Central Dispatch and Integration of Wind and Other Intermittent Generation) Rule 2008’ (1 May 2008) 1.
212 Ibid.
213 Ibid 20.
214 Ch 5, II B 2 a.
However, a lack of investment security hampers the ability to invest and therefore to get to participate in the wholesale market in the first place. The decision to invest in generation capacity requires a market price that can recover the costs for investment. Here, the RET provides an important source of additional income for a renewable generator.\textsuperscript{215} It does this by creating demand through requiring retailers to source a set percentage of energy from renewable sources. However, both the wholesale market price and the RET price are volatile. Together with the intermittency of renewable energy generated from wind and solar, and no guaranteed dispatch of the power produced, this makes it difficult to forecast investment returns for renewable generators. In Australia, financing investment in new renewable generation therefore usually required additional security.\textsuperscript{216} This is provided by either having a degree of vertical integration, i.e. retailers investing directly into renewable energy, or by underwriting investment in renewable generation through so-called power purchase agreements.\textsuperscript{217} Power purchase agreements ‘are contracts with an “off-taker”, generally a retailer, to purchase the electricity generated for a period of time at a certain price’.\textsuperscript{218} The opportunity for vertical integration has led to a dominance of the three big Australian generations and retailer businesses in renewable generation investment.\textsuperscript{219} Because these ‘gentailers’\textsuperscript{220} also invest in fossil fuel generation, they have limited interest in investment beyond that which is required by law, i.e. the RET. Independent renewable generators, on the other hand have had difficulties securing investment.\textsuperscript{221}

Entry into the regulatory space of the electricity market is therefore complicated by the higher investment risk for renewable generators. In contrast, Germany, where a feed-in-tariff scheme provides for guaranteed dispatch and a guaranteed income for a long-term

\textsuperscript{215} Detail on the RET scheme, below III B.
\textsuperscript{218} See McConnell, above n 216.
\textsuperscript{219} These companies are EnergyAustralia, AGL Energy and Origin Energy, see eg Productivity Commission, above n 146, 93.
\textsuperscript{220} Ibid.
\textsuperscript{221} Ibid. Pacific Hydro, for example, formerly an independent power producer, has opened a retail arm in 2012 to circumvent the need for securing a power purchase agreement, see, eg, Pacific Hydro, ‘Retail Opens for Business’ (Press release, 17 September 2012).
period, this investment risk is mitigated. The UK, too, has recently changed their renewable energy support to provide more investment security.

*b Regulating Infrastructure: Network Regulation and Renewable Energy*

Participating in the wholesale electricity market, however, is dependent on the ability to physically access the market. Questions of how to become connected to the electricity network are ‘just as important to renewable technology investors as the price they would get for their power. Price [does] not matter if you [can] not access the grid.’

In a liberalized market, network investment is separate from generation investment. Yet, while institutionally separated, the electricity system continues to be operated as an integrated system. As set out in chapter 2, generators in liberalized markets make commercial decisions on whether to invest in new capacity. While market participation can technically be achieved by way of licensing and registration, the access to the market is interdependent with the decision-making of other actors, specifically the network operators. Their decisions on whether and where to invest in new network capacity, has considerable impact on the commercial viability of renewable generation. Regulation of existing network infrastructure and its future development by the network businesses, therefore influences generators’ investment decision-making.

This section shows that together with the existing network layout, the rules for network access, investment and planning, systemically disadvantage renewable energy. They lock-in outdated generation profiles by not addressing the special and different requirements of renewable energy in comparison to conventional, fossil fuel-based generation.

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222 Ch 6, II C 2 a.
223 Ch 5, III, through contracts for difference.
225 Ch 2, I C 1.
226 At II A.
227 For NEM participation, additionally registration with AEMO as registered participant is required, NER ch 2.
Network Access

The NER provides that all parties need to have ‘the opportunity to form a connection and have access to the network’. Network service providers need to negotiate in good faith and make a fair and reasonable offer to connect. There is no guaranteed right for generators to be connected as such, but ultimately connection will depend on the applicant fulfilling certain technical standards and being able to bear the costs of connection. This has encouraged generation investment foremost ‘in areas well serviced by transmission capacity’. While this applies to all proponents of new generation investments, it disproportionately disadvantages renewable generators. Existing generators benefit from a custom-built grid developed at public costs by the then integrated and state-owned utilities. Further, renewables are less transportable than fossil fuels such as gas (via pipelines) and coal, and in many cases they need to be harvested at the site of the renewable resource.

The NER only provide rules for technical standards necessary to access the grid; they do not specify ‘the issues of who should pay for augmentations to facilitate the network connection and how these costs are to be allocated between network users and the connection applicant’. The NER do not require the network service provider ‘to undertake an augmentation to facilitate that connection’. Instead it is left to a private contract, the connection agreement, to determine who pays. The cost of grid connection studies also forms part of the responsibility of the generators, and studies can be prohibitively expensive. If the augmentation has been made part of the connection agreement in order to meet access standards of the NER, it is usually considered ‘fair and

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228 NER, cl 5.1.3.
229 NER, cl 5.3.6 (c), (f).
230 Oakeshott, above n 6, 44.
232 Ibid 14, see also NER, cl 5.3.6(k) stating that: ‘nothing in the Rules is to be read or construed as imposing an obligation on a Network Service Provider to effect an extension of a network unless that extension is required to effect or facilitate the connection of a Connection Applicant and the connection is the subject of a connection agreement’.
233 In Victoria the necessary grid connection studies can cost up to AUD 500 000; Parliament of Victoria, above n 191, 237f.
reasonable’ to require the connection applicant to pay.\textsuperscript{234} Otherwise, the network service provider will only need to invest if reliability standards require an augmentation to be undertaken. The AEMC refers to ‘the underlying principle in the NEM that those who impose a burden on the network should contribute to the cost of any resulting necessary network augmentation’.\textsuperscript{235}

This is different to the German system, where special network access and financing rules exist for renewable energy.\textsuperscript{236} The UK, too, has introduced different instruments to specifically address the challenges for remote renewable generation to access the electricity network.\textsuperscript{237}

So far, in Australia, considerable investment close to the existing network has been forthcoming.\textsuperscript{238} If the Australian electricity system was to move to a high renewable energy scenario, though, it will require considerable additional network investment.\textsuperscript{239}

\textit{Network Investment}

The costs of updating the grid to include large-scale renewable power are forecast to be enormous.\textsuperscript{240} Grid capacity constraints\textsuperscript{241} are already experienced for some high wind areas in Western Victoria,\textsuperscript{242} and for South Australia.\textsuperscript{243} This means that in order to connect new generation to the grid in these areas, the transmission grid will have to be upgraded. Additionally, considerable upgrades to the existing grid infrastructure will be necessary in

\textsuperscript{235} AEMC, ‘National Electricity Amendment (Connecting Embedded Generators) Rule 2013’ (Draft Rule Determination, July 2013) 82.
\textsuperscript{236} See ch 6, II C 2 b.
\textsuperscript{237} See ch 5, II B 2 b.
\textsuperscript{238} Oakeshott, above n 6, 42.
\textsuperscript{239} AEMO, ‘100 per cent’, above n 20.
\textsuperscript{240} See, Melbourne Energy Institute and Beyond Zero Emissions, above n 18, costings in Appendix 6.
\textsuperscript{241} ‘There are physical limits on the amount of power that can flow over any one part or region of the network’ see, AER, \textit{State of the Electricity Market 2009} (2009) 140.
\textsuperscript{242} See Parliament of Victoria, above n 191, 225.
the short term, regardless of the entrance of new renewable generators. For instance, in Victoria, most of the electricity grid infrastructure will be at the end of its lifecycle within the next 10 years.\(^{244}\)

Principally, in the NEM, the network businesses decide whether or not to invest in network infrastructure and carry the risks associated with investment.\(^{245}\) However, network investment decisions are tightly bound by the National Electricity Rules and predominantly taken where required to meet reliability standards.\(^{246}\) The network service provider can, however, strategically upgrade the grid and recoup the costs where a market benefit can be shown.\(^{247}\)

Service and price levels for new investments into transmission services and for transmission revenue are set by the AER for five years following applications from the transmission businesses.\(^{248}\) The same applies for distribution companies.\(^{249}\) If the businesses manage to operate below this revenue cap, they are rewarded with an increased return.\(^{250}\) The applications are approved on a cost-benefit basis,\(^{251}\) with an extensive regulatory test to determine whether the planned augmentations are economically viable.\(^{252}\)

All investments have to ‘maximise the net economic benefit to all those who produce, consume and transport electricity in the market.’\(^{253}\) AER has to make a decision based on the NER rules that emphasize efficiency and prudence.\(^{254}\) Successful expenditure proposals have so far usually been justified on the grounds of regional reliability standards.\(^{255}\)

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\(^{244}\) As found by: Victoria, Royal Commission into Victoria’s Bushfires, Final Report (2010), vol II, part 1, 151-152, para 4.3.

\(^{245}\) Oakeshott, above n 6, 41.

\(^{246}\) AEMC, ‘First Interim Report’, above n 209, 61.

\(^{247}\) Ibid.

\(^{248}\) See NER, ch 6A; all current determinations for transmission and distribution businesses are available at AER, Determinations and Access Arrangements <http://www.aer.gov.au/networks-pipelines/determinations-and-access-arrangements>.

\(^{249}\) See NER, ch 6; also Victorian Bushfires Royal Commission, above n 244, para 4.5.

\(^{250}\) Victorian Bushfires Royal Commission, above n 244, para 5.

\(^{251}\) Australian Energy Regulator, State of the Electricity Market 2009 (2009), see notes at 129.

\(^{252}\) NER, cl 5.6.5A to 5.6.6AA; Australian Energy Regulator, Regulatory Investment Test for Transmission (RIT-T) (1 July 2010).

\(^{253}\) NER, cl 5.6.5A (b)(1).

\(^{254}\) NER, cl 6A 6.6(c).

Network overinvestment under these scenarios, so-called ‘gold plating’, has been criticized as unnecessarily raising electricity prices.\textsuperscript{256} Germany and the UK have similar incentive regulation for network investment.\textsuperscript{257} Both, however, have introduced exceptions and special treatment for investment facilitating renewable energy.\textsuperscript{258}

The necessity to balance efficiency concerns with reliability requirements leaves little space for developing a network that specifically supports renewable energy.\textsuperscript{259} Strategic network planning, as shown in the next section, can identify these opportunities and could address the path-dependence inherent in the custom built grid. However, its impact on network investment is limited, because it is not binding on the network businesses, which are responsible for network investment.

\textit{Strategic Network Planning}

Given the role that renewables, especially large-scale wind power, may play in the future energy mix of Australia,\textsuperscript{260} the strategic upgrading and extension of transmission lines to allow for renewable energy producers to access the grid will be crucial.

As the Victorian Government submitted to the Victorian Parliamentary Inquiry on Renewable Energy:

\begin{quote}
The issue of funding investment in grid infrastructure entails a dilemma for policy makers. Building transmission infrastructure is capital intensive, complex and time consuming and tends to be a stumbling block for renewable energy project developers. Conversely if transmission infrastructure building costs were to be recovered by the [network service
\end{quote}

\textsuperscript{256} Garnaut, 'Transforming the Energy Sector', above n 153, from 43.
\textsuperscript{257} Ch 5, II B 2 B; ch 6, II C 2 b.
\textsuperscript{258} Ibid.
\textsuperscript{259} Oakeshott, above n 6, 41.
\textsuperscript{260} Indeed, AEMO considered in 2009 that almost all of the RET will be provided by wind power, Australian Energy Market Operator, \textit{National Transmission Statement} (2009) 4-37.
provider] from all end-users, this could distort the operation of the market by encouraging generation connections in areas that are inefficient or more expensive than elsewhere.\textsuperscript{261}

The question of whether strategic transmission planning can counter this dilemma remains unresolved in Australia, especially because transmission planning does not translate into the actual building of infrastructure. Indeed, there is no incentive in the privatized industry to strategically invest in renewable-friendly network infrastructure.\textsuperscript{262} The reflection of the costs of transmission upgrades back upon the proponent, forces the developer to find the ‘most efficient’ solution.\textsuperscript{263} The lead terms for network investment – reliability and efficiency – are in the short-term most efficiently addressed ‘through exploiting the characteristics of dominant technologies’,\textsuperscript{264} reflecting the path-dependence of the development of the electricity system.

While transmission planning used to be a task of the states, AEMO has taken on the role of the National Transmission Planner since 1 July 2009. This nationalization of strategic planning has the potential to move infrastructure investment away from regional level planning only, towards a more holistic approach. A recent study of the transmission network planning found that the ‘ability of AEMO to proactively identify transmission augmentations […] that deliver national market benefits may encourage investments of a different form or timing than might otherwise be the case if taking a purely regional view.’\textsuperscript{265}

Yet, the role for AEMO as a national transmission planner has no binding effect on transmission planning. These constraints are system-inherent and echo the principle of the free commercial decision-making for all the electricity industry participants. CoAG made clear that ‘the national transmission planning function would not bind transmission

\textsuperscript{261} Parliament of Victoria, above n 191, 227. Indeed, this is the case in some European countries, where it was found that the connection of unsuitable generators ‘clogs’ the grid for more efficient generators, see European Wind Energy Association, \textit{WindBarriers: Administrative and grid access barriers to wind power} (July 2010).


\textsuperscript{263} Parliament of Victoria, above n 191, 228.

\textsuperscript{264} Catherine Mitchell and Bridget Woodman, ‘Regulation and Sustainable Energy Systems’ in Robert Baldwin et al (eds), \textit{The Oxford Handbook of Regulation} (Oxford University Press, 2010) 572, 582 (citations omitted).

\textsuperscript{265} ACIL Tasman, above n 255, 20.
companies to specific investment decisions’, and that accountability for jurisdictional transmission investment, operation and performance will remain with transmission network service providers.\(^{266}\) AEMO merely provides guidance and additional information on opportunities. As AEMO notes in the plan: ‘should transmission owners be unable or unwilling to proceed with the network investments required for national benefits, then the means of enhancing and clarifying accountability for benefit delivery warrant consideration’.\(^{267}\) This applies to network augmentation as well as to future investments in new infrastructure. AEMO states ‘a fundamental and holistic debate on the transmission industry’s structure and its relationship with the market is needed if the transmission sector is to successfully meet Australia’s demands over the next few decades’.\(^{268}\)

Yet, in reality, the rule change process has not delivered a rethink of the role of the transmission businesses. Unlike in the UK and in Germany, where centralized network planning has been accompanied by a regulatory shift of planning power away from the private network businesses towards the public sphere, national transmission planning provisions have not engendered a move away from business-as-usual in network investment. To overcome path-dependent investment decision-making, arguably targeted legislation compelling network businesses to invest in a renewable-friendly way will be necessary. However, in Australia, the experience with one such rule change proposal has shown that old patterns are difficult to overcome.

The creation of so-called hubs to connect ‘generation clusters’ was one recommendation made by the AEMC’s Review of Energy Market Frameworks in Light of Climate Change Policies, in order to enable the efficient connection of renewable generation ‘clustered in specific geographical areas and often remote to the grid remote from the grid.’\(^{269}\) Under the existing investment rules, the first investor in this area will have to bear the cost of connection. The proposal envisioned generators sharing the costs of augmentation and extension into the remote area. If not all generators become connected, customers have to

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\(^{266}\) Council of Australian Governments, Communiqué (April 2007).
\(^{267}\) AEMO, ‘National Transmission Statement’, above n 260, 3-16.
\(^{268}\) Ibid 3-39.
pay ‘for any revenue requirement not recovered from generators’. This model could also facilitate the capture of economies of scale in transmission investment.

Attempts to introduce these arrangements through a regulatory rule change, containing a regulatory framework for Scale Efficient Network Extensions (SENE), have not been successful. After extensive stakeholder and community consultation, the resulting rule allocates risks and costs of a network extension to the market participants and not consumers. The new rule provides that transmission businesses need to undertake and publish on request specific locational studies to allow generators to ‘make informed, commercial decisions to fund a SENE, having weighed the potential gains from coordinated, efficient generator connection arrangements against the potential costs of assets not being fully used’. The rule basically provides for an opportunity for several generators seeking connection in a specific area to coordinate their efforts. The final decision to fund, construct, operate and connect to a SENE is still made within the existing framework of rules. With such inherent disincentives still at play, the likelihood that the rule will overcome barriers for renewable generators seeking ‘competitive’ grid augmentation and extension is uncertain. This contrasts with the position especially in Germany, but also increasingly in the UK, where network planning is centralized to address the challenges for renewable energy strategically.

In summary, in Australia renewable energy is inherently disadvantaged in a regulatory framework, which perpetuates systemic disadvantage. The current framework relies on decentralized decision-making in regard to both network and generation investment, guided by efficiency and reliability concerns. This favours incumbent generators, which can provide electricity within these parameters. Supporting the contention of the thesis that exiting regulatory frameworks in Australia perpetuate fossil fuel dependence, rules for network investment and planning further deepen the reliance on outdated generation and network patterns. Because electricity market legal frameworks have been designed to

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270 Ibid 16.
272 The new rule only considers augmentations of existing lines as SENEs; extensions into new resource areas are not covered by the framework.
separate policy making from market operation, it has been complicated to overcome these inherent disadvantages for renewable energy, effectively locking out much renewable generation. So far, attempts to introduce targeted renewable-friendly network rules have been largely unsuccessful.

In the next section it will be shown that the main renewable energy support instrument, the RET, does not address and is not designed to address the challenge for renewable energy to participate in the electricity market.

### III Legal Instruments for Renewable Energy Support in Australia

In order to support renewable energy generation, Australian governments have employed and continue to employ different instruments. These include the RET and various State feed-in-tariff schemes as well as a range of research and development measures, which play an important role in the early stages of development of any new technologies. Australian states have also implemented so-called green power schemes, which aim to promote the voluntary uptake of renewable energy by retailers offering renewable generated electricity to its customers. Finally, the now abolished federal CPM had been designed to indirectly support renewable energy where it provides a least-cost greenhouse gas abatement option.

This section will concentrate on the impact of the RET as the main targeted measures for renewable energy uptake. The central question for this analysis is whether the RET addresses system-inherent barriers for renewable energy in the electricity market.

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273 See also above n 52.

274 Technology development lifecycles are commonly separated into research and development, demonstration, deployment and commercialization phases, see, eg, International Energy Agency, *Global Gaps in Clean Energy RD&D* (2010) 11. Research and development as well as policy development have been targeted mostly through the establishment of agencies on both state and federal level. These included centrally the Australian Centre for Renewable Energy, which has been provided with substantial funding for development of renewable energy, see also *Australian Centre for Renewable Energy Act 2010* (Cth). In 2012 the Centre was subsumed into the newly created Australian Renewable Energy Agency. For details on state-based agencies see, Bradbrook and Lyster, above n 40, 163.

275 See in detail, Bradbrook and Lyster, above n 40, 155-160.
The federal RET was established in 2000. While the scheme went through numerous amendments to change targets and other details, its basic mechanism has remained unchanged.

The RET is an example of a tradable green certificate scheme, used in different jurisdictions all over the world.276 All of these schemes have in common that tradable certificates, in Australia called renewable energy certificates (REC’s), are created for renewably generated electricity. These are then bought by liable entities, usually retailers, which are required by law to purchase a set proportion or quota of their electricity from renewable sources.277 These quotas, embodied in the so-called Renewable Power Percentage, are set at the beginning of every year by regulation.278 They are based on an estimated amount of energy produced in the year to come.279 If more or less electricity is used than forecast, the interim target and accompanying percentage will be adjusted accordingly in the following year. If a liable entity does not surrender sufficient REC’s to cover its liabilities, it is required to pay a shortfall charge.280 The penalty rate provides the upper limit of certificate prices. The REC’s, which are electronically created, are freely transferrable281 and stay valid until surrendered.282 Unlimited banking by carrying excess REC’s into coming years is therefore possible.283 A statutory authority administers the scheme. Initially this was the Office of the Renewable Energy Regulator.284 When the federal government introduced the CPM in 2012, administration of the RET scheme was

278 Ibid s 14; Renewable Energy (Electricity) Regulations 2001 (Cth) reg 23.
279 See Renewable Energy (Electricity) Act 2000 (Cth) s 39; Lyster and Bradbrook, above n 40, 99-100.
281 Renewable Energy (Electricity) Act 2000 (Cth) s 27.
283 Ibid s 38.
284 Ibid s 149, repealed by Clean Energy (Consequential Amendments) Act 2011 (Cth).
moved to the newly introduced Clean Energy Regulator, responsible for a range of legislation addressing climate change mitigation.\(^{285}\)

The price of the certificates provides the renewable generator with an income source \textit{in addition} to the price received in the electricity market – the schemes ‘are based on the idea of separating the actual power and its “greenness”’.\(^{286}\)

1 \textit{The Mandatory Renewable Energy Target Scheme 2000-2009}

The RET was first mentioned in 1997,\(^{287}\) however, it was only put into place as the Mandatory Renewable Energy Target Scheme (MRET) in 2000.\(^{288}\) The MRET had a target of an additional\(^{289}\) 2 per cent or 9500GWh of electricity to be generated from renewable sources by 2010. Its first independent review, the 2003 Tambling review, generally considered the scheme a success.\(^{290}\) However, it recommended considerable changes for the future, including a steady increase of the target to a total of 20 000GWh from 2010 to 2020 in order to ‘provide ongoing certainty and industry development opportunities to the renewable industry’.\(^{291}\) The Panel predicted that the low target was likely to be achieved early, forecasting a massive decline in investment after the target was reached.\(^{292}\)

The Australian government in reply to the MRET review extended the operation of the scheme to 2020, but did not lift the target. As predicted, after an initial surge in renewable energy projects from 2001 to 2006, the positive investment climate for renewable energy in

\(^{285}\) \textit{Clean Energy Regulator Act 2011} (Cth).
\(^{286}\) Ibid.
\(^{287}\) In Howard’s speech, ‘Safeguarding the Future’, above n 38, see above at I B.
\(^{289}\) At the time of the implementation of the Act, Australia was sourcing approximately 10 per cent of electricity from hydro, Roarty, above n 95.
\(^{291}\) Ibid xxi.
\(^{292}\) Ibid xvii.
Australia ceased when the target was achieved in 2007. Investment stalled and the local industry was pushed out of the country.

Australian states moved to fill the gap left by the Howard government’s failure to expand the MRET and to halt declining investment in renewable technologies. Over the period of 2005-2010 most states considered or implemented renewable energy targets. Victoria, for example, established a Victorian Renewable Energy Target Scheme, based on the same design as the federal scheme, which operated from 2007 to 2010. After the enhanced RET was introduced in 2010, the scheme was transitioned into the federal scheme.

2 Renewable Energy Target Scheme under the Rudd Government

The Rudd government’s success in gaining office in 2007 was in part based on the promise to act on climate change. Among other climate related commitments, Rudd vowed to introduce a 20 per cent renewable energy target, to be achieved by the expanded MRET. The scheme was adopted in 2009. It contained a new target of 45000GWh, as an estimated equivalent of 20 per cent renewable energy by 2020. The basic design of the MRET scheme, however, was retained.

The expanded national RET scheme was intended to provide interim stimulus for the deployment of renewable energy during the early years of a national emissions trading

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294 For example, widely reported in 2007 were the manufacturing plant closure by Vestas in Victoria and Tasmania in 2007, Sarah Wotherspoon, ‘Vestas Blades Australia Closes Plant’, Herald Sun (Melbourne), 23 August 2007.
295 See, eg, NSW Greenhouse Gas Reduction Scheme, Renewable Energy Bill 2007 (NSW) with a 15% mandatory target, which was never implemented.
296 Victorian Renewable Energy Target Act 2006, mandating a 10% increase in renewable energy use by 2016; Climate Change and Greenhouse Gas Emissions Reduction Act (2007) (SA) including a 20% renewable energy target by 2014, and the 10 per cent political commitment to renewable energy.
299 See above at I B.
300 The scheme was to be kept at that level for 10 years and then to be phased out beyond 2030.
scheme which was also under consideration at the same time.\textsuperscript{301} The rationale behind phasing out the RET has been captured by Professor Garnaut, a prominent economist who advised the Rudd government on climate policy and the design of a national emissions trading scheme. In his high level review of the impact of climate change on the Australian economy Garnaut stated:

Once a fully operational emissions trading scheme is in place, the Mandatory Renewable Energy Target will not address any additional market failures. Its potentially distorting effects can be phased out naturally as the emissions trading scheme takes up the load of encouraging low-emissions technologies.\textsuperscript{302}

Accordingly, to match a future emissions trading scheme, partial exemptions in respect of electricity used in undertaking emissions-intensive trade exposed (EITE) activities as defined under the then discussed CPRS legislation were introduced.\textsuperscript{303}

Further important changes included the introduction of solar credits; a mechanism that multiplied the number of REC’s created for small generation units installed after 9 June 2000.\textsuperscript{304} That meant that for every MWh of electricity produced by such a unit, the producer would receive up five certificates, four of which were ‘phantom’ certificates, not representing any actual renewably-generated electricity. The solar credits were introduced to replace the government’s Solar Homes and Communities Plan, which provided government rebates for small-scale solar generation.\textsuperscript{305} They are an example of the government providing specific support for one source of renewable generation, which does not readily match the rationale of a RET scheme supposed to support the lowest cost renewable energy. The solar credits led to a flooding of the REC market, and depressed REC market prices to the detriment of large-scale installations.\textsuperscript{306}

\textsuperscript{301} See also above at I B.
\textsuperscript{303} These exemptions were only to commence when the matching section 3 of the CPRS commences.
\textsuperscript{304} Introduced with the Renewable Energy (Electricity) Amendment Regulations 2009 (No 2).
\textsuperscript{305} Explanatory Statement, Renewable Energy (Electricity) Amendment Regulations 2009 (No 2) (Cth).
In reaction to this situation, and also to the lack of success in introducing the CPRS substantial changes were made to the federal scheme in 2010, creating the current ‘enhanced Renewable Energy Target Scheme’.\footnote{Renewable Energy (Electricity) Amendment Act 2010 (Cth), the Renewable Energy (Electricity) (Small-scale Technology Shortfall Charge) Act 2010 (Cth) and the Renewable Energy (Electricity) (Charge) Amendment Act 2000 (Cth).}

3 The Current Scheme and Future Outlook

The RET has now been split into large-scale and small-scale obligations. Liable entities need to meet obligations under both schemes. These changes were introduced to avoid a concentration of REC creation in the small-scale sector, as happened with the introduction of the Solar Credits mechanism, and to boost large-scale production – ultimately crucially important for a real change in energy production in Australia.\footnote{Explanatory Memorandum, Renewable Energy (Electricity) Amendment Act 2010 (Cth) 4.}

Most of the 2020 target, in total 41000 GWh, is now to be achieved by a large-scale renewable energy target, which operates similarly to the expanded scheme. The remaining 4000 GWh are included in the small-scale renewable energy scheme. Features of this scheme include a fixed price of AUD40 for small-scale certificates, produced by small generation units.

A 2012 review of the RET scheme by the Climate Change Authority found that the scheme performed well in regard to its objectives of encouraging the additional generation of electricity from renewable sources and to lower emissions. The review recommended the target be kept in its current form.\footnote{Climate Change Authority, 2012 Renewable Energy Target Review (December 2012).} The successful performance has been confirmed by another review of the scheme in 2014.\footnote{Commonwealth of Australia, ‘Renewable Energy Target Scheme’ (Report of the Expert Panel, August 2014) ch 2.} However, the report also recommended a scaling back of the scheme, which it considered a ‘high cost approach to reducing emissions’.\footnote{Ibid i.} The federal government discussed severely cutting the scheme to represent a ‘real 20 per
cent’. The background for this measure is that as electricity demand is falling, the numerical target of the RET will likely no longer represent a 20 per cent share of the market. While repealing or amending legislation has not yet been introduced to parliament, the current uncertainty over the future of the scheme has had severe impacts on investment. A report found that investment was down 70 per cent in 2015 compared to the same period in the year before.

In summary, the RET has so far been successful in lifting the deployment of renewable energy in Australia. It has done so in a way that has supported predominantly large-scale wind energy, as well as small-scale solar installations. In line with the emphasis of this thesis, the following section will discuss to what degree the RET can change and has changed the electricity system to support a future high percentage of renewable energy. In other words, to what degree has the RET been successful in addressing the systemic disadvantage renewable energy faces.

B The Electricity System Impact of the Renewable Energy Target Scheme

This thesis claims that electricity market legal frameworks are not suited for supporting renewable energy and will need targeted legislation to overcome this disadvantage.

The RET does not address systemic disadvantages for renewable energy. It is designed to be entirely separate from the electricity market. Its objective of supporting additional generation of renewable energy can currently be achieved without changes to regulatory frameworks of the electricity market. Because the RET is designed to support the lowest cost renewable energy, it has achieved its targets in an uneven way – supporting predominantly large-scale wind and small-scale solar energy. As introduced in chapter 1, modelling of generation and network development shows that a successful transition to a high renewable scenario is dependent on a carefully balanced mixture of energy generation

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312 Ian Macfarlane and Greg Hunt, ‘Renewable Energy Target’ (Joint Media Release, 22 October 2014).
314 Commonwealth of Australia, above n 310, 8.
sources. This is not a scenario that the RET scheme furthers, precisely because it supports the lowest-cost renewables.

The prevalent political opinion in this regard can be illustrated by the following quote from the former Rudd Government Minister for Resources, Energy and Tourism, Martin Ferguson:

The Australian Government has decided to use the expanded Renewable Energy Target (RET) as our key policy for encouraging new investment in renewable energy generation. In contrast to a technologically-prescriptive and ideologically-based feed-in tariff, the RET is a market-based mechanism that does not favour specific technologies. It allows the market to choose those technologies, which reliably produce renewable energy at the lowest cost. The Government should not be attempting to pick winners.315

The Minister’s reaffirmation of the market as the suitable avenue to achieve lowest-cost renewable uptake and continuing the model of the light-handed state - one that is ‘not picking winners’ - echoes the stance of non-intervention in regard to the electricity market. The target scheme ‘seems to require a minimal amount of government interference, and this is consistent with the economic theory underlying the restructured market’.316

Targeting specific generation investment, as provided by the German feed-in-tariff scheme,317 or in the UK under contracts-for-difference arrangements,318 is not possible under these circumstances. The attempt to ‘steer’ generation investment, by means such as the solar multipliers, clashed with the basic design of the scheme. It had unintended negative consequences for the investment security for large-scale investment. Likewise, the RET does not address network regulation for renewable energy. As a result, large wind installations close to the existing network have dominated renewable energy investment, because they could be accommodated within the existing frameworks. Yet, as chapters 5 and 6 will show, expressly supporting network connections for renewable energy and, centrally, adopting a whole-of-system planning approach for a future decarbonized

315 Martin Ferguson, Speech at the Solar Flagship Forum (24 September 2009).
316 Bradbrook and Lyster, above n 40, 194.
317 Ch 6, II B.
318 Ch 5, III B.
electricity system, is crucial for a timely and orderly transition of the electricity system. In Australia, these changes are left ‘to the market’.

Because the RET is a mechanism separate to the electricity market, it cannot address the inherent disadvantages of renewable energy. As a result the RET is not suited to set the Australian electricity system on a new path, but instead perpetuates the institutional and regulatory design that benefits the incumbent fossil fuel generators.

IV Conclusion

The physical and institutional properties of Australia’s electricity system continue to reflect traditional generation patterns. The regulatory framework for the electricity market in Australia perpetuates a systemic lock-in in several ways. Its governance structure is removed from parliamentary scrutiny by a unique national arrangement that relies on an executive structure.319 The relative stability of this CoAG arrangement prevents political volatility of electricity market regulatory frameworks, unlike the changing political conditions which the RET has been exposed to. Some would therefore like it extended to the RET.320 Yet, this stability also leads to inertia and a very slow process of policy change.321 This policy inertia is further exacerbated by a market reform process that is confined to a narrow objective, limiting the reach of reforms to those within a narrow efficiency objective. Instead, non-market objectives, such as a sustainable electricity system, are supposed to be achieved through instruments external to the market. This has been successful within narrow targets.

Market reform, where it has benefitted renewable generation, was targeted at addressing information imbalances between market participants and providing a new, intermittent, category of generation. It did not, however, introduce special rules for renewable

319 Saunders, ‘Constitution of Australia’, above n 86, 250, stating that ‘the ministerial council system cuts across lines of accountability that responsible government assumes. It also obscures the decision-making process to a degree that makes it difficult to pinpoint the causes of underperformance’.
320 MacGill and Healy, above n 139, 636.
321 In detail see Productivity Commission, above n 146, ch 21.
generation. Unlike in Germany and the UK, where renewable energy has been afforded a special place in the electricity market regulatory space, the underlying system of planning and investment decision-making for networks in Australia has not been addressed by reforms. Renewable generators are thus treated the same as any other generator, but lack the advantages that the electricity system affords traditional fossil fuel generators, which ‘fit’ in the historically developed system. Thus, large-scale transition to renewable energy is hampered not only by low targets and the lack of political vision for the future, but also by the fact that they do not address the network constellations currently supporting fossil fuel reliance.

Chapters 5 and 6 show how Germany and the UK, have addressed electricity market challenges of renewable energy. Driven by Europe-wide targets described in chapter 4 and a political support for an energy transition, both countries had to scale up their renewable energy generation in their electricity systems. Unlike in Australia, this policy has led to shifting responsibilities for network planning and an increasing regulation for renewables, amounting to positive discrimination in favour of renewables.
Following the study of the Australian legal frameworks for renewable energy and the electricity system in chapter 3, this chapter introduces the European Union (EU) law and policy in regard to energy markets and renewable energy.

The EU experience is provided as an introductory chapter for the comparative studies of the electricity systems of Germany and the UK, which are both EU member states. The law of electricity systems in European member states has been substantially influenced by European level law and policy. They provide a further regulatory layer to the regulatory space of member states’ electricity systems. The nature, scope and influence of European energy and environmental law are therefore introduced here.

Although there is still considerable divergence in member state implementation of European energy law, European legislation and policy has promoted both, the support for renewable energy throughout the Union, as well as a particular, and arguably ‘British’, model of electricity market regulation.1

As this chapter will show, in the EU, in contrast to Australia, the energy policy dialogue has started to move beyond a distinction between achieving competitive markets on the one hand and environmental objectives on the other. As a result EU law and regulation support renewable energy within a commitment to creating an internal market for electricity. This is reflected in the European legislation and in turn in the member states’ regulatory frameworks for electricity and renewable energy. It is this convergence that increasingly characterizes the engagement with renewable energy in the electricity market in the EU, and subsequently in the member states.

Thus, even though European law prescribes market liberalization, it at the same time opens decision-making spaces for member states to allow for special regulation for renewables.

This chapter has two objectives: firstly, explaining the influence of European law and policy on member states’ law, and secondly, introducing the substantive European law

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1 See below at II B.
pertinent to renewable energy and electricity markets. Part I of the chapter introduces European energy law, its institutions and its relationship to national law. It discusses whether in EU member states, the ‘terms of entry’ and the architecture of the regulatory space are now determined at the EU level. This overview of the development of EU energy policy and the sources of European energy law foregrounds the discussion in parts II and III, which introduce the European law which specifically applies to electricity market liberalization and renewable energy respectively.

I INTRODUCTION TO EUROPEAN ENERGY LAW

The EU is a political and economic partnership that now comprises 27 member states. The EU emerged from three original treaties creating the European Economic Community (EEC), the European Atomic Energy Community (Euratom) and the European Coal and Steel Community (ECSC). These treaties were aimed at economic integration of the member states, with a ‘common market’ considered to be the key to ‘accelerated raising of the standard of living and closer relations between its Member States’. The centrepiece of these treaties was an internal European market for the free movement of people, goods, services and capital between member states.

4 Treaty instituting the European Coal and Steel Community, signed 18 April 1951, 261 UNTS 140 (entered into force 23 July 1952).
5 EEC Treaty art 2.
6 Ibid art 3.
Even before the creation of the EU, increasing political integration saw EU competencies move beyond purely economic integration as envisioned by the *EEC Treaty* to cover a range of areas, including, for the purposes of this thesis, prominently the environment.  

The EU was formally established with the Treaty of Maastricht in 1993 and widened the reach of European law and policy into member states enormously to include ‘economic and social cohesion’ as well as the creation of an economic union.  

A ‘tense relationship’ between nation member states and the community ‘defines the European experience’. The relationship between nation state sovereignty and governance on a European level has become even more contentious with the increasing importance of European policy on the national scale. The constant balancing of national and European interests is apparent in the idea of legislative competences, which determine the scope and relationship of EU and member states law-making powers. It has shaped EU institutional design, its principles and the instruments available for law-making, as introduced below in general terms. This tension also is apparent in the European law and policy for energy and renewable energy.

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**A European Law: Principles, Instruments and Institutions**

The interaction between national and supranational law is guided by several principles of European law, prominently among which is the principle of subsidiarity.

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7 See below at I C.
10 The competences for law-making in the renewable energy and energy market area are explained in more detail at I C.
11 Other principles of European Law include the principle of conferral, which regards the question of competences; the principle of proportionality which according to art 5 (4) *TEU* means that ‘... the content and form of Union action shall not exceed what is necessary to achieve the objectives of the treaties’; as well as the principle of supremacy which states that EU law has supremacy over national law and each member state has to implement EU law into national law, where it is not directly applicable, and can be held responsible if the implementation is lacking or late, art 258 *TFEU*. 
According to the Treaty on European Union (‘TEU’) the principle of subsidiarity means that

in areas which do not fall within its exclusive competence, the Union shall act only if and in so far as the objectives of the proposed action cannot be sufficiently achieved by the Member States, either at central level or at regional and local level, but can rather, by reason of the scale or effects of the proposed action, be better achieved at Union level.\(^12\)

The principle of subsidiarity allows the member states to use their national policies to fulfil European obligations. The principle of subsidiarity has been used specifically in the energy market directives to provide for the so-called ‘public service’ exemptions by member states, which include renewable energy policies that extend beyond the requirements of the renewable energy directives.\(^13\)

European level institutions, too, reflect the balancing of member states’ and EU interests. Three institutions, the European Commission (Commission), the European Parliament and the Council of European Union (Council) are responsible for law-making on a European level.

The Commission\(^14\) is responsible for drafting proposals for legislation. It plays an important role in driving EU energy policy, especially in regards to promoting an internal market for energy, representing the EU’s supranational interest in energy policy.\(^15\) The Parliament adopts, in most cases together with the Council, proposals by the Commission.\(^16\) The Council is the main body representing the member states national interests.\(^17\) In regard to energy policy, meetings of the energy ministers of the member states inform the work of the Council.

\(^{12}\) Art 5.3 TEU.
\(^{13}\) In more detail below at II F.
\(^{14}\) Not to be confused with the Council of the European Commission, which is setting the general political direction and priorities of the EU. It comprises the heads of state of the member states and the president of the European Commission and the Council of Europe.
\(^{16}\) See arts 289, 294 TFEU.
The EU can choose between three types of legally binding instruments when legislating; regulations, directives and decisions. According to Art 288 of the Treaty of the Functioning of the European Union (‘TFEU’), regulations are binding in their entirety and directly applicable in all Member States. Directives, on the other hand, are binding only ‘as to the result to be achieved’ and leave the ‘choice of form and methods’ to the member states. Much of the EU law and regulation, especially in regard to energy, has been in the form of directives rather than regulations. The most prominent of these are the Energy Market Directives and the Renewable Energy Directives. As will be seen, the use of directives leaves considerable scope for member states to implement their own versions of national energy markets and renewable energy support instruments. The choice of directives over regulation reflects the national political importance of the subject matter, and highlights member states’ reluctance to give complete control to the EU in respect of their energy sectors.

European case law plays an important role in the development of energy law in the member states. The task of interpreting and applying EU law is shared between the national courts and the Court of Justice of the EU (ECJ). The ECJ ensures the ‘in the interpretation and application of the Treaties the law is observed.’ This includes a range of different cases that can be brought before the court, including:

- infringement proceedings against national governments for failing to comply with EU law;
- actions for failure of EU institutions to act;

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18 As well as non-binding ones such as recommendations and opinions, art 288 TFEU. See Alan Dashwood and Derrick Wyatt, Wyatt and Dashwood’s European Union Law (Hart Publishing, 6th ed, 2011), 70 for an overview.


20 Which will be introduced below at II and III.


22 Art 267 TFEU

23 Art 19(1) TEU.
• annulment applications where an EU act is thought to violate EU law; and

• sanctioning of EU institutions.\textsuperscript{24}

Of special importance in energy law is the ability of the courts of a member state to refer to the court for clarification on whether a national law is compatible with EU law.\textsuperscript{25} This jurisdiction of the ECJ to give a preliminary ruling has been the mechanism used in the two cases interpreting the validity of national renewable energy, which will be discussed below at III B.

\textbf{B European Energy Policy and the Convergence of Objectives}

It was not until the 1990s that a common energy policy for the EU emerged.\textsuperscript{26} The reasons for the delay were based in the unwillingness of EU member states to relinquish sovereignty in a highly political area; which was characterized by clear public service expectations on the part of the public on the one hand and close relationships between governments and the electricity supply industry on the other.\textsuperscript{27}

Electricity market integration is part of the commitment for an internal market, which lies at the heart of initially the EEC and now the EU.\textsuperscript{28} Accordingly, all of the electricity market directives so far have been based on provisions providing for the harmonization of the internal market.\textsuperscript{29} On the other hand, climate change,\textsuperscript{30} as well as more general concerns

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{24} For an overview see European Union, \textit{Court of Justice of th European Union: Overview} \texttt{<http://europa.eu/about-eu/institutions-bodies/court-justice>}, as well as Section 5 TFEU, setting out composition, procedure and jurisdiction of the Court.
\item \textsuperscript{25} See Art 267 TFEU.
\item \textsuperscript{26} For an overview, see eg Midttun, above n 21, 255.
\item \textsuperscript{27} See, eg, ibid 258 ff.
\item \textsuperscript{28} The internal market for electricity is considered an integral part of the European internal market, ‘an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured’, see preamble [1],[2] of Directive 96/92/EC of the European Parliament and of the Council of 19 December 1996 concerning common rules for the internal market in electricity [1996] OJ L 27/20 (‘Directive 96/92/EC’)
\end{itemize}
\end{footnotesize}
over the environmental impacts of energy production, have been highly influential in driving changes in the EU engagement with energy.\textsuperscript{31}

Another important driver for energy policy development in the EU is energy security. Unlike Australia, many member states of the EU have limited energy resources of their own and depend on potentially politically volatile states for their energy supply.\textsuperscript{32} Early EU policy on renewable energy was based in objectives of security of energy supply, but became connected to an environmental agenda especially after the 1992 Rio Conference on climate change.\textsuperscript{33}

The first comprehensive EU energy policy green paper, the ‘European Strategy for Sustainable, Competitive and Secure Energy’\textsuperscript{34} expressly provided for the convergence of these themes of sustainability, competition and energy security. The six priority areas provided for in this document included:

- energy for growth and jobs in Europe: completing the internal European electricity and gas markets;
- an Internal Energy Market that guarantees security of supply;
- tackling security and competitiveness of energy supply: towards a more sustainable, efficient and diverse energy mix;
- an integrated approach to tackling climate change;
- encouraging innovation: a strategic European energy technology plan; and

\footnotesize{\textit{electricity and repealing Directive 2003/54/EC} \cite{2009 OJ L 211/55}, were based in \textit{47(2), 55, 95 Treaty establishing the European Community} \cite[cited historically]{cited historically}.}

\footnotesize{\textit{The EU and its member states are signatories to the Kyoto protocol, Kyoto Protocol to the United Nations Framework Convention on Climate Change}, open for signature 10 December 1997, \textit{37 ILM 32} \cite{1998} (entered into force February 2005).}

\footnotesize{\textsuperscript{31} See, eg, Chad Damro, Iain Hardie and Donald MacKenzie, ‘The EU and Climate Change Policy: Law, Politics and Prominence at Different Levels’ \cite{2008} \textit{4(3) Journal of Contemporary European Research} 179.}

\footnotesize{\textsuperscript{32} On the energy security implication of the Ukraine crisis see, eg, European Commission, ‘European Energy Security Strategy’ \cite{2014} \textit{COM(2014) 330 final}, 28 May 2014.}

\footnotesize{\textsuperscript{33} Isabelle De Lovinfosse, \textit{How and Why Do Policies Change?} \cite{2008} 71.}

\footnotesize{\textsuperscript{34} Commission, ‘Energy for the Future: Renewable Sources of Energy: Green Paper for a Community Strategy and Action Plan’ \cite{2014} \textit{COM(96)576 final}.}
• towards a coherent external energy policy.

Further EU energy policy dialogue subsequently led to the Climate and Energy Package\textsuperscript{35} legislative proposal of the Commission. This package was implemented to legislate the policy agreements made by the EU heads of state and government in the Council in the 2007 action plan, namely:

• a reduction in EU greenhouse gas emissions of at least 20 per cent below 1990 levels;

• 20 per cent of EU energy consumption to come from renewable resources; and

• a 20 per cent reduction in primary energy use compared with projected levels, to be achieved by improving energy efficiency.\textsuperscript{36}

The process of merging sustainability and market concerns has subsequently culminated in the introduction of a new express competence for energy in Article 194 TFEU through the reform Treaty of Lisbon in 2009.

A range of interlinking European mitigation measures aim at achieving these objectives. The European Emissions Trading Scheme,\textsuperscript{37} now in its third phase, has introduced a cap for carbon emissions across a range of European industries.\textsuperscript{38} Also, the Large Combustion Plant Directive,\textsuperscript{39} introducing stringent emissions standards to fossil fuel-based electricity

\textsuperscript{38} For a detailed overview of the scheme and its mechanisms, see, eg, Jurgen Lefevre, ‘The EU Greenhouse Gas Emissions Allowance Trading Scheme’ in Farhana Yamin (ed), Climate Change and Carbon Markets (Taylor & Francis, 2012) 75.
generation, is leading to plant closures, which is accelerating systemic change. While important for decarbonizing the electricity sector, both of these schemes do not directly address renewable energy in the electricity system. They will therefore not be further investigated in this thesis.

C Sources of European Energy Law

EU Law relies on its founding treaties as the primary source of law. The founding treaties are international law treaties between the member states of the EU. Secondary sources of law of supranational character are the laws made by the EU institutions, the Commission, the Council and the Parliament. These include the main pieces of EU legislation introduced in this chapter, the directives concerning the internal energy market, as well as the renewable energy directives.

Competences or powers to make supranational law in certain subject matters are conferred by the TEU and detailed in the TFEU. Similar to federal-state relationships in federal states, EU competences to make law can be exclusive or shared.

This ‘quasi federal’ structure of competences reflects the interaction and tensions between nation state and supra national level.

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41 See above I A.
42 See in detail at III and IV.
43 TEU art 5.
44 Which includes matters such as customs and monetary policy for member states whose currency is the Euro, TFEU art 3.
45 Which include the subject matter for this thesis, such as environment and energy, TFEU art 4.
According to the *TFEU*, member states and the EU currently have shared competence in the areas of energy, environment, the internal market and trans-European networks.\(^{48}\) The EU can legislate in order to achieve EU environmental policy objectives (Arts 191 and 192 *TFEU*) and energy policy objectives (Art 194 *TFEU*).

Whether the introduction of an explicit shared competence on energy will ultimately make much of a difference to the extent of the law and policy-making of the EU in this area is uncertain. Hancher and Salerno emphasize that the EU has managed to adopt several substantive legislative packages in the subject area, namely the climate and energy package as well as the third energy package,\(^{49}\) without the need for a new competence.\(^{50}\) They argue that while the new competence may lead to more consistency and transparency, it has so far been of limited use.\(^{51}\) Others warn that the fact that paragraph 2 of Art 194 *TFEU* leaves the ultimate sovereignty over the energy supply mix in the hands of the member states constrains the ‘advancement towards policy coherence’.\(^{52}\)

Finally, the EU can also contribute the ‘establishment and development of trans-EU networks in the area[s] … of energy infrastructure’,\(^{53}\) a competence is becoming increasingly more important with a rise of EU activities in regard to interconnecting network infrastructure.\(^{54}\)

\(^{47}\) The question of the democratic deficit of the EU has so far led to an impressive amount of academic research, but is beyond the scope of this thesis. For further reading see, eg, Joseph Weiler, Franz Mayer and Ulrich Haltern, 'European Democracy and Its Critique' (1995) 18 *West European Politics* 4; Helen Wallace, 'Deepening and Widening: Problems of Legitimacy for the EC' in Soledad Garcia (ed), *European Identity and the Search for Legitimacy* (Pinter, 1993) 95.

\(^{48}\) *TFEU* art 4(2)(a), (e), (i).

\(^{49}\) Also below at II D.


\(^{51}\) Ibid 401-2.


\(^{53}\) *TFEU* art 170, see also 171-2.

European law and regulation especially on electricity markets, but also in regard to renewable energy is now the single most important driver of policy and legal change in its member states. Accompanying these developments is an increase of European institutions in the energy space.

The question of where regulation is taking place – on a European or at the member state level – therefore becomes relevant. Arguably, if the European regulatory frameworks now are the focal point of regulation in member states of the EU, the EU, rather than its member states, should be the subject of comparison. If, as Majone claims, the tasks of the regulatory state become increasingly transferred to the EU level, EU law would provide the relevant regulatory space for the member states’ electricity systems.

Theories of Europeanization on the one hand and nationalization on the other hand seek to describe the location of regulation in the European setting. The term Europeanization is used to describe a wide variety of EU/member state interactions. On the one hand it describes the extension of European policy, institutional arrangements, rules, beliefs or norms to the member states. On the other hand it denotes the ‘building of European capacity’, i.e. the development of institutions at the European level, or the ‘central penetration of national systems of governance’, which are identified by Bulmer as core use of the concept. Energy sector-specific examinations of the Europeanization have concentrated to a large degree on the Europeanization of the internal energy market, and

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59 Ibid.
more recently also on ‘green Europeanization’ through European support for renewable energy.

Political science literature has engaged with the concept of Europeanization in the context of the location of the ‘regulatory state’, with respect to the liberalization of network industries, including the electricity sector. Europeization in this regard is defined narrowly to describe a delegation of regulatory power to the EU and thus to a supranational level. It ‘may serve to redistribute resources among domestic actors, strengthening reform elements against their opponents’. Under this model, the tasks of the regulatory state become increasingly transferred to the EU level.

The proliferation of European level informal institutions in the energy policy space could be argued to be supporting the Europeanization thesis. Driven by the uneven implementation of the internal energy market directives due to the wide national discretion afforded to the member states by the directives, EU networks of regulators were introduced. The following list introduces these networks and their responsibilities.

- 2000: establishment of the Council of EU Energy Regulators (CEER), an independent association of Europe's national regulators of electricity and gas, to provide for coordination between regulators and cooperation with the EU institutions.

- 2003: establishment of the EU Regulators Group for Electricity and Gas (ERGEG), a formal advisory group to the European Commission, created by the Commission

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63 Especially Majone, above n 55.
64 Humphreys and Padgett, above n 21, 385.
65 Majone, above n 55.
in 2003 to ‘propose consistent regulatory application of EU directives and establish best regulatory practice’.\(^{68}\)

- 2010: replacement of ERGEG with the Agency for the Cooperation of Energy Regulators (ACER) as part of the third energy package to explicitly to assist and coordinate the national regulators tasks and activities.\(^{69}\) In contrast to ERGEG, ACER can make regulatory decisions in specific cases.\(^{70}\) While these decision-making powers are currently limited to cross-border infrastructure and technical issues, they provide for additional actors in the national frameworks; thus altering the regulatory space of the nation state.\(^{71}\)

Other transnational institutions include the EU Network of Transmission System Operators for Electricity (ENTSO-E). As an association of all member state transmission network operators, ENTSO-E provides a platform for communication and coordination of transmission system operators with other institutions.\(^{72}\) ENTSO-E works closely with the EU Commission and ACER in the area of cross-border trade of electricity, having recently been made formally responsible for the development of network codes and network development plans.\(^{73}\)

Nevertheless, even with this increasing formalization and the growing influence of these institutions, they have not subsumed the role of a national regulator. European level regulators only play a role in the nation states’ regulatory space in the area of cross-border trade, where transnational institutions have been given roles in network development and facilitation. The question of interconnection and cross-border trade, while important for the

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technical viability of high renewable energy scenarios, however, is not part of the enquiry in this thesis.

At the other end of the spectrum from Europeanization are the theories of nationalization. These theories claim that regulation of markets remains essentially on nation state level – the nation state is the regulatory state. Eberlein and Grande find that while there is considerable regulatory activity on the EU level, the powers of EU agencies are usually weak and at best only ‘supplement member states’ regulatory activity’. Eberlein and Grande also show that most of the EU regulatory activity has been in the areas of ‘social regulation’, such as environmental, labour, health and consumer protection. ‘Economic regulation’ on the other hand, which includes electricity market regulation, has not been subject to independent regulation at the EU level. However, localization of the regulatory state on the national level only, they claim, would be short-sighted. Instead the EU influence has considerably shaped and integrated national level legislation. Thus, while ‘the institutional focus undoubtedly lies at the national level, the national regulatory regimes are embedded in a transnational regulatory structure’.

From a legal perspective, the EU shapes national regulatory frameworks through the use of directives, as well as through the interpretation of national law through the European Court of Justice. The EU undoubtedly plays an important role as a driver of change of law and policy in its member states. Much of the policy-making in regard to energy and especially renewable energy is now taking place on the European level. However, focusing on the role of law, the translation of European policy into national law remains to a large degree the sphere of the member state. To change the architecture or the terms of entry to the regulatory space for electricity supply in the member states, European law requires the medium of national law. The following figure depicts the interaction of European and national law and their influence on the regulatory space of the electricity system.

74 See, eg, Gilardi, above n 57.
75 Eberlein and Grande, above n 62, 95.
76 Ibid.
77 Ibid 96-7.
78 Ibid 98.
Fig 3: The relationship between European and national law influencing the regulatory space of member states’ electricity systems.
II AN INTERNAL MARKET FOR ENERGY: ENERGY LIBERALIZATION IN EU LAW AND REGULATION

The move towards a European internal energy market, has led to three packages of legislation, targeting gas and electricity market reform.

The packages provide for a gradual move towards a single energy market for Europe. This staged approach to building a single market was considered necessary in order to bridge the vast differences in member states energy regulation.

While EU energy policy statements early on contained a strong commitment to developing an internal energy market, the actual legislation in the form of directives approached the harmonization of the member states’ electricity markets cautiously. As a result, the process of market liberalization has been patchy and resulted in considerable variation of member state electricity markets.

A The Internal Electricity Market Directives

1 The First Package of Energy Market Directives: Harmonization over Competition

It was not until 1996 that the first of the three EU legislative packages creating the internal energy market was passed. The package had the first internal electricity market directive as its centrepiece. The directive aimed foremost at harmonization, not at integration of

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79 Here, only the directives dealing with the electricity market will be addressed; it should be noted though, that parallel to these directives for gas market liberalisation were issued, addressing the other crucial part of the internal energy market.

80 Commission of the European Communities, ‘Proposal for a Council Directive Concerning Common Rules for the Internal Market in Electricity’ (COM(91)548 final) [5.2].


member states’ electricity markets. This left considerable freedom to the member states to pursue their own market model within the wider framework of a competitive market.

It did, however, establish general principles for limited competition, third party access rules and unbundling requirements. Affirming the subsidiarity principle, the electricity market directive also contained a commitment to the right of member states to impose public service obligations; a provision that remains a feature of the later directives on the internal market. Public service obligations could include issues such as security of supply, regularity, quality and price of supplies and environmental protection. Likewise, the directive contained provisions that allowed for priority to be given to the production of electricity from renewable sources.

The directive had little impact on the integration of electricity markets. Implementation in the member states was slow and uneven, due to the scope left to member states. Academic literature was divided on whether or not national regimes were converging. Diverse regimes emerged, a situation that led one commentator to argue that ‘the European ‘internal market’ for energy is neither unified nor uniform’.

2 The Second Package of Energy Market Directives: More Prescriptive Regulation

The second package contained more detailed rules to provide for an eventual internal energy market. Its central piece of legislation was Directive 2003/54/EC, which replaced

84 See IIA.
86 Ibid [27].

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Directive 96/92/EC, and tightened rules in order to achieve more harmonization of the different electricity markets of the member states. As remarked in the preamble of the directive, ‘concrete provisions are needed to ensure a level playing field in generation and to reduce the risks of market dominance and predatory behaviour...’.\textsuperscript{92} The directive identified different tariffs, access to networks and the different degrees of market opening in the member states as main impediments to the internal market.\textsuperscript{93} Accordingly, the new directive detailed specific regulation for third party access,\textsuperscript{94} unbundling of integrated utilities\textsuperscript{95} and also required the establishment of a national independent regulatory authority.\textsuperscript{96}

Nonetheless, the second package, too, is considered to have fallen short of achieving further integration of member states markets to create an internal electricity market on electricity. In its enquiry into the internal gas and electricity markets,\textsuperscript{97} the Commission found that ‘the present rules and measures do not provide the necessary framework for achieving the objective of a well-functioning internal market.’\textsuperscript{98} This assessment was echoed in the literature, with for example Jamasb and Pollitt judging that the ‘consensus-based minimum requirements of the Directives’ will not suffice to address more specific and technical issues.\textsuperscript{99}

\textsuperscript{92} Ibid preamble at [2].
\textsuperscript{93} Ibid [5]
\textsuperscript{94} Ibid art 20. Third party access describes the access of generators that are not part of an integrated utility to the transmission and distribution networks.
\textsuperscript{95} Ibid arts 10, 15, respectively. Note the exemption from unbundling requirements for small distribution networks that serve less than 100,000 customers in art 15(2) (also in current Directive 96/92/EC [1996] OJ L 27/20 art 26 (4)). Germany has applied this exemption in national law, see Gesetz über die Elektrizitäts- und Gasversorgung (Germany) [Energy Industry Act], 7 July 2005, BGBI I, 2005, 1970, § 7 (2).
\textsuperscript{96} Ibid art 23.
3 The Third Package of Energy Market Directives: Moving forward with the Internal Market

A range of directives and regulations for both the gas and electricity markets comprise the so-called Third Energy Package. The objective of the package was to enhance ‘secure, competitive and sustainable energy’, expressing the new EU energy policy. Accordingly the package included the furthering of the internal liberalized market and recognition of the need to address sustainability and energy security concerns.

As part of the package, the newest of the energy market directives, Directive 2009/72/EC, contains ever more detailed provisions in regard to the energy markets in the member states with the aim of moving towards an internal market. The directive prescribes the following ‘common rules for the generation, transmission, distribution and supply of electricity’:

- Ownership unbundling for transmission systems and transmission systems operators. The operator of the transmission system is not entitled to ‘directly or indirectly to exercise control over an undertaking performing any of the functions of generation or supply’. Ownership unbundling is supported by the directive as the ‘most effective tool by which to promote investments in infrastructure in a non-discriminatory way, fair access to the network for new entrants and transparency in the market.’

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102 See above I B.


104 Ibid art 9(1)(b).

• Exceptions from ownership unbundling are provided where an independent system operator (ISO)\textsuperscript{106} or an independent transmission operator (ITO)\textsuperscript{107} is put in place. The ITOs or ISOs are supposed to ‘enable a vertically integrated undertaking to maintain its ownership of network assets, while ensuring effective separation of interests’.\textsuperscript{108}

• Legal unbundling of vertically integrated distribution network operators.\textsuperscript{109} Unlike the ownership unbundling required for transmission operators, legal unbundling requires independence ‘in terms of its legal form, organisation and decision-making from other activities not related to distribution’.\textsuperscript{110}

• Additional independence for the independent regulatory authority for example through the implementation of independent budgets.\textsuperscript{111}

• More cross-border cooperation.\textsuperscript{112}

• New rules requiring
  
  o the preparation of annual network development plans for infrastructure investment;\textsuperscript{113}
  
  o non-discriminatory third party access to networks; and\textsuperscript{114}
  
  o moving towards freedom of choice of retailer for the consumer.\textsuperscript{115}

\textsuperscript{106} ISO – company retains ownership but transfers management of networks to the ISO, ibid arts 13/14. For example, while England opted for full ownership unbundling, its system operator and owner, National Grid Electricity Transmission plc, acts as ISO for the two Scottish integrated utilities, Scottish Power and Scottish and Southern Energy, see ch 5 II A 2 a.

\textsuperscript{107} ITO was introduced, inter alia, by pressure from Germany, see Eckart Ehlers, Electricity and Gas Supply Network Unbundling in Germany, Great Britain and the Netherlands and the Law of the EU (Intersentia, 2009) nn 29-32. In an ITO, the transmission network remains part of a vertically-integrated utility and independence is guaranteed by additional regulation, see Directive 2009/72/EC [2009] OJ L 211/55, art 17-23.

\textsuperscript{108} Ibid preamble [16].

\textsuperscript{109} Ibid art 26.

\textsuperscript{110} Ibid art 26(1)

\textsuperscript{111} Ibid art 35(5).

\textsuperscript{112} Ibid art 38.

\textsuperscript{113} Ibid art 22.

\textsuperscript{114} Ibid art 32.
The third package shows an increasing specification of the requirements for national legislation to comply with the EU model of an internal electricity market. This model is itself based on the UK market. The notable exemption in the directives from the standard model for electricity markets promoted by economists and introduced in chapter 2, is the absence of a requirement to privatize the industry. This is due to the fact that at least partly publicly or nationally-owned utilities are still the norm in many European countries. European energy policy in this regard reflects ‘... a pragmatic approach towards a collective agenda, rather than attempting to follow an optimum reform path’. Nonetheless electricity privatization is an ongoing process, and the market opening for third parties, including private generators introduced a move away from ‘full public ownership towards more private involvement’. In the UK and Germany the electricity industry is fully privatized.

4 Renewable Energy in the European Union Electricity Market Framework

The current Directive 72/2009 contains express recognition of the needs of renewable energy generation. This shows that the integration of sustainability and internal market policies impacts not only on a policy level, but is also directly recognized in EU legislation. Exemptions from market rules through public service obligations can relate to ‘security of supply, regularity, quality and price of supply and environmental protection ... including energy from renewable sources’. Public service obligations have to be ‘clearly defined, transparent, non-discriminatory, verifiable and ...guarantee[ing] equality of access for electricity undertakings of the Community to national consumers. Art 3(2) also provides

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115 Ibid art 41.
116 See, eg, Dieter Helm, Energy, the State, and the Market: British Energy Policy since 1979 (Oxford University Press, 2003) 372, more at II B.
117 See ch 2, III A.
119 Jamasb and Pollitt, above n 99, 16.
120 Ibid.
122 Ibid
for the opportunity to undertake long-term planning to pursue ‘goals for energy from renewable sources’. Additionally, the preamble of the directive contains a general commitment that ‘a well-functioning internal market in electricity should provide producers with the appropriate incentives for investing in new power generation, including electricity from renewable energy sources’.\textsuperscript{123}

\textit{Directive 72/2009/EC} also contains several express references to the current \textit{Renewable Energy Directive 28/2009/EC}.\textsuperscript{124} These include a reference to the requirement to develop renewable-friendly access and operation of the electricity grid, as well as to the 20 per cent renewable energy target to be considered when authorizing new generation capacity.\textsuperscript{125} The directive further contains an option for member states to provide for priority dispatch\textsuperscript{126} for renewable sources.\textsuperscript{127}

While the inclusion of targeted provisions for renewable energy within the electricity market directives is a positive development, many of the provisions are not mandatory or leave considerable scope for interpretation by the member states. The renewable energy directives, which will be introduced below, contain further electricity market specific provisions.

\textbf{B The EU Electricity Regulatory Model: A British Model?}

The EU energy packages now prescribe a very sophisticated and detailed regime of energy market regulation for all member states. Hancher and Guayo describe this as a ‘steady path from regulatory principle to regulatory detail’.\textsuperscript{128} While this level of detail may be

\footnotesize{\textsuperscript{123} Ibid preamble [6].
\textsuperscript{124} Below at III B.
\textsuperscript{126} Priority dispatch guarantees that renewably-generated electricity is dispatched first if there are several competing generators, and is thus guaranteed to be sold in the market. Priority dispatch has been found important to ensure investment security for renewable generators, it is a part of the German system, see ch 6, II C 2a.
\textsuperscript{128} Leigh Hancher and Iñigo del Guayo, 'The European Electricity and Gas Regulatory Forums' in Lila K Barrera-Hernandez et al (eds), \textit{Regulating Energy and Natural Resources} (Oxford University Press, 2006) 243, 245.}
necessary to truly achieve an open, internal energy market for Europe with all its advantages, it is a very particular, British-inspired model of the market that has been chosen for Europe. Several authors have described how the UK model of the electricity market has been of central influence to the EU vision for the internal energy market. The concept of policy transfer has been used to describe this ‘cross-national dissemination of policy ideas’ in the energy market context. The influence of the British model on the EU idea of an internal market has been well documented. This influence has manifested in a market model based on ‘principles of open and transparent access to interconnection/transmission networks and independent regulation’, all of which are cornerstones of the British electricity market model.

The UK therefore has had little difficulty in incorporating and complying with EU law. For Germany, by contrast, the electricity market directives provided a major impetus for electricity market liberalization. Germany had considerable difficulties introducing certain elements of the directives into national law. Many of the exemptions and variations provided within the directives were added to accommodate features of the German system.

III EUROPEAN UNION LAW AND REGULATION IN REGARD TO RENEWABLE ENERGY

Unlike the creation of an internal energy market, supporting renewable energy was not one of the core goals of European integration. Instead, renewable energy policy is closely

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129 Eberhard Bohne, 'Conflicts between National Regulatory Cultures and EU Energy Regulations' (2011) 19 Utilities Policy 255; Helm, above n 116, 372; Humphreys and Padgett, above n 21, 394 with further references.
130 For terminology see, Mark Evans and Jonathan Davies, 'Understanding Policy Transfer: A Multi-Level, Multi-Disciplinary Perspective' (1999) 77(2) Public Administration 361.
131 Humphreys and Padgett, above n 21, 395.
132 Ibid, explaining UK influence in council discussion, but also policy transfer through sources such as UK consulting firms, 394-5.
133 Ibid.
134 See ch 5, II.
connected to the EU engagement with environmental concerns and especially climate change since the 1990s. The current regime for renewable energy is dominated by the renewable energy Directive 2009/28/EC, which contains binding targets but leaves the choice of instruments to the member states. However, support for renewable energy has also been discussed in the context of European competition law, specifically on whether support for renewable energy could amount to unauthorized state aid and be defined as incompatible with free movement of goods. Both issues will be addressed in turn below.

A The Renewable Energy Directives

To date, two EU renewable energy directives have been introduced. Under the requirements of the first renewable energy directive, the member states were expected to meet indicative targets for electricity generation from renewable energy sources. Although there was significant variation in national targets, the directive meant that in effect an average of 22 per cent of electricity in each member state would have to be generated by renewables by 2010. Member state opposition not only prevented the introduction of binding targets, but also blocked the harmonization of renewable support instruments, which the Commission tried to achieve. The Commission was initially strongly supportive of the introduction of green certificates over feed-in-tariffs in its 1996 Green Paper. It argued, that a green certificate schemes, or as the Commission called it at that time, ‘renewable energy credits’, could support renewable energy while at the same time prevent market distortions between member states.

137 Compared to 13.9 per cent in 1997. Ibid art 4(2).
141 Ibid 34-5. The discussion of the respective advantages of feed-in-tariffs and green certificate schemes, has been subject to a drawn-out political and academic debate. See, eg, A Held, M Ragwits and R Haas, ‘On the
As required by the first renewable energy directive, a thorough review of different renewable support mechanisms was undertaken in 2005. The report found that well designed feed-in-tariffs were the preferable policy instrument. The Commission subsequently withdrew its support for one instrument over the other, taking account of research that had emerged that showed that feed-in-tariff schemes had performed better than quota schemes overall. The PreussenElektra decision endorsing the legitimacy of feed-in-tariffs similarly led to an acceptance of the feed-in-tariff alternative in the Commission support. However, apart from the instrument discussion, the review found that the directive overall was inefficient in achieving its aims.

The integration of climate and energy policy in the third energy package provided the EU with an opportunity to strengthen European renewable energy legislation. A second renewable energy directive was part of the 2008 Climate and Energy Package. Most significantly, this directive contained for the first time binding national targets for each member state to ensure that overall a 2020 EU-wide target of 20 per cent renewable energy would be achieved. Each country target is calculated according to the share of energy from renewable sources in its gross final energy consumption for 2020. Germany has a target of 18 per cent by 2020, whereas the UK has committed to 15 per cent reduction by 2020. Further, member states are now required to establish national renewable energy


See, eg, Rowlands, above n 139.
See also above at I B.
Ibid preamble [8], art 3, annex I.
Ibid annex I.
action plans (NREAPS), which set out targets for renewable energy in transport, heating and electricity supply in 2020.\textsuperscript{150}

Of central interest to this thesis are the requirements the directive has in regard to planning of and access to network infrastructure. These issues have been identified in prior chapters as a major barrier for renewable generators to access electricity markets. To address these barriers, article 16 of \textit{Directive 2009/28/EC} contains wide-ranging requirements for access to and operation of grids. It prescribes that member states;

\begin{quote}
shall take appropriate steps to develop transmission and distribution grid infrastructure, … in order to allow the secure operation of the electricity system as it accommodates the further development of electricity production from renewable energy sources, including interconnection between member states and member states and third countries.\textsuperscript{151}
\end{quote}

The directive clearly promotes a whole-of-system focus for developing renewable energy resources, taking into account the systemic challenges renewable energy faces in a traditional electricity grid.

Further requirements of the directive in regard to networks include:

\begin{itemize}
\item the provision of either priority or guaranteed access to the grid for renewably generated energy;\textsuperscript{152}
\item priority dispatch as far as the system permits;\textsuperscript{153}
\item transparent grid operations rules and costs arrangements;\textsuperscript{154} and
\item the option to require grid operators to bear costs of network investment.\textsuperscript{155}
\end{itemize}

\textsuperscript{150} Ibid art 4.
\textsuperscript{151} Ibid art 16 [1].
\textsuperscript{152} Ibid art 16 [2].
\textsuperscript{153} Ibid.
\textsuperscript{154} Ibid Art 16 [3].
\textsuperscript{155} Ibid art 16 [4].
These requirements clearly illustrate that the EU has realized the importance of supporting renewable energy not only through feed-in-tariff schemes or quota schemes, but also through accommodating renewable energy in the electricity market system, especially in regard to network development. The directive expressly provides for the introduction of special rules for grid access by renewable generators, different from those conventional generators face.

B Renewable Energy in European Case Law

The first engagement of the ECJ with renewable energy concerned the question whether member states’ renewable energy support instruments were incompatible the principle of free movement of goods and amounted to unauthorized state aid. State aid is ‘any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall’. 156 It is considered incompatible with the internal market, but exemptions may apply in certain circumstances. However, in these cases approval of the measure by the Commission is required. 157

The German feed-in-tariff scheme introduced in 1991 158 was tested in the European Court of Justice (ECJ) in the case of PreussenElektra v Schleswag. 159 In this case one electricity supply company, PreussenElektra, sued another electricity supply company, Schleswag, over the conditions of the German feed-in-law. Electricity supply companies were ‘obliged to purchase the electricity produced in their area of supply from renewable energy sources’. 160 If the amount of electricity generated from renewable sources exceeded 5 per cent, the upstream electricity supply undertaking was to be responsible for partial reimbursement. This ‘hardship clause’ was meant to prevent the electricity supply undertaking in a certain area having to raise prices due to a high intake of renewable

156  *TFEU* s 107.
157  Ibid s 108(2), see below for state aid guidelines.
158  *Stromeinspeisungsgesetz* (Germany) [*Electricity Feed-In Act*], 7 December 1990, BGBl I, 1990, 2633.
160  Ibid at [6].
energy. PreussenElektra claimed that the hardship rule, newly introduced into the legislation in 1998 amendment, was unauthorized state aid, and therefore not applicable. State aid is incompatible with the common market according to Article 87(1) of the EC Treaty, unless one of the exemptions in paragraph (2) or (3) applies. The German court requested a preliminary ruling on the issue. The ECJ found that, because the state did not pay the tariff, the measure did not constitute state aid. Until 2012, this has exempted the German feed-in-tariff from state aid rules. However after the changes to the institutional structure of the feed-in-tariff scheme in 2012, the Commission found that the scheme amounted to state aid. State aid can be justified under certain circumstances, eg where it is employed to cover the gap between wholesale market price and production costs of renewable energy. Guidelines by the Commission provide a detailed account on when state aid is considered justified for environmental reasons. Ultimately most aspects of Germany’s scheme were approved by the commission as being in line with state aid rules.

A recent decision, the Ålands Vindkraft case, the ECJ reconfirmed the right of member states to choose their own instruments to support renewable energy and clarified the freedom of instrument choice conferred in Directive 2009/28/EC. In this case a Ålands Vindkraft was a Finnish company, which operated an offshore windfarm that fed into the Swedish electricity grid. The wind farm, however, was located in Finnish waters. Ålands Vindkraft applied to the Swedish authorities to be awarded green certificates for under the Swedish renewable energy support scheme. The Swedish energy authority denied the application, because only installations located in Sweden could be approved of an award of certificates. Ålands Vindkraft argued that this barrier to trade could not be justified by the protection of the environment, because ‘the consumption of green electricity in Sweden

161 See in more detail ch 6.
164 Commission, ‘State aid’ above n 162.
165 Ålands Vindkraft AB v Energimyndigheten (C-573/12) [2014] (unreported).
166 Ibid [23].
167 Ibid.
168 Ibid [24].
would be promoted just as effectively through the award of electricity certificates consumed in Sweden but produced in other Member States.\textsuperscript{169} The Court decided that member states have the freedom to limit renewable energy support to energy produced within their territory. The main reason is that the directive grants member states the freedom to choose their own measures to support renewable energy, because national support schemes have not yet been harmonized.\textsuperscript{170} The directive also recognizes that restrictions such as those implemented for the Swedish scheme are necessary to contain the costs of these measures.\textsuperscript{171}

There is a distinct contradiction in EU legislation – while the energy market directives aim to eliminate barriers and discrimination, renewable energy support remains fragmented.\textsuperscript{172} As Steinbach and Brückmann have pointed out, the decision further confirms that there is still a long way to a ‘uniform and barrier-free electricity market in Europe’.\textsuperscript{173}

IV Conclusion

European energy policy and regulation have been highly influential for developing the potential of renewable energy in member states especially in the last decade. Two main areas of European engagement with renewable energy in the electricity market can be distinguished; these comprise the internal energy market directives and the renewable energy directives. However, these subject matters increasingly converge, with European energy policy now promoting competitive, sustainable and secure electricity markets. This integration is reflected in legislation, with the internal energy market directives providing for exemptions in regard to renewable energy support, while the renewable energy directives actually prescribes changes to the network regulation for national market frameworks. European policy and regulation define the actors and objectives of the internal energy market with increasing detail. Similarly, for renewable energy binding targets and

\textsuperscript{169} Ibid [25].
\textsuperscript{170} Ibid [94].
\textsuperscript{171} Ibid [99]. [103].
\textsuperscript{173} Ibid 15.
strengthened provisions to facilitate grid access and development have driven framework development on a national level. While energy policy is driven on the EU level, implementation remains however, mostly the responsibility of member states. So far, EU regulatory agencies have only limited powers in the area of cross-border trade and harmonization.

As will be seen in the following chapters on the UK and Germany, European law has provided a vehicle of reform in the EU member states in regard to legal reform supporting renewable energy and electricity markets. The European influence on member states' regulation of electricity provision is characterized on the one hand by the drive to harmonize national electricity markets to ultimately achieve a unified internal European market in energy. On the other hand, European renewable energy directives have introduced targets for renewable energy generation in the electricity market, and promote increasingly prescriptive network planning and access provisions for renewable generation. Australia, in contrast, lacks such a supranational influence on its energy regulation – an important difference to Germany and the UK.

While this chapter is foremost designed to provide the necessary context for the following chapters, EU law shows an acceptance that a commitment to an efficient electricity market is not incompatible with targeted renewable energy support. European promotion of special rules for renewable-friendly network regulation and the many exceptions the energy market directives allow for renewable energy, therefore support the contention of this thesis. Systemic lock-in of unsustainable patterns of electricity supply can only be overcome by targeted reform that acknowledges the needs of renewable energy.
CHAPTER 5: THE UNITED KINGDOM

The second of the comparative studies employed in the thesis to clarify the role of renewable energy in the liberalized electricity market is that of the United Kingdom (UK).\(^1\) As Australia and Germany, the UK faces considerable challenges to decarbonize an electricity system traditionally depending on fossil fuel. Unlike Australia, however, the UK’s market model has responded more effectively to the new policy challenges that climate change and energy security have posed, including the need to support renewable energy.

The British liberalized electricity market is considered by many to be the forerunner for a more general, global move towards market models for electricity provision.\(^2\) It was the first in the world designed to supply electricity based on a system ‘in which competition was the central feature’.\(^3\) The genesis of the British liberalized electricity market has been the subject of much scholarship, especially in the areas of economics\(^4\) and political science.\(^5\) This model has had immense influence on other market models around the world, including that prescribed for its member states by the EU,\(^6\) and Australia.\(^7\) Its introduction to replace

\(^1\) Here, talking of the UK electricity system refers to the electricity system in Great Britain, which covers England, Wales and Scotland. In this chapter the term British electricity system will therefore be used. Northern Ireland, while a part of the UK, has separate arrangements and a system interconnected with Northern Ireland. Likewise, Scotland has only become part of the British electricity system in 2005. More on the reach of the British electricity system below at I C.


\(^6\) Ch IV, II B.
a centralized and nationalized electricity supply industry in the late 1980s, was facilitated by distinct changes in ownership, vertical disaggregation and the introduction of market objectives. All of these features are now considered cornerstones of electricity market liberalization.

The British electricity system is now undergoing another major albeit not as dramatic paradigm shift. Electricity security and climate change policy pressures, partially driven by supranational European policies, are changing the objectives and actor relationships in the electricity market and the wider policy environment for renewable energy. The changes reflect the ‘realisation that the current electricity market design [is] unlikely to meet the Government’s challenging targets for reducing greenhouse gas emissions and increasing the share of renewable energy’. While a commitment to the competitive electricity market remains intact, increasing complexities and multilayered regulation have led to a departure from the rhetoric of non-interventionism that characterized regulation after market reform. Instead, increasing regulation, a strengthened role of the regulator and its objectives, and a reinforcement of public interest components in electricity regulation are occurring.

This chapter will show how the legal frameworks of the British electricity market have developed from supporting systemic fossil fuel-dependence to addressing challenges for renewable energy. Part I provides background information on the British electricity system; covering resources and physical system characteristics and an outline of the policy developments impacting renewable energy and constitutional constraints. In part II the development of the institutional elements of the British electricity system will be set. Initially the UK took a similar path to Australia, with market privatization and liberalization locking-in a fossil fuel-dependent electricity system. However, in contrast to Australia, the UK has undertaken further comprehensive reform of its electricity market framework in order to accommodate renewable energy. These regulatory reforms are addressed in the

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8 Such as the Renewable Energy Directives, see in detail ch 4, III.
10 Especially Littlechild, above n 2.
second part of part II. Finally, in part III, targeted legal instruments for renewable energy and their impact will be discussed. The chapter shows the degree of targeted regulation necessary to overcome system-inherent fossil fuel lock-in.

I The British Electricity System: Context and Policy Drivers

A Resources and Physical System Characteristics

The UK has a range of different energy sources, both fossil fuel-based and considerable resources in renewable energy such as wind and wave and tidal energy. In 2012-13, natural gas accounted for 27.7 per cent, coal for 28.4 per cent, nuclear energy for 20.6 per cent and renewable sources for 11.3 per cent of the UK fuel mix in electricity supply.

Compared to Australia, with its five metropolitan centres, the UK grid is highly interconnected. However, the existing grid layout still emphasizes network patterns not suited to renewable generation. Many of the best renewable resources in the UK, such as wind, wave and tidal, are located offshore, requiring connection to the onshore system. Harnessing these sources is likely to be crucial for achieving the UK’s ambitious renewable energy targets.

Onshore wind has high potential especially in Scotland. However, limited interconnection with England hampers the transport of energy to the more populated South. Thus, while the geographical scale of the challenge may be different to that of Australia, lessons can be learned from how the challenge of integrating renewable energy

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11 The UK has indigenous black coal, natural gas and oil reserves. However, considerable amounts of gas and coal are imported to meet demand, as production has peaked and continues to decline. See, Department of Trade and Industry, Meeting the Energy Challenge, A White Paper on Energy (May 2007) 109, 116.
12 Ibid 143 ff.
14 For a map see, eg, National Grid, Electricity <http://www2.nationalgrid.com/About-us/What-we-do/Electricity/>.
16 A similar scenario of limited north–south interconnection complicating a successful energy transition is faced by the German electricity system.
17 Australia has 35 times the area of Great Britain, yet, only about a third of its population.
such as offshore sources in the British electricity system is addressed by its legal and regulatory frameworks.

B Policy Development and Drivers

Renewable energy initially was of little interest for UK energy policy beyond limited research and development programs that were based in energy security considerations, which followed the 1970s oil crisis.\textsuperscript{18} Although renewable energy has been supported by the Non-Fossil Fuel Obligation since 1989,\textsuperscript{19} this instrument only supported a small uptake of renewable energy.\textsuperscript{20}

The Labour government came into power in 1997 on a policy platform, which expressly committed to action on renewable energy. The Labour party’s 1997 policy manifesto contained a commitment to a ‘new and strong drive to develop renewable energy sources’,\textsuperscript{21} as well as to a 20 percent reduction of CO\textsubscript{2} emissions below 1990s levels. The European Kyoto Protocol commitments and the subsequent implementation of the European emissions trading scheme further supported climate change mitigation action on the national policy stage.\textsuperscript{22} A 2000 policy committed to a 10 per cent renewable energy target by 2010.\textsuperscript{23} The Renewables Obligation, a tradable green certificate scheme,\textsuperscript{24} was introduced in 2002 through amendments to the Electricity Act 1989 (UK)\textsuperscript{25} to fulfil the Labour party’s commitments.

\textsuperscript{18} See, eg, Isabelle De Lovinfosse, How and Why Do Policies Change? (Peter Lang, 2008) 232-3; Helm, above n 5, 347.
\textsuperscript{19} See in detail below at III.
\textsuperscript{20} Ibid.
\textsuperscript{21} Labour Party, ‘New Labour because Britain deserves better’ (Manifesto, 1997).
\textsuperscript{22} The UK’s individual emissions reduction target for the first commitment period was 12.5 per cent below the 1990s levels for the first commitment period 2008-2012, see Kyoto Protocol to the United Nations Framework Convention on Climate Change, open for signature 10 December 1997, 37 ILM 32 (1998) (entered into force February 2005), Appendix B.
\textsuperscript{24} Such as Australia’s Renewable Energy Target Scheme, see ch 3, III.
\textsuperscript{25} See below at III A 2.
Support for renewable energy in the UK has accelerated following European level renewable energy target setting through the Renewable Energy Directives in 2001 and 2009.\textsuperscript{26} Even with considerable renewable energy resources, the ambitious binding renewable energy target of 15 per cent renewable energy in electricity consumption by 2020, set by the second directive, may not be achieved under the current regulatory framework for the British electricity market.\textsuperscript{27} While the government is considered to be making ‘very good progress’, the acceleration necessary to achieve the target on time has necessitated considerable market reform.\textsuperscript{28}

These targets for renewable energy are accompanied by a nationally-set binding carbon reduction target of 80 per cent from the 1990 baseline by 2050, which is embodied in section 1 of the \textit{Climate Change Act 2008} (UK). This Act provides the legal framework for the UK climate mitigation commitments. There is now strong political commitment to a low carbon energy future for the UK. Binding five-year carbon budgets, to be achieved by a range of measures.\textsuperscript{29}

The background system, into which these new drivers must be incorporated, is that of a liberalized and privatized energy market. A long line of energy white papers and other policy documents by the British government starting with the Energy White Paper 2003,\textsuperscript{30} addressed the options for a decarbonization of the electricity sector. This recurrent readjustment of policy demonstrates that systemic change to integrate renewables is difficult to achieve.

Entitled ‘Our Energy Future – Creating a Low Carbon Economy’, the Energy White Paper in 2003 focused on climate change as the major challenge for Britain’s energy system. The objectives for future energy policy identified in the White Paper included:

\begin{itemize}
\item For detail see ch 4, III D.
\item See in detail on Electricity Market Reform below at II D 3.
\item See ss 4-10 \textit{Climate Change Act 2008} (UK).
\end{itemize}
• putting the United Kingdom on a path to cut emissions by 60 per cent by around 2050 with real progress by 2020;

• maintaining the reliability of energy supplies;

• promoting competitive markets in the United Kingdom and beyond, helping to raise the rate of sustainable economic growth and to improve productivity; and

• ensuring that every home is adequately and affordably heated.\textsuperscript{31}

The subsequent 2007 White Paper\textsuperscript{32} reconfirmed the commitment to a low carbon energy future and introduced concrete changes, such as banding in the Renewables Obligation,\textsuperscript{33} and the offshore wind transmission regime.\textsuperscript{34} Both of these reforms will be discussed in more detail below. Additionally a small-scale feed-in-tariff scheme, similar to the ones that are in place in several Australian states, was introduced in 2008.\textsuperscript{35}

Reflective of the increasing interlinkage between energy and climate concerns, the separated government responsibilities for energy\textsuperscript{36} and climate\textsuperscript{37} were merged together to form the Department of Energy and Climate Change (DECC) in 2008.\textsuperscript{38} McHarg identifies this as an important step towards reorienting the British regulatory regime for the electricity market towards a more sustainable electricity system, by firstly ‘creat[ing] a strong advocate for sustainable energy policies within government], but also by making Ofgem no longer ‘answerable to ministers in the pro-market business department.’\textsuperscript{39}

\textsuperscript{33} Ibid 150 ff.
\textsuperscript{34} Ibid 164 ff.
\textsuperscript{35} See \textit{Energy Act 2008} (UK) ss 41-43. As explained in ch 1, small-scale feed-in-tariffs will not be a part of the analysis in this thesis.
\textsuperscript{36} Formerly responsibility of the Department of Business, Enterprise and Regulatory Reform.
\textsuperscript{37} Formerly responsibility of the Department for Environment, Food and Rural Affairs.
\textsuperscript{39} Aileen McHarg, ‘Regulating for Sustainable Electricity Market Outcomes in Britain: Asking the Law Question’ (2013) 30 \textit{Environmental and Planning Law Journal} 289, 294 ['British Energy Regulation].
Far reaching electricity market reform proposals were first proposed in the Energy White Paper in 2011 and now have been adopted in the *Energy Act 2013* (UK). These reforms have also been driven by the need to integrate sustainability concerns into the electricity market framework. The aim of these reforms is to transform the way the UK generates its electricity. Support for renewable energy here becomes part of a wider package of supporting a transition to a decarbonized energy sector. The reforms are concerned foremost with achieving carbon reduction targets as set out in the *Climate Change Act 2008* (UK) and also with meeting the legally binding European renewable energy target. At the same time, concerns about energy security and energy poverty are central to UK energy policy. Thus, unlike Australia, which still keeps electricity market development separate from renewable energy support, the UK, in line with the European and German approach, now seeks to implement an energy policy that integrates sustainability and energy security concerns with a market-driven approach to energy supply.

## C Devolution and Constitutional Responsibility for the Electricity System

Unlike Australia and Germany, the UK is not a federal state. However, it consists of four countries – England, Scotland, Wales and Northern Ireland – which are subject to differing degrees of legislative and administrative devolution. Unlike federalism, devolution is an ongoing process of decentralization ultimately leading to independence. Yet, both models involve sharing of administrative and legislative powers between a central government and state/devolved governments. For the purpose of this thesis, two central questions emerge. Firstly, is the devolved legislature responsible for the legal frameworks

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40 Department of Energy and Climate Change, *Planning our electric future*, above n 27.
41 See *Energy Act 2013* (UK) s 5(2); also Explanatory Notes, *Energy Act 2013* (UK) 2.
42 For the main energy policy objectives, see Department of Energy and Climate Change, *Planning our electric future*, above n 27, 16.
44 Ibid.
45 Scotland’s bid for independence in 2014 has been defeated. However, discussion about future independence is ongoing.
of energy system and renewable energy? Secondly, to what degree is the administration of
the electricity system decentralized?

While England, Wales and now Scotland have a common electricity system, Northern
Ireland’s electricity infrastructure is physically separate with separate institutional and
regulatory arrangements applicable. Since 2007 it forms part of the Single Electricity
Market of Ireland. Its position is similar to the electricity system in Western Australia,
even though it is part of the nation state. Given this physical and institutional separation,
Northern Ireland will not be part of this study.

Since 2005 Scotland has been fully integrated into the British electricity system. Before
that it had its own regulatory arrangements. The Scotland Act 1998 (UK), which lists
matters reserved from devolution, states that ‘generation, transmission, distribution and
supply of electricity’ is a reserved matter for which the UK parliament remains in control.
This takes account of the necessity to centrally manage the interconnected system.
However, the administration of renewable energy support as well as land use planning law
is within the scope of the Scottish parliament, giving Scotland opportunities to steer
renewable energy investment. The Scottish government has a renewable energy target of
100 per cent of electricity consumption to be met by renewable sources by 2020. Scotland
is on track to achieve this target thanks to its excellent resources of wind and hydroelectric
energy.

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46 For more information see the website of the Irish Commission for Energy Regulation
47 See ch 3, I A.
48 With the Introduction of the British Electricity Trading and Transmission Arrangements (BETTA), which
included Scotland in the British transmission systems operation by the National Grid Electricity Transmission
plc, see also below at II B 2 a.
49 For a detailed description of the separate generation market, transmission arrangement and supply
competition see, Elizabeth McRobb and Tony Prosser, ‘Regulating Electricity’ in Laura MacGregor, Tony
Prosser and Charlotte Villiers (eds), Regulation and Markets Beyond 2000 (Aldershot, 2000) 63, 63. Note,
that Scotland, unlike England and Wales, continues to have vertically integrated utilities, see below at II A 2.
50 Scotland Act 1998 (UK) s 29, sch 5 heading D; please note that land use planning is within the powers of
the Scottish parliament.
51 David Toke et al, ‘Scotland, Renewable Energy and the Independence Debate: Will Head or Heart Rule the
II THE BRITISH ELECTRICITY SYSTEM: LEGAL FRAMEWORKS

This section explains the co-development of the legal elements with the other elements of the electricity system from a historical perspective. The British electricity system has, similarly to Australia, followed a pattern of a state provided electricity sector followed by first privatization and then regulatory reform to create the current market frameworks. Unlike in Australia, however, reregulation of some aspects of these frameworks is now addressing the integration of renewable energy.

A The Development of the Legal Frameworks for the British Electricity System: Historical Overview

1 Electrification and Nationalization of the Electricity Industry in the United Kingdom

Initially provision of electricity in the UK was undertaken on a local level. Even before the later nationalization of the electricity industry, private tenures were often limited and council-run utilities was preferred, reflecting ‘provincial civic pride’. To construct the high voltage transmission grids, centralization was considered necessary to achieve economies of scale. Network investment had not been forthcoming due to the powerful local interests of some 600 operations that had little interest in providing electricity more efficiently through interconnection. Interconnection and grid building was therefore provided early on in a centralized manner by the Central Electricity Board created through the Electricity Supply Act 1926 (UK). This statutory corporation was responsible for the establishment of the National Grid and overseen by the Electricity Commissioners.

After coming into power in 1945, Labour nationalized the British electricity, coal and gas industries rapidly, as part of an overall move towards nationalizing infrastructure

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54 Newbery, ‘Reforming Competitive Electricity Markets’, above n 9, 1.
56 Established with the Electricity Supply Act 1919 (UK).
57 Through the Electricity Act 1947 (UK), Gas Act 1948 (UK), Coal Industry Nationalisation Act 1946 (UK), see also Helm, above n 5, 17-21, Beder, above n 5, 180 ff.
industries in the UK.\textsuperscript{58} The ensuing system was managed under ministerial control. Energy policy aims during this period concentrated on nation building, and the achievement of industrial strength through effective electricity provision in post-war Britain.\textsuperscript{59} The vesting of electricity industries in public ownership was a central ideological position of the British left, echoing the ingrained idea that public ownership supports the achievement of public goods more efficiently than private ownership.\textsuperscript{60} Public ownership was also considered desirable by the Marxist left as being more equitable, aiming at redistributing wealth and leaving ‘the means of production in the hands of the workers’.\textsuperscript{61}

The \textit{Electricity Act 1947} (UK) established the British Electricity Authority, as well as 14 Area Boards to manage the electricity industry,\textsuperscript{62} and it dissolved the Electricity Commissioners.\textsuperscript{63} The Authority replaced the Central Electricity Board as the responsible authority for interconnection and grid development, and was also responsible for generation. The object of the British Electricity Authority was ‘to develop and maintain an efficient, co-ordinated and economical system of electricity supply for all parts of Great Britain’.\textsuperscript{64} The Authority was subsequently transformed into the Central Electricity Generating Board (CEGB), and an Electricity Council was created to provide for advisory and oversight functions.\textsuperscript{65} The Area Boards replaced the distribution and supply side of the council-run and local electricity utilities. They were ‘to acquire from the British Electricity Authority bulk supplies of electricity and to plan and carry out an efficient and economical distribution of those supplies to persons in their area who require them’.\textsuperscript{66} The Area Boards had a degree of independence from government through their structure as a public

\footnotesize{\textsuperscript{58} This included the nationalisation of railway and telephone services, for an overview see James Foreman-Peck and Robert Millward, \textit{Public and Private Ownership of British Industry, 1820-1990} (Clarendon Press, 1994).} 
\footnotesize{\textsuperscript{59} Beder, above n 5, 180.} 
\footnotesize{\textsuperscript{60} Helm, above n 5, 17.} 
\footnotesize{\textsuperscript{61} Ibid 18.} 
\footnotesize{\textsuperscript{62} Two of those in Scotland, at this time not part of the British electricity system.} 
\footnotesize{\textsuperscript{63} By order of the Minister, \textit{Electricity Act 1947} (UK) s 58.} 
\footnotesize{\textsuperscript{64} Ibid s 1(1).} 
\footnotesize{\textsuperscript{65} \textit{Electricity Act 1957} (UK) s 3(4) of the Act.} 
\footnotesize{\textsuperscript{66} \textit{Electricity Act 1947} (UK) s 1(2).}
corporation. They combined ‘public ownership, public accountability, and business management for public ends’. 67

In theory, this corporatization limited the Minister’s influence over the CEGB and the Area Boards. The Minister had the power to issue general directions as laid out by statute and to approve capital investment programs by the industry. 69 In practice, however, the Minister had considerable influence on the industry and intervened regularly, especially in the politically sensitive area of customer price control. 70

The era of nationalization was characterized by placing ‘ownership, control and regulation within a single framework’ managed through ministerial control. 71 There was an emphasis on ‘keeping the lights on’, as underinvestment and resulting potential blackouts would lead to a severe public backlash. 72 As Newbery and Green show, overinvestment would not be penalized, which created incentives to overinvest to ensure reliable supply. 73 Later, over-forecasting, that is planning for more electricity demand than was actually realized, exacerbated this problem in an industry unfettered by competition and profit margins. 74

Management of the electricity industry in the name of wider political and social objectives 75 resulted in little connection between consumer price, and cost of generation and distribution of energy. Indeed, as Helm claims, customers came to expect that in return for paying monopoly prices for energy, a wide account of public interest would be taken, ‘to include concepts of fairness to their workers and customers, to subsidize worthy causes, and to provide a public service’. 76

The role of law in this setting was a fairly straightforward one, through setting up an institutional framework that initially unified the role of owner, planner and supplier of
electricity in the authority. Matching generation and network planning and construction was unproblematic under this centralized scenario. The approach to the whole of the electricity industry was a planned one, or, as Newbery called it, a ‘command and control structure with cost-based (and often politically influenced) charges’. A similar arrangement guaranteed security of supply in Australia, albeit on a state level. In contrast, in Germany electricity was supplied not by a nationalized industry but by both privately and publicly owned vertically integrated utilities. There, a planned approach to electricity provision was ensured through vertical integration and guaranteed monopolies for specific areas.

By the end of the 1970s the UK had one of the highest proportion of state ownership of industry in the world, accounting for almost 10 percent of GDP and employing a considerable part of the workforce. While renewable energy sources did not play much of a role in generation capacity at this stage, and almost none in energy policy, the nationalization phase continues to be influential in regard to energy regulation today. On the technical side the nationalized industry with its emphasis on nation building and centralization, drove the development of a generation, transmission and distribution profile that has persisted until today. As in Australia, the electricity industry was characterized by large centralized power plants fueled by coal, and in the UK also by nuclear energy, that are connected to the major load centers by high voltage transmission lines and, through the distribution networks to all consumers. As found in chapter 2, a highly centralized power generation and network system has proven to be persistently detrimental to the needs of renewable energy generation. The real and perceived failings of the nationalized electricity industry would influence the creation of the later deregulated market.

77 See also ch 2 I C 1, on the technical requirements of the electricity system.
80 Foreman-Peck and Millward, above n 58, 319-20.
Electricity Market Liberalization: Thatcherism and the Competitive Electricity Market

The advent of the conservative Thatcher government in 1979 was to change the focus on public interest that was central to the nationalized industry. It saw a fundamental shift in the attitudes towards the electricity industry. While the phase of nationalization created the infrastructure profile of today’s electricity industry, deregulation through the conservative government is responsible for its basic institutional and regulatory framework. The combination of the two has led to the development of a techno-institutional complex, which promotes the lock-in of fossil fuel-based electricity supply, hampering the uptake of renewable energy greatly. Much of the later legal and regulatory reform of the British electricity market is aimed at remedying these disadvantages for renewable generation.\(^{82}\)

Privatization and liberalization in the UK was, according to Beder, not driven by disillusionment by the public with the service the nationalized industry provided, but rather through influential think tanks,\(^{83}\) and the ideas prevalent in economics and policy at this time.\(^{84}\) Economic doctrine based in neo-liberal ideas, with its emphasis on unfettered competition, was influential at the time,\(^{85}\) similar to that which has been described for Australia in chapter 3. Other commentators cite the excessive costs of investment and the inability to control those and generally ‘a perception that large nationalised industries…were inflexible, bureaucratic, [and] secretive.’\(^{86}\)

The idea of the light-handed state, emphasizing the reduction of the role of government, was central to the Thatcher government’s policy goals, and the privatization and later liberalization of the electricity industry was greatly informed by this.\(^{87}\) The proceeds of the

\(^{82}\) More below at II B.


\(^{84}\) Helm, above n 5, recounts influences of Hayek, Friedman, Schumpeter and Popper at 58-9.

\(^{85}\) Foreman-Peck and Millward, above n 58, 328-9.

\(^{86}\) Newbery and Green, above n 55, 58.

\(^{87}\) For further reading on the ideological stance of Margaret Thatcher and the factors and experiences that influenced her see, eg, Beder, above n 5, 193-200; Helm, above n 5, 67 ff, or Eric Evans, Thatcher and Thatcherism (Routledge, 2nd ed, 2004).

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asset sales also helped to alleviate the effects of recession in the UK. The changes were made possible by technological advances as well.

Proponents of market liberalization in the UK justified the moves as ensuring better accountability and efficiency gains: a fundamentally new view of the role of government in energy provision. These sentiments can be seen echoed in the Secretary of State for Energy, Nigel Lawson’s, speech on the ‘Market for Energy’, where he famously said

I do not see the government's task as being to try and plan the future shape of energy production and consumption. It is not even primarily to try to balance United Kingdom demand and supply for energy. Our task is rather to set the framework, which will ensure that the market operates in the energy sector with a minimum of distortion and energy is produced and consumed efficiently.

The speech, later called the Lawson Doctrine, encapsulated the attitude towards regulation that informed the reforms to come.

Market liberalization in the UK involved several steps, including privatization, unbundling and the gradual opening of retail and generation markets. This was by no means a simple process. Instead it was a task of unprecedented complexity that took almost two decades to finish. It needs to be appreciated that this was the first time worldwide that a liberalization of this magnitude had been undertaken for the electricity industry. The regulatory system set up to support the introduction of competition was therefore ‘often tortuous and

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88 Thomas, above n 3, 47.
89 Such as Littlechild, above n 2.
90 Nigel Lawson was Secretary of the State for Energy, appointed in 1981, later the treasurer, and a key player in the privatization debate.
91 As cited by Helm, above n 5, 57.
92 An overview of the most important early adopters of electricity market liberalization can be found in Fereidoon P Sioshansi and Wolfgang Pfaffenberger (eds), Electricity Market Reform: An International Perspective (Elsevier, 2006), pt II. Chile started liberalization before the UK, with a new institutional framework introduced in 1982, while Norway also introduced competitive wholesale markets in 1990. See, Ricardo Raineri, ‘Chile: Where it all started’ in Sioshansi and Pfaffenberger (eds), Electricity Market Reform: An International Perspective (Elsevier, 2006) 77; and Atle Midttun, ‘The Norwegian, Swedish and Finnish Reforms: Competitive Public Capitalism and the Emergence of the Nordic Internal Market’ in Atle Midttun (ed), European Electricity Systems in Transition: A Comparative Analysis of Policy and Regulation in Western Europe (Elsevier, 1997) 89. However, the magnitude of reform undertaken in the UK was unprecedented and made this market model ‘one of the most studied models in the world’, see, Newbery, ‘Electricity Liberalization in Britain’, above n 79, 109 and 111.
inevitably full of surprises’.\(^9\) The continued public ownership of and special support for nuclear energy particularly complicated a smooth transition into a competitive market.\(^9\)

Partial competition had already been introduced to the electricity sector pre-privatization with the *Energy Act 1983* (UK). This Act abolished the former prohibition of private generation as ‘main business’.\(^9\) It created a requirement for the Area Boards to publish private purchase tariffs.\(^9\) It also required the Boards to allow private generators or suppliers to use the transmission and distribution networks\(^9\) subject to charges prepared by the board.\(^9\) The Act did not result in considerable new entrant activity.\(^9\) This was due to the fact that the Act left ‘the incumbent industry with effective control of prices and entry conditions’.\(^9\) It became clear that in order to truly open the electricity market for competition, a fundamental restructuring of the industry was necessary.\(^9\)

Privatization and unbundling, i.e. the separation of generation and network business, were the next steps in the creation of the British electricity market.\(^\) Gas had already been privatized earlier, in 1985/86, albeit on a much smaller scale.\(^\) Helm identifies three core problems with electricity privatization that made this task even more complex:

- the sheer scale of the sale; the nuclear component; and the challenge of introducing competition into a traditional monopoly industry without prejudicing security of supply or technical efficiency.\(^\)

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\(^{9}\) Helm, above n 5, 2.
\(^{9}\) On this and other difficulties, see ibid 89 ff.
\(^{9}\) See *Energy Act 1983* (UK) s 1 which opened up third party generation, distribution and supply, by removing the former monopoly of the Electricity Boards to undertake these activities. Private generation for other than generation as ‘main business’ use was already allowed before that, such as co-generation and generation for own use, see, EM Hammond, DR Helm and DJ Thompson, ‘Competition in Electricity Supply: Has the Energy Act Failed?’ (1986) 7(1) *Fiscal Studies* 11, 13.
\(^{9}\) *Energy Act 1983* (UK) s 7.
\(^{9}\) Ibid s 5(1).
\(^{9}\) Ibid s 8(1).
\(^{9}\) Hammond et al, above n 95, 11.
\(^{10}\) Ibid 31.
\(^{10}\) Ibid 31.
\(^{10}\) Through the *Electricity Act 1989* (UK).
\(^{10}\) Helm puts the value of British gas at 8 billion British pounds, whereas the CEGB alone, without taking into account the 12 area boards was valued at 32 billion British pounds, Helm, above n 5, 125-6.
\(^{10}\) Ibid 125.
To overcome such challenges, the *Electricity Act 1989* (UK) not only provided for the transfer of ownership and property to the successor companies, but also created the institutional design for a competitive electricity market. This institutional design has been highly influential internationally.\footnote{See also ch 3, II A 2 for the influence on Australian reform, and ch 4, II B, showing the impact of the British model on internal energy market policy.}

Reforms included the split of the CEGB into two generating companies, National Power and PowerGen, and one transmission company, the National Grid Company. The three companies were privatized in 1990, with the government continuing to hold 40 per cent of the shares until 1995.\footnote{So-called golden shares, see Helm, above n 5, 148, 222 ff.} The nuclear power stations were initially part of National Power, but became a separate company, Nuclear Electric, which continued to be held in public ownership until 1996.\footnote{When it was privatized as British Energy together with the Scottish Nuclear, see Helm, above n 5, 186 ff.} This separation of nuclear generation capacity from other generators was undertaken to account for the difficulties in introducing competition to the nuclear power sector and the political will to continue the British nuclear program.\footnote{Ibid.}

The Area Boards were transformed into Regional Electricity Companies, responsible for distribution and supply, and subsequently privatized.\footnote{Nuclear also continued to be supported though the non-fossil fuel obligation, in more detail below at III A 1.} The Regional Electricity Companies initially had ownership of the National Grid Company through a holding company, but eventually sold off their shares. Following several changes in ownership and name changes, National Grid, as National Grid Electricity Transmission plc (NGET) is now the transmission system’s operator and owner for England and Wales.\footnote{See also, National Grid, *About Us* <http://www2.nationalgrid.com/About-us/>.} In Scotland, two vertically integrated electricity utilities, Scottish Power and SSE, continue to be the transmission network owners.\footnote{Through their subsidiaries, Scottish Hydro-Electric Transmission Limited and Scottish Power Transmission Limited.} NGET provides independent system operation services for Scotland since 2005, when Scotland became part of the wholesale market.\footnote{See also below at II C 2 a.}
Finally, the *Utilities Act 2000* (UK) required the Regional Electricity Companies to separate their retail businesses from their distribution network businesses,\(^1\) thereby finalizing the unbundling of the British electricity industry.

Within a few years of privatization several splits and mergers transformed the industry to a mostly foreign-owned one. Merger activity ultimately led to considerable vertical integration between generation and electricity retail businesses.\(^2\) Indeed, vertical integration between supply and generation is now considered the norm rather than the exception in Britain, a situation similar to that of Germany and increasingly also Australia, where the so-called ‘gentailers’ have been criticized for preventing the entry of independent generators through their market power.\(^3\)

The final stage of market reform in Britain was the introduction of a regulatory framework to the now increasingly privatized and unbundled electricity sector. It has been claimed that the regulatory framework for the electricity industry of Britain came as ‘somewhat of an afterthought’ to privatization.\(^4\) There was a presumption that ‘a simple transfer of ownership to the private sector would improve the efficiency of a company’.\(^5\) The idea that light-handed regulation would be sufficient, and that competition would protect customer interests was central to the initial regulatory approach.\(^6\) Similar considerations were influential for the reform of the electricity market in Australia, where the Hilmer review was based on an achievement of consumer interest through competition.

By the end of the 1990s, the regulation of the electricity industry in the UK had a characteristic profile, which, to a degree it retains even today. As in Australia and Germany, competitive wholesale and retail markets are accompanied by regulated monopolies for transmission and distribution. An independent regulator is responsible for

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1. Section 30 of the Act, replacing s 6 of the *Electricity Act 1989* (UK) with a new s 6, 6A, 6B. Section 6(1) now requires separate supply and distribution licences, whereas s 6(2) provides that these licences cannot be held by the same person.
2. See detailed description in Helm, above n 5, 221 ff.
3. See also ch 3, II B 2 a.
4. Helm, above n 5, 143.
5. Thomas, above n 3, 47.
economic regulation, and market participants make their investment decisions either on the basis of commercial considerations, or as incentivized through regulation.

The electricity market framework is facilitated through legislation contained primarily in the *Electricity Act 1989* (UK), which sets out regulators’ responsibilities, and provides the basis for a licensing regime. Electricity operators, i.e. generators, network businesses and suppliers, are subject to licensing, but also to statutory obligations, setting out their rights and responsibilities. This regime of individual licences is administered by the regulator. The licences contain standard and negotiated requirements for the different electricity companies. These ensure third party access rights to the network, and generally provide for a duty to provide information to the regulator to enable OFFER, the Office for Electricity Regulation, and later Ofgem, the Office for Gas and Energy Markets, to carry out their responsibilities. Standard licence conditions require licencees to become party to a range of industry codes and standards, which ‘establish rules that govern market operation and the terms for connection and access to energy networks.’

This basic institutional structure remains untouched. However, a range of reforms, many of which are addressing the decarbonization of the electricity sector, have lead to considerable reregulation.

Systemically, the market frameworks, geared towards competition and low cost, supported the status quo of network infrastructure. While the generation profile changed considerably after liberalization, this was mostly due to the change from coal to gas fired generation. Considerable new gas resources were developed in the North Sea at this time, but gas, unlike renewable energy, could easily be integrated into the existing system.

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119 But also in the *Utilities Act 2000* (UK), and *Energy Act 2004 and 2013* (UK).
120 See *Electricity Act 1989* (UK) s 4 ff.
121 Ibid s 9, for the general duties of licence holders.
122 Ibid s 16(1).
123 Ibid s 8a, s 33(1), (2); *Utilities Act 2000* (UK) s 33.
125 Ibid.
126 Note, though, the ongoing support for nuclear energy and later favourable conditions for gas, see, eg, Newbery, ‘Evolution of the British Electricity Market’, above n 2, 8-9.
127 For a figure on the generation mix see ibid 6.
However, as will be seen, a change towards renewable energy was not forthcoming without considerable changes to the regulatory framework for the electricity market.

B The Changing Regulatory Space of the British Electricity System and Renewable Energy

The legal framework for the British electricity market emphasizes decentralized and privatized decision-making, which favoured incumbent industry participants and disadvantaged renewable energy. The role of the state was confined to light-handed regulation of the network investment through an independent regulator, designed to mimic competition. Forward planning capacity by the state was not facilitated. Instead market forces were accepted as the superior means to achieve reliable, secure and cheap electricity supply, reflecting also a paradigm shift occurring across the world at that time. However, beginning with the Labour government’s ascent to power in 1997, the UK proved increasingly willing to adapt electricity market regulation to decarbonize its electricity system.

Themes emerging from these reforms were a re-strengthening of the role of the state in the electricity market by providing more central direction, and a move towards express recognition of ‘green’ concerns in the framework. Three developments can be distinguished, which together challenge the liberalized market paradigm. These are, firstly, a general rethinking of the role of the regulator and its relationship to the government. Secondly, network regulatory reform introduced a more planned approach to network development. Thirdly, they included targeted reform of generation investment to incentivize low carbon generation, including renewables.

This section will employ the concept of regulatory space to describe and analyze these changes. It will show that, unlike in Australia, both the architecture of the space and its

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terms of entry have been adapted to address the need to support renewable energy as part of the decarbonization of the electricity sector.


a The Changing Institutional Structure of the British Electricity Market

A range of institutional actors are involved in the electricity market development and delivery in the UK.

The UK government is responsible for energy policy and establishing strategic goals for the electricity market based on their democratic mandate.\(^{131}\) There are also responsibilities for the Minister in legislation. Thus, the Minister can grant exemptions to licences and modify licence conditions.\(^{132}\)

The original regulator for electricity markets as created through the *Electricity Act 1989* (UK) was the Director General of Electricity Supply (DGES)\(^ {133}\) acting through its executive arm, OFFER, the Office for Electricity Regulation. The regulators were initially individuals,\(^ {134}\) who had considerable independence in to how they were to achieve their objectives.\(^ {135}\) OFFER’s main responsibility was the regulation of the newly privatized natural monopoly network industry through price regulation. NGET, the then systems operator, operated the wholesale market according to the obligations set out in its transmission licence.

The role of the independent regulator is a central one in the liberalized electricity market. The original regulators were deliberately hands-off, interpreting their duties narrowly, as

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\(^{131}\) See Department of Energy and Climate Change, *Ofgem Review: Final Report* (July 2011) [70].
\(^{132}\) *Electricity Act 1989* (UK) ss 5, 15.
\(^{133}\) Ibid s 1, sch 1.
\(^{134}\) The first regulator was Stephen Littlechild, from 1990-1998.
\(^{135}\) For changing objectives see below at II C 1 a.
limited to economic regulation of the transmission and distribution networks. The role of the regulator was also initially very much bound to the person appointed. The first regulator, Stephen Littlechild, set out the textbook model for liberalized electricity markets and continues to be associated with the idea of light-handed regulation and a limited role for the regulator. In practice these early regulators considered objectives other than economic ones ‘as the responsibility of other agencies’. The government, even though the Minister had the power to appoint the regulator, and to intervene in the market, ‘rarely intervened in regulatory decisions’. Prosser describes the characteristics of the original regulator as ‘vesting of powers in individual Director-Generals, confused statutory duties, and only very limited requirements for participation and transparency’.

The Utilities Act 2000 (UK) introduced a new energy regulator responsible for gas and electricity assisting the likewise newly created statutory Gas and Electricity Markets Authority. The Office for Gas and Energy Markets (Ofgem) was created through the Utilities Act 2000 (UK). It unified the formerly separate regulators for gas and electricity. Similar to its predecessors, OFFER and OfGas, Ofgem is the executive arm of GEMA, the Gas and Electricity Markets Authority, a body formed from the Director General of Gas Supply and the Director General of Electricity Supply. The Authority ‘determines strategy, sets policy priorities and takes decisions on a range of matters, including price controls and enforcement’. The Utilities Act 2000 (UK) also introduced a regulatory

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136 Helm, above n 5, 210, 277-8; also Aileen McHarg, ‘The Political Economy of Regulation: Developments in British Energy Regulation under Labour’ in Barry Barton, Alastair R Lucas, Lila K Barrera-Hernandez and Anita Ronne (eds), Regulating Energy and Natural Resources (Oxford University Press, 2006) 149, 151-2 ['Political Economy'].
137 He coined the term of the standard model of market liberalization, see ch 2, III A.
139 Electricity Act 1989 (UK) s 1(1).
140 McHarg, ‘Political Economy’ above n 136, 151-152.
142 The terms authority and Ofgem are used interchangeably to signify the regulator in the literature, here, Ofgem will be used when talking about the independent regulator.
board structure,\textsuperscript{144} which replaced the former individual regulator. This has led to a legitimation of ‘regulatory decisions through a transparent and participatory process.’\textsuperscript{145}

\textit{b Changing Objectives of the British Electricity Market}

Reflecting the underlying ideas of electricity delivery through competitive markets, the objectives of DGES and thus OFFER according to section 3(1) of the \textit{Electricity Act 1989} (UK) were originally based on the competitive and secure supply of electricity:

The Secretary of State and the Director shall each have a duty to exercise the functions assigned or transferred to him by this Part in the manner which he considers is best calculated–

(a) to secure that all reasonable demands for electricity are satisfied;

(b) to secure that licence holders are able to finance the carrying on of the activities which they are authorised by their licences to carry on; an

(c) subject to subsection (2) below, to promote competition in the generation and supply of electricity.

In subsections 2-5 of s 3 of the \textit{Electricity Act 1989} (UK) objectives, such as consumer protection, safety of electricity provision, and protection of vulnerable or rural customers, were listed to be taken into account in the exercise of their duties.\textsuperscript{146} The consumer protection objectives in subsection 3 were expressly secondary, ‘subject to subsections (1) and (2) above’.\textsuperscript{147} In addition, public interest objectives ‘were given very limited emphasis’

\textsuperscript{144} Utilities Act 2000 (UK) sch 1 s 1.
\textsuperscript{146} Subsection 2 contains special rules for Scotland and for the remaining public enterprises; subsection 3 was concerned with consumer protection and health and safety issues, whereas subsection 4 and 5 concerned rural and vulnerable customers.
\textsuperscript{147} \textit{Electricity Act 1989} (UK) s 3(3).
by the regulators, echoing the commitment that competition alone was suited to achieve the different objectives of energy policy.\textsuperscript{148}

The \textit{Utilities Act 2000} (UK) also brought the first of several changes to the objectives of the Authority and accordingly Ofgem. The new primary duty of the regulator was now ‘to protect the interest of consumers where possible by promoting effective competition’.\textsuperscript{149} Secondary and tertiary duties included a reference to a ‘diverse and reliable supply of electricity’, ‘energy efficiency’ and the ‘environmental impacts of the electricity industry’.\textsuperscript{150} The \textit{Energy Act 2004} (UK) introduced a further secondary duty, which required the regulator to carry out its functions in a way that is best calculated ‘to contribute to the achievement of sustainable development’.\textsuperscript{151} Additions introduced through the \textit{Energy Act 2008} (UK) included the reference to ‘existing and future’ consumers.\textsuperscript{152} Further changes in 2010 introduced a specification of the primary duty to protect consumer interests to mean:

\begin{quote}
Those interests of existing and future consumers are their interests taken as a whole, including, (a) their interests in the reduction of electricity-supply emissions of targeted greenhouse gases; and (b) their interests in the security of the supply of electricity to them.\textsuperscript{153}
\end{quote}

These gradually changing objectives have brought a ‘significant organisational shift’, in that they promoted awareness of sustainability matters in Ofgem’s decision-making.\textsuperscript{154} Sustainability objectives can provide a ‘touchstone of legitimacy for an independent regulator’, but also for public criticism.\textsuperscript{155} McHarg points out that, while objectives set for regulators are vague, and therefore difficult to enforce, an impact for symbolic reasons is likely.\textsuperscript{156}

\textsuperscript{148} McHarg, ‘Political Economy’, above n 137, 150; also, Helm, above n 5, 141-2.
\textsuperscript{149} \textit{Electricity Act 1989} (UK) s 3A(1), introduced through \textit{Utilities Act 2000} (UK) s 13.
\textsuperscript{150} Ibid s 3A(5).
\textsuperscript{151} \textit{Electricity Act 1989} (UK) s 3A(1), (5ba), introduced through \textit{Energy Act 2004} (UK) s 83.
\textsuperscript{152} Ibid s 3A(1), (2c).
\textsuperscript{153} \textit{Electricity Act 1989} (UK) s 3A(1a), introduced through \textit{Energy Act 2010} (UK) s 17(3).
\textsuperscript{154} Aileen McHarg, ‘British Energy Regulation’, above n 39, 297.
\textsuperscript{155} Ibid.
\textsuperscript{156} Ibid 296.
c Introducing Avenues for Government Intervention

Beyond the widening of regulatory objectives, however, UK legislation provides for a specific link between high-level policy development and the development of regulatory frameworks for the electricity market.

The Utilities Act 2000 (UK) added additional powers for the Minister. Significantly, these included the core ability to issue social and environmental guidances, but also new or enhanced powers to

- set standard licence conditions;\textsuperscript{157}
- promote energy efficiency;\textsuperscript{158}
- annual reporting requirements of the authority to the Minister;\textsuperscript{159}
- promote renewable energy,\textsuperscript{160} and
- provide for cross subsidies to support disadvantaged customers.\textsuperscript{161}

According to McHarg, Labour Ministers were more willing than their predecessors to use their existing powers, such as their power to withhold consent to new generation stations.\textsuperscript{162}

Centrally, the introduction of a new section 3B into the Electricity Act 1989 (UK) provided the government with the power to issue guidances on social and economic issues to the regulator. Such guidance has to be taken account of in decision-making, but is not binding on the regulator, who is merely required to ‘have regard to any guidance’ issued.\textsuperscript{163}

Guidances are expressly issued to support the implementation of the government’s energy policy. The 2010 guidance\textsuperscript{164} addressed for example the following issues:

\textsuperscript{157} Utilities Act 2000 (UK) s 33.
\textsuperscript{158} Ibid ss 70, 103.
\textsuperscript{159} Ibid s 5.
\textsuperscript{160} Ibid ss 62-67.
\textsuperscript{161} Ibid s 69.
\textsuperscript{162} For example, to impose a temporary ban on new Combined Cycle Gas Turbine stations, McHarg, ‘Political Economy’, above n 136, 156 n 32.
\textsuperscript{163} Electricity Act 1989 (UK) 3B(2).
\textsuperscript{164} The first guidance was issued in 2002. It was revised in 2004 and 2010.
• Enabling timely delivery of an effective offshore transmission regime.

• Enabling timely investment in necessary capacity for the electricity transmission and distribution networks.

• Ensuring connection to the electricity networks for new generation, including renewable, nuclear and other low carbon generation, in a timeframe consistent with their development programme whilst maintaining security of supply.

• Eliminating unnecessary regulatory and market barriers to the economic deployment of distributed energy.\(^{165}\)

Ofgem has used this guidance to develop considerable activity in policy-making,\(^{166}\) both individually and in concert with the government. The use of such measures to define the relationship between government and regulator has been described as creating ‘a system which involves a degree of partnership between government and regulators’.\(^{167}\) It marks ‘an expectation of joint ministerial/Ofgem decision-making in respect to major regulatory initiatives, rather than distinct spheres of responsibility.’\(^{168}\)

However, the 2011 Ofgem review, while reconfirming the need for an independent regulator, found that

> the current framework of broadly scoped duties and weak guidance is unlikely to support a predictable regulatory environment that is coherent with government strategy, as the energy sector goes through a period of substantial change over the coming decades.\(^{169}\)

The guidance model has therefore been replaced with a new statutory Strategy and Policy Statement, enabled in part 5 of the \textit{Energy Act 2013} (UK). Subject to a five yearly review,\(^{170}\) the statement will set out


\(^{166}\) See, eg, below on details of the offshore wind regulatory regime.

\(^{167}\) Prosser, above n 141, 183.


\(^{170}\) \textit{Energy Act 2013} (UK) s 134.
(a) the strategic priorities, and other main considerations, of Her Majesty’s government in formulating its energy policy for Great Britain (“strategic priorities”);

(b) the particular outcomes to be achieved as a result of that policy (“policy outcomes”); and

(c) the roles and responsibilities of persons (whether the Secretary of State, the Authority or other persons) who are involved in implementing that policy or who have other functions that are affected by it.\(^{171}\)

Section 132 of the *Energy Act 2013* (UK) provides that beyond ‘having regard to the strategic priorities set out in the strategy and policy statement when carrying out regulatory functions’, the regulator and the Secretary of State must also ‘carry out their respective regulatory functions in the manner which … [it] considers is best calculated to further the delivery of the policy outcomes’.

Significantly, section 137 of the *Energy Act 2013* (UK) inserts a new section 4A into the *Utilities Act 2000* (UK), which requires the authority to set out a forward working program to deliver the policy outcomes defined by government.\(^{172}\) This can ensure the interlinking of energy policy and regulatory decision-making,\(^{173}\) which is necessary to achieve the fundamental systemic change. This development also has the potential to deliver a considerable reassertion of government influence over energy market issues. This continues the trend towards a strengthening of the role for government as direct actor in the electricity market. Together, these reforms have changed the dynamics in regulatory space, by introducing ‘green’ concerns into regulatory decision-making. These changes to meta-regulatory law provide the basis for adapting regulatory law, or the ‘terms of entry’ to regulatory space in a way that is responsive to new challenges. The next sections will show how this adaption, especially in network regulation has been used to support renewable energy.

\(^{171}\) Ibid s 131(2).
\(^{172}\) *Utilities Act 2000* (UK) s 4A(3).
In contrast to the powers the UK government has to influence market operation, the regulatory framework of the Australian electricity market provides for a more strict separation between government and regulator. The difficulties of linking new challenges in energy policy development to electricity market reform, have led to a remarkably unresponsive, if stable, regulatory space.\(^{174}\) Rethinking how such a link could be provided in the context of the intergovernmental arrangement of Australia’s electricity market, will be a major challenge.

2 Entry to the Regulatory Space of the Electricity System: The Challenge for Renewable Energy

a The Wholesale Market

From 1990-2001, the market was organized as a pool-price trading arrangement, operated by the National Grid Company (NGC). It was accompanied by a licensing regime for all market participants.\(^{175}\) Licences for generators and suppliers required them to sell and buy electricity through the pool.\(^{176}\) Generators bid their price forecast for the next day. The NGC as the market operator would then centrally dispatch electricity according to bids and network constraints.\(^{177}\) The pool model was abandoned\(^ {178}\) after a review in 2000 and replaced with NETA, the New Electricity Trading Arrangements. These arrangements relied on ‘four overlapping and interdependent markets operating over different

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\(^{174}\) In detail ch 3, II B 1 c.

\(^{175}\) *Electricity Act 1989* (UK) s 6.

\(^{176}\) Mark Bartholomew, ‘The UK Electricity Market - from Pool to Exchange’ in François Boisseleau and Martha M. Roggenkamp (eds), *The Regulation of Power Exchanges in Europe* (Intersentia, 2005) 81, 91-2; the licencees where obliged to become party to the Pooling and Settlement Agreement, which contained the pool requirement.

\(^{177}\) In much more detail, see Newbery and Green, above n 55, 61 ff; for another pool model, albeit with half hourly bidding, see the NEM arrangements in Australia, ch 3, II B 2 a.

\(^{178}\) There are different opinions on whether the pool model was a success or not. Newbery criticizes the replacement, Newbery, ‘Electricity Liberalization in Britain’, above n 79, 126-7, finding it based on unsubstantiated evidence, whereas McHarg, ‘Political Economy’, above n 136, 167 claims that the introduction of NETA got rid of ‘extremely cumbersome arrangements for reforming market rules’ and generally welcomes the new arrangements.
timescales’. In 2005, BETTA, the British Electricity Transmission and Trading Arrangements, which included Scotland, replaced NETA.

Wholesale market trading is undertaken primarily through bilateral contracting, and to a small degree through power exchanges, with self-dispatch balanced by the systems operator, NGET. These arrangements are ostensibly technology-neutral – renewable generators have the same rights and responsibilities as fossil fuel generators. However, the bulk of trading is done in forward markets, favouring generators that can provide predictable energy outputs. BETTA leaves the burden of contract administration, as well as the cost of balancing demand and supply to the generators. This disadvantages intermittent and small-scale generators, such as many renewable generators. In practice the risk of not being able to provide contracted outputs, has led to the bulk of electricity being contracted and traded either within large energy companies that have a generation and retail arm or between large generators and the main electricity supplier. This has further entrenched existing structures of electricity supply; a disadvantage that the Renewables Obligation was not designed to overcome. Similar problems of vertical integration are experienced in Australia, where an oligopoly of gentailers dominates the retail and generation markets. The recent introduction of Contracts for Difference for renewable energy support in the UK, seeks to redress some of these disadvantages for renewable generators as detailed below.

b Regulating Infrastructure: Network Regulation and Renewable Energy

As in the case of Australia, access to the market for renewables in the UK is not just a question of financing investment, but also of facilitating network access and network

179 Newbery, ‘Electricity Liberalization in Britain’, above n 79, 127. The different markets included short-term, medium term and forward and futures market.
180 Now National Grid plc.
181 Adrian Smith and Jim Watson, ‘The Renewables Obligation: Can it deliver?’ (Tyndall Briefing Note No. 4 April 2002, Tyndall Centre for Climate Change).
183 Ibid.
184 Below at III.
investment for renewable energy sources, which are often located remote to the existing grid. A second challenge for network investment is ensuring system stability while supporting renewable energy.

When market frameworks were introduced to the British electricity system, as a legacy of the formerly state-led investment, there was overinvestment in network capacity. ‘Disruptive technological change’ as was later introduced with renewable energy was not an issue.\(^{185}\) Helm has pointed out that optimal levels of network development to support renewables ‘will not be developed by vertically integrated oligopolists’.\(^{186}\) Instead, he claims, ‘[a]n element of planning and a (heavy) dose of regulation is essential.’\(^{187}\)

Ofgem’s wide discretion in how to achieve its objectives, in conjunction with the guidance, which emphasized network investment as a focus of regulatory reform, has seen a range of measures introduced that address this need for ‘a heavy dose of regulation’. These measures include the new incentive regulation for network investment, RIIO\(^{188}\) which is replacing the price cap regulation RPI-X, as well as changes to the transmission access regime, the reform of transmission charging methodology and targeted support of renewable-friendly network investment. These measures continue a theme of reregulation that promotes public influence in the market framework.

*Network Access and Charging Regime Reforms*

In addition to measures supporting investment in renewable-friendly networks, network access and charging regimes can provide considerable barriers to renewable energy.

In the UK, network access regimes are governed by the Connection and Use of System Code (CUSC), which is part of the licence conditions for the transmission network owners and operators. While the codes have their own industry governance arrangements, Ofgem is

\(^{185}\) McHarg, ‘Evolution and Revolution’, above n 145, 321; also ibid.  
\(^{186}\) Helm, above n 5, 422-3.  
\(^{187}\) Ibid 423.  
\(^{188}\) RIIO stands for Revenue=Incentives+Innovation+Output.
‘responsible for making decisions on any modifications proposed through these governance processes’.  

Similarly to the Australian system, a generator seeking to connect to the electricity network will have to enter into a contractual relationship, the connection agreement, with the network operator. The connection agreement requires adherence to a set of technical requirements and the network operator has to make a connection offer to the generator within a certain timeframe. The network has to connect the generator as part of their licence conditions. The generator will also have to become a party to the CUSC as part of the connection agreement.

The Transmission Access Review, a joint initiative of Ofgem and the Department for Business, Enterprise and Regulatory Reform (BERR) was initiated after the 2007 White Paper identified considerable delays in getting renewable energy projects connected to the transmission networks. These delays were due to a number of reasons, including a ‘queue’ of transmission connections offered to new Scottish renewable energy projects preceding the introduction of the BETTA trading arrangements to Scotland.

The review identified uncertainty about if and when renewable generation would be able to connect; especially because the projects that had applied for access exceeded the available network capacity. Subsequently, Ofgem introduced the ‘connect and manage’ approach as part of a new, ‘enduring’ access regime. This new arrangement allows generators the option ‘to connect to the network ‘once all enabling works are complete, but ahead of wider transmission system reinforcement being finished. Wider system reinforcement can thus be targeted to match generator demand, and stranded assets can better be avoided.

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190 Connection and Use of System Code, cl 2.13.
192 Ibid.
Additionally, transmission-charging regimes have been changed to facilitate renewable energy. Generally, shared network costs are split between generators and suppliers. The further generators are located from their load centres, i.e., the place where the electricity generated is used, the more they pay. With renewable energy resources often being located in remote locations, this locational signal has hampered investment in some of the best renewable resources, especially in rural and peripheral locations. Renewable generators in Northern Scotland specifically, are disadvantaged by these arrangements. This locational disadvantage led to a lack of investment, even though the region has excellent renewable resources.

To address this problem, Ofgem launched Project TransmiT, ‘an independent and open review of transmission charging and associated connection arrangements’. As a result, a process to change the charging methodology of the Transmission Network Owners contained in their licences is underway. The current proposals include lower costs for remote and intermittent generators, reflecting the need to invest in renewable energy where the best resources are located. Overall these measures reflect the unsuitability of market-based regulation to engender change favourable to low carbon generation. In the British electricity system this has been addressed by a reordering of the regulatory space to specifically support renewable energy.

**Network Investment and Planning**

Until 2010, network investment was regulated through price cap arrangements, following the so-called RPI-X formula. The model was designed by Stephen Littlechild, the first

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195 Generators cover 27 per cent and retailers 73 per cent of the cost.
196 Ofgem, ‘Scope of Project TransmiT and summary of responses to our call for evidence’ (Jan 2011) 9.
199 Although, implementation has just been delayed, see Ofgem, ‘Project TransmiT: update on progress and next steps’ (December 2013).
201 On the new RIIO arrangements see below at II C 2 a.
energy regulator, to mimic competition within a largely monopoly-based system.\textsuperscript{203} The regulator set a price cap, based on what the network business was expected to need to spend to fulfill its licence obligations for the next five years, as well as a rate of capital return on network use. The cap was designed to incentivize the network company to make efficiency savings and retain the additional profits.\textsuperscript{204} This model was ‘a technical formula; it embodied a philosophy of regulation – that it should be light-handed, pro-competition, and focused on economic rather than social regulatory goals.’\textsuperscript{205}

The shift to market-based electricity provision and its accompanying regulatory framework ‘occurred against a backdrop of … well-developed infrastructure and slack demand, which reduced the significance of long-term investment’.\textsuperscript{206} However, with the rise of renewable energy, the lack of suitable network capacity became one of the major obstacles for the uptake of more renewable energy in the UK.\textsuperscript{207} RPI-X failed to ensure the investment into networks that would be necessary to facilitate the needs of renewable energy. While it did ensure ‘efficiency in business as usual activities’,\textsuperscript{208} long-term investment was not incentivized.\textsuperscript{209} The five-year regulatory periods, especially, were found to be too short to support long-term network transformation.\textsuperscript{210}

Additionally, the RPI-X mode provided only limited incentives to make new investments in transmission capacity as opposed to retaining and managing the existing network

\begin{footnotesize}
\begin{enumerate}
\item\textsuperscript{202} Retail Price Index minus X per cent.
\item\textsuperscript{203} Helm, above n 5, 277.
\item\textsuperscript{204} See in more detail ibid; Helm, above n 5, 277 ff.
\item\textsuperscript{205} McHarg, ‘Evolution and Revolution’, above n 145, 315.
\item\textsuperscript{208} Rita Shaw, Mike Attree and Tim Jackson, ‘Developing Electricity Distribution Networks and Their Regulation to Support Sustainable Energy’ (2010) 38(10) \textit{Energy Policy} 5927, 5932, also Ofgem, ‘Regulating energy networks for the future: RPI-X@20 Principles, Process and Issues’ (Consultation, 2009).
\item\textsuperscript{209} McHarg, ‘Evolution and Revolution’, above n 147145, 321 with further sources; Shaw et al, above n 194208, 5931, for distribution networks.
\item\textsuperscript{210} Ofgem, ‘Regulating energy networks for the future: RPI-X@20 Recommendations’ (Consultation, 2010) 28 ff.
\end{enumerate}
\end{footnotesize}
As is still the case in the parallel Australian framework, which also relies on narrowly defined efficiency and reliability objectives, RPI-X ‘fail[ed] to incorporate aspects of the public interest other than economic efficiency … such as social and environmental’ concerns. As energy policy moved towards multiple objectives, centrally that of mitigating climate change, RPI-X needed to be adapted to address new challenges.

Accelerated by the changes in European energy policy committing to emissions reductions and renewable energy targets, the RPI-X@20 review was undertaken by Ofgem in 2008/2009. The subsequently introduced new model of network regulation, RIIO, presents a shift away from ‘notion of regulation as a competition-substitute towards a more planned approach.’ It provides for a longer planning horizon of 8-year regulatory periods to ensure long-term investment. RIIO is designed to encourage network companies to:

- put stakeholders at the heart of their decision-making process;
- invest efficiently to ensure continued safe and reliable services;
- innovate to reduce network costs for current and future consumers; and
- play a full role in delivering a low carbon economy and wider environmental objectives.

On this basis, Ofgem is setting framework objectives for each network company. Each company is to address these objectives in a business plan, which must subsequently be approved by the regulator. The new process of stakeholder engagement, informed by government policy-driven goal setting and the new consumer-centered objective of the regulator, is designed to ensure an output-led regime, which provides for a balancing of ‘investment, innovation and efficiency’.

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211 Ibid.
212 Ibid 280.
215 Ofgem, ‘Price Controls explained’ (Factsheet 117, March 2013).
216 Bolton and Hawkes, above n 206, 147.
Compared to the former RPI-X approach, which was characterized by narrowly defined commercial incentives, the new RIIO methodology considerably widens the scope of regulatory direction and the objectives of network regulation. Clearly, rather than a technical exercise of substituting competition, network regulation under RIIO ‘acknowledges that the regulator’s role is to drive forward a positive policy agenda, and that this inevitably involves balancing a range of sometimes conflicting goals and values’.

Additional arrangements have been introduced to support the focus of RIIO on innovation and flexibility. They address inter alia the challenge of encouraging renewable energy through targeted network investment.

Strategic Wider Works Arrangements allow the network companies to bring forward investments, which have not been approved for the regulatory period. This allows for the necessary flexibility to address challenges as they come up during the regulatory period. This process also seeks to address the problem of stranded assets, where transmission investment depends on the level of future generation. The arrangements are designed to balance the risks of overinvestment in network infrastructure.

If these investments are undertaken earlier than needed this may lead to higher costs for consumers due to unnecessary infrastructure financing costs or increase the risk of assets being built that turn out not to be fully utilised. On the other hand, delayed delivery of critical infrastructure could be detrimental to consumers’ interests including through higher costs to manage network constraints; higher greenhouse gas emissions; and possible risks to security of supply.

Instead of being approved for the entire regulatory period, ‘flexible arrangements are included in RIIO-T1 to consider large transmission projects when more information was

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218 Ofgem, ‘Guidance on the Strategic Wider Works arrangements in the electricity transmission price control, RIIO-T1’ (Guidance, October 2013) 1.
219 A similar challenge to that which the SENE rule change sought to address in Australia.
available to inform decisions on whether the investment is in the interests of existing and future consumers.\footnote{221}{Ibid, RIIO-T1 refers to the first transmission price control under the new RIIO approach.}

Additionally to the RIIO approach, specific transmission investment projects can be supported under an investment fund for Transmission Investment for Renewable Generation. This fund provides ‘transmission licencees with revenue allowances to connect renewable generation that was not forecast at the time the relevant transmission price controls were set.’\footnote{222}{Ofgem, Transmission Investment for Renewable Generation (2015) <https://www.ofgem.gov.uk/electricity/transmission-networks/critical-investments/transmission-investment-renewable-generation>}. Following the transmission access review in 2008,\footnote{223}{Ofgem and Department for Business, Enterprise and Regulatory Reform Transmission Access Review: Final Report (2008), see more below.} an expert group\footnote{224}{The Electricity Network Strategy Group is a high level forum, bringing together key stakeholders in electricity networks, see <https://www.gov.uk/government/groups/electricity-networks-strategy-group>}. identified an urgent need for several specific investments necessary to meet the government's 2020 renewable energy and low carbon targets.\footnote{225}{Energy Networks Strategy Group, Our Electricity Transmission Network: A Vision for 2020 (2009).} The Transmission Network Investment Incentives Framework was implemented to address these needs and considerable funding for the identified projects was awarded.\footnote{226}{For details and further links, Ofgem, Transmission Investment Incentives (2015) <https://www.ofgem.gov.uk/electricity/transmission-networks/critical-investments/transmission-investment-incentives>}. The changes to the transmission investment regime show that decarbonization of the electricity sector will require a more flexible regulatory framework, which can respond to high-level policy change. This has been achieved by a reengagement of the public hand in network investment, through widening regulatory objectives and linking high-level policy developments to regulatory change. Additionally, however, targeted and flexible support for transmissions investment to assist renewable energy was made possible through an investment fund. Renewable energy generators, which until this point had been treated as any other generator in network regulation, have through these measures been given a special place in regulatory space.
Special Regulatory Regime for Offshore Wind Connection

Offshore wind resources are excellent in the UK and offshore wind is planned to provide the bulk of renewable generation capacity in the UK.\(^{227}\) New network infrastructure is required to connect these resources. The onshore regulatory regime for transmission investment was not considered sufficient to lead to a timely and efficient connection of offshore generation.\(^ {228}\)

Similar to Germany,\(^ {229}\) the UK has therefore created a separate offshore transmission regulatory regime to facilitate offshore wind energy. The *Energy Act 2004* (UK) added a new competency for Ofgem to run competitive tender processes for new offshore transmission infrastructure that was needed to connect the vast offshore wind resources of the UK.\(^ {230}\) Investment costs for offshore transmission are socialized, with 20 years revenues guaranteed for the new Offshore Transmission Owners (OFTO). By contrast, the standard revenue periods for transmission investment onshore were set at five years and now are set at eight years.\(^ {231}\)

Again, the necessity to provide for an entirely new regulatory regime to incentivize offshore wind investment proves that financial support to generators is not sufficient to overcome systemic lock-in. Instead, in acceptance that electricity networks were designed for the existing generation profiles, specific regulation for renewable energy in addition to supporting generation costs will need to be introduced. While these measures have carved out an increasingly separate position for renewable energy in the electricity system regulatory space, reforms introduced by the *Energy Act 2013* (UK), have the potential to further change the dynamics in the regulatory space in regard to renewable energy.

\(^ {228}\) See, Ofgem and Department of Trade and Industry, ‘Regulation of Offshore Electricity Transmission’ (Joint Consultation, 2005).
\(^ {229}\) Ch 6, II C 2 b.
\(^ {230}\) Section 92, adding a new s 6C to the *Electricity Act 1989* (UK).
3 Energy Market Reform for Decarbonization: The Energy Act 2013 (UK)

The Energy Act 2013 (UK)\(^{232}\) introduced a range of measures to achieve the objectives of the White Paper 2011, namely ‘to ensure the future security of electricity supplies, drive the decarbonisation of our electricity sector and minimise costs to the consumer’\(^{233}\). These include Contracts for Difference (CfD)\(^ {234}\) to replace the Renewables Obligation, a capacity market,\(^ {235}\) emissions performance standards,\(^ {236}\) as well as a carbon price floor.\(^ {237}\) Together these measures aim to address the challenges of decarbonization on the one hand and energy security on the other hand. The challenge the UK faces and which the Act seeks to redress is:

The need to ensure that, as older plants are taken offline, the United Kingdom remains able to generate enough energy to meet its needs even if demand increases. Doing this while also decarbonizing requires significant investment in new infrastructure to be brought forward… and new schemes to be integrated to ensure this investment comes forward.\(^ {238}\)

The Contract for Differences are designed to ensure that enough investment in low carbon electricity generation is forthcoming by providing a stable revenue stream.\(^ {239}\) As they directly target renewable generation, details of their design will be addressed in part III of this chapter.

Accompanying this measure, the carbon price floor will raise the cost of the fossil fuel generation and thereby encourage switching to low carbon generation. The emissions performance standards, finally, are meant to ensure that no new high emitting fossil fuel plants are built.\(^{240}\) Plant closures of a quarter of the existing fossil fuel generators as a result of tightening environmental regulation as well as the age of the plant, and at the same time

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\(^{232}\) Further measures, not directly applicable to the thesis are contained in parts 3-7 of the Act.
\(^{233}\) Department of Energy and Climate Change, *Planning our electric future*, above n 27, 16.
\(^{234}\) Energy Act 2013 (UK) ss 6-26.
\(^{235}\) Ibid ss 27-43.
\(^{236}\) Ibid ss 57-68.
\(^{237}\) The carbon price floor is based on the tax regime set up for the Climate Change Levy, *Finance Act 2000* (UK) s 30 and schs 6-7, which have been amended to include this measure with the *Finance Act 2011* and 2012 (UK).
\(^{238}\) Explanatory notes, Energy Act 2013 (UK) 1.
\(^{239}\) See Explanatory Notes, Energy Act 2013 (UK) 2.
\(^{240}\) Department of Energy and Climate Change, *Planning our electric future*, above n 27, 49 ff.
the increase of intermittent renewable generation, is forecast to put considerable pressure on security of supply.\textsuperscript{241}

It is claimed that ‘the generation mix will no longer be decided by a number of competing private companies on the basis of price signals alone but will be more or less completely determined by government.’\textsuperscript{242} Others have dubbed the reform a ‘gosplan’ approach,\textsuperscript{243} ‘central direction’,\textsuperscript{244} or the end of ‘the liberalized electricity market’.\textsuperscript{245} While some dispute the revolutionary nature of the reforms, and question their usefulness,\textsuperscript{246} the interlocking measures contained in the Act have the potential to narrow decision-making in generation investment considerably. Within the remaining decision space, market principles continue to apply. The degree of public direction possible is a long way from the standard liberal market model’s ‘hands off’ attitude which provided for some price support and ‘do nothing more’.\textsuperscript{247} However, to say that UK regulation has come ‘full circle’, returning to the centrally directed national system of the past, would be a simplistic statement. The reforms leave the electricity market as the central regulatory instrument in electricity supply. However, the British experience has shown the limits of what market instruments can achieve. The increasing range of energy policy objectives, centrally among them the challenge of decarbonizing the electricity system, cannot be achieved without considerable reregulation.

\textsuperscript{241} Ibid 59; see also Newbery, ‘Evolution of the British Electricity Market’, above n 3, 14.
\textsuperscript{243} Dieter Helm, ‘EMR and the Energy Bill’ (Commentary, 27 June 2012).
\textsuperscript{247} Littlechild, above n 2, xvii; see also ch 3, III A.
III LEGAL INSTRUMENTS FOR RENEWABLE ENERGY SUPPORT IN THE UK

Specific renewable energy support mechanisms in the UK include the Renewables Obligation and small-scale feed-in-tariffs.248 ‘Contracts for Difference’ (CfD) have been introduced recently to eventually replace the Renewables Obligation. There exist a range of research and development support mechanisms, as well as financial support for specific projects in the shape of the Green Investment Bank, which has a specific mandate to support offshore wind energy.249

This section will address the question of whether the Renewables Obligation and the CfD mechanism can address the systemic disadvantage for renewable energy in the electricity market.

A The Development and Operation of the Renewables Obligation

The Renewables Obligation has, together with its predecessor, the Non-Fossil Fuel Obligation (NFFO), been the main support mechanism for renewable energy in the electricity market for over 25 years.

1 The Non-Fossil Fuel Obligation

Renewable energy was, at least on paper, supported early on in the UK through special provisions in the Electricity Act 1989 (UK). The NFFO required the suppliers of electricity to purchase prescribed amount of electricity from non-fossil fuel generation, including nuclear energy.250 Indeed the instrument was introduced to ensure the viability of the nuclear program of the UK, which had proved ‘too difficult to privatise’, 251 and only

248 Enabled through Energy Act 2008 (UK) ss 41-43; Feed-in-Tariffs (Maximum Specified Capacity Cap and Functions) Order 2010. The microgeneration scheme supports small-scale generators up to 5MW capacity.
250 Electricity Act 1989 (UK) s 32 as originally enacted.
included renewable energy to avoid being ‘seen as a discriminatory subsidy to the nuclear industry’.

The NFFO was based on a bidding system for a determined net capacity. The amount Regional Electricity Companies were required to contract, was set by order of the Secretary of State. Non-fossil fuel generators could submit bids at the price they would be prepared to sell their electricity for in a fixed-term period. The lowest bidder was awarded with a contract for a guaranteed premium price over the contract period. While the first order did not distinguish between technologies supported, the following orders provided for different technology bands. The scheme was financed through a fossil fuel levy charged on suppliers, which reimbursed the difference between the contracted premium price and the wholesale market price to the regional electricity companies. The last order was made in 1998, and the NFFO was replaced by the Renewables Obligation in 2002. The NFFO had several design faults, in particular a lack of effective enforcement provisions, which resulted in contracted generating capacity not being built. Its tendering process also encouraged overly optimistic assessment of project costs, which further increased the risk of projects not being developed.

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254 Initially the end date of the measure was 1998 (see NFFO-1 and NFFO-2, above n 253, sch 1), because the EU commission did not want to ‘grant authorization for support of nuclear power beyond 1998’, see Mitchell, ‘NFFO’, above n 251, 1079. From NFFO-3 onwards, longer timeframes of 15 years could be agreed (see NFFO-3-5, above n 253, sch 1).


256 In sch 1.

257 Electricity Act 1989 (UK) s 33 as originally enacted, Fossil Fuel Levy Regulations 1990 (UK) SI 1990/266.

258 Ibid.

259 Mitchell and Connor, above n 253, 1937; see also Mitchell, ‘NFFO’, above n 253; only about one third of the contracted generation capacity was actually built, see Pollitt, ‘UK Renewable Energy Policy’, above n 252, 19.

260 Ibid.
The NFFO was an atypical instrument – a political fix – initially introduced to support nuclear energy. It did not entirely fit in with the wider policy environment of the day, based on competitive markets and light-handed regulation.\textsuperscript{261} While tendering provided some competition between sources, ultimately the obligation guaranteed both market share and price for renewable energy.\textsuperscript{262} The price guarantee of 15 years, too, is reminiscent of a feed-in-tariff that is generally thought to enable long-term investment into new technologies.\textsuperscript{263} In that regard it is closer to the model of a feed-in tariff, such as the German one, than the later Renewables Obligation, which exposed renewable energy generators to full market risk. Commentators consequently criticized it as a ‘somewhat half-hearted hybrid market/interventionist system’.\textsuperscript{264}

With all its shortcomings, the NFFO had positive design aspects that were later resurrected. These included the use of technology bands to provide targeted support to a range of different technologies. These distinctions between technology costs are a major feature of feed-in-tariffs\textsuperscript{265} and were later re-introduced into the Renewables Obligation.

2 The Renewables Obligation

The Renewables Obligation was introduced in 2000 following the Labour government accession to power in 1997 and its commitment to renewable energy.\textsuperscript{266}

It replaced the NFFO pursuant to the \textit{Utilities Act 2000} (UK). The Act replaced section 32 and added a new sections 32A-C to the \textit{Electricity Act 1989} (UK), with the actual details of the Renewables Obligation prescribed through regulation, the Renewables Obligation Order.\textsuperscript{267} The Renewables Obligation is based on creating a market for Renewable Obligation Certificates (ROC’s), which will provide a source of income to renewable

\begin{itemize}
\item \textsuperscript{261} See above at II A 2 a.
\item \textsuperscript{262} McHarg, ‘Political Economy’, above n 136, 166.
\item \textsuperscript{263} See, eg, A Held, M Ragwits and R Haas, ‘On the Success of Policy Strategies for the Promotion of Electricity from Renewable Resources’ (2006) 17(6) \textit{Energy and Environment} 849.
\item \textsuperscript{264} David Elliott, ‘Renewables and the privatization of the UK ESI: A case study’ (1992) 20 \textit{Energy Policy} 275, 276.
\item \textsuperscript{265} See eg ch 6, III for the German feed-in-tariff design.
\item \textsuperscript{266} See also above at I B for policy development.
\item \textsuperscript{267} Currently the \textit{Renewables Obligation Order 2009} (UK) SI 2009/785 as amended.
\end{itemize}
energy generators, additional to the income received through the regular electricity market. The ROC’s are created by Ofgem for each MWh eligible renewable energy generated.\footnote{According to \textit{Electricity Act 1989} (UK) s 32(8), ‘renewable sources’ means sources of energy other than fossil fuel or nuclear fuel, but includes waste of which not more than a specified proportion is waste which is, or is derived from, fossil fuel.} The certificates are then bought by the retailers, which have to surrender them to Ofgem at the end of the year to fulfill their obligations. If the suppliers fail to present the necessary number of ROC’s they have to pay a buy out price.\footnote{\textit{Electricity Act 1989} (UK) s 32 C.} The revenue received for the buy-out price is recycled on a pro-rata basis to the suppliers that presented the ROC’s, a provision that has proved problematic. In the UK, Ofgem regulates the ROC market, unlike in Australia, where an entirely different regulator, the Office of the Renewable Energy Regulator, has been created. This further establishes the position of Ofgem as more than just an economic regulator, diversifying its functions and objectives.

Similar to other tradable green certificate schemes, in practice the most established technologies were supported by the Renewables Obligation.\footnote{See, eg, Mitchell and Connor, above n 25 1, 1946.}

It is now well established that the existence of a low buy-out price led to underperformance in the scheme.\footnote{In more detail, see Pollitt, ‘UK Renewable Energy Policy’, above n 253, 20-1; Lucy Butler and Karsten Neuhoff, ‘Comparison of feed-in tariff, quota and auction mechanisms to support wind power development’ (2008) 33(8) \textit{Renewable Energy} 1854.} The buy-out price bound the market and as it was recycled back to the renewable generators, the maximum subsidy amount could therefore be realized if the full target was not achieved; a design flaw that was exploited by the suppliers.\footnote{See Huizhong Zhou, ‘Impacts of Renewables Obligation with Recycling of the Buy-out Fund’ (2010) 64 \textit{Energy Policy} 284.}

Initially the Renewables Obligation, similar to the Australian Renewable Energy Target, had a distinctly market-based approach. The underlying idea was that the most efficient, i.e., cheapest technology was supported, to achieve targets ‘at low cost and with available technologies’.\footnote{For policy background see David Toke and Volkmar Lauber, ‘Anglo-Saxon and German Approaches to Neoliberalism and Environmental Policy: The Case of Financing Renewable Energy’ (2007) 38(4) \textit{Geoforum} 677, 682.} It also became apparent that in order to achieve especially longer term
policy goals it was necessary to support a wider variety of renewable energy sources instead of only the most efficient.\textsuperscript{274}

The Renewables Obligation was reformed significantly through the \textit{Energy Act 2008} (UK).\textsuperscript{275} It introduced \textit{inter alia} section 32D into the \textit{Electricity Act 1989} (UK), which allowed for ‘banding’. This meant that technology bands could be introduced which changed the 1kWh:1ROC ratio to respond to the different generation costs of different renewable energy sources. Different technologies could now be offered differentiated amounts of ROC’s per MWh, with cheaper, more established technologies getting less assistance and newer, more costly energies getting more than 1ROC per MWh.\textsuperscript{276} These changes introduced an active role for the government in determining the desired technology mix. In that regard, the Renewables Obligation became more like a feed-in-tariff, which similarly allows for flexible tariff-setting.\textsuperscript{277}

These changes demonstrate that the policy makers recognized that systemic change to a high renewable energy scenario requires a diverse range of technologies to be supported. Unlike in Australia, banding was introduced to allow for differentiated support. However, the Renewables Obligation could not provide sufficient investment security for renewable generators, which still led to underinvestment in renewable energy.

The lack of a stable investment climate for renewable energy due to the volatility of wholesale and certificate market prices, is a recognized problem for renewable certificate schemes. In Australia the situation has resulted in investment in renewable energy needing to be secured by power purchase agreements.\textsuperscript{278} In Germany, feed-in-tariffs provide

\begin{itemize}
  \item \textsuperscript{274} Department of Trade and Industry, \textit{Meeting the Energy Challenge, A White Paper on Energy} (May 2007) 14, 164-5.
  \item \textsuperscript{275} Section 37 of the \textit{Energy Act 2008} (UK), amending ss 32-32C and introducing new ss 32D-32M to the \textit{Electricity Act 1989} (UK).
  \item \textsuperscript{276} Landfill gas generated electricity, for example, was offered 0.25 ROC per MWh, whereas the more expensive wave or solar photovoltaic energy got 2 ROCs per MWh, \textit{Renewables Obligation Order 2009} (UK) SI 2009/785, pt 6 sch 2.
  \item \textsuperscript{277} See especially the German feed-in-tariff scheme, ch 6, II B and II C 1.
\end{itemize}
In the UK this volatility, but also planning law constraints, which especially hindered investment in onshore wind, led to less investment than was necessary to achieve the renewable energy targets. As Helm argues, ‘renewables are [un]likely to thrive within the NETA market which regulators and government have created. [They] need long-term, take or pay contracts.’

Contracts for Difference were introduced with the Energy Act 2013 (UK) to provide for enhanced investment security for renewable energy.

B Contracts for Difference

The Contract for Difference mechanism is designed to replace the Renewables Obligation by 2017. The basic idea of the CfD instrument is that eligible generators will enter into long-term contracts with a CfD counterparty. The mechanism also supports other low carbon options, such as nuclear power.

The model of a ‘Contract for Difference’ contains a guaranteed strike price, i.e., a price per unit of electricity generated. The contracts will be allocated in a competitive process. That means that different generators will compete in a reverse auction system, with the lowest cost offers winning the contract. Different technologies compete in two different pots, one for established technologies and one for less established technologies. The generators will then trade in the market and, if the market price is below the strike price, receive a top-up payment to the strike price. Details of the contract for difference scheme are provided through subordinate legislation, with substantial scope for regulations by the Secretary of State provided for in the Act. While the CfD mechanism has been dubbed a ‘poor

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279 Ch 6, II B.
280 Planning law has been a particular issue for the onshore development of renewable energy in the UK, especially for wind installations. See, eg, Pollitt, ‘UK Renewable Energy Policy’, above n 253, 30-1 with further sources.
281 Helm, above n 5, 422.
282 See, Energy Act 2013 (UK) s 10(3); see also, the Contracts for Difference (Definition of Eligible Generator) Regulations 2014 (UK).
284 See Energy Act 2013 (UK) ss 6-26 for the full description.
relation of the continental FIT schemes,\textsuperscript{285} it provides a considerable departure from the model of the Renewables Obligation, and at least partially, a return to the principles of the NFFO.

Germany, too, increasingly has moved away from feed-in-tariffs as entirely independent of wholesale market. It now prescribes mandatory participation of new renewable energy installations above a certain size in the wholesale markets.\textsuperscript{286}

\textbf{IV Conclusion}

The regulatory framework for the liberalized electricity industry in the UK today has changed considerably from the time of its introduction in 1989. A theme of re-emphasizing governmental influence on energy policy has now emerged, which is characterized by a widening of the competencies and objectives of the regulator to include other than economic concerns in their decision-making on network regulation.

Much recent energy law and regulation is directly concerned with making the regulatory framework more compatible with the needs of renewable energy. However, the government is trying to accommodate those needs within the model of a liberalized electricity market, with its distinct pattern of an independent regulator, regulated networks and competitive generation and retail markets. While the commitment to the market model remains, new developments point towards an increased willingness of the state to intervene to support renewable energy in pursuit of broader economic and environmental objectives. Not only has separate space for renewable generators been created with separate schemes for generation and network investment, access and charging, but also the decision-making space for investment in fossil fuel generation has been narrowed.

The gradual changes introduced to the regulatory framework of the British electricity system show that overcoming systemic lock-in of unsustainable patterns of electricity

\textsuperscript{285} Toke, above n 130, 7610.
\textsuperscript{286} See ch 6, II C 2a.
supply is not possible without considerable reregulation. Supported by a high level policy commitment to decarbonizing its electricity system, legal reform has addressed both network regulation and the support instruments for renewable energy.

The UK system provides an important model for potential Australian reforms, given that the Australian model of market organization has been, in many aspects, adopted from the British one. Unlike the UK, Australia largely continues to support the idea that the public interest is best served by a competitive market, and has not accepted the need for policy change in order to support renewable energy.

In the next chapter the German developments in electricity market regulation and renewable energy will illustrate how the liberalized market model, superimposed through the European energy directives, has been applied to a system relying very much on direct regulation to support renewable energy. Germany, unlike Australia and the UK, has not relied on the electricity market to provide for renewable energy support, but has had separate regulatory arrangements for renewable energy in place.
**Chapter 6: Germany**

As the final of the case studies, Germany exhibits a significantly different approach to regulating renewable energy, relying on a parallel framework that only has limited overlap with the framework for traditional sources of electricity. It therefore provides a counterpoint to the Australian and, to a lesser degree, the British approach. It illustrates the legal and regulatory changes a large-scale transition towards a low carbon economy requires.

Despite traditionally having an electricity system relying almost entirely on fossil fuels and nuclear power for electricity generation, starting with the implementation of the *Electricity Feed-In Act*\(^2\) in 1990, Germany has embarked on a remarkable transformation of its energy system. This transformation aims to achieve a generation profile that is, to a large degree, based on renewable energy.\(^3\) Support for renewable energy in Germany is part of a far-ranging transition to a low carbon generation profile for Germany’s electricity industry.\(^4\) The comprehensive and holistic 2010 *Energy Concept*\(^5\) of the German federal government lays down targets for the future energy profile of Germany, with the term ‘Energiewende’\(^6\) – the transformation of the energy system – now the lead term in German energy policy.\(^7\) It is centered around ‘environmentally sound, reliable and affordable energy supply’, and provides a roadmap ‘to the age of renewable energy’.\(^8\) The need to integrate renewable

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1. See below at I A.
2. *Stromeinspeisungsgesetz* (Germany) [Electricity Feed-In Act], 7 December 1990, BGBl I, 1990, 2633.
3. With a target of 80 per cent renewables in electricity consumptions, see below at I B 3.
6. Which translated literally means ‘energy turnaround’. All translations in this chapter are by the author, except otherwise indicated.
energy into the electricity system has taken centre stage in the German electricity market’s future development.

Unlike in Australia and in the UK, German measures supporting renewable energy preceded the liberalization of the electricity market. Therefore the dynamics of market development in regard to renewably generated electricity are different to that of the other two comparative case studies. Renewable energy was always positively discriminated for in the regulatory framework of the German liberalized electricity market. This has led to a differently defined place of renewable energy generators in the electricity market regulatory space. It is likely a major factor in the success of the German renewable energy support.

Germany’s model of adapting their electricity system to renewable energy serves as an example of how a mix of planning and market elements has been employed to support a large-scale transition to renewable energy. This approach supports the contention of the thesis that a timely transition to a low carbon energy system will require targeted reform of electricity market legal frameworks.

In concert with the approach adopted in relation to other country case studies, part I of this chapter describes the context and policy drivers of the German electricity system. Unlike Australia and the UK, the process of electricity market liberalization in Germany occurred subsequent to the emergence of renewable energy policies and needed to integrate already existing frameworks for renewable energy. Part II will therefore discuss the intertwined developments of the introduction of a liberalized market and the support for renewable energy in a parallel fashion. The chapter shows that, unlike in the UK and Australia, systemic lock-in of fossil fuel-based electricity through introducing liberalized markets did not occur to the same degree. It serves as a further example of how ‘green’ electricity market frameworks need to be adapted to successfully integrate renewable energy.
Germany traditionally has been reliant on coal, both brown and black, for its electricity generation, as the country has considerable coal resources.\(^9\) Since the 1970s, nuclear energy was added to the generation profile and, up until 2010, it provided around 30 per cent of the gross electricity generation.\(^10\) Since the 1980s gas has also become an important fuel, progressively replacing coal generation.\(^11\) Domestic black coal, or hard coal, while substantial reserves still exist, continues to lose ground, because it is significantly more expensive than imported coal.\(^12\) However, domestic brown coal, or lignite, remains an important fuel. Coal generates about 45 per cent of Germany’s electricity.\(^13\) Hard coal has been heavily subsidized,\(^14\) but the government has agreed to phase out all subsidies by 2018.

Much of Germany’s energy needs are covered through the use of imported fuels.\(^15\) Germany has little national natural gas and oil resources, instead relying on predominantly Russian and Norwegian gas supply\(^16\) and oil imports from a variety of countries, but also

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10 See AG Energiebilanzen [Working Group Energy Balances], ‘Evaluation Tables on the Energy Balance for the Federal Republic of Germany 1990 to 2013’ (2014) <http://www.ag-energiebilanzen.de/10-1-Evaluation-Tables-on-the-Energy-Balance-1990-to-2013.html> (‘AGEB’) showing the percentage of different energy sources in gross electricity generation for the last 20 years. Nuclear energy provides between 26-30 per cent of the gross electricity generation between 1990 and 2006. This drops to around 22 per cent after 2007 and 17.7 per cent for 2011. By 2022 the last nuclear generators will be taken off the grid. See also below at n 24, for background.


12 Bundesministerium für Wirtschaft und Technologie [Federal Ministry of Economics and Technology], Energie in Deutschland [Energy in Germany] (2010) 15 (‘BMWiT’).


14 The infamous ‘Kohlepfennig’ (coal penny), for example, was a surcharge on consumer electricity prices from 1974-2005 and was only abolished after a decision by the Federal Constitutional Court found it to be unconstitutional, see Bundesverfassungsgericht [German Constitutional Court], 2 BvR 633/86, 11 October 1994 reported in 91 BVerfGE 186.

15 70 per cent in 2009, see BMWiT, above n 12, 15.

16 BMWiE, above n 12, table 23.
primarily from Russia. Consequently energy security is an important topic for Germany’s energy policy, as it is, indeed, for the whole of Europe. Starting from a low 3.4 per cent in 1990, renewable energy provided 25.3 per cent of Germany’s electricity in 2013. The percentage of renewable energy in the electricity market is expected to accelerate with the German ‘Atomausstieg’ (nuclear power phase-out) by 2022.

B Policy Development and Drivers

Several distinct drivers of energy policy can be identified in Germany. On the one hand, environmental concerns have proven to be a powerful incentive for change. On the other hand, the worldwide move towards electricity market liberalization, – in the Germany driven mainly by EU regulation, – has also driven regulatory reform in Germany. Lately, energy security concerns have also driven energy policy agendas and have provided additional incentives to support domestically available renewable energy sources.

17 Ibid table 19.
18 See the Energy Concept of the federal government, above n 5, centrally featuring security of supply.
19 See, eg, European Commission, ‘Energy 2020 – A strategy for competitive, sustainable and secure energy’ (Communication No COM(2010) 639 final, 10 November 2010); see also, Hugh Dyer and Maria Julia Trombetta (eds), International Handbook of Energy Security (Edward Elgar, 2013) especially part 3 on security of energy supply, for examples of geopolitical conflict and energy security.
20 Almost entirely from hydroelectricity, BMWi, Zeitreihen zur Entwicklung der Erneuerbaren Energien in Deutschland [Timelines for the Development of Renewable Energies in Germany] (2013) table 2, 3.
21 Ibid.
22 The nuclear power phase-out was first agreed between the federal government and the nuclear generators in 2000, and then legislated in 2002 through amendment legislation to the Atomic Energy Act, see the Gesetz zur geordneten Beendigung der Kernenergienutzung zur gewerblichen Erzeugung von Elektrizität (Germany) [Act for the orderly exit from the commercial generation of electricity from nuclear energy], 22 April 2002, BGBl I 2002, 1351. While in 2009 operating lifes where initially extended again, the Fukushima disaster triggered an immediate shut down of 8 older plants and subsequent legislation for a phasing out by 2020; Atomgesetz [Atomic Energy Act] (Germany) 15 July 1985, BGBl I 1985, 1565, § 7, as amended through the Dreizehntes Gesetz zur Änderung des Atomgesetzes [13th Act amending the Atomic Energy Act] (Germany) 31 July 2011, BGBl II, 2011, 1704. See also Lars Kramm, ‘The German Nuclear Phase-out after Fukushima: A Peculiar Path or an Example for Others?’ (2012) 4 Renewable Energy Law and Policy Review 251; and below at I B 2.
23 See also ch 2, II A.
24 In detail see ch 4.
1 European Energy Market Liberalization

Energy market reform in both Australia and the UK were driven by an embrace of neoliberal ideas of higher efficiency in a competitive market. In contrast, Germany’s electricity market reform was driven mainly, if not exclusively, by the reform moves at the EU level. Even before liberalization, the system had been criticized for the massive concentration of power in just a few big utilities. Liberalization was part of the program of Liberals-Christian Democratic coalition in the 1980s, yet, it ultimately needed the final impetus of the EU internal market directives to put reform into motion in Germany. The major reforms of the Energy Industry Act in 1998 and 2005 were both driven by the first and second EU internal electricity market packages, which are expressly referred to in the German legislation. The latest major electricity market reforms in 2011 have been undertaken to implement the third internal market directive.

2 Environmentalism

Multiple factors played a role in the rise of environmentalism in Germany in the 1980s. Influential in regard to the electricity sector was the environmental destruction associated with fossil fuel power generation. The nuclear accident in Chernobyl in 1986, traumatic for the risk averse German public, led to a reconsideration of nuclear power as a source of

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28 Ibid.
29 See ch 4, II.
30 On the different energy packages see ch 4, II A.
33 Especially the so-called ‘Waldsterben’ (forest dieback) caused by acid rain.
electricity,\textsuperscript{35} which was at that stage was providing almost 25 per cent of Germany’s electricity.\textsuperscript{36} The German Greens Party, which addressed these concerns of the public as a central component of its policy programs, first entered federal parliament in 1983. It has been a major influence in environmental policy since.\textsuperscript{37} The creation of the Ministry for the Environment in 1996 by the then conservative government was a reaction to the increasing environmental concerns of the population. It has further proven to be central to driving political change.\textsuperscript{38} The introduction of environmental protection as a state aim into the German Constitution in 2002 further emphasizes how far ‘green’ concerns have permeated mainstream policy in Germany.

Global warming appeared on the German policy agenda early in the mid-1980s, due to the green movement, and policies to address global warming have exerted further pressure on coal as an energy source.\textsuperscript{39} Additionally, there was an increasing search for domestic energy sources after the 1970s oil crisis, leading to increased research and development funding at that stage for both renewable energy and nuclear power.\textsuperscript{40} The combined pressure of the search for not only environmentally-friendly but also domestic energy sources has been a major driver of German investment in renewable energy sources, which addresses both of these factors.

Finally, a further nuclear disaster, the Fukushima incident in 2011,\textsuperscript{41} accelerated policy pressures to embark on an energy system transition. While a gradual phase-out of nuclear power by 2022 was already legally enshrined,\textsuperscript{42} an immediate shutdown of the older half of

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\begin{itemize}
\item \textsuperscript{35} See, eg, Frank N Laird and Christoph Stefes, ‘The diverging paths of German and United States policies for renewable energy: Sources of difference’ (2009) 37 Energy Policy 2619, 2621; Jacobsson and Lauber, above n 4, 132-3.
\item \textsuperscript{36} See Röhling and Mohnfeld, above n 9, 542.
\item \textsuperscript{37} Mez, ‘German Electricity Reform’, above n 27, 231.
\item \textsuperscript{38} Laird and Stefes, above n 35, 2626.
\item \textsuperscript{39} Helmut Weidner and Burkard Eberlein, ‘Still Walking the Talk? German Climate Change Policy and Performance’ in G Bruce Doern and Burkard Eberlein (eds), Governing the Energy Challenge: Canada and Germany in a Multi-Level Regional and Global Context (University of Toronto Press, 2009) 314, 316.
\item \textsuperscript{40} See, eg, Lutz Mez, ‘Renewables in Electricity Generation: Germany as Pioneer?’ in G Bruce Doern and Burkard Eberlein (eds), Governing the Energy Challenge: Canada and Germany in a Multi-Level Regional and Global Context (University of Toronto Press, 2009) 373, 375 with further sources.
\item \textsuperscript{41} In depth background information on the accident can be found for example in Richard Hindmarsh (ed), Nuclear Disaster at Fukushima Daiichi: Social, Political and Environmental Issues (Routledge, 2013).
\item \textsuperscript{42} See in detail above n 22.
\end{itemize}
all of Germany’s nuclear power stations was decided in March 2011.\textsuperscript{43} The moratorium enabled a minimum 3-months disconnection from the grid while safety testing of the plants was undertaken. It was made permanent through phasing-out legislation in June 2013.\textsuperscript{44} This falling away of considerable generation capacity has accelerated the necessity for new network infrastructure to allow for a higher percentage of renewable generation.\textsuperscript{45}

Renewable energy policy in particular has generally enjoyed cross-party support since the implementation of the first renewable energy support instrument in 1990.\textsuperscript{46} This could be due to the fact that Germany has embraced a national identity as environmental leader state,\textsuperscript{47} and is considered a global leader in climate change policy.\textsuperscript{48} The UK, has also, albeit only from the mid-2000, emerged as leader on climate policy.\textsuperscript{49} Australia, on the other hand, has been considered a ‘laggard’, in climate change action.\textsuperscript{50}

3 The Integration of Energy Policy and Environmental Concerns

As a result of early commitment to environmental protection, energy policy became increasingly integrated with environmental policy. The first expressly integrated energy policy, addressing the connected challenges of energy and climate change, was adopted by

\textsuperscript{43} Through the so-called nuclear moratorium, an executive decision by the German government, which was based on § 19(3) of the Atomic Energy Act 1985. This clause allows for shutdown based on security concerns. See also, Jacobs, above n 7, 225. Courts have found this decision to be unlawful, and further court cases for compensation can be expected, see Verwaltungsgerichtshof Kassel [Higher Administrative Court Kassel], 6 C 824/11.T, 27 February 2013, upheld by Bundesverwaltungsgericht [Federal Administrative Court], 7 B 18.13/7 B 19.13, 20 December 2013.

\textsuperscript{44} Specifically, the 13\textsuperscript{th} Act amending the Atomic Energy Act.


\textsuperscript{46} See, eg, Laird and Stefes, above n 35, 2620.

\textsuperscript{47} Rüdiger Wurzel, ‘Environmental, Climate and Energy Policies: Path-Dependent Incrementalism or Quantum Leap?’ (2010) 19 German Politics 460, 460.

\textsuperscript{48} Peter Christoff and Robyn Eckersley, ‘Comparing State Responses’ in John S Dryzek, Richard B Norgaard and David Schlosberg (eds), The Oxford Handbook of Climate Change and Society (Oxford University Press, 2011) 431.

\textsuperscript{49} Ibid 444.

\textsuperscript{50} Ibid 442.
the federal government in 2007 with the so-called Meseberg Program. The Energy Concept of the German federal government, adopted in September 2010, reflects the importance of environmental concerns for German energy policy. It sets out ‘Germany’s energy policy until 2050 and specifically lays down measures for the development of renewable energy sources, power grids and energy efficiency’. The concept endorses a commitment to ‘environmentally sound, safe and affordable energy supply’. It clarifies the range of transformational change necessary to achieve the envisioned energy turnaround. Ambitious energy and climate targets are the centrepiece of the concept. They are depicted in the following chart.

52 Above n 5.
53 Energy Concept, above n 5, preamble.
54 Compare the aims of energy policy in the Australian Government, Energy White Paper (2012) xvii, which emphasizes economic issues over environmental ones: ‘to build a secure, resilient and efficient energy system that: provides accessible, reliable and competitively priced energy for all Australians, enhances Australia’s domestic and export growth potential; delivers clean and sustainable energy.’
What is especially striking, apart from the ambition of the targets\textsuperscript{56} and the long-term vision they contain, is the breadth of the policy commitment, touching on energy efficiency, energy generation profile, as well as a greenhouse gas reduction commitment.

Legislating for the transformation of Germany’s energy system gained further momentum with the Fukushima nuclear disaster and it triggered a supplementary package of measures to speed up implementation. The Atomic Energy Act was amended, to accelerate the

\textsuperscript{55} The concept also contains a commitment to lifting building renovation rate of the total building stock from less than 1 per cent per year to 2 per cent per year.

\textsuperscript{56} Which led commentators to say that Germany is undertaking a ‘real-time experiment on itself without need’, Hans Ulrich Buhl and Michael Weinhold, ‘Editorial: The Energy Turnaround: A real-time experiment allowing no failure or a major opportunity for our economy?’ (2012) 4 Business & Information Systems Engineering 179, 180.
phasing out of nuclear energy.\textsuperscript{57} Further changes included amendments to the \textit{Renewable Energy Act 2008},\textsuperscript{58} changes to the \textit{Energy Industry Act 2005} and the implementation of the \textit{Grid Extension Acceleration Act}, which are all discussed in more detail below. The package also contained an Act to establish an energy and climate fund,\textsuperscript{59} as well as legislation changing the Federal Building Code in order to further allow onshore wind power development.\textsuperscript{60}

As a result Germany’s energy policy is now clearly targeted towards a changed generation profile based mainly on renewable energy sources as well as a holistic approach towards energy efficiency. These commitments inform the entire legal environment of the electricity market and renewable energy.

\section*{C Constitutional Constraints for Regulating Renewable Energy and Electricity Markets}

Germany, as Australia, is a federal state. As explained in chapter 2 and in regard to Australia,\textsuperscript{61} constitutional legal frameworks have impact on the institutional frameworks of electricity markets, as meta-regulatory law, providing legislative power to different levels of government in a federal state.

Constitutional law thus provides a further layer of regulation to the German legal and regulatory frameworks for electricity markets and renewable energy. As for the other case studies, it is discussed here as part of the wider socio-technical electricity system, as well as meta-regulatory law – determining architecture and general principles of the regulatory space of electricity supply.

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{57} See \textit{Atomic Energy Act} § 7.
\item \textsuperscript{58} \textit{Erneuerbare Energien Gesetz} (Germany) [Renewable Energy Act] 5 October 2008, BGBl I, 2008, 2074 ("\textit{Renewable Energy Act 2008}").
\item \textsuperscript{59} \textit{Gesetz zur Änderung des Gesetzes zur Errichtung eines Sondervermögens "Energie- und Klimafonds"} (Germany) [Act amending the Law establishing an Investment Fund "Energy and Climate Fund"], 6 August 2011, BGBl I, 2011, 1702.
\item \textsuperscript{60} \textit{Gesetz zur Stärkung der klimagerechten Entwicklung in den Städten und Gemeinden} (Germany) [Act for the Strengthening of a Climate Conscious Development of Towns and Municipalities], 30 July 2011, BGBl I, 2011, 1509.
\item \textsuperscript{61} Ch 3, I b B.
\end{itemize}
\end{footnotesize}
Germany has further constitutional characteristics, which shape and govern the general principles of the regulatory space. An important constitutional element in this regard is the constitutional obligation to protect the natural environment, as well as the impact German basic rights have on the reach of legislation. Both influence the orientation of the regulatory frameworks of the electricity system as meta-regulatory law.

1 Federalism and Legislative Powers

Levels of government in Germany include the federal government as well as the 17 state (Länder) governments. Similarly to Australia, constitutional law determines the extent of the respective legislative competencies of states and on the federal level.

In the German constitution, the Basic Law, Articles 70 to 82 list the legislative powers of the Federation and the Länder. Article 70 on the division of powers between the Federation and the Länder provides that

(1) The Länder shall have the right to legislate insofar as this Basic Law does not confer legislative power on the Federation.

(2) The division of authority between the Federation and the Länder shall be governed by the provisions of this Basic Law concerning exclusive and concurrent legislative powers. It distinguishes between exclusive and concurrent legislative powers.

The exclusive legislative powers at the federal level are listed exhaustively in Article 73 and include typical matters of federal importance such as defence, foreign policy and currency. Where concurrent legislative powers exist, usually the Länder ‘shall have power to legislate so long as and to the extent that the Federation has not exercised its

\[\text{Grundgesetz für die Bundesrepublik Deutschland [Basic Law of the Federal Republic of Germany]} \text{ art 20a (‘Basic Law’).}\]

\[\text{Ibid art 14.}\]


\[\text{The equivalent in Australia is section 52 of the Australian Constitution.}\]

\[\text{Listed in Basic Law art 74}\]
legislative power by enacting a law.\textsuperscript{67} Contained in the list of Article 74 are powers to make ‘law relating to economic matters’, which explicitly lists energy as an example in Article 74 (1) no 11. The other power that is applicable in this context, Article 74 (1) no 24, also includes a competence for ‘air pollution control’, a power that is generally thought to include climate change mitigation.\textsuperscript{68}

In Germany, the question of the relevant head of power for climate and energy-related legislation is therefore less contentious than in Australia, because of the express listing of the subject matters in the catalogue of Article 74.\textsuperscript{69} However, the federal power to legislate in the area ‘relating to economic matters…(including energy)’ is limited by a necessity test. The test provides that the federal government can only legislate ‘to the extent that the establishment of equivalent living conditions throughout the federal territory or the maintenance of legal or economic unity renders federal regulation necessary in the national interest’.\textsuperscript{70} The essential service character of electricity, as well as the fact that the electricity network is connected across Länder borders, ensures the necessity test is passed.\textsuperscript{71} Accordingly, utilizing the relevant head of power for electricity market reform and for renewable energy legislation has been mostly unproblematic.\textsuperscript{72} The legislature has relied on Article 74 (1) No 11 Basic Law for the changes to the laws governing the electricity market,\textsuperscript{73} and on Article 74 (1) No 24 Basic Law for legislation in the area of renewable energy.\textsuperscript{74} This division is also apparent in the different ministries responsible for

\textsuperscript{67} See Basic Law art 72(1), or as expressed more bluntly in Basic Law art 31 ‘Federal law shall take precedence over Land Law’. Cf Australian Constitution s 109.

\textsuperscript{68} See, eg, Volker Oschmann, Energy in Transition: A Comparative Analysis of the Australian and German Legal Frameworks for the Decarbonization of the Energy Sector in Response to Climate Change (LLM thesis, University of Western Australia, 2011) 170, with further sources.

\textsuperscript{69} The full catalogue in art 74 is considerably more extensive than s 51 of the Australian Constitution. Very few powers are now considered to be exclusive matters of state legislation, these include, eg, education, the press, and the organisation of the police, see, eg, Andreas Fisahn, Verfassungsrecht Konkret: Staatsorganisationsrecht (Berliner Wissenschaftsverlag, 2012) 36.

\textsuperscript{70} Basic Law art 72(2).

\textsuperscript{71} See Explanatory Memorandum for the Act reforming the Energy Industry Act 2011, above n 33, 47.

\textsuperscript{72} Although the 2011 reform of the Energy Industry Act 2005 has been criticized by the Länder for extending into the planning law head of power, see in more detail below at III C 2 b dd.

\textsuperscript{73} See, eg, Explanatory Memorandum for the Act reforming the Energy Industry Act 2011, above n 33, 46.

both of these areas for a long time. Between 2002 and 2013, renewable energy, was the responsibility of the Federal Ministry for the Environment, Nature Conversation and Nuclear Safety, while electricity market development remained with the Ministry for Economics. In 2002 the responsibility for renewable energy was transferred from the Ministry for Economics, responsible for energy industry, to the Ministry for the Environment, Nature Conservation and Nuclear Safety. This split in governmental regulatory powers loosened the previously close connections between the industry and the Ministry for Economics, which had resulted in a delaying of reforms for renewable energy. Following the federal election in 2013, the responsibility for energy including renewable energy has been transferred back to the Ministry for Economics. This step echoes the move towards increased integration of renewable energy into the wholesale electricity market, which had been introduced in 2011.

Flanking this division of legislative powers is an arrangement that sources executive power for the implementation of most of the federal laws at Länder level. This vertical division of powers is enshrined in Articles 30 and 37 of the Basic Law. The split of legislative and executive responsibilities is further apparent in ongoing engagement of Länder administration in electricity regulation and planning. The Länder have the responsibility to

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75 See also above I B 2.
77 In detail on the legislative history on the Renewable Energy Acts see below at II B. See, eg, Christoph H Stefes, ‘Bypassing Germany’s “Reformstau”: The Remarkable Rise of Renewable Energy’ (2010) 19(2) German Politics 148, 152-3. Cf the impact of the creation of the Department for Energy and Climate Change in the UK, ch 5 I B.
80 The structure of the German legislature, comprised of the Bundestag and the Bundesrat, too, reflects this arrangement. The Bundestag, whose members are elected by the general public, the German federal parliament, enacts federal legislation. The Bundesrat comprises appointed representatives of the Länder and is thus not a directly elected body, see art 51 Basic Law. Its rights to participation in federal legislation are enshrined in arts 76 to 80 of the Basic Law. This structure of the legislature ensures that the Länder have meaningful participatory rights on the laws ‘they will have the responsibility to implement’. Cheryl Saunders, ‘Cooperative Arrangements in Comparative Perspective’ in Gabrielle Appleby, Nicholas Aroney and Thomas John (eds), The Future of Australian Federalism: Comparative and Interdisciplinary Perspectives (Cambridge University Press, 2012) 414, 426.
administer the regulation of networks and the unbundling of utilities that have less than 100,000 customers and are entirely operating within one Land (state).  

2 The Constitutional Role of the State in Electricity Supply

The German constitution enshrines in Article 20(1) Basic Law the ‘social state principle’.  

The German Federal court has interpreted this provision, together with Article 1(1) Basic Law, to cover a state responsibility to supply essential services including electricity supply. Accordingly ‘it was the state’s obligation to ensure a secure and adequate energy supply. However, the state was under no obligation to supply the energy itself.’ In contrast, in both the UK and Australia at the time of nationalization (in the UK) and centralization (at a state level in Australia) it was considered that efficient electricity supply could only be undertaken by public authorities. Liberalization led to a distinct withdrawal of the state from electricity provision. In Germany, where ‘private entities are operating this system …the state’s obligation is converted into the function of a guarantor’. The state thus remains responsible for a framework that ensures secure energy supply even after liberalization. Bohne terms this as an ‘ensuring role’ for the state in energy supply. Arguably, this ongoing constitutional responsibility allows a greater willingness by the

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81 Energy Industry Act 2005 § 54(2); in more detail see below at II C 1 a.
82 Basic Law art 20(1) states: The Federal Republic of Germany is a democratic and social federal state (emphasis added).
83 According to Basic Law art 1(1), ‘(1) Human dignity shall be inviolable. To respect and protect it shall be the duty of all state authority’.
84 The Bundesverfassungsgericht [Federal Constitutional Court], 20 March 1984, BVerfGE 66, 248, 258 included ‘all public services that are indispensable for ensuring a humane existence’ (trans Eberhard Bohne, ‘Conflicts between National Regulatory Cultures and EU Energy Regulations’ (2011) 19 Utilities Policy 255, 260).
85 This has been confirmed in several decisions by the highest German Court, the Bundesverfassungsgericht [Federal Constitutional Court], above n 84 with further sources.
87 See ch 3, 5, II A 1, respectively.
89 The Federal Administrative Court has reinforced that this also applies post liberalization, see Bundesverwaltungsgericht [Federal Administrative Court], 11 July 2002, BVerWGE 116, 365, 371-2.
90 Bohne, above n 84, 260.
state to regulate, where security of electricity supply is challenged. This in turn, requires an ongoing involvement of the state in the regulatory space of electricity supply.

Closely connected with the question of the role of the state is the function of municipalities in electricity supply. Municipalities were among the first investors in the early days of electrification. Unlike in Australia and the UK, where municipal electricity utilities were rolled into state-owned corporations, in Germany municipalities continue to play an important role in electricity supply. That function is based on their constitutionally enshrined right to regulate local affairs. According to Article 28 (2) of the Basic Law

Municipalities must be guaranteed the right to regulate all local affairs on their own responsibility, within the limits prescribed by the laws. Within the limits of their functions designated by a law, associations of municipalities shall also have the right of self-government according to the laws…

This right is generally thought to include the local electricity supply. Municipalities continue to be involved as shareholders in many corporatized electricity supply businesses, with public opinion backing electricity supply by community-owned utilities. Municipal governments further are responsible for the ‘concession’ contracts and for local distribution networks. Effectively they can decide about the distribution network provider in the local supply networks. Currently, a move towards ‘remunicipalisation’ is underway. Many of the concession contracts are expiring within the next couple of years.

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92 In contrast the constitutional recognition of municipal government is in ongoing discussion in Australia. For a recent overview see, Expert Panel on Constitutional Recognition of Local Government, ‘Public Discussion Paper’ (September 2011).
93 See, eg, Bundesverwaltungsgericht [Federal Administrative Court], 18 May 1995, BVerWGE 98, 273, 275.
94 They are involved in generation, distribution and retail of electricity, see further Theobald, ‘Basic Principles’, above n 91, 34-7; however, the majority of shares in many municipal utilities or ‘Stadtwerke’ is held by the ‘big four’ utilities, at 36.
95 See below at II A 1.
97 In German ‘Re-Kommunalisierung’.
98 In more detail Theobald, ‘Basic Principles’, above n 91, 35.
Municipalities are in this context considering opportunities to take over the running of the distribution network in full or in part. Municipalities therefore remain important actors in the electricity industry in Germany.

3 The Constitutional Protection of the Environment

One further and quite unique feature of the German Constitution is the provision to protect the environment that was introduced in 2002.

Article 20a of the Basic Law on the Protection of the natural foundations of life and animals provides:

Mindful also of its responsibility toward future generations, the state shall protect the natural foundations of life and animals by legislation and, in accordance with law and justice by executive and judicial action, all within the framework of the constitutional order.

This provision is generally thought to be a basic institutional principle and national aim, but which does not lead to an individual right to environmental protection. Instead it ‘require[s] the legislator to protect certain minimal environmental standards without defining their content or form’. It also informs discretionary decision-making by the executive. However, the principle ‘has to be balanced against the other subjects of constitutional protection in each individual case’ as it expressly applies ‘within the framework of constitutional order’.

Oschmann argues that the existence of this constitutional obligation may ‘explain potential divergences and differences in Australian and German legislation on the transformation of

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99 Concession contracts are, since 1995 at the latest, required to have a maximum duration of 20 years, Gesetz gegen Wettbewerbsbeschränkungen (Germany) [Act against restraints on competition] 24 September 1980, BGBI I, 1980, 1761, (‘Cartel Act 1980’) § 103a(1), (4).
101 Ibid 187.
102 Ibid with further sources.
the energy sector to a certain extent. Given the symbolic importance of high-level objectives as meta-regulatory law, the inclusion of this constitutional commitment certainly transcends the concerns of the politics of the day. It has a strong impact on ensuring an ongoing commitment to ‘green’ issues in electricity market development. It thereby becomes a general principle of the regulatory space of the German electricity market.

4 Other Constitutional Constraints

Apart from the influence of Article 20a of the Basic Law, there are further constitutional constraints on the content and reach of legislation for the electricity industry and renewable energy in Germany.

These constraints include in particular the constitutionally enshrined basic rights. The right to property, Article 14 of the Basic Law, which is also applicable to legal persons such as companies, protects existing property rights and thus ‘tends to preserve the status quo’. This basic right has impacted on ownership unbundling of the vertically integrated energy supply companies. It has been one of the reasons that have led Germany to lobby at EU level for the inclusion of alternative models for network unbundling, such as the Independent System Operator and the Independent Transmission Operator.

\[104\] Ibid 160.
\[105\] See Aileen McHarg, ‘Regulating for Sustainable Electricity Market Outcomes in Britain: Asking the Law Question’ (2013) 30 Environmental and Planning Law Journal 289, 292. Also, on the importance of meta-regulatory law, ch 2 III.
\[106\] Basic Law arts 1-19.
\[107\] See, eg, Bohne, above n 84, 261.
\[108\] See, eg, Christian Theobald, ‘The Transformation of German Energy Regulation: Struggling with Policy Legacy’ in Bruce Doern and Burkard Eberlein (eds), Governing the energy challenge: Canada and Germany in a multi-level regional and global context (University of Toronto Press, 2009) 259, 266.
II THE GERMAN ELECTRICITY SYSTEM AND LEGAL FRAMEWORKS

The following part of the chapter provides a short historical overview of the gradual transformation of the regulatory framework of the German energy industry. Initially and in contrast to the other case studies, Germany’s electricity market regulation was based in industry-led self-regulation. Driven by European level legislation, and continued through several reform packages, the current electricity market framework is in the process of approximating the ‘British’ model of liberalized electricity markets. However, a parallel and partially overlapping legal framework has continued to ensure the support of renewable energy. These separate but interconnected developments will be introduced in the historical overview at sections II A and B, respectively, before the regulatory space of electricity supply as a result of these developments is discussed at section II C.

A The Development of the Legal Frameworks of the Electricity System: Historical Overview

1 Electrification and Early Developments

Until 1998, the Energy Industry Act 1935,\textsuperscript{110} introduced under the then Reich’s Chancellor Adolf Hitler, provided the regulatory framework for the German energy industry. It was implemented to introduce universal energy supply; considered to be an essential part of preparing infrastructure for the coming war.\textsuperscript{111} Similar sentiments of nation building supported the nationalization and centralization of the electricity industry in the UK and in Australia. Unlike these countries, though, Germany did not opt for a centralized vertically integrated electricity supply in state control.

The Energy Industry Act 1935 had as its object the safe and economical supply of energy and the avoidance of competition harmful for the national economy.\textsuperscript{112} Electricity supply was seen as central to the national interest, being called an ‘important basis of economic


\textsuperscript{111} Theobald, ‘Basic Principles’, above n 91, 6.

\textsuperscript{112} See Energy Industry Act 1935, preamble.
and social life’ in the preamble of the Act. The Act was based on the assumption that electricity supply was not suited to competition, and should be subject to public supervision.

While the big generators and the transmission companies were usually integrated, and continue to be so to a certain degree, electricity retail and distribution was undertaken by mostly communally owned public utilities. As a result, pre-reform, there existed multiple distribution and retail companies, as well as nine big generation and network providers, which had almost all of the generation and the whole transmission grid divided among them.

The Energy Industry Act 1935 legislated ministerial supervision in regard to construction and extension in the area of electricity. Private law contracts, the ‘demarcation treaties’ and concession contracts, further ensured electricity supply. The demarcation treaties were concluded between suppliers to provide for exclusive areas of supply. Concession contracts allowed the utilities responsible for the electricity supply to a certain area right of way in return for a payment of a concession tariff to the municipality. The Cartel Act introduced limited cartel office supervision in 1958, but explicitly exempted the demarcation and concession contracts from competition law. Later amendments to the Cartel Act did, however, limited the maximum duration of demarcation contracts to 20 years. Abuse of

\[^{113}\text{Ibid.}\]
\[^{114}\text{Ibid.}\]
\[^{115}\text{Theobald, ‘Transformation’, above n 108, 262.}\]
\[^{116}\text{According to Mez, ‘German Electricity Reform’, above n 27, 232, there were about 900.}\]
\[^{117}\text{These big utilities owned around 83 per cent of the generation capacity pre-reform, see Brunekreeft and Bauknecht, above n 96, table 8.2, 241.}\]
\[^{118}\text{See Energy Industry Act 1935 §§ 3, 4, 8 of the Act; also Büdenbender, above n 26, 71.}\]
\[^{120}\text{Gesetz gegen Wettbewerbsbeschränkungen [Act against restraints on competition] (Germany) 27 July 1957, BGBl I, 1957, 1081 (‘Cartel Act 1958’) § 104.}\]
\[^{121}\text{Cartel Act 1958 § 103(1), exempting these contracts from the applicability of the competition rules in §§ 1, 15, 18.}\]
\[^{122}\text{Cartel Act 1980 § 103a(1).}\]
market power was also to be avoided by requiring ‘rates to be set no higher than reasonably needed to perform’.

This multi-player, highly diverse structure reflects the German geography, with its polycentric settlement pattern. It supported the development of a comparatively intermeshed and dense electricity grid with distributed generation. This enabled, at least initially, the easy integration of renewable energy. However, with the increasing investment in renewable energy, the traditional network patterns, where generation was primarily situated close to the major load centres, are under stress.

2 Electricity Market Reform: Changing Perceptions

By the time of electricity market reform in the 1990s, Germany had very high electricity prices by international standards. Several expert committee reports starting in the 1980s considered a new direction for energy supply, turning away from the traditional supply model relying on demarcated area monopolies and an exemption from competition for electricity utilities. The federal government similarly began to consider the necessity of more competition. Reform in other network industries, especially postal services and telecommunications, further changed attitudes towards electricity market reform. The already diverse industry structure was considered to lend itself to the introduction of competition. Especially municipalities, however, lobbied to keep the status quo.

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123 Von Danwitz, 88, 426.
126 Ibid.
127 Ibid.
129 For a history see ibid 9.
130 Büdenbender, above n 26, 64-5.
131 Ibid.
132 Von Danwitz, above n 86, 428.
133 Ibid.
Ultimately it was the external pressure of having to comply with the first European Electricity Market package in 1996 that provided the final impetus for reform.

The electricity market model that emerged in Germany following the liberalization reforms was very unlike the existing model. Up until that point the German electricity supply had deliberately few competitive elements, and relied on a combination of government supervision and private contracts. There was limited ex-post competition law control to avoid anti-competitive behaviour, but no ex-ante steering of economic activity but the state. The concept of an independent economic regulator was likewise foreign to the German idea of regulation.\(^\text{134}\)

In part, the target of reform was different to that of the UK and Australia, with regulation needed ‘to coordinate an already decentralised industry rather than to keep in check a formerly publicly owned dominant player in the market’.\(^\text{135}\) Reform in Germany therefore emphasized the need for third party access provisions, while ‘problems of market concentration were overlooked’.\(^\text{136}\) This further cemented the oligopoly structure of especially the transmission and generation sector.\(^\text{137}\) Ownership unbundling was also considered problematic because of its potential to violate the constitutional right to property of the companies.\(^\text{138}\)

\(^\text{134}\) Bohne, above n 84, 262; Gunther Kühne, ‘Conventional Regulation Renascent but Changing Alternatives to Regulation: The German Experience’ in Barry Barton et al (eds), Regulating Energy and Natural Resources (Oxford University Press, 2006) 203, 204.

\(^\text{135}\) Tony Prosser et al, ‘Neo-Institutionalist and Collaborative-Relational Approaches to Governance in Services of General Interest: The Case of Energy in the UK and Germany’ in Olivier de Schutter and Jacques Lenoble (eds), Reflexive Governance: Redefining the Public Interest in a Pluralistic World (Hart Publishing, 2010) 67, 75.


\(^\text{137}\) A series of mergers concentrated the German electricity industry to four (from formerly nine) big transmission companies that also own 80 per cent of the generation capacity. Ibid 264; also monitoring report of the Ministry of Economics and Labour, Bundesministerium fuer Wirtschaft und Arbeit, ‘Bericht an den Deutschen Bundestag uber die energiewirtschaftlichen und wettbewerblichen Wirkunge der Verbändevereinbarungen’ [Report to the Federal Parliament on the impact of association agreements on energy economics and competition] (August 2003).

The first major reform of the law in regard to electricity markets since 1935 took place in 1998, with the implementation of the first internal market directive\textsuperscript{139} through the \textit{Energy Industry Act 1998}.\textsuperscript{140} At this time the \textit{Electricity Feed-In Act}, which provided for targeted renewable energy support, had already been in place for seven years. The general ‘greening’ of energy policy was also reflected in the objectives of the \textit{Energy Industry Act 1998}, which required ‘safe, affordable and environmentally sustainable’ electricity supply in ‘the public interest’.\textsuperscript{141}

The first internal market directive was mainly targeted at harmonizing the disparate regulation of member states’ electricity markets, and only required the gradual opening up of the retail market to competition.\textsuperscript{142} At the heart of the first internal market directive was the introduction of third party access to the grid.\textsuperscript{143} As a consequence demarcation contracts were abolished, and competition law exemptions repealed. Municipalities, however, continued to be responsible for concession contracts for local distribution, as part of their constitutional right to regulate local affairs.\textsuperscript{144}

Germany was the only European state to opt for a model of negotiated access to networks, an option that had been included in the directive at the request of Germany, instead of the otherwise preferred model of regulated access. The provisions of §6 of the \textit{Energy Industry Act 1998} required that access had to be allowed ‘under fair and non-discriminatory terms’.

\textsuperscript{139} In detail ch 4, II A.
\textsuperscript{141} § 1 of the Act, in original ‘Zweck des Gesetzes ist eine möglichst sichere, preisgünstige und umweltverträgliche leitungsgebundene Versorgung mit Elektrizität und Gas im Interesse der Allgemeinheit’.
\textsuperscript{142} Germany opened its retail market 100 per cent with the introduction of the \textit{Energy Industry Act 1998} and ahead of the requirements of the directive, but retail competition remained slow. This was due to the administrative burdens of switching, European Commission, Energy Sector Inquiry (10 January 2007) SEC(2006) 1724, part 2, 166; and the ability of municipal utilities to lower their retail margins significantly, Bruneekeft and Bauknecht, above n 96, 239.
\textsuperscript{143} Ch 4, II A 1.
\textsuperscript{144} See also above at I C 2. The question of retaining the role of the municipalities in electricity supply was subject to considerable discussion in the lead up to the Act, see, eg, Explanatory Memorandum for the Act reforming the Energy Industry Act 1997, above n 128, 20-1, 27-8, 32-3.
These terms took the form of association agreements (Verbändevereinbarungen),\(^{145}\) which were negotiated by the stakeholders in the sector.\(^{146}\)

The negotiated access option relied on self-regulation by the industry. This agreement-based option suited the industry structure and the regulatory tradition in Germany, which had relied on private contracting and negotiation between different actors. Also, ‘it was generally believed that in the absence of any prior experience with competition in the network-bound energy system it would be very difficult and bureaucratic to introduce a state regulatory system for such a heterogeneous pattern of networks’.\(^{147}\) The agreements were not legally binding, but rather guidelines for ‘the terms on which system use was granted on a contractual basis’.\(^{148}\)

The Ministry responsible for energy, the Federal Ministry of Economics and Technology, had the option to regulate conditions for an access rate, if this was necessary to support competition or to achieve the objectives of §1 of the *Energy Industry Act 1998*.\(^{149}\) However, it took a ‘hands-off’ approach at this time, officially not getting involved in the self-regulatory regime.\(^{150}\) Similarly, the Länder authorities were inclined to be compliant because of the ‘long-standing collaboration with and leniency towards their regional energy companies’.\(^{151}\) Instead the Federal Cartel Office as well as the courts, provided ex-post evaluation of what constituted non-discriminatory access as well as permissible access fees.\(^{152}\) As a result, the ex-ante association agreements on what was considered ‘fair and

\(^{145}\) This form of agreement has been used for tariff setting even before the reform, see Kühne, ‘Conventional Regulation’, above n 134, 209. There were three agreements superseding each other in 1998, 199 and 2001. See also Kühne, above n 134, 214, with further sources in English; Theobald, ‘Basic Principles’, above n 91, 14-15.

\(^{146}\) Prosser et al, above n 135, 74-5. Controversially negotiations especially of the first agreement, excluded both government and consumer groups, and instead took place between the Federation of German Industries, the Association of Large Industrial Consumers and the Association of German Electricity Suppliers, see Prosser, at 74 and Kühne, ‘Conventional Regulation’, above n 134, 214; also Theobald, ‘Transformation’, above n 110, 267.

\(^{147}\) Kühne, ‘Conventional Regulation’, above n 134, 213.


\(^{149}\) Through an ordinance according to § 6(2) of the *Energy Industry Act 1998*.

\(^{150}\) Dominik Böllhoff, ‘Developments in Regulatory Regimes: Comparison on Telecommunications, Energy and Rail’ in David Coen and Adrienne Héritier (eds), *Refining Regulatory Regimes* (Edward Elgar, 2005) 15, 30; although the ministry involved in the process of negotiating the association agreements did represent the associations in the European process, at 31.


\(^{152}\) Ibid.

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non-discriminatory’ was flanked by an ex-post control through the Cartel Office and the courts.

This did not necessarily mean that the grid access regime did not work. Glachant et al found that the ex-ante and ex-post components of the German approach to network regulation are ‘mixed and reinforced in an open “cumulative pro-competition process” framed by the Competition Authority’, 153 and were not less competitive than, for example, their British counterparts. 154

However, the non-transparent procedure and exclusion of large interest groups, such as consumer protection groups, in the making of the agreements led to a considerable imbalance in the interests considered. As Prosser et al find:

\[\text{The first stage of liberalization was based around the negotiation of contracts by private parties rather than regulatory decisions taken by a public authority; it was closed to interests and viewpoints outside the industry and large industrial consumers.}\] 155

Thatcher characterizes this model of regulation as an ‘industry model of coordination’, in which ‘regulatory powers lie with the industry or industry associations’. 156 It is a tradition, which he considers is continuing despite reform. 157 Bohne, in turn, considers this characterization as too narrow. Instead, he applies the term of a ‘corporatist model of market coordination’, where ‘industry associations, labor unions, environmental and consumer organisations, and other societal groups hav[е] considerable influence on setting and implementing public policies including regulations’. 158

While this model of regulation would seem to favour incumbents and could therefore prevent the introduction of renewable energy, support for renewable energy was at this time already provided by separate legal frameworks. The renewable energy support mechanism

154 Ibid 1605.
155 Ibid 1605.
156 Prosser et al, above n 135, 76.
158 Ibid 16.
159 Bohne, above n 84, 260.
in Germany, embodied in the *Renewable Energy Acts*, has been shown to support a diverse ownership structure by ‘small and medium sized commercial enterprises against the interests of oligopolistic electricity suppliers’.\(^{159}\) In contrast, the green certificate schemes as employed in the UK and in Australia have supported ‘control and ownership of renewable energy by the main electricity supply corporations’.\(^{160}\) This differing structure in Germany has allowed new entrants to break incumbent power,\(^{161}\) and introduced new actors into the regulatory space, which are not encumbered by ongoing business interests in fossil fuel generation.

Nonetheless, high network charges and a lack of competition were considered to be some of the key reasons for electricity market reform in Germany.\(^{162}\) However, instead of introducing more competition, the reforms enabled further concentration of market power in four big oligopolies.\(^{163}\) The market power of these utilities has since been weakened,\(^{164}\) not least through the advent of renewable energy, but also through the phasing-out of nuclear plants, which were all operated by the big four.\(^{165}\)

Following this first round of reform, Germany was still left with a very ‘German style’ of regulation, which was unlike any other deregulatory reforms.\(^{166}\) The EU was likewise dissatisfied with the outcome of the first directive and proceeded with a further market liberalization directive to address these concerns.\(^{167}\)


\(^{160}\) Ibid; see on the so-called ‘gentailers’: ch 3, II B 2 a; ch 5, II A 2 a.


\(^{162}\) See, eg, Explanatory Memorandum for the Act reforming the Energy Industry Act 1997, above n 128, 1.

\(^{163}\) Following electricity market reform, several mergers have led to the formation of the so-called ‘big four’ utilities, RWE, E.on, EnBW and Vattenfall, which in 2000 held 90 per cent of all generation capacity, controlled the transmission networks and were heavily involved in distribution and retail; in Brunkreft and Bauknecht, above n 96, 239.

\(^{164}\) In 2012, only 73 per cent of generation capacity for electricity traded in the market, was owned by the big four; Bundesnetzagentur [Federal Network Agency] and Bundeskartellamt [Federal Cartel Office], *Monitoring Report 2012* [trans Bundesnetzagentur and Bundeskartellamt] (2013) 15.

\(^{165}\) Ibid 5.

\(^{166}\) Glachant et al, above n 154153, 1600.

\(^{167}\) For detail see ch 4, II A.
The Energy Industry Act 2005

It was the implementation of the second internal market directive\(^{168}\) that significantly changed the German approach to electricity regulation away from its continuing reliance on self-regulation to more prescriptive model. Prosser et al called this the move ‘from deliberation to hierarchy’.\(^{169}\) The Energy Industry Act 2005 centrally introduced an economic regulator, the Federal Network Agency, and abolished the negotiated access option.

While the introduction of first the Energy Industry Act 1998 and its later replacement with the Energy Industry Act 2005 were mainly in response to the European directives, other major amendments to the Act in 2011\(^ {170}\) were only partly driven by the third internal market directive.\(^ {171}\) Instead, the commitment to the energy transformation had now become the major factor shaping electricity market reform.\(^ {172}\)

The 2011 reform amended the Energy Industry Act 2005, but also introduced new legislation to enable a network planning regime that reflected the new reality of a higher percentage of renewably energy in Germany’s generation profile. Similarly, an extended objective of the Energy Industry Act 2005 reflects this clear focus on renewable energy. Further unbundling requirements of the EU directive are translated into German law, as well as strengthening of the rights of the consumers, together with new transparency requirements.\(^ {173}\)

\(^{168}\) See ch 4, II A 2.
\(^{169}\) Prosser et al, above n 135, 76.
\(^{171}\) See ch 4, II B.
\(^{173}\) Ibid 1-2.
The Development of Legal Frameworks for Renewable Energy: Historical Overview

Germany’s renewable energy regulation is generally considered a great success story, and a central factor in starting a successful transition to Germany’s low carbon energy future. While some commentators have criticized the high cost of this transition, others have pointed out that the wider economic benefits of the ‘resulting rapid expansion of renewable energy’ have so far outweighed the costs. While in Australia and the UK renewable energy is traded within the general electricity market, with additional regulation to address price risks, the German feed-in-tariff (FIT) scheme provided until recently a different approach. This has been identified as the main reason for the impressive rise of the percentage of renewable energy. Until the introduction of limited wholesale market exposure in 2012, renewable energy did not compete with fossil fuel-generated electricity in the electricity market, but generators were paid a fixed amount of money per kWh fed into the electricity grid.

This feed-in-tariff is not the only support Germany provides for renewable energy. It also extensively regulates in the area of network access and development. Unlike in the UK and Australia, where these issues are regulated under the auspices of general electricity market frameworks, Germany has introduced targeted, lex specialis, regulation for renewable energy. This separate treatment of renewable energy acknowledges that it has different requirements than conventional fossil fuel-based generation. This specialized regime has allowed Germany to address many of the regulatory barriers renewable energy faces in a liberalized electricity market structure. The UK and Australia, in contrast, continue to

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177 From less than 3 per cent in 1998 to more than 20 per cent in gross electricity generation in 2013, BMWiE, above n 13, table 28, 29.
178 However, while not participating in the market, priority dispatch of renewably generated electricity enshrined in legislation ensures that renewably generated electricity diminishes the market power of the fossil fuel generators, because it will always have to be purchased prior to other electricity. See Bundesnetzagentur and Bundeskartellamt, above n 164, 17.
179 In more detail below at II B 4.
struggle to support renewable electricity within the conventional electricity market regulatory frameworks. The following will trace the development and explain the provisions of the Acts enshrining the feed-in-tariff scheme in Germany.

1 Early Renewable Energy Support: The Electricity Feed-In Act

Even before the introduction of the targeted feed-in laws, research and development spending on renewable energy sources, especially for wind and solar, increased. Promoted by a change in attitude towards fossil fuels and nuclear energy in the general populace, these support programs created ‘small niche markets’, but also aided the formation of organizations, such as industry advocacy groups for solar. In the mid-80s, the twin pressures of phasing-out nuclear power after Chernobyl and the issue of human-induced climate change led to the introduction of the first feed-in law in Germany, the Electricity Feed-In Act in 1990.

The idea of a feed-in mechanism for renewable energy preceded the implementation of the Electricity Feed-In Act. Prior to the Act, renewable generators had a claim in competition law to feed electricity into the grid. The generators that were covered by these arrangements were initially mostly small-scale, connected to industrial installations that generated electricity for their own use. They could feed any excess electricity into the grid. The reimbursement for this electricity, however, was limited to that agreed in the association agreements. Prices were considerably below the costs of the renewable generators, and therefore it failed to achieve significant investment in renewable energy. The Electricity Feed-In Act was supposed to lift the reimbursement above the

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180 For an overview see Jacobsson and Lauber, above n 4, 129-32.
181 Ibid.
182 According to Cartel Act 1980 § 26(2) and 103(5); see in detail Altrock et al, above n 76, 28-9, paras [7]–[12].
183 Ibid, on association agreements see above at II A 2 a.
184 Ibid especially at [7], [8].
185 Ibid.
avoided costs on a long-term basis because of the ‘energy and environmental policy importance of these installations’.\(^{186}\)

The initial *Electricity Feed-In Act* came into force on 1 January 1991. Its political history has been described in detail by different commentators.\(^{187}\) Unlike the usual Bill procedure of drafting in the responsible ministry, the *Electricity Feed-In Bill* was introduced into parliament by a group of parliamentarians from different ends of the political spectrum,\(^{188}\) who managed to overcome the inaction of the Ministry for the Economy.\(^{189}\) The long-term impact of the Act in changing the political dynamics and in starting the renewable energy boom in Germany cannot be overestimated.

The initial *Electricity Feed-In Act* was very short; comprising only five paragraphs. According to the explanatory memorandum its objective was to increase the share of renewable energy in energy supply for reasons of ‘resource conservation and climate protection’.\(^{190}\) The Act and its provisions reflect the vertical integration of the electricity supply companies at the time, with disclaimers for generation by the electricity supply company itself included in the Act.\(^{191}\)

According to §2 of the Act, electricity supply companies were required to purchase the renewable energy generated in their supply area. Remuneration was set at a percentage of the consumer price and differed according to the source of electricity.\(^{192}\)

The Act contained a hardship clause in § 4(1) of. If the requirements of §§2 and 3 comprised an ‘unreasonable hardship’, the upstream electricity supply company was responsible for partial reimbursement. According to §4(2) of the Act, such an unreasonable

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\(^{186}\) Ibid.


\(^{188}\) Namely from the Christian-Conservative CSU and from the GREENS Party, see Stefes, above n 41, 155.

\(^{189}\) Ibid 154.


\(^{191}\) *Electricity Feed-In Act* § 1(2).

\(^{192}\) Initially 75 per cent, later raised to 80 per cent for hydro, sewage and landfill gas. After the first 500kw fed into the grid, the generator would only receive at least 65 per cent for the remainder. Wind and solar could claim 90 per cent.
hardship was especially the case if the electricity supply company was required to raise its prices noticeably above those of similar or upstream companies.

The Act was considerably amended in conjunction with the *Energy Industry Act 1998*. To implement third party access requirements the Act now obligated the ‘electricity supply company which manages a network for public supply’ to purchase renewable energy. The supply company who was physically closest to the generator and technically suited, was now the entity obligated to connect the renewable generator and purchase their generated electricity. Controversially, the 1998 amendments to the Act included clarification as to what was considered ‘unreasonable hardship’. The unreasonable hardship clause applied, where the amount of electricity generated from renewable sources exceeded five per cent for the whole of the supply area. The five per cent target was forecast to be reached for the northerly electricity supply company PreussenElektra by 1999, which was one of the reasons for later reform in 2000.

The Act triggered considerable market expansion for renewable energy, with especially wind energy growing from 55 MWh capacity installed in 1990 to 6097 MWh capacity installed in 2000.

However, as a result of the introduction of the *Energy Industry Act 1998* and the 100 per cent opening of the retail market, as well as a fall in world market prices of fossil fuels, the formerly stable consumer price for electricity began to fall. To further ensure a secure investment environment for renewable energy investors, a decoupling of feed-in-tariffs from electricity prices became necessary, and has been a major feature of the *Renewable Energy Act 2000*. Also, the investment in renewable energy sources was initially heavily biased towards wind, a commodity mostly found in the windier north of the country. Solar energy with its considerably higher costs than wind did not benefit much under the

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193 Unlike formerly the Electricity Supply Company, in whose area the electricity was generated, § 2 of the Act.

194 Altrock et al, above n 76, 31. The hardship clause and the subsequent triggering of responsibility by the upstream company was also attacked as ‘unauthorised state aid’ in the European Court of Justice, see in more detail ch 4, III B.

The northern utilities therefore had higher costs than those in the southern Länder of Germany. For these reasons a reform of the Act was initiated.

2 The Renewable Energy Act 2000

In 1998, a new government was elected, inter alia, on the promise to reform and enhance the Act. The new coalition government comprising the Social Democratic Party and, for the first time in government, the German Greens party, had a range of ‘green’ issues in its program, including the phasing out of nuclear energy, ecological tax-reform as well as the strengthening of renewable energy and combined heat and power sources.

As in 1990, the Bill to replace the Electricity Feed-In Act was drafted by a group of parliamentarians that overcame the stonewalling of the renewal of the Act by the energy utility-friendly Ministry for the Economy. Commentators have regarded these agents, using windows of policy opportunity, as crucial for the success of the scheme and in overcoming institutional path dependence through political entrepreneurism.

Also, by now the feed-in-tariff mechanism had developed enough political and economic dynamics to have public and also to a degree industry support. The scheme was found to have positive effects on innovation and workplace creation and the effect on electricity prices was not as large as initially feared.

In 2000, the first Renewable Energy Act was passed, which created the current lex specialis framework for renewable energy with particular provisions in regard to third party

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196 See, eg, Jacobsson and Lauber, above n 4, 134.
197 In more detail below.
198 Mez, ‘German Electricity Reform’, above n 27, 231.
199 Oschmann, ‘Success Story’, above n 174, 46 for more detail for the political process; similar Stefes, above n 41, 158.
200 See especially Stefes, above n 77, 158-9; Oschmann, ‘Success Story’, above n 174, 46-7.
201 See, eg, Stefes, above n 77, 156; Jacobson and Lauber, above n 4, 148.
202 Erneuerbare-Energien-Gesetz [Renewable Energy Act] (Germany) 29 March 2000, BGBl I 2000, 305 (‘Renewable Energy Act 2000’). The Renewable Energy Act has been amended several times, last in 2013 and 2014. The Acts are however, only renamed if considerable renumbering is taking place. Accordingly and in line with the official denomination available in the Federal Law Gazette (Bundesgesetzblatt), this thesis will use the terms Renewable Energy Act 2000/2004/2008/2014 (Germany) respectively. The currently applicable
access to the grid. Unlike the *Electricity Feed-In Act*, it created a separate regime for network access, extension and augmentations; issues which have been shown to be considerable barriers for renewable energy in the Australian and the UK electricity market. The detailed provisions of the Act will be addressed in the following section C as far as relevant to the thesis.

### C The Regulatory Space of the German Electricity System and Renewable Energy

The regulatory space for electricity supply has in Germany since 1990 developed around a special place for renewable energy.

While European market reform has led to the creation of a British style electricity market, renewable energy has until recently, not participated in the electricity wholesale market. Instead separate legal frameworks allow for access to network infrastructure, network planning as well as for financial support for renewable energy.


   **a Institutional Structure of Electricity Supply System**

   The implementation of the second internal market directive into German national law introduced an independent regulatory body, the Federal Network Agency; to oversee the regulation of utilities with more than 100 000 connected customers.203

   The Federal Network Agency is an independent federal agency initially created in 1998 for the regulation of telecommunications and post. The regulation of railways, as well as the

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203 Länder authorities are responsible for smaller networks, although several Länder have chosen to transfer this responsibility to the Federal Network Agency.
energy and gas markets was added in 2005. Its tasks are as prescribed by legislation. Lately, the Agency has been given powers in regard to network planning for the necessary transmission network investment to ensure the ‘Energiewende’. The Federal Cartel Office, as well as the cartel authorities of the Länder, remains responsible for regulating any abuse of market power that is not addressed by the Federal Network Agency.

The European internal energy market directives required legal, functional and management separation of the network functions from the generation and supply functions of the industry. As a result, the formerly integrated network businesses have been unbundled. However, Germany opted to only implement the minimum unbundling requirements of the directive, which did not require ownership unbundling. As a result, the ‘big four’ utilities separated their transmission network businesses from their generation businesses.

Transmission network operators have a pivotal role in regard to enabling renewable energy in the German electricity supply system. They have statutory responsibilities in regard to feed-in-tariffs and networks access for renewable energy. Further, they are responsible for physically matching supply and demand. Investment decision-making of network businesses is therefore not just bounded by commercial reasons, but is greatly narrowed by an extensive body of legislation and subordinate legislation.

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204 *Energy Industry Act 2005 §§ 54 ff.*
205 Below at II C 2 b.
206 I.e, non-network related anti-competitive practices.
207 See ch 4, II A.
208 Additionally networks supplying less than 100 000 customers are exempted from the unbundling requirements, which included a considerable part of the German utilities.
209 See also Bundesnetzagentur and Bundeskartellamt, *Monitoring Report 2012*, above n 166, 15..
210 The current operators of the transmission networks are Hertz 50, Amprion (Initially a subsidiary of RWE, now owned by a consortium of investors), TransNetBW (A subsidiary of ENBW), and TenneT TSO (Initially a subsidiary of E.on, later sold to TenneT, the Dutch transmission network operator).
Both, the objectives and targets enshrined in *Energy Industry Act 2005* and the *Renewable Energy Act* provide direction for the actors in the electricity system and thereby shape the dynamics and architecture of the regulatory space.

A look at the objectives of the *Energy Industry Act 2005* reveals that the new reality of increased amounts of renewable energy in the energy industry is now well recognized. The objectives of the Act include the usual market objectives in §1(2), which stipulates that:

> The regulation of electricity and gas supply networks is to serve the goals of securing effective and undistorted competition in the supply of electricity and gas and of ensuring the long-term, effective and reliable operation of energy networks.

However, in paragraph 1, environmental compatibility and generation from renewable energy is emphasized. It states that:

> The objective of this Act is to ensure the provision of, to the extent possible, cost effective, consumer friendly, efficient and environmentally compatible on-grid public supply of electricity and gas, which is increasingly generated from renewable energy sources (emphasis added).

The final part of the sentence was added in 2008, to ensure that electricity networks, too, allow for the increasing generation of energy from renewable energy sources.\(^\text{212}\) Thus, it complements and deepens the commitment to support renewable energy network investment. It also reflects the increasing integration of market regulation with the more specific renewable energy regulation.

According to §2, these objectives have to be taken into account by all companies involved in the energy industry. The Federal Network Agency has to make decisions taking into account the objectives of the Act.\(^\text{213}\)

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\(^{212}\) See Explanatory Memorandum for the Act reforming the Energy Industry Act 2011, above n 33, 50.

Further objectives and also legally binding targets are contained in the *Renewable Energy Act*. The *Renewable Energy Act 2000* initially contained in §1 the objective to ‘facilitate a sustainable development of energy supply, particularly for the sake of protecting our climate and the environment’ and to at least double the share of renewable energy in electricity supply by 2010. The objective was expanded in 2004\(^{214}\) to include an express reference to renewable energy. The Act now aims ‘to promote the further development of technologies for the generation of electricity from renewable energy sources’.

The *Renewable Energy Act 2014* contains in §1(2) the renewable energy targets, which reflect the steadily rising commitments by the federal government.\(^{215}\) These legislated targets mirror the renewable energy targets in the *Energy Concept* of the German government.\(^{216}\) The policy commitment of the German government to aggressively decarbonize the electricity system and support renewable energy is thus clearly reflected in the legal frameworks for the electricity market.

2 Entry to the Regulatory Space of the Electricity System: The Challenge for Renewable Energy

a The Wholesale Market

In Germany, electricity is traded in a wholesale market, operated through the European Energy Exchange.\(^{217}\) As in Australia, merit order, that is, the cheapest option, determines which of the bidders into the spot-price market is dispatched first.\(^{218}\) The transmission networks are responsible for the physical trading in their networks.\(^{219}\)


\(^{215}\) While the *Renewable Energy Act 2004* contained a commitment to a share of at least 12.5 per cent by 2010 and 20 per cent by 2020, in 2009 this was updated to a share of 30 per cent by 2020.

\(^{216}\) See above at I B 3.


\(^{218}\) Harry Wirth, ‘Recent Facts about Photovoltaics in Germany’ (Fraunhofer Institute, May 2014) 14-5.

\(^{219}\) In detail see *Ordinance on Access to the Electricity Network*. 237
However, for a long time the wholesale market mechanisms did not provide a barrier to renewable energy generators, because renewable energy was supported by a separate feed-in-tariff scheme. Renewable generators were therefore not exposed to wholesale market risk. However, optional mechanisms for limited market exposure have been introduced in 2012 and made mandatory with the 2014 reform for most generators. These changes are explained below.

Feed-in-tariff mechanism

The *Renewable Energy Acts* until 2014 provided for a differentiated feed-in-tariff for every kWh of renewably generated electricity fed into the electricity grid. Unlike under the *Electricity Feed-In Act*, the rates of return for renewable energy are no longer linked to the average customer tariff. Instead, the legislated tariff is guaranteed for 20 years. The tariff is paid by the grid operators to the generators. For smaller renewable energy generators, this regime continues under the *Renewable Energy Act 2014*.

The legislation requires the transmission network operators to sell the renewable energy in the wholesale electricity market. The difference between the achieved market price and the feed-in-tariff is covered by the renewable energy surcharge, which can be recovered from the consumer on a pro-rata basis. A nationwide equalization scheme ensures that the costs are equalized across all of the German transmission network operators at the end of the business year.

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221 Ibid § 21.
222 Ibid § 16.
224 Ibid.
225 Ibid § 60.
226 In detail see *Ausgleichsmechanismusverordnung* [Ordinance on the Further Development of the Nationwide Equalisation Scheme] (Germany) 17 July 2009, BGBI I, 2009, 2170, § 3.
Increasing Market Integration

All other generators in the German electricity system need to market renewable energy directly since 2014. While a direct marketing option was already introduced in 2008, it has now been made mandatory for all new renewable energy installations of a certain size. Direct marketing requires renewable generators to sell the generated electricity directly in the wholesale market. They receive a market premium, which is used to ‘top-up’ the difference between the feed-in-tariff and the market price.

The 2014 changes also introduced section 55 of the Renewable Energy Act 2014, which provides the possibility to introduce tenders for solar photovoltaic installations. Similarly to the competitive allocation process for Contracts for Difference in the UK, these tenders will allow to determine the feed-in-tariff for a certain amount of solar photovoltaic installations in a competitive way.

The respective Renewable Energy Acts have always contained a priority dispatch rule for all renewable energy fed into the electricity grid. That means that renewable energy will always have to be dispatched first, thereby guaranteeing its sale. Together with the, often generous, tariffs, this has guaranteed a very positive investment climate for renewable energy. Investment security has been emphasized as one of the main reasons for feed-in-tariff schemes being more successful in supporting renewable energy uptake and ultimately cheaper than the green certificate schemes, such as the Australian Renewable Energy Target. However, recent reforms show that, as renewable energy technology matures, it is increasingly considered to be able to successfully participate in the wholesale market. In contrast to the rising exposure to wholesale market risk for renewable energy, the rules for infrastructure access and planning have to be increasingly tightened.

228 Renewable Energy Act 2008 § 17.
229 Renewable Energy Act 2014 §§ 20, 37. Initially this applies to all new installations bigger than 500kW installed capacity, and from 2016, also for those that have an installed capacity of bigger than 100kW.
231 See ch 5, III B.
b Regulating Infrastructure: Network Regulation and Renewable Energy

In Australia and in the UK access to networks, including the development of networks in a renewable-friendly way, have been identified as crucial to develop high renewable energy scenarios. The way network access is regulated, provides further ‘terms of entry’ to the regulatory space of electricity supply. While the Energy Industry Act 2005 and associated ordinances provide the legal framework for network access, investment and planning, the Renewable Energy Act 2014 contains a special access regime for renewable generators.

Third party access

Access and physical connection of new generation installations to the grid in general is regulated in the Energy Industry Act 2005. It is required to be ‘adequate, free of discrimination, transparent’.\textsuperscript{234} Further detailed requirements are found in the Ordinance on Access to the Electricity Network, the Ordinance on Fees for the Access to the Electricity Networks,\textsuperscript{235} and the Ordinance for Network Access for Power Stations,\textsuperscript{236} which refine third party access rules. The latter ordinance requires network operators to connect new generators wherever technically possible.\textsuperscript{237} Competing applications for one connection point are allocated on a ‘first comes first served’ basis.\textsuperscript{238}

Renewable energy, however, always had priority connection rights, thus, it has priority and the ‘first comes first served rule’ does not apply. Instead, lex specialis provisions of the Renewable Energy Act 2014 take precedence over the requirements of the Energy Industry Act 2005, and the Ordinance for Network Access for Power Stations.

The Renewable Energy Act 2014 provides that ‘grid system operators shall immediately and as a priority connect installations generating electricity from renewable energy

\textsuperscript{234} Energy Industry Act 2005 § 17(1).
\textsuperscript{235} Stromnetzentgelterordnung [Ordinance on Fees for the Access to the Electricity Networks] (Germany) 25 July 2005, BGBl I 2005, 2243.
\textsuperscript{237} Ibid §§ 3, 4.
\textsuperscript{238} Ibid § 4(6).
While this requirement does not mean that the operators also bear the connection cost, it has, however, led to a timely process of connection to the grid for renewable generators. Germany has the shortest grid connection times for wind energy installations in the EU, even while having the highest number of projects in the EU. To enable these fast and uncomplicated connections the necessary grid augmentations are regulated in the *Renewable Energy Act 2014*, which provides that:

> Upon the request of those interested in feeding in electricity, grid system operators shall immediately optimise, boost and expand their grid systems in accordance with the best available technology in order to guarantee the purchase, transmission and distribution of the electricity generated from renewable energy sources.

The provision also extends to the upstream network operators.

This provision is limited by its paragraph 3, which states that the ‘grid system operator shall not be obliged to optimise, boost or expand his grid system if this is economically unreasonable.’ Additionally, §14 of the Act allows for feed-in management. Feed-in management was introduced as a reaction to the technological challenges of managing large amounts of intermittent generation. Accordingly, ‘notwithstanding their obligation with section 12, grid operators shall be entitled, by way of exception, to assume technical control over installations’. In case of network overload, the network operator can remotely stop certain installations from further feeding electricity into the grid, in order to protect network stability.

The Act also prescribes regulations regarding financial burdens for connections. While ‘shallow access’ to the grid, that is the costs for connecting to the closest grid connection point, has to be borne by the installation operator according to §§16 and 17, ‘deep access’,

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239 *Renewable Energy Act 2014* § 8(1).
240 European Wind Energy Association, *WindBarriers: Administrative and grid access barriers to wind power* (July 2010) 102; the latest amendments applicable from 2012 have added a new § 9(5), (6), further refining that the grid system operators need to provide without delay timetabling for connection requests, as well as cost estimates and all information required with in a maximum of 8 weeks.
242 Ibid sentence 2.
which includes augmentation costs, is the responsibility of the grid operator. The Act thus creates a very favorable climate for renewable energy generators in regard to grid connection, especially compared to Australia.

**Network Investment**

Similarly to Australia and the UK, network investment in Germany is now regulated based on an incentive-based approach. Initially §21 of the *Energy Industry Act 2005* provided for a cost-based regulation of network charges, similar to the old association agreements. Since 2009 the *Ordinance on Incentive-Based Regulation of the Power Grid* applies. In general, the Federal Network Agency approves network investment projects where investments are ‘necessary for the stability of the whole of the system, for the integration into the national or international grid system or for a needs-based development of the energy supply network according to §11 of the *Energy Industry Act*’. This is particularly considered to be the case for *inter alia*, ‘… the integration of installations which fall under the *Renewable Energy Act*…’. With the latter substantiation the German legislator again reinforces the central importance of renewable energy in electricity supply. In Australia, in contrast, transmission network operators invest primarily to ensure system reliability, which has the effect of disadvantaging renewable energy.

**Connection of Offshore Wind Regime**

Offshore wind is forecast to play an important role in achieving Germany’s renewable energy targets. The regulatory regime for connecting offshore wind installations to the

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243 According to *Renewable Energy Act 2014* § 17 the grid operator ‘shall bear the costs of optimising, boosting and expanding the grid system’.

244 *Anreizregulierungsverordnung* [Ordinance on Incentive-based Regulation of the Power Grid] (Germany) 19 October 2007, BGBl I, 2007, 2529.

245 In original ‘soweit diese Investitionen zur Stabilität des Gesamtsystems, für die Einbindung in das nationale oder internationale Verbundnetz oder für einen bedarfsgerechten Ausbau des Energieversorgungsnetzes nach §11 des Energiewirtschaftsgesetzes notwendig sind’.

246 *Ordinance on Incentive-based Regulation of the Power Grid* § 23(1) sentence 2 No 2.

247 Energy Concept, above n 5, 8.
onshore network is provided for in §17(2a) of the *Energy Industry Act 2005*. The provision aims at both relieving the generators from the burden of the cost for the connection between the offshore installation and the onshore grid network, but also ensures that the transmission network operators that border the shore, and are thus responsible for connecting the new installations, do not bear the full burden of providing both the new offshore grid connections and onshore grid augmentation.

According to §17(2a) of the *Energy Industry Act 2005*, the network service provider is responsible for grid connections to the next distribution or transmission network. In order to not unfavorably disadvantage transmission system operators, the various costs for these connections are to be offset between all operators, ensuring that the financial burden of creating an offshore grid is distributed equally among end users. The provision states that ‘transmission grid operators are obliged to balance the different scope of their costs’ and refers to the relief mechanism in §9(3) of the *German Combined Heat and Power Act 2002* to be applicable by analogy.

As in the UK, the choice of a separate regime for offshore wind points to the inability of the existing regulatory system to leverage the high costs of investment necessary. Even with the already advantageous terms for network access in German law, it would be too high a burden to leave the responsibility and cost of network investment solely to the generator. The offshore wind farm example is especially pertinent for Australia, because it addresses the need for transmission networks that have to be built entirely new to a remote location. As has been pointed out for Australia, the Australian regulatory system does not support forward-looking investment in transmission networks to develop new renewable energy resources.

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248 Introduced with the *Gesetz zur Beschleunigung von Planungsverfahren für Infrastrukturvorhaben* [Infrastructure Planning Acceleration Act] (Germany) 9 December 2006, BGbl I, 2006, 2833, art 7.
249 According to § 13 of the *Renewable Energy Act 2008*, the generator pays the cost of connecting to the nearest grid connection point.
250 All offshore wind is found off the coast in Northern Germany.
251 *Energy Industry Act 2005*, s 17(2a), last sentence.
252 Ch 3, II B 2 b.
Network Planning

While the feed-in-tariff laws and the network access regime emphasize the support for the individual generator, in Germany there is increasing focus on strategic, whole-of-system network planning to enable the targeted high uptake of renewable energy.

Several Acts seeks to address the issue of timely and renewable-friendly network development. These Acts generally target the simplification and acceleration of network planning. A new strategic network planning regime was introduced in 2011 with the §§12a-12e of the Energy Industry Act 2005.

Prior to these changes, network planning was the responsibility of the individual network operators, and based on purely business-level efficiency considerations. The new framework has introduced a national, macro-economic focus, with considerable new powers for the regulator. While the third internal electricity market directive requires the development of network development plans by transmission network operators, the regulation of coordinated common network development plans for the whole of German transmission networks extends beyond the EU directives’ requirements.

The law now requires the four German transmission network operators to collectively develop at least three medium-term scenarios for network development in the next 10 years; including at least one scenario covering the next 20 years. The scenarios need to be in line with federal energy policy, which, as shown, now has renewable energy at its

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256 Ibid.


heart. The network regulator will publish the scenarios, and ensure community comment and participation.\textsuperscript{259}

Further, each transmission network operators will need to develop an annual national network development plan.\textsuperscript{260} The plan needs to contain inter alia ‘efficient measures for a demand-based optimization, augmentation and extension of the grid, which will be necessary in to ensure a safe and reliable network operation for the next ten years’.\textsuperscript{261} The separate offshore network development plan according to \textsection17(2)a Energy Industry Act 2005 as well as the European ten year network development plan of ENTSO\textsuperscript{262} need to be incorporated.\textsuperscript{263} The Federal Network Agency reviews and approves the plan and can require changes from the transmission network operators.\textsuperscript{264}

The third planning step is the Federal Demand Plan (Bundesbedarfsplan).\textsuperscript{265} This plan is based on the Network Development Plan and it needs to be presented to the federal government by the Federal Network Agency at least every three years. It must include an explanatory statement that takes account of the objectives of \textsection1 of the Act.\textsuperscript{266} It will then be passed by Parliament and becomes binding to the transmission network operators.\textsuperscript{267}

Together with these amendments to the Energy Industry Act 2005, infrastructure planning law was changed through the introduction of the Grid Extension Acceleration Act in 2009. This Act removes the responsibility for spatial planning for transmission network infrastructure from the state planning authorities, and transfers it to the Federal Network Agency, for all projects traversing Länder or federal borders.\textsuperscript{268} The planning approval procedure for transmission infrastructure, too, has been removed from the general

\textsuperscript{259} Ibid \textsection12a(2).
\textsuperscript{260} Ibid \textsection12b.
\textsuperscript{261} In original: ‘wirksamen Maßnahmen zur bedarfsgerechten Optimierung, Verstärkung und zum Ausbau des Netzes enthalten, die in den nächsten zehn Jahren für einen sicheren und zuverlässigen Netzbetrieb erforderlich sind’, see 12b(1)1.
\textsuperscript{262} See ch 4, II A 3.
\textsuperscript{263} Energy Industry Act 2005 \textsection12b(1) last sentence.
\textsuperscript{264} Ibid \textsection12c.
\textsuperscript{265} Ibid \textsection12e.
\textsuperscript{266} Ibid \textsection12e(1), (2).
\textsuperscript{267} Ibid \textsection12e(4).
\textsuperscript{268} \textsection28 of the Grid Extension Acceleration Act, replaces the formerly applicable \textsection15b of the Spatial Planning Act.
provisions of planning law. Instead the provisions of §§19ff of the *Grid Extension Acceleration Act* now apply to all new applications. The objectives of the Act in §1 explicitly mention an ‘extraordinary public interest’ for the ‘transparent, efficient and environmentally sound extension of the transmission networks’. The explanatory memorandum clarifies that these changes were considered necessary to achieve rapid expansion of the share of renewable energy in electricity generation.269

As a result the new requirements for network planning allow for a national approach as well as for a European dimension in planning. The need to plan and build networks with a focus beyond the Länder level has been a main driver for the reform. Indeed, this focus on infrastructure has according to Kühne, now replaced third party access as the main priority of energy policy.270 The extension of the role of the regulator was criticized both by the Länder271 and by academic commentators.272 The centrepoint of the criticism was that the regulator, unlike the Länder planning authorities, does not have the necessary expertise or the capacity to undertake this new and different role.273

The new planning regime signifies a whole-of-country approach that forces the different operators to take into account investment needs across borders. The regulator has considerable new powers to control and steer these investments. Kühne criticizes the ‘resurgence of state interventionism at the expense of entrepreneurial autonomy’.274 However, the systemic and planned approach to network extensions may be what is necessary to ensure a renewable energy compatible network. In contrast to Germany, the network planning function of the market operator in Australia, AEMO, remains only an advisory one. Network planning taking into account needs for interconnection and renewable energy cannot be compelled.

269 Above n 45, 1.
272 Calliess and Dross, above n 255, 1011.
273 Ibid.
274 Kühne, ‘Regulating the Extension’, above n 88, 393.
The regulatory space for electricity supply in Germany clearly reflects a commitment to directly integrate renewable energy into the electricity system. Through objectives, but also through targeted renewable-friendly legislation, the legal framework directs the transition of the German energy system to a more sustainable one. Specific regulatory intervention changes the dynamics in the regulatory space by shifting power away from private commercial decision-making to increased system-wide planning by the state. This focus is in contrast to the regionalized investment by private actors, as is prevalent in Australia.

To support change, there has been a clear shift of power from private actors to the regulator, which now has extensive control rights regarding network regulation and methods and conditions of network access. In sum, network access is now ‘stipulated by law to a larger extent and …controlled by a powerful regulatory agency’.

Further reforms, and especially the planning powers that have recently been given to the Federal Network Agency show that this trajectory continues, both in regard to a shift of responsibilities from the industry actors to the regulator, as well as from the Länder to the federal level.

**III Conclusion**

Germany was slow to commit to market liberalization, but, driven by increasingly prescriptive EU legislation, has now established a ‘British model’ electricity market. In particular, the introduction of a regulator, the Federal Network Agency, which has taken over significant amounts of tasks formerly self-regulated by the industry, has changed the actor relationships in the market.

Early on, Germany chose to regulate strongly to allow for a successful integration of renewable energy. This is in line with a long-standing political commitment to environmental protection, which is also now anchored in the constitution. This development continued even throughout the later parallel electricity market liberalization.

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275 Prosser et al, above n 135, 78.
Obviously, the introduction of a competitive market was not considered to be sufficient to drive renewable energy development. The extent of regulation necessary to lead to an energy turnaround has led to German energy policy being likened to a ‘planned economy’.

Separate legal frameworks for renewable energy exist in regard to network access and financing renewable energy. This narrows the decision-making spaces of other market participants, especially conventional generators and network operators. The former have to adapt their energy output ‘according to quantities produced by renewables’, and not just responding to market signals. The latter have extensive statutory responsibilities to integrate renewable energy into the network. Additionally, the wider legal framework for the electricity market, particularly regarding network investment and planning, is consistently supportive of renewable energy. Supporting renewable energy thus is a theme running through the architecture, direction and general principles of the regulatory space for electricity supply.

While initially the emphasis has been on supporting individual installations through direct regulation of feed-in-tariffs and access regimes, reforms now emphasize system-wide developments. A shift of power from privatized network businesses to a regulator, with strong pro-renewable objectives, as well as away from the Länder, has allowed for the development of a national regulatory framework aimed at supporting a high percentage of renewable energy. While some have criticized the loss of ‘entrepreneurial autonomy’, energy transition is clearly thought of as a whole of nation exercise that needs strong government. In contrast, the Australian example shows that the national electricity market is hampered by the regionally focused interest of both private and public actors, which persists in the regulatory framework.

Germany is now on a new path to a sustainable energy system. This is a dynamic ongoing process, with the increasing amount of amending Acts and reforms pointing to the need

276 Kühne, ‘Regulating the Extension’, above n 88, 393.
277 Pfaffenberger and Chrischilles, above n 217, 98.
278 Kühne, ‘Regulating the Extension’, above n 88, 393.
279 Jacobs, above n 7.
to address new issues as they occur. The German example shows that liberal electricity market frameworks are, by themselves, not able to overcome systemic disadvantage for renewable energy. It clearly support the thesis contention that, targeted reform of electricity market legal frameworks is necessary to overcome systemic disadvantages for renewable energy.

The experiences from the regulation of the German electricity system, as well as the Australian and UK experiences will provide the basis for a more general analysis of the potential for successfully supporting renewable energy within a liberalized electricity market regulatory framework. In the final chapter of this thesis, these findings will be assessed in the light of the analytical framework developed in chapters 1 and 2 to provide a basis for potential lessons for electricity market reform in Australia.
CHAPTER 7: SUMMARY AND LESSONS FOR AUSTRALIA

In this final chapter the findings of the comparative case studies are consolidated and reviewed in the light of the analytical framework developed in chapters 1 and 2. These findings will provide a basis for deriving potential lessons for electricity market reform in Australia.

This thesis set out to demonstrate that the current liberalized electricity market in Australia will not be able to incorporate high amounts renewable energy without considerable changes to its legal and regulatory frameworks. Liberalized market frameworks lock in path dependent patterns of fossil fuel dependence. Therefore, the thesis argues, targeted regulation is necessary to allow for a timely transition to a decarbonized electricity system.

In order to investigate this claim, the thesis has compared the electricity market legal frameworks in three country case studies – Australia, Germany and the UK – all of which have all liberalized their electricity markets, although in different ways and with different consequences for the uptake of renewable energy.

In chapter 2, an analytical framework was developed for this comparative analysis. This framework draws on theories of socio-technical systems\(^1\) to take account of the way legal frameworks for electricity supply, emerge as elements of a wider system. Systems conceptions of electricity depict law as an institutional element of a socio-technical system, which has co-developed with the norms and the technology of this system.\(^2\) The challenge for renewable energy in this system is a multidimensional one. Renewable energy needs to be integrated with existing physical electricity infrastructure, especially electricity networks, which have developed to connect centralized and constant generation facilities, with the consumer. It also needs to be integrated in a way that allows an ongoing safe, secure and reliable supply of electricity as an essential service in today’s society.

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\(^1\) For the development of the concept, see ch 2, I A.

\(^2\) On implications of systems conceptions, especially, co-development, path dependence and lock-in, see ch 2 I B.
This research takes into account how legal and regulatory frameworks are influenced by the evolution of the wider electricity system, its infrastructure and norms. In a second step the thesis has employed the concept of regulatory space\(^3\) to identify specifically the changing role of law in liberalized electricity markets, and its impact on renewable energy.

Electricity markets are constructed as regulatory instruments,\(^4\) relying heavily on law and regulation to achieve their objectives.\(^5\) Using the concept of regulatory space allowed an investigation of the interdependent and dynamic relationships between the private and public actors involved in electricity supply, following liberalizing reforms. The concept of regulatory space captures the role of law in determining the relative power and influence of different actors within this space, as well as its ‘architecture and general principles’. ‘Who gains entry and on what terms’\(^6\) has been identified as the leading question for the legal analysis in this thesis, which has provided a new frame for investigating the role of law in supporting renewable energy in liberalized electricity markets.

In this final chapter, part I summarizes the findings of the analysis of the different case studies. Part II then identifies distinct themes of how regulatory frameworks for electricity supply need to adapt and change in response to the renewable energy challenge. As new policy paradigms of sustainable, rather than just efficient electricity supply emerge, the legal and regulatory frameworks for electricity markets need to respond to and integrate these concerns. Shifting architectures of the regulatory space are associated with a growing role for public system planning, separate roles for renewable generators and a limitation to free commercial decision-making of fossil fuel generators and network companies. Taken together they indicate that facilitating large-scale energy transitions in liberalized electricity markets requires rethinking the role of all market participants. This provides pertinent lessons for Australian electricity market reform, elaborated in part III. Finally, future directions for legal research, centred on different possible energy futures for Australia will be discussed in part IV.

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\(^3\) By Leigh Hancher and Michael Moran, ‘Organizing Regulatory Space’ in Leigh Hancher and Michael Moran (eds), *Capitalism, Culture and Regulation* (Clarendon Press, 1989) 271; considered in detail in ch 2, IV A.

\(^4\) See ch 2, II B 3.

\(^5\) Ibid II B 1.

\(^6\) Hancher and Moran, above n 3, 282.
I FINDINGS

The research showed that while, in detail, electricity systems are quite diverse, in all case studies the dominant technology choices, but also user expectations of safe, secure and reliable electricity supply, have developed in a similar way and continue to influence the development of legal and regulatory frameworks.

Demand for a sustainable electricity system, i.e. one that does not rely on greenhouse gas-intensive electricity generation, is of relatively recent origin. During the era of electrification, and to a large extent also the later liberalization of electricity markets, essential service objectives, centered on safe, secure and reliable supply of electricity, dominated policy and law making. The exploitation of the most readily available and cheapest fuel for electricity generation was therefore paramount. Dominant fuel sources reflect local resources and conditions. In the comparative case studies, the respective electricity systems developed around the availability of coal, gas, or nuclear power. Both, the physical elements of the systems, and their legal and regulatory frameworks reflect this reliance. They have accordingly developed generation and network capacity that emphasizes large centralized generation facilities connected to the major load centres. These conditions have informed the current, market-based, governance frameworks for electricity supply in Australia, Germany and the UK.

Liberalized markets have been introduced in all three case studies over the last decades to supply electricity. Legal frameworks for these markets have in common the legal separation of the different elements of electricity supply, the introduction of an independent regulator, and support decentralized decision-making by the different market actors. Yet, the difficulties in introducing renewable energy make visible to what degree these market frameworks support conventional patterns of generation. They also show that liberalized markets are not able to meet these new challenges without considerable reregulation. Legal barriers to renewable energy uptake can be identified especially in areas where renewable

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7 See, eg, original objectives in Germany’s Energy Industry Act 1935, However, cf Germany’s electricity market reform, which, because of a strong political movement around green issues, has integrated sustainability concerns into the liberalized market development; see ch 6, 1 B 1-3.
8 See chs 3, 5, 6 at I A, respectively.
energy does not ‘fit in’ with the existing system. Network regulation and planning therefore emerges as a major barrier for renewable energy in three comparative jurisdictions. Typically, this is the case because the existing network is physically often located away from the best renewable energy resources. For example, in Germany there is a lack of network infrastructure transporting renewably generated electricity from the windy North of the country to the big load centres in the South. However, the existing legal frameworks for investing in network infrastructure were not designed for large-scale projects connecting different parts of the country, but rather on business level efficiency and reliability considerations.\(^9\) To introduce a new, macro-economic focus, considerable legal reform had to be undertaken, culminating in the new role for the Federal Network Agency as network planner.\(^{10}\)

Beyond these specific challenges for renewable energy sit more general legal barriers to changing existing patterns of electricity provision and its regulation. Addressing new policy challenges, such as transitioning the electricity system to be more sustainable, depends on the ability of the state to reform legal and regulatory frameworks accordingly. The introduction of liberalized markets has deliberately provided for an arm’s length role of the state through the introduction of an independent regulator, and centrally through the unbundling and privatization of formerly state-owned electricity utilities. Direct intervention of the policy maker, as possible with a publicly owned utility, is therefore no longer an option. Meta-regulatory law, such as constitutional structures and the institutional design of the market determine how effectively new policy challenges can be integrated.

In the following, the main findings in regard to the success of renewable energy integration drawn from the analysis across case studies are synthesized. They show the role different levels of law play in exacerbating the lock-in of unsustainable generation patterns, and how legal change towards a decarbonized system can be targeted.

\(^9\) See *Energy Industry Act 2008* (Germany) § 12(3).
\(^{10}\) See in detail ch 6, II C 2 b.
Findings from the case studies suggest that the successful introduction of renewable energy into an established electricity system needs several interlinked legal conditions to overcome systemic path dependence. These include:

- the integration of sustainability concerns into the legal frameworks for the electricity market;
- legal reform to define and treat renewable energy generators as different to fossil fuel generators, both in regard to network access and in the wholesale market; and
- the introduction of a planning element into system development.

They will are addressed in turn below.

A Integration of Sustainability Concerns into the Legal Frameworks for the Electricity Market

One outstanding difference between the experience of supporting renewable energy in Australia on the one hand, and Germany and the UK on the other hand, has been the integration of energy policy objectives of competitive, secure and sustainable supply. This has enabled recognition of the specific challenges for renewable energy. The following sections will address firstly to what degree constitutional legal frameworks allow for such an integration and then secondly expand on some mechanisms that can be used to integrate different energy policy concerns of competitiveness and sustainability. This ‘meta-regulatory law’, has been identified in chapter 2 as critical in providing either a barrier to, or enabling renewable-friendly market frameworks.¹¹

¹¹ Aileen McHarg, ‘Regulating for Sustainable Electricity Market Outcomes in Britain: Asking the Law Question’ (2013) 30 Environmental and Planning Law Journal 289; and also see ch 2, III.
In chapter 2, constitutional law was identified as one of the factors that have shaped the ability of legal frameworks to respond to the needs of renewable energy. Constitutional law settings influence the institutional set up of the electricity market legal and regulatory frameworks. They also impact the ability to integrate different policy issues such as energy policy and climate policy in one legal framework.

In the federal states of Australia and Germany the delineation of responsibilities between the federal and the state level, impacts on the ability to make changes to integrate renewable energy into the electricity system. The differing constitutional competences for making laws in regard to energy and the environment have not only influenced the evolution of the respective electricity system, but also live on in the way the electricity system is regulated, its objectives and institutional frameworks.12

In Australia, the distribution of state and federal legislative powers hampers the development of a truly integrated energy policy. Different levels of government responsible for environmental issues on the one hand and energy markets on the other hand, make it difficult to integrate these concerns. Thus, while there is legislation supporting renewable energy on both state and federal levels,13 energy market regulatory frameworks rely on a cooperative intergovernmental arrangement, which does not require a constitutional head of power. These arrangements perpetuate the insulation of energy market development from environmental and especially climate change concerns, through flow on effects on institutional frameworks and regulatory objectives.

In Germany, on the other hand, constitutionally enshrined federal responsibility for both energy market development and climate change policy14 has enabled the development of electricity market legal frameworks integrating renewable energy concerns. In the UK, these issues have a potential impact following Scotland’s increasing devolution.15 The

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12 See next section 2 below.
13 The federal Renewable Energy Target, in detail at ch 3 III; and various feed-in-tariff schemes on state level.
14 Grundgesetz für die Bundesrepublik Deutschland [Basic Law of the Federal Republic of Germany] art 74(1) no 11 and no 24; see in detail ch 6, I C 1.
15 See ch 5, I C.
accompanying legislative and administrative devolution has the potential to provide similar challenges to the ability for integrating environmental and energy policy at least in Scotland. While currently electricity market reform has been reserved from devolvement, renewable energy policy in Scotland is already a responsibility of the Scottish parliament. How this split of responsibilities will influence the future development of the British electricity system\textsuperscript{16} remains to be seen.

2 Institutional Frameworks, Government Intervention and Regulatory Objectives

a Institutional Frameworks

Emerging from the case studies is the importance of institutional frameworks for electricity markets and their responsiveness to policy changes. Institutional change can help ‘reorienting regulatory regimes towards sustainable outcomes’.\textsuperscript{17} Here the impact of the institutional design of electricity market frameworks, especially the split in responsibility between policy making, regulating and market operation, has emerged as a decisive issue in regard to the ability of legal frameworks to integrate renewable energy concerns.

The model of an independent economic regulator is a ‘textbook’ element of electricity market liberalization,\textsuperscript{18} and is a common feature of all three case studies. The Australian Energy Regulator (AER), the Office for Gas and Electricity Markets (Ofgem) and the German Federal Network Agency are responsible for economic regulation of network businesses in Australia, the UK and Germany, respectively. The original model of market liberalization envisaged a clear split of economic regulation of networks, to be the responsibility of the economic regulator, while social and environmental regulation, was left to be undertaken by the government. In Australia, this split is regularly emphasized,\textsuperscript{19}

\textsuperscript{16} One integrated electricity system is operating across Scotland, England and Wales, ch 5, n 1.
\textsuperscript{17} McHarg, above n 11, 293.
\textsuperscript{18} For this and other textbook elements, see ch 2, III A.
and it reveals a conceptualization of a limited role of public intervention into the ‘private’ electricity market.\textsuperscript{20}

In contrast, legal reform in the UK and in Germany has introduced additional responsibilities for the regulators, beyond the core economic regulatory responsibilities. In Germany these powers include the coordination and oversight of network planning.\textsuperscript{21} In the UK, the regulator has considerable discretion in regard to implementing government environmental and social policies. Supported by wide statutory duties,\textsuperscript{22} this has meant that Ofgem has moved beyond a narrowly conceived role as an economic regulator. This is also reflected by its responsibility for administering the offshore electricity network\textsuperscript{23} and also the Renewables Obligation,\textsuperscript{24} both of which have clearly environmental objectives to support renewable energy.

In Australia, the national Council of Australian Governments (CoAG)-based institutional framework for the electricity market provides for a strict separation between the different roles of policy making, economic regulation, market operation and the development of the market rules.\textsuperscript{25} This split of regulatory responsibility leaves little scope for renewable-friendly market reform. The rule maker, the Australian Energy Market Commission (AEMC), relies on policy direction from a ministerial council, comprising ministers from all states and the federal government. A direct link of market development with state or federal climate or renewable energy policy can only be provided through this framework if all governments agree. The narrow conception of the role of the AEMC also means that it has much less discretion than Ofgem proactively to investigate rule changes for renewable energy. As will be discussed in the next section, this is exacerbated by the fact that the AEMC is bound in its reform proposals by the electricity market objective, which in Australia relies on a limited set of essential services and efficiency criteria.

\textsuperscript{20} See for the artificial public-private divide and its influence on legal research, ch 2, II B 3.
\textsuperscript{22} Electricity Act 1989 (UK) s 3A.
\textsuperscript{23} Ibid s 6c.
\textsuperscript{24} Ibid s 32.
\textsuperscript{25} In detail see ch 3, II B 1 a.
b Regulatory Objectives

Regulatory objectives serve the important function of directing and orientating the regulatory framework. As a formalized expression of the norms and purpose of the electricity system, they can support a move towards a more sustainable, renewable-friendly regulatory framework. McHarg, writing on the new sustainability objectives of the electricity market regulator in the UK, claims that the main impact of objectives is symbolic – it creates ‘an expectation of change’.26

In chapter 2 it was explained that electricity markets are regulatory instruments to achieve a public purpose – that of essential service provision. In all three case studies these objectives of safe, secure and reliable supply and the protection of consumer interest continue to be reflected in law.27

Efficiency, as an additional norm, has been the central target of the liberalization process, to be achieved through competitive wholesale and retail markets as well as by introducing efficiency into network regulation. Multiple objectives therefore are already a defining feature of electricity market legal frameworks. Understanding that contemporary electricity markets are not ‘real’ but hybrid markets,28 already trying to bundle numerous objectives, helps to illuminate this aspect. Both Germany and the UK have introduced additional objectives for electricity market regulators that address sustainability concerns. In the case of Germany, there is express recognition of the need to acknowledge renewable energy in the electricity market.29 In Australia, the National Electricity Objective (NEO) does not include such concerns, but instead is centred on reliability and efficiency concerns. The lack of a ‘green’ objective is not only preventing the economic regulator, the Australian Energy Regulator, taking into account environmental concerns when making regulatory

26 McHarg, above n 11, 289.
27 See Australia’s National Electricity Law s 7; the UK’s Electricity Act 1989 (UK) s 3A; and Germany’s Energy Industry Act 2005 § 1.
29 The German Energy Industry Act 2005 § 1(1), § 3 requires an ‘environmentally compatible’ supply of electricity, with renewable energy considered of special importance in this context. Electricity Act 1989 (UK) s 3A(5a), (ba), refers to a duty to carry out regulatory functions in a way that is best calculated ‘to contribute to the achievement of sustainable development’.
decisions, but is also limiting opportunities for policy development to support renewable energy. As the electricity market rule maker, the Australian Energy Market Commission, has to undertake rule changes and also market reviews with regard to the NEO. The AEMC cannot consider rule changes or the adaptation of market frameworks that are not in the interest of either reliability or efficiency gains. To change this, the NEO would need to be updated – a task that would require the concerted efforts of all governments, because of the particular institutional design of the legal framework for the Australian electricity market.

c Avenues for Government Intervention

In this thesis, the importance of a mechanism connecting government policy and ongoing development of regulatory frameworks has become apparent. Unlike the more general regulatory objectives discussed above, these explicit mechanisms provide additional and flexible means by which changing energy policy goals can be achieved. While regulatory objectives open the possibility for regulators to take into account sustainability, or even specific renewable energy objectives in their decision-making, further avenues for governmental intervention into the regulatory process can target specific regulatory changes to support renewable energy.

Especially in the UK, guidances, plans and policy statements have an important function as ‘commitment forcing mechanisms’ for the government. Social and environmental guidances, recently replaced by the statutory strategy and policy statements, provide this link between changing energy policy objectives and electricity market regulatory frameworks. These mechanisms oblige the regulator to carry out their functions in a manner that can achieve policy outcomes defined in the policy. Specific regulatory interventions, such as a new framework for incentive regulation, renewable-friendly transmission access and charging arrangements, and a range of instruments to achieve

30 National Electricity (South Australia) Act 1996 (SA) s 88.
31 McHarg, above n 11, 300.
32 Energy Act 2013 (UK) pt 5.
33 Ibid s 132.
renewable energy investment, have subsequently been developed by the regulator. While argued to be ‘politicking the regulatory process’, these guidances have an important role in bridging the divide between government policy and market regulation. It allows for dynamic development, responding to new policy challenges, instead of a stagnant perception of electricity market regulation.

In Germany, the role of the regulator, the Federal Network Agency, is more limited. Instead, in Germany, the government has implemented its ambitious energy transition policies by legislating directly for renewable energy. The reason for this pattern may be that there is little experience with independent regulators in Germany. Indeed, the Agency, only introduced in 2005 after long political struggles, is highly unusual in Germany in its degree of independence. Secondly, the German Constitution requires the parliament to define the ‘content, purpose and scope’ of legislative powers which are delegated to the executive. Where regulatory powers have been expanded, for example in regard to network planning, they remain clearly defined. In common law countries, on the other hand, passing ‘skeleton legislation’, with broadly defined delegated legislation that allows the executive wide powers, is a normal occurrence.

In comparison, Australia’s NEM is arguably particularly well insulated from change. Due to its reliance on an executive governance framework, there is no instrument for direct governmental influence on electricity market development. Instead, policy-making relies on an intergovernmental process, requiring all state and the federal government to agree on changes. While this has led to a high stability of electricity market legal frameworks, it is also very static and resistant to change.

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36 Grundgesetz für die Bundesrepublik Deutschland [Basic Law of the Federal Republic of Germany] art 80.
37 Below at I C.
39 Also below at III.
B Regulating for Renewable Generation

A second set of findings from the thesis show that successful renewable energy integration requires law to define and treat renewable energy generators in the electricity market as different to fossil fuel generators. In both Germany and the UK, electricity market regulation recognizes renewable energy generation as different to conventional fossil fuel-based generation. This takes account of the fact that market frameworks support the existing patterns of electricity supply, because they can usually achieve the market objectives of reliable supply more efficiently. The case studies have shown how especially network access and investment rules in the NEM support large-scale centralized electricity supply. That is due to the generators’ responsibility to pay for access to networks. While this rule applies to all generators, it is renewable energy that is especially disadvantaged, because resources are often located remote to existing networks. In Germany and the UK network development, and access has therefore been an increasing focus of reform. Indeed, one finding of this thesis is a shift of regulatory attention from financial support for renewable generators, such as the target schemes or feed-in-tariffs, to network access rules to support renewable generators specifically. This is clearly a move to address the inherent disadvantage of renewable energy in a system designed for fossil fuel-based generation.

In the UK, until 2007, no distinction was made in the legal and regulatory frameworks of the electricity market between renewable and other generators. Since then, an increasing degree of positive discrimination is taking place in regard to renewable energy. Network regulation regimes for renewable generators are increasingly separate from those for conventionally generated energy. For example, a review of transmission charging arrangement for remote renewable generation has led to the introduction of more favourable connection charging.

41 See ch 5, II C 2.
The law initially provided entirely separate regulatory regimes for renewable energy in electricity supply in Germany. Since 2012, renewable energy has been able to be traded in the electricity market and further wholesale market integration has been the subject of recent reforms of the *Renewable Energy Act*.\(^{43}\) However, network regulation for renewable energy remains separate. *Lex specialis* network rules for renewable energy will remain a permanent feature of the German electricity system, which is rapidly scaling up renewable energy. Priority access for renewable generators to networks and a requirement for network operators to augment networks if this is necessary to connect renewable energy generators, have accompanied the renewable feed-in-tariff Germany provides for its renewable generators.

In Australia, no such *lex specialis* rules exist, and the insulation of electricity market development from governmental sustainability goals has prevented changes, similar to those occurring in Germany and the UK. The failure to introduce burden-sharing arrangements for extending network infrastructure, where necessary for remote generation,\(^{44}\) demonstrates this difficulty.

**C Planning Electricity System Development**

While much of the market reform for renewable energy has been targeted at supporting the participation of single generation plants in the electricity market, these are increasingly accompanied by new approaches for whole-of-system planning. There is little doubt that system planning is one aspect of electricity system governance that has substantially changed under a liberalized market system. Under the vertically integrated utility model, which dominated before liberalization, planning to expand the system, especially generation and transmission planning, were either undertaken jointly or transmission

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\(^{44}\) Ch 3, II B 2 b on Scale Efficient Network Extension rules.
planning followed generation planning. Following liberalization, the unbundling of the different functions involved in the electricity system has clearly led to a disjuncture between generation and transmission investment. Because the investment in renewable energy relies more than other generation technologies on location, the transmission investment problem has become apparent in regard to renewable energy. This problem has been a focus of considerable reform moves in the UK and Germany. Successful introduction of a high percentage of renewable energy into the electricity system requires substantial generation and network planning. This is a function that liberalized markets, which rely on multiple corporatized or privatized actors to achieve their objectives, cannot provide without further extensive regulation. Centralized planning therefore needs to accompany individual plant support.

In Germany, the 2012 reforms introduced new strategic planning regulation that allowed for whole of nation network planning. Ultimately the new provisions in §§ 12a ff of the Energy Industry Act 2005 facilitate integration of transmission network planning by the various network operators, both, in regard to each other’s plans and in regard to federal policy and European level network planning. Investment scenarios agreed with the regulator become binding for the network operators. The legal framework for the development of the offshore wind transmission network provides a further example of centralized network planning. Unlike the UK approach to offshore wind planning, which provides for connecting the individual plant to the coast, in Germany, planning of the offshore network and offshore generation is more fully integrated.

In the UK, the new RIIO arrangements for network regulation have opened up opportunities to reward strategic network planning via the strategic wider works agreement. Further strategic investment opportunities to facilitate renewable energy development are provided through specific regulatory instruments, such as the Transmissions Investment

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46 See Energy Industry Act 2005 (Germany) § 17(2a).
47 Ibid.
48 See ch 5, II C 2 a.
Incentives Framework. The UK regulation seeks to incentivize and reward strategic network development in regard to renewable energy needs. Importantly, these new arrangements have been developed following a guidance on social and economic issues. This shows how mechanisms of government intervention can provide for a timely development of the regulatory frameworks in response to changing government policy.

In Australia, strategic network planning has been introduced, albeit as part of the ongoing commitment to build a national market. While this is not specifically targeted at providing opportunities for renewable energy, AEMO has used the planning instruments of the National Transmission Network Development Plan, as well as targeted scenario modelling, to identify renewable energy opportunities. However, this proactive identification of opportunities by AEMO is only an information tool for network investment opportunities. It does not bind Transmission Network Operators, and as such is not an instrument of strategic network investment for renewable energy.

As will be indicated in the potential lessons for Australia, without reforms addressing these issues, Australia will continue its path-dependent development of network infrastructure that supports fossil fuel generation.

II Emerging Themes of Regulatory Change

Several themes of regulatory change around the introduction of renewable energy into liberalized electricity market frameworks emerge from the efforts of the UK and Germany. They have some albeit limited parallels in Australia. These initiatives include a reengagement of the state in the electricity sector, especially in planning and guiding network infrastructure development, together with a redefinition of the role for the market. Centrally, the addition of a new objective for electricity supply, that of decarbonization, is

49 Ibid.
50 See also above at I A 2c.
51 The latest being the National Transmission Development Plan (2013).
52 See, eg, Australian Energy Market Operator, ‘100 percent Renewables Study: Modelling Outcomes’ (July 2013).
reflected in the regulatory space in both case studies. Accompanying this development is an increasing willingness to provide for specific regulation to support renewable energy, separate from that applying to other electricity generators. Significant shifts in regulatory power and changing functional roles for actors in regulatory space are associated with this development.

A Reengaging the State and Redirecting the Market

A common theme of regulatory change in the UK and German case studies was the reengagement of the state in areas that had formerly been decided by market participants, such as network investment and access decisions. As explained in chapter 2, the theoretical basis of electricity market liberalization relied on a retreat of the state, not only from ‘rowing’ i.e., directly providing electricity through state-owned utilities, but also towards a clearly defined and narrow role for ‘steering’.53

Liberalized electricity markets with their unbundled, largely privatized, or at least corporatized actors were supposed to deliver the same outcomes as the formerly vertically integrated system more efficiently.54 However, the experiences with electricity market liberalization in the case studies in this thesis show that this trust in markets to deliver all functions of electricity supply has been challenged by the need to decarbonize electricity supply.

In a liberalized market the link between energy policy objectives and the ability for ongoing ‘steering’ to achieve these objectives, has been seriously diminished, because the market frameworks have been designed to be ‘at arms length’ from day to day politics. To overcome this disjuncture between changing expectations on the electricity system and a market-based governance system that has been deliberately separated from public influence, new forms of reengagement of the state have to be found. This does not mean a

53 See ch 2, II B 1.
move back towards renationalization of electricity supply,\textsuperscript{55} nor signal a return to the formerly vertically integrated electricity utilities, even though a supposed return to a planned economy has drawn criticism of both, the German and the UK energy market reforms.\textsuperscript{56} Instead, an increasingly centralized direction of both network and wholesale market development has led to a reintroduction of more governmental control and direction in order to achieve public policy goals. This development has been enabled by widening objectives and responsibilities for public agencies, especially the regulators. Examples of these developments can be found in the use of guidance powers by the government in the UK and the changing and expanding role of regulators in regard to network planning in Germany and the UK, but also, to a lesser extent, in Australia. In short, a ‘more active role for government in shaping industry outcomes’\textsuperscript{57} is required to achieve renewable energy transitions.

This changing role of the state has been accompanied by a more directed role for market participants. Thus, in Germany it is the renewable energy generators’ location decisions that trigger investment decision-making by the network operator. The operator is responsible and liable for updating grid infrastructure according to renewable energy needs. Decision-making spaces of market participants have therefore narrowed. In summary, in Germany and the UK clear shifts of the ‘allocation of roles between rule makers, enforcers and bearers of sectional interests’\textsuperscript{58} can be perceived.

\textbf{B Defining Renewable Energy Generators as a Separate Actor in Regulatory Space}

A second feature of the changed regulatory spaces for electricity markets, is a definition of renewable energy generators as distinctly separate actors in the regulatory space. While at

\textsuperscript{55} Note, however, the potential for remunicipalization of German electricity distribution networks, see ch 2, I C 2. While this has generated a lot of press attention in Germany, it is an expression of a specific constitutional responsibility municipalities have for essential services.

\textsuperscript{56} For example the UK reforms have been called a ‘gosplan approach’ by Dieter Helm, ‘EMR and the Energy Bill’ (Commentary, 27 June 2012); similar statements have been made for Germany; Gunther Kühne, ‘Regulating the Extension of Electricity Networks: A German Perspective’ in Martha M Roggenkamp et al (eds), \textit{Energy Networks and the Law} (Oxford University Press, 2012) 371, 393.

\textsuperscript{57} McHarg, above n 11, 289.

\textsuperscript{58} Hancher and Moran, above n 3, 276.
the outset liberalized market frameworks were designed to be technology-neutral, and therefore made no distinction between different forms of electricity generation, the system-inherent disadvantages for renewable generators have necessitated increasingly separate regulation for this group. In the regulatory space, renewable energy generators have become separate actors with different rights and responsibilities to those of other generators. This position remains a dynamic one. For example in Germany renewable generators were, until recently, not participants in the wholesale electricity market. Yet, as renewable generators have become increasingly competitive in the wholesale market, they have moved towards full market integration. On the other hand, network access and charging rules remain separate in Germany and are increasingly separately defined in the UK, thus carving out a separate role in the regulatory space for renewable generators. It is likely that as electricity networks change and adapt to a higher volume of renewable generation this distinction between renewable generators, and fossil fuel generators, will no longer be necessary.

III Lessons for Australia

This thesis has addressed a topic that, especially in Australia, has been given little attention from legal academics. As shown in chapter 1, legal research around renewable energy regulation largely concentrates on renewable energy support instruments, their design and their respective merits. Instruments such as feed-in-tariffs or renewable energy target schemes are important for assuring competitiveness of renewable energy generators in a liberalized wholesale electricity market. They have been used extensively in Australia as incentives for renewable energy investment. The research in this thesis demonstrates, however, that such mechanisms have to be accompanied by specific changes to the electricity market frameworks, especially in regard to allowing access to networks by individual plants, in order to transition effectively towards a decarbonized electricity system. Additionally and centrally, provisions for whole-of-system planning are required to

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59 Ch 6, II C 2 a.
60 At III A.
coordinate the investment in generation and the accompanying network investment for renewable energy. Fundamentally, energy transition towards a decarbonized electricity system requires not only a departure from the current path of fossil fuel-dependent electricity supply, but also the choice of a new path. The liberalized market legal and regulatory framework in Australia, while succeeding in delivering electricity reliably and efficiently, is not designed to do so sustainably.

It is acknowledged here that in the short-term the political climate is not conducive to promotion of electricity market reform to decarbonize Australia’s electricity system. The current federal government has shown a high willingness to roll back support for not only for renewable energy, but also for climate mitigation measures more generally. Yet, as the world prepares for agreement on new and binding commitments for climate mitigation by the end of 2015, the challenge of decarbonizing the Australian electricity system will resurface, even if the current domestic political climate is not favourable.

Lessons for Australia are therefore presented below on a sliding scale. They provide an indication of where legal reform to support renewable should be undertaken, but also where legal reform may be perhaps the most politically feasible.

On one level the findings in the thesis acknowledge the degree to which renewable energy can be supported within a liberalized electricity market. Australia’s Renewable Energy Target, if left unchanged, is on track to provide for at least 20 per cent of Australian electricity use to come from renewable energy generation by 2020. This reflects the excellent physical resources for renewable energy in Australia. Yet, moving considerably beyond this 20 per cent level provides the real challenge to the existing system, and its market-based legal and regulatory frameworks. Both the federal government and the Australian Energy Market Commission (AEMC) have consistently emphasized that the electricity market as such does not need to be adapted to support renewable energy. By

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61 See also ch 1, introduction and ch 3.
63 Possibly more because of sinking electricity demand, see Mike Sandiford, ‘Another Summer in the NEM’ (The Conversation, 17 March 2014).
contrast, given the evidence from Germany and the UK, which have changed their market frameworks to support renewable energy, Australia needs to reconsider this approach.

The research in this thesis clearly points towards uniquely Australian barriers for change in comparison to the UK and Germany. Even given the current lack of political commitment to decarbonization, the National Electricity Market (NEM) is particularly resistant to change. Integration of climate and energy market policy development is prevented on several interlinked levels. Not only is there no direct mechanism for government intervention linking federal climate change policy to national market development, but also the institutional frameworks for the NEM have effectively removed electricity market legal frameworks from parliamentary scrutiny. Environmental objectives for national market development, which would allow the rule maker, AEMC, to take into account the needs of renewable energy in the rule change process do not exist. Due to the special national governance regime that is in place this type of change is unlikely to be introduced without significant commitment by governments to a stronger support for the decarbonization of the electricity system.

One possibility for overcoming this continued lock-in of old patterns of electricity supply would be a concerted bottom-up push by the states through the CoAG regime. This could help to overcome the currently agreed upon separation of electricity market frameworks from climate change concerns. Given the ongoing political influence of mining and incumbent electricity industry interests in state and federal politics, this option currently seems remote. Alternatively, a take-over of electricity market development by the federal government could be envisioned. This position is a theoretical possibility through the corporation’s power in the constitution, but is unlikely to be taken up given the federal-state dynamics around co-operative federalism. This would also require a federal

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65 *Australian Constitution* s 51 (xx).

66 Cf the developments in the water law. After an unsuccessful history of intergovernmental cooperation, the federal government legislated for a federal framework with the *Water Act 2007* (Cth). Section 9 of the Act lists the multiple heads of power that this legislation has relied upon. However, unlike in the electricity sector, there was high dissatisfaction with the former cooperative approach to water management. For details, see, eg,
government committed to decarbonizing the electricity sector, which is currently not the case. However, a global push towards renewable energy, together with continuing climate change impacts in Australia, may lead CoAG or the federal government independently to reconsider their options in the longer term.

Keeping in mind these constraints, insights from the other case studies show that moving to a high renewable energy scenario in a timely fashion requires NEM legal frameworks to introduce targeted regulation to support renewable energy. This would not only include an environmental or sustainability objective for the electricity market, but also changes to find national solutions to renewable energy friendly network access, investment and planning reform.

The examples from the UK and Germany, summarized in the findings above at I, provide a starting point for a reform agenda for Australia. As regulatory regimes for electricity supply are deeply embedded into infrastructure and the institutional context in each country, policy solutions are not easily transferable. Already the experiences in only two countries, Germany and the UK, show that, while policy challenges of increased need for system-wide planning and support for network connections for renewable generators are similar, legal solutions differ in detail. This is due to the specific challenges of the wider legal system, as well as the specific design of the electricity markets in each country. Electricity system development and the attendant changes to legal and regulatory frameworks will ultimately require a local solution.

Some potential starting points for legal reform to enhance renewable energy integration in electricity generation have been discussed in this thesis. These include on an institutional, meta-regulatory level:


While specific agreements on renewable energy are few in the international climate change law, Steven Ferrey, 'The Failure of International Global Warming Regulation to Promote Needed Renewable Energy' (2010) 37 Boston College Environmental Affairs Law Review 67; some initiatives do exist, such as the International Conference for Renewable Energies, ‘Political Declaration’ (Declaration, 4 June 2004).

- a reform of the national electricity objective to include a sustainability objective; and
- the introduction of a mechanism to link environmental and climate policies with electricity market development. The UK’s statutory strategy and policy statements could provide one potential model for this much needed link.

On a more instrumental level, several measures could support renewable-friendly network investment:

- a burden-sharing arrangement for network investment such as the one envisioned for Scale Efficient Network Extensions, which would enable access to areas with excellent renewable resources, but which are remote from the grid; and
- a stronger role for AEMO as transmission network planner, in order to overcome the state-centricity of network businesses and to support a more interconnected and robust electricity network.

Ultimately, though, the choice of a new path for the electricity system is required. Liberalized electricity markets inherently further the existing generation and network profile, therefore choosing a new path is a process, which will require considerable steering that the market alone cannot provide. Germany and the UK have chosen to regulate for an energy transition, which takes account of the centrality of electricity use to our way of life. Thus, these reforms do not change the basic essential services norms of the electricity system, but instead add an additional sustainability norm. This normative standard the reforms seek to achieve through targeted regulation for renewables in their electricity systems.

For Australia, however, in the long term, different scenarios may be more suited for its unique settlement patterns and its large distances. These off-grid and distributed scenarios, which do not rely on large-scale centralized electricity supply, are discussed as a potential area for future research below.
IV Future Research Directions

This thesis has investigated how electricity markets in Australia need to adapt for renewable energy, drawing on lessons from comparable reforms in Germany and the UK. It seeks to provide one piece of much-needed research into how Australia can move toward a low carbon electricity system. It accompanies the vibrant technology and economic research already undertaken by researchers throughout Australia – acknowledging that energy transitions will require interdisciplinary research.

On a practical level it provides the basis for a concrete rethinking of how an Australian energy transition might proceed. Adapting network and wholesale market regulation in a way that supports renewable energy is just one way of supporting this energy transition. Lowering electricity demand through efficiency measures and smart grid developments, as well as a more stringent regulation of emissions-intensive electricity supply will also have an important role to play. The design of these measures and their interaction with renewable energy support provide important areas for future research. Finally, energy storage technology has also emerged as major ‘game changer’ for a decarbonization effort. Battery storage, which has made great technical advances in the last decade, can provide the technology necessary to overcome the intermittency of some of the most important renewable energy sources, wind and solar. The assessment of energy storage interaction with electricity market frameworks is in its infancy, and it will be a crucial part of future research.

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research. The analytical framework developed in this thesis can provide a starting point for the analysis of the regulatory challenges for introducing this type of new technology into the electricity market; hopefully in concert with other reforms that are needed to enhance renewable energy integration.

Not considered in this thesis, but of paramount importance to such future research, is also the question of how renewable energy will interact with questions of energy security. Especially in the UK, an aggressive push towards renewable energy has brought these questions to the fore. As electricity prices in Australia rise, energy poverty is becoming an important policy challenge. The generation and network investment necessary to support very high percentages of renewable energy will have to be balanced with the need for affordable electricity, given that electricity is characterized as essential service.

Reliability and secure supply is also challenged, at least in the short term, by the integration of renewable energy into the electricity system. Introducing more and more renewable energy to the electricity system impacts the stability of the wholesale electricity market and thereby the future investment decision-making by all generators. Renewable energy generators have very low running costs and can therefore bid at very low costs into the wholesale electricity market. As they get dispatched first, this leads to a drop of wholesale market prices. This, in turn, makes fossil fuel generators, which have fuel costs and therefore higher running costs, increasingly uneconomic. As these generators may make commercial decisions to shut down their plants under these circumstances, energy system security has to be secured by different means.

In Germany, recent reforms have introduced a new section 13a to the Energy Industry Act 2005, which requires generators to inform the transmission network operator and the

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75 See also ch 7, IV.
79 Ibid.
Federal Network Agency in advance of any plans to decommission a plant. Significantly, system-relevant generators can be forced by the Federal Network Agency to remain operational as an emergency back-up facility in case system stabilization is needed. The introduction of capacity markets, which requires a central authority to forecast and provide a bidding process for future capacity, is another mechanism that will be introduced in the UK, and is under discussion in Germany.\textsuperscript{80} Several capacity markets operate in the US,\textsuperscript{81} and their experiences can further feed into the debate about how to best ensure stable electricity supply in a high renewables scenario that have a penetration of renewable energy beyond the 20 per cent envisioned in the RET. In Australia, the current fall in electricity demand, and falling wholesale electricity market prices may lead to a situation where capacity markets will be required to ensure system stability. This, of course, necessitates considerable forward planning by public authorities, anticipating future demand and attracting necessary investment to meet this demand. Careful design of law and regulation for capacity markets, while still supporting renewable energy, will require additional legal research. The highly regulated capacity markets for electricity further resonate with a more directive role for government in the regulatory space.

Going beyond accommodating renewable energy within the current electricity market framework, future legal research will need to inform efforts aimed at fundamentally reconceiving the way Australia uses and produces energy. For Australia, with its long distances and lack of intermeshed networks, a shift away from centralized electricity generation towards off-grid production, backed by energy efficiency measures, is increasingly being discussed.\textsuperscript{82} The massive uptake of solar rooftop installations points towards the technical feasibility of these developments. With rising electricity prices, becoming self-sufficient ‘prosumers’, i.e., producers and consumers of electricity, becomes

\textsuperscript{80} See, eg, \textit{Energy Act 2013} (UK) ch 3; and a recent green paper by the German government, Bundesministerium für Wirtschaft und Energie [Federal Ministry for Economic Affairs and Energy], ‘Strommarkt für die Energiewende’ [An Electricity Market for Energy Transition] (November 2014).

\textsuperscript{81} One example is PJM Interconnected, which operates a wholesale electricity market across 13 states in the North-East of the United States, see <www.pjm.com>.

increasingly attractive to formerly passive electricity consumers.\textsuperscript{83} Here it should be pointed out that the legal barriers to change identified above apply, even more so, in regard to a major reconception of the entire electricity system.

However, unlike the reforms discussed in this thesis, which do not challenge the underlying commitment to electricity as an essential service, these new ‘distributed’ approaches have the potential to reconceive fundamentally the relationship between the state and the citizen in regard to electricity supply. As citizens increasingly claim the right to produce their own electricity, there is a question of whether the state will, in response, withdraw from its essential service responsibilities. Legal research into changing norms and conceptions of state responsibility for electricity provision will need to accompany this process.

This thesis has shown how liberalized markets have been enabled by legal frameworks that emphasize decentralized decision-making and efficiency gains. They have thereby participated in locking-in outdated generation and network profiles. The examples of Germany and the UK show that overcoming these path-dependent patterns will require considerable government intervention. Successful transformation of electricity systems needs to address not only the instrumental level of renewable energy regulation, but also the institutional level of the electricity market itself. A reconception of the architecture and the general principles of the regulatory space of the electricity system, as well as the rights and responsibilities of actors are necessary to achieve this outcome.

The thesis provides a foundation for considering in which areas of regulation reform will be necessary, but it has also demonstrated the barriers that the wider legal system provides for reform.

Liberalized markets have, over the last several decades, been the preferred tool for delivering electricity reliably and efficiently in most developed countries. In Australia and elsewhere they have done so relying on fossil fuels. New challenges, such as climate change, now require a reconception of the way we use and produce energy. Understanding

\textsuperscript{83} Haines and McConnell, above n 83.
the opportunities and barriers that law provides in this context will be crucial for a successful and sustainable electricity transition.


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