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The development of energy law in the 21st century: a paradigm shift?

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ABSTRACT

To date there have been limited attempts by energy law scholars to ensure that their research impacts upon legal practice and in particular upon the decision-making of judges. One of the aims of this article is to address this issue and call for the need of energy law scholars to re-engage with what their sub-discipline of law is and also to provide new scholarship that can bridge the gap between academics and professionals in energy law. This article aims to begin a wider movement across the energy law field of scholars with the aim of initiating and advancing the aim and direction of energy law. A central aim of this article is to begin a debate on whether a paradigm shift is needed in energy law. As part of this new initiative, three theoretical frameworks are advanced and these are as follows: (i) The Energy Law and Policy Triangle; (ii) The Theory of Change in Energy Law; and (iii) The Power of Energy Law: Targeted Legislation. These theories outlined in this article aim to highlight some of what scholars and practitioners should focus on, and present them with thinking-tools or theories of how to do so. In order to finalize the emergence of energy law as its own sub-discipline of law it needs its own theory to evolve and grow as other sub-disciplines of law do both in theory and in practice.

1. INTRODUCTION

Energy law and policy plays a vital role in the energy sector in the 21st century. It aims to ensure that societies meet their energy targets whether that is about the provision of increased energy security and/or economic benefits, and/or environmental goals. For many years, energy law has been developed to meet these societal aims. Yet, there has been little reflection by the legal community into aiming to understand energy law itself, and what it should aspire to.

Indeed, it is a noted issue according to Judge Posner in the USA, that there is a disconnect between legal practice and academic debate in legal scholarship in general. This article argues that this is the case in energy law academic scholarship.[1] To date there has been limited attempts by energy law scholars to ensure that their research impacts upon legal practice and in particular upon the decision-making of judges. One of the aims of this article is to address this issue and call for the need of energy law scholars to re-engage with what their sub-discipline of law is and also to provide new scholarship that can bridge the gap between academics and professionals in energy law.

The aim of the article is also to reach out to legal practitioners, policymakers and other disciplines. In order to achieve this, it is necessary for energy law to have frameworks, systems and theories for how an

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1 RA Posner, *How Judges Think* (Harvard University Press 2008).

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energy law academic or professional 'should' think. These practitioners and other interdisciplinary scholars should be able to engage with energy law scholarship at the first instance and then enable the growth of energy law as a discipline through their additional perspective while also enriching the debate around what energy law should be.

Energy law should complement one's understanding as easily as other theories or frameworks that exist from other disciplines. For example, in the study of engineering in for energy sector there is a focus on the energy life cycle and how the infrastructure at each stage of the cycle should be complimentary. In biology, the system of the body is studied and energy production by the body is assessed through analysing Krebs life cycle. While Issac Newton's third law of motion states that for every action there is an equal but opposite reaction. These approaches to thinking about energy are easily transferable to interdisciplinary researchers and to date this has been lacking in energy law scholarship. This article aims to address this gap and provide theories or frameworks for 'thinking' about energy law and ones that are easily transferable to other disciplines.

Periodically, there has been some academic debate in the literature as to what energy law should focus on as a discipline; however, this has been very limited.[2] This article aims to begin a wider movement across the energy law field of scholars with the aim of initiating and advancing the aim and direction of energy law. In addition, as mentioned earlier there is the need also to reconnect academics and legal practitioners (including Judges) with the key academic debates in energy law. In essence therefore, what this article is really aiming to begin is a debate on whether a paradigm shift is needed in energy law.[3]

The key goal of this article is its intention to mark the beginning of the discussion of whether it is necessary to have a paradigm shift in energy law. In order to begin the debate, the article focuses on first discussing briefly what is energy law[4]. Then the discussion moves to focusing on what the authors describe as three theoretical perspectives or new frameworks—and provide a contribution shifting our current paradigm of the thinking in energy law—that can be used to determine what good energy law should be, and these are as follows:

- The Energy Law and Policy Triangle
- The Theory of Change in Energy Law
- The Power of Energy Law: Targeted Legislation

The conclusion then analyses briefly the outlook for energy law in the future and also the future direction of this scholarship.

This article does not intend to answer the question of what energy law should be. Its focus is to advance what are the issues that need to be considered in order to state what good energy law should consider. In essence, the articles present a number of theoretical perspectives that should be considered to enable scholars to identify what good energy law should include. Energy law for many years has adopted theoretical perspectives from other sub-disciplines of law and other disciplines themselves (in particular, economics). There is a need as a discipline develops to develop its own theories that aim to be more inclusive and offer more scope for debate. Energy law has to move beyond being focused on an economics-centred approach and consider solutions to some problems that do not have economic decision-making as their basis. As society advances,

2 For example, 'International Energy Law as an Academic Discipline' in Paul Babie and Paul Leadbeter (eds), *Law as Change: Engaging with the Life and Scholarship of Adrian Bradbrook* (University of Adelaide Press 2014) 223–55 or Adrian Bradbrook, 'Energy Law as an Academic Discipline' (1996) 14 J Energy Nat Res L 193.

3 To read more on 'paradigm-shift' please read Thomas Kuhn's classic text on the issue: T Kuhn, *The Structure of Scientific Revolutions* (University of Chicago Press 1962).

4 This article in presenting three new frameworks about energy law builds on earlier views expressed in the author's works and in particular: Heffron. R. J. 2015. Energy Law in Ireland. Roundhall, Thomson Reuters: Dublin, Ireland; and Heffron, R. J. 2015. Energy Law: An Introduction. Springer: Heidelberg, Germany.

and as the energy sector develops, energy law scholars need to question whether we need to have a paradigm shift in terms of the development of energy law.

2. WHAT IS ENERGY LAW?

Energy law concerns the management of energy resources. This is a simple definition, and disguises that it is arguably one of the more complex areas of law. It demands that a scholar in the area engage with other disciplines to some degree, such as politics, economics, geography, environmental sciences and engineering.[5]

In 2015, energy law is still considered a new area (sub-discipline) of law.[6] It appears not to have the established academic literature base of other legal areas. However, this is to misunderstand what energy law is. It has been in existence in different forms for over a century. In the 1800s and early 1900s, there was legislation to manage energy sectors such as coal and oil. These energy sources are known as fossil fuels (along with gas) and form one of the two main categories of energy sources. The other category is low-carbon energy sources which have been in development since after the Second World War (1945) and consist of nuclear energy, hydropower, wind, solar, biomass and several other minor renewable energy sources.

Energy law has now come to the fore. It is beginning to be viewed with a holistic approach today whereas in the past it was divided into many parts—in general in relation to each type of energy source.[7] There is a realization in the 21st century of the fundamental role that the energy sector plays in the economy of a country. It is an important sector for employment, future economic development and the personal health of a nation's citizens. In particular, recently, it has been pushed high up the political agenda with the advent of climate change and policies concerning energy security. For example, the impacts of Russia's ability to affect gas prices in the majority of the European Union (EU) have highlighted the importance of the energy sector at both EU and Member State level. Further, politicians can be credited with pushing the agenda, in part, because high energy prices—mainly electricity prices—have an influence on election outcomes. In addition, at an international level, there will over the years to come be an impact from the Paris COP21 2015 negotiations.[8]

It is no surprise therefore that, as a legal speciality, energy law has returned to prominence. The area is now growing at an accelerated pace, with journals, textbooks and practitioner books all appearing in numbers. Commercially, there is widespread growth of energy law divisions in the majority of medium to large legal practices. Legal training in energy law has also increased, with a proliferation of continuing professional development (CPD) summer courses and dedicated Masters courses, and a number of undergraduate law programmes in the EU and USA have introduced it as a core and optional subject.

The EU itself represents an example of the subject status of energy law. The EU was founded upon two treaties—the European Coal and Steel Community Treaty and the Euratom Treaty—that were used to manage the natural resources and energy assets of countries within the initial group of Member States. Indeed, the initial aim was to prevent—or at least limit—the possibility of future outbreaks of war by having a common management scheme for energy resources and assets. The two treaties that formed the EU—with one of these, the EURATOM Treaty, unchanged since—are one reason why specific energy law did not appear in individual Member States until the last decade.

Energy law development in the future

The next decade will be particularly important for the energy sector globally. The energy infrastructure built and policy concerning future energy infrastructure development during this period will determine whether many countries will meet the climate change targets that they set for the period 2020–2050 (considering the

5 For example, this is visible in the AIPN virtual university project, which also includes legal, commercial and engineering issues.

6 RJ Heffron, *Energy Law: An Introduction* (Springer 2015).

7 RJ Heffron *Energy Law* (Roundhall, Thomson Reuters 2015).

8 2015 Paris Climate Conference—United Nations Framework Convention on Climate Change—UNFCCC Conference of Parties (COP) 21 Paris.

lifespan of new energy infrastructure is generally 25 years plus), and they will set in place the physical and legal frameworks within which energy policy will have to function for many years.

A vital purpose of current energy law is to encourage, incentivise and/or initiate new energy infrastructure. For example, nearly a decade ago the USA enacted the Energy Policy Act 2005. The key aim of this piece of legislation was to initiate several hundred billion dollars worth of new energy infrastructure projects. While initially it was slow in its application, the Act has since 2012 resulted in almost $30 billion of energy projects beginning construction—in particular, the nuclear energy projects in the states of Georgia and South Carolina.

Similarly, the UK government declared that the goal of its Energy Act 2013 was to initiate £110 billion of new energy infrastructure.[9] Across Europe, many countries plan to follow the UK approach to energy law in encouraging investment in energy infrastructure, and as such developments in energy law will be of considerable value and interest to policymakers, practising lawyers and scholars across Europe. The development of energy infrastructure is seen as not only a method of increasing economic growth through spending, but also a key means of achieving future economic growth through developing energy infrastructure supply chains and exportable expertise and technology in the sector.

3. THE ENERGY LAW AND POLICY TRIANGLE

It is hard to separate the study of energy law from energy policy. In many ways they are intertwined. The first of the three frameworks (or theories) in energy law and policy that this text offers can be seen simplistically in Figure 1. Here this is referred to as the Energy Law and Policy Triangle and it is also known in other cases as the Energy Trilemma;[10] either name can be used in the literature. However, it is advanced that there is a distinction, as the challenge of balancing the Energy Trilemma can actually be achieved through energy law and policy; indeed, the World Energy Council question how can the trilemma be balanced and how does society resolve it.[11]

In considering the Energy Law and Policy Triangle and the problem of the Energy Trilemma, lawyers (both academic and practitioner) should see this as the 'lens' with which they should look at their discipline. For example, should some new environmental policy happen, they should automatically consider how this may change things politically and economically. In essence, given any change in each of the three points of the triangle—economics, politics and the environment—one can apply Issac Newtons's third law of motion which states that for every action there is an equal but opposite reaction. No one 'policy action' will have only a positive outcome and it is important to consider the potential negative outcomes of policy actions too.

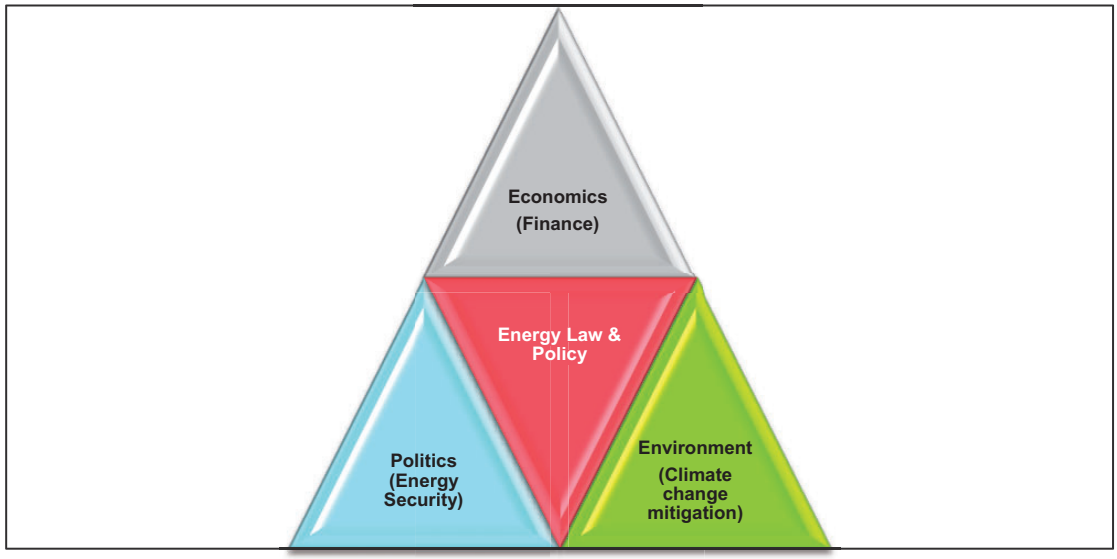
For many years, energy policy has been dominated by economics and this has had negative outcomes for many countries both in terms of energy security and issues around environmental protection. It is not just that the Energy Trilemma has been influenced by economic thinking, and different economic theorists—though it is worthy of consideration in the context of this debate, the influence research economists have had over the practice of economics—but energy law has been influenced by the demand to develop the economy of a country. Indeed, one of the arguments put forward concerning the continuation of the widespread use of fossil fuels is the fact that they are lowly priced. There are counterarguments to this and most notably for example, it is not that coal was a cheap and abundant source of energy when it emerged but more that it provided for a new way of managing the workforce.[12] The aim was to transform the economy and as a result

9 UK Energy Act 2013. Please see: (i) https://www.gov.uk/government/collections/energy-act; and (ii) http://www.legislation.gov.uk/ukpga/2013/32/introduction/enacted

10 Please see the World Energy Council: 43. World Energy Council, 2015. 2015 World Energy Issues Monitor (World Energy Council: London, UK) <http://www.worldenergy.org/wp-content/uploads/2015/01/2015-World-Energy-Issues-Monitor.pdf> accessed 2 February 2014.

11 World Energy Council, 2015. *Priority Actions on Climate Change and How to Balance the Trilemma*. World Energy Council: London, UK. <https://www.worldenergy.org/publications/2015/world-energy-trilemma-2015-priority-actions-on-climate-change-and-how-to-balance-the-trilemma/> accessed 27 July 2015.

12 A Malm, *Fossil Capital* (Verso Books 2016).



Explanation: Energy law and policy is in the centre of the triangle and on the three points of the triangle are economics (finance), politics (energy security) and environment (climate change mitigation). These three issues are each trying to pull energy law and policy in their direction. In essence, effective and efficient energy law and policy will balance these three aims to deliver the best outcome to society. However, if one examines energy law and policy in more detail, often it is just one of these issues that dominates the energy agenda.

Figure 1. The Energy Law and Policy Triangle—the 'Energy Trilemma'.

Source: RJ Heffron, *Energy Law: An Introduction* (Springer 2015).

both politics and particularly, the environment were affected. With countries at different stages of development across the world there needs to be this triple objective (economic–political–environmental) of energy policy. Under the Theory of the Energy Law and Policy Triangle, the energy law scholar envisions this and holds that it is through energy law that society can achieve a balance between these three competing objectives and deliver an energy policy that delivers the best outcome for society.

4. THE THEORY OF CHANGE IN ENERGY LAW

The Theory of Change in Energy Law states that energy law is subject to change from three levels of law—international, national and local—and what happens at one level will have an effect on another level.[13] At each of these tiers or levels of energy law, there are a number of influences and this following sub-section details the influences at the each of the three levels. In developing, analysing and in decision-making on energy law it is necessary to think about why it changes, what are the elements of change at international, national and local level, and how do these three tiers (levels) of energy law relate to each other. In energy law's sister sub-discipline of law, environmental law, one of the leading international environmental scholars, Peter Sand also notes several levels of environmental law but provides little discussion in extending his arguments on this.[14]

13 In essence, this is similar to Issac Newtons's third law of motion which states that for every action there is an equal but opposite reaction. However, in relation to energy law the effect of a change at one level of energy law does not necessarily mean there will be an opposite reaction which will be negative, rather the reaction could also be complimentary or in accordance with the 'change'.

14 P Sand, 'The Evolution of International Environmental Law' in D Bodansky, J Brunnee and E Hey (eds), *The Oxford Handbook of International Environmental Law* (OUP 2007).

International change in energy law

Energy law is derived from the three levels of law, international, national and local. The first level take its form from international treaties and organizations.

International treaties

International treaties are global agreements signed by a number of countries—though it is important to consider the number of countries who have ratified the treaty—on particular issues. Examples of some of these are listed in Table 1. These set out certain standards for a variety of activities in the energy sector and here there is major relationship to international environmental law.

The United Nations (UN) driven agreements on climate change have been on-going since the Declaration of the United Nations Conference on the Human Environment, (adopted at Stockholm on 16 June 1972). Often these and following agreements are seen as international environmental treaties but they can also be described as energy-related. These international agreements now heavily influence what new energy infrastructure is built in countries that are signatories to the treaties. For example, many countries signed the Kyoto Protocol, which meant having to reduce their greenhouse gas emissions. In the UK, this in part prompted the move over the past decade to introduce legislation to promote more renewable energy development, with new development in fossil fuels not being a key feature of this new legislation.

The next level of energy law development can be seen in supranational administration. The EU and USA are the prime examples here. In the EU, the European Commission sets policy and legislative goals in the energy sector that are followed by 28 Member States, with a combined population of 507 million (Eurostat 2014). Similarly the USA sets Federal policy and law for its 50 states and has a population of 316 million (US Census Bureau 2013). While these two essentially federal governments represent a minority of the world's population, they lead the international community in setting energy law and policy. Many other countries look to these two regions for guidance in establishing new energy law and policy in their respective states.

The key source of energy law and policy is national governments. Governments set the energy policy in their country and then introduce the legislation to meet those goals. Many Member States in the EU and states in the USA have to take into account federal law and policy but these states have a large amount of autonomy as to how they meet their energy needs. Other countries outside the EU and USA are generally free to set their own energy law and policy but have to take into account whatever international treaties they may be signatories to. For many countries, issues such as international political and trade relationships with other countries also influence their energy law and policy formulation.

Table 1. International treaties for energy issues

International treaties for energy issues
• Vienna Convention for the Protection of the Ozone Layer (Vienna, 22 March 1985).
• Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal, 16 September 1987).
• United Nations Framework Convention on Climate Change (Rio, 9 May 1992).
• Kyoto Protocol to the United Nations Framework Convention on Climate Change (Kyoto, 11 December 1977).
• Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus, 25 June 1988).
• Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, 25 February 1991).
• Lugano Convention on Civil Liability for Damages resulting from Activities Dangerous to the Environment (Lugano, 21 June 1993—not yet in force).

Table 2. The main energy law and policy organizations

Energy law and policy organizations
1. International Energy Agency[15]
2. International Atomic Energy Agency[16]
3. United Nations Environmental Programme[17]
4. European Commission Energy Department[18]
5. Department of Energy, USA[19]
6. Oxford Energy Institute, University of Oxford, UK[20]
7. Energy Policy Research Group, University of Cambridge, UK[21]
8. MIT Center for Energy and Environmental Research, USA[22]
9. Centre for Energy, Petroleum, and Mineral Law and Policy, University of Dundee, UK[23]
10. Center for Climate Change, Energy and Environmental Law (CCEEL) University of Eastern Finland, Finland[24]
11. Aberdeen University Centre for Energy Law (AUCEL), University of Aberdeen, UK[25]

The final place where energy law and policy is developed is at a local level. This is where local legislators from regions to small counties (or districts) set certain energy goals and may offer local incentives for companies that plan to develop energy infrastructure in their region. Thes
e usually take the form of tax breaks, grants and the transfer of land. An example is Victoria County in the state of Texas in the USA where Exelon was given benefits for initially developing its plans to build a new nuclear plant there.

International energy law and policy organizations

There are a number of energy law and policy organizations that provide analysis, new approaches and perspectives on energy policy in an international context. Table 2 lists these key organizations.

Table 2 is not a complete listing of all the key energy law and policy organizations. However, it is a list of the most influential organizations, which also make a significant amount of published material available free to all readers. The EU, UN and US Department of Energy produce numerous policy documents and hold copies of legislation and international treaties. The energy research centres at the Universities of Oxford and Cambridge are very strong at producing publications on issues across the energy sector and with an international context. The energy centre at MIT has long had an influence in providing input into US energy policy, and it is noticeable that one of its members, Professor Ernest Moniz, was appointed as the Secretary of State for Energy in the Barack Obama administration in May 2013. There are many other energy research centres in other countries but they have not yet the capacity and volume of publications that these aforementioned centres have.

15 For their website please see: <http://www.worldenergyoutlook.org/>.
16 For their website please see: <http://www.iaea.org/>.
17 For their website please see: <http://www.undp.org/content/undp/en/home/ourwork/environmentandenergy/overview.html>.
18 For their website please see: <http://ec.europa.eu/energy/index_en.htm>.
19 For their website please see: <http://www.energy.gov/>.
20 For their website please see: <http://www.oxfordenergy.org/>.
21 For theirwebsite please see: <http://www.eprg.group.cam.ac.uk/>.
22 For their website please see: <http://web.mit.edu/ceepr/www/>.
23 For their website please see: <http://www.dundee.ac.uk/cepmlp/>.
24 For their website please see: <http://www2.uef.fi/en/cceel/centre-for-climate-change-energy-and-environmental-law>.
25 For their website please see: <http://www.abdn.ac.uk/law/research/centre-for-energy-law/>.

International Treaties
Change begins with 'international treaties.' Many of these are well established (examples of some of these appear in Table 1 above) and when they are updated they prompt change in national energy law.

International Agencies
'International agencies'also drive change. An example of this is the International Atomic Energy Agency (IAEA). The IAEA can set new law and policy guidelines for the international nuclear energy sector, and countries that are members have to change their nuclear energy law and policy as a result. An example of this is safety practices and insurance (liability) in the nuclear energy sector. Similarly there are agencies (for example, the International Association of Oil and Gas Producers) responsible for offshore oil and gas safety practices, and, again, countries change their national energy law to take into account new policies proposed by these agencies.

International politics (relations)
'International politics (relations)' is also a driver of change. Countries often have highly developed political relationships that lead to cooperation on energy infrastructure development. This can take many forms but usually involves one country selling its energy expertise or technology to another country. An example of this is the developing international political relationship between Russia and Turkey. In the context of energy, this has resulted in Russia being given approval to build a four reactor nuclear plant at Akkuyu in Turkey. Russia will build and then own and operate the plant for 20 years before selling it to Turkey. Similarly, Romania built a nuclear power plant in a consortium with a Canadian nuclear energy company and availed itself of Canadian expertise during the project and after the plant was operational.

International business and trade.
Linked with international politics as a driver of change in energy law is 'international business and trade'. Often energy projects such as the ones mentioned above result from and include agreements on other international business and trade between two countries. These agreements for the sale of other products (usually non-energy products) can see one country being given the contract to build energy infrastructure, and energy law and policy will change as a result.

Figure 2. Elements of international change in energy law.

Examples of international change in energy law

Presented in Figure 2 are a number of examples of how change arises at an international level.

National change in energy law

There are four main drivers of change at national level. These are naturally related to some degree to the international drivers. The 'Aim of Government' is the first of these and is considered in more detail below. Related to the 'Aim of Government' are 'Availability of Finance'; 'Advances in Technology'; and 'Societal Preferences'. These are issues a government has to consider when formulating its own energy policy. However, they are also issues in their own right.

The Aim of Government

The 'Aim of Government' is the first of these. This is of importance as, depending on the political party in government, energy policy may be subject to change. From the examples in Table 3, it is evident that the election of a new government can result in significant changes in energy law and policy.

Table 3. New governments and new energy law

Germany
With the election of Angela Merkel's government in 2005, energy policy in Germany changed. The energy policy promoted by her party and government involved a significant emphasis on renewable energy development and the closure of nuclear energy plants—which did receive an impetus after the Fukushima accident in Japan in 2011.
United Kingdom
The indecision of the UK coalition government elected in May 2010 has delayed new investment in the UK energy sector. It took the first few years of the government for both parties (the Conservatives and the Liberal Democrats) to agree a way forward. This indecision has reduced the interest from investors in the UK energy sector, and there has been little interest in developing new energy infrastructure.
France
Since the election of François Hollande of the French socialist party as president of France in May 2012, French energy policy has changed. The previous dominance of nuclear energy within the French energy policy is being reduced and a new emphasis has been placed on renewable energy development, with a planned limit on the use of nuclear energy to 50 per cent of the country's energy mix by 2025.

Table 4. Energy projects and investor withdrawal

Romania
Originally, there were six investors involved in building Romania's third and fourth nuclear reactors; however, in 2009 three of these withdrew. Another investor withdrew in 2012, and the final two had done so by December 2013.
United Kingdom
Numerous wind energy projects have been cancelled (for example, the Atlantic Array £4 billion wind farm project). The investors RWE stated that there were financial considerations in their decisions.

Availability of Finance

The 'Availability of Finance' has been particularly important since the beginning of the financial crisis in 2007. Obtaining finance for a project has become increasingly difficult and investors are looking for a guaranteed return on their investment. Energy projects can be seen as risky. Some suffer from long construction times and others from long planning processes, and this increases the risk profile of each project. In a time of recession, investors will look for more secure projects. There have been many cases where investors have pulled out from completing major energy projects—see Table 4 for examples.

In many cases where the 'Availability of Finance' is an issue, new energy law and policy will be formulated that will have as one of its objectives to increase the investment in the energy sector. For example, and as stated previously, the specific aim of the UK Energy Act 2013 was to stimulate £110 billion in investment in the energy sector. Its success in achieving this will determine when new legislation will be introduced in the future.

Advances in Technology

'Advances in Technology' will also contribute to change in energy law. Advances in the technology for wind turbines and solar energy are having a major effect in many countries. This has resulted in many countries changing their energy law in part to capture these technological benefits from more efficient technology—Denmark and Germany are good examples of this. This is also currently evident in relation to Carbon

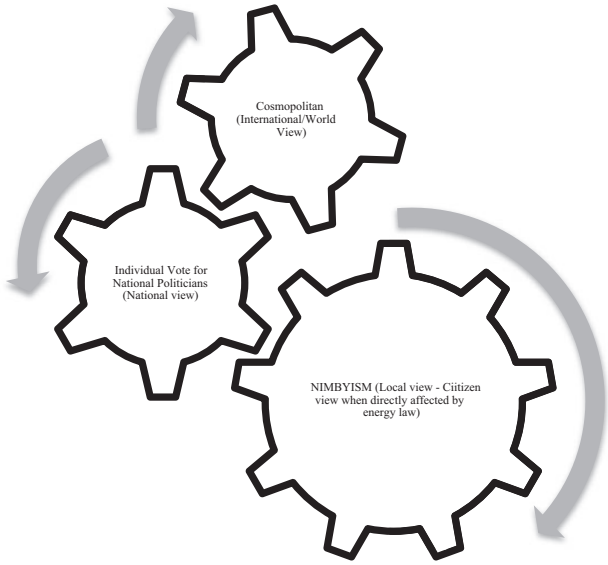


Figure 3. Individual theory of change in energy law.

Capture and Storage (CCS) technology. The advances made in this technology may see a return of new coal-fired plants that use this technology. Energy law has been changed to promote the use of CCS technology, for example, in the USA and the UK.

Societal preferences

A final related driver of change in energy law is 'Societal Preferences'. Different countries have different societal structures which contribute in part to different societal preferences. In many cases, this emanates from how the culture has developed over time. For example, the Republic of Ireland has a very anti-nuclear stance. For the Republic of Ireland to build a nuclear reactor, there would have to be a referendum on the issue in which every individual would have a vote. This is in contrast to the UK where the majority of the population still see nuclear energy as part of the UK energy mix and a solution to reducing CO_2 emissions.[26] In France, nuclear expertise and technology was developed to the degree that engineers had a dominant role in energy policy formulation for several decades. In Denmark, there has been cross-party political support for the development of wind energy since the 1970s and this has resulted in a society that sees wind energy as the solution to its energy problem and a way to reduce its reliance on fossil fuels, and also as a contributor to economic development. In the USA, certain states have a culture that has developed around their coal-mining industry. It is hard in such communities to break the preference of some citizens to continue with coal mining and coal-fired plants.

Local (individual) change in energy law

In examining local change for energy law and policy, it is complex. For this reason, it is also possible to construct a theory of change in energy law and policy from an individual perspective. This can be seen in Figure 3 where there are three intertwining perspectives that an individual can have at a certain time when thinking of a particular energy issue—a world perspective, a national perspective and a local perspective—which

26 NF Pidgeon and others, 'Climate Change or Nuclear Power—No thanks! A Quantitative Study of Public Perceptions and Risk Framing in Britain' (2008) 18 Global Environ Change 69–85; and W Poortinga and others, 'Public Perceptions of Climate Change and Energy Futures before and after the Fukushima Accident: A Comparison between Britain and Japan' 62 (2013) Energy Policy 1204–11.

capture the complexity of thinking about energy law at a local level (or in essence from an individual perspective).

The world perspective is supported by a cosmopolitan philosophy where individuals view themselves as world citizens and view prospective change as enabling change for the better of humanity.[27] This takes the form of the development of international treaties and is led by international institutions. The national perspective is where the individuals have voted politicians into government, and governments in turn apply their political mandate to bring in new energy law and policy—as such, this perspective is national government led. The local perspective is where individuals form their views on energy policy when they are directly impacted by it. The view of individuals here is affected by their personal finances, the health effects resulting from energy infrastructure and the location of energy infrastructure. In the last of these, the location of energy infrastructure, NIMBYism (Not-in-my-back-yard) syndrome is of concern, and results in public participation at a local level, with people giving their views on energy infrastructure development located near to their places of residence.

5. THE POWER OF ENERGY LAW: THE THEORY OF TARGETED LEGISLATION

The development of energy law is not confined to any one particular country. An examination of countries in the EU and a range of countries outside the EU demonstrates that the development of specific law in the energy sector has been, and is, a concern of many governments. The desire of many governments is to develop their energy sectors, to encourage investment in energy infrastructure and in many cases to take action against climate change. Indeed, this latter consideration is significant when one considers what some countries have shown can be achieved by having effective energy law, for example, the earlier mentioned case of Denmark.

As stated in a number of sub-sections above, it is important to remember the overlap between law and policy in considering energy issues. Energy policy is the driver of the legislation in many respects. In order to have effective energy policy, it is necessary to have the legislation to deliver it. This is particularly important to secure investment from the private sector in the various infrastructures and initiatives that a government may see as being instrumental in delivering the energy policy it has promoted. The delay of the path of the Energy Bill in the UK is an example where a government failed to clarify its exact energy policy and thus investors were unsure what commitment they could offer.[28]

Despite the lethargy that the UK Energy Bill (now the UK Energy Act 2013) experienced in the legislative process, it represents an important piece of legislation in an EU context. Already other Member States have expressed a desire to incorporate aspects of it into their legislation. The UK Energy Act 2013 is ambitious, and it has built upon ten years of policy and legislative development.[29] Under this Bill, the electricity system will be redesigned and the energy sector focused on developing low-carbon energy assets in the medium to long term. Of note is the long-term focus of the legislation and in general the eventual cross-party political support for the legislation. Further, in many respects the coalition government (Conservatives and Liberal Democrats) is building on the work of the previous Labour government.

In these difficult financial times, with many countries experiencing some of the deepest recessions in a century, the power of energy law should be recognized. In this context, the Theory of Targeted Energy Legislation is proposed and examples are identified below which demonstrate the power and effect of such Targeted Legislation.

27 For more on the interaction of energy law with cosmopolitanism, please see: (i) RJ Heffron, D McCauley and BK Sovacool, 'Resolving Society's Energy Trilemma through the Energy Justice Metric' (2015) 87 Energy Policy 168–76; and (ii) BK Sovacool, and M Dworkin, *Global Energy Justice: Problems, Principles and Practices* (CUP 2014).

28 RJ Heffron, 'The Application of Contrast Explanation to Energy Policy Research: UK Nuclear Energy Policy 2002-2012' (2013) 55 Energy Policy 602–16.

29 RJ Heffron, 'Lessons from the United States: For Legal Change and Delay in Energy Law in the United Kingdom' (2012) 31(2) Int Energy L Rev 71–77.

Table 5. The growth of the wind energy sector in Denmark (Ronne, 2013)

Key facts on the wind energy industry in Denmark
• Installed capacity = 3124 MW (2007)—423 MW is offshore.
• Wind power generates 20% of electricity production (2007).
• The Danish wind turbine industry employs 28,000 persons and sells turbines for €7 billion (2008).
• Most of the turbines are exported and the Danish wind turbine industry serves 30% of the world market (2007).

In comparison to environmental law where EU Member States must follow the direction of the EU, a country has much more control in determining what energy law it can enact. An example of this is what Denmark has done, and what the UK plans to do. In both these cases, energy law favours particular energy sources, and encourages their development. Although this is perhaps contrary to EU competition principles, these countries do support other aims of the EU such as contributing towards energy security and the EU 2020 renewable energy policy targets.

Targeted energy legislation in Denmark

Denmark is the leading example of the power of energy law in the EU. Its growth in domestic energy production was one phase, but the second phase has seen substantial subsidies given to the wind energy sector. The development of the wind energy sector, as highlighted in Table 5, clearly demonstrates that with effective energy legislation, energy law can make a number of major contributions to a nation economically and environmentally. It also shows the period needed to develop an effective and sustainable energy value chain—ie the 35–40 years before Denmark witnessed the fruition of its wind energy industry.

What is clear from the Denmark case is the importance of policy formulation: all politicians, independent of their party, meet in a forum where energy policy for the nation is agreed upon for the medium to long term. This has a number of benefits, with the most significant being to ensure private sector investment, with legal certainty providing stability for private investment. Uniquely, however, Denmark's energy policy also incorporates clear incentives for the public and encourages to a degree the need for the public to be involved in the decision-making and the potential for shared public–private ownership of energy assets. The net result thereof is that energy prices are lower for consumers.

Targeted energy legislation in Georgia (USA)

Another demonstration of the autonomy and resulting power of energy law and the positive effect from 'targeted legislation' is from the USA. Targeted legislation in the energy sector can have a significant effect in that it can be the deciding factor in whether or not energy infrastructure is developed. As a result, targeted legislation represents one way of directly contributing to climate change mitigation and reducing CO2 emissions. Consequently, it represents more of a hope in the battle against climate change than many environmental legislative initiatives.[30] In the USA, the introduction of the Georgia Nuclear Energy Financing Act in 2009 was a key reason why the two-reactor nuclear energy project progressed.[31] This $16 billion nuclear energy project means a significant amount to the state of Georgia[32] in terms of job creation and resulting economic benefits. Further, the same is the case in the neighbouring state of South Carolina which has a

30 RJ Heffron, 'Accommodating Energy Law within Environmental Law: An Irish Exploration' (2013) 20(2) Irish Plann Environ L 56–64.

31 RJ Heffron, 'Lessons for Nuclear New Build in the USA 1990-2010: A Three State Analysis' (2013) 80(5) Technol Forecast Social Change 876–92; and RJ Heffron, 'Nuclear Energy Policy in the United States 1990-2010: A Federal or State Responsibility' (2013) 64 Energy Policy 254–66.

32 Population 9.9 million—US Census Data 2013.

similar project (V. C. Summer) underway after the introduction of similar legislation. Despite the economic crisis, these states have found a way to initiate these two low-carbon energy projects.

Targeted energy legislation in the USA

Other examples of targeted legislation have seen major developments that can directly contribute to reducing the effects of climate change. A further example in the USA is where the EPA, given significant power to set air quality standards, has been responsible for a dramatic decrease in the number of coal-fired plant applications over the past 15-year period—from around 300 to just a few. And through this legislation the EPA has closed down many coal-fired plants with more closures to follow. In the UK, a new development has seen the creation through legislation of new public administration units to directly oversee the development of new energy infrastructure—the Office for Nuclear Development and the Office for Unconventional Oil and Gas. These two units will oversee the delivery of new infrastructure in the nuclear and unconventional oil and gas sectors and will in essence create the legislation needed to do so. The targeted legislation that saw the development of and responsibilities given to these agencies will result in major transformation of these industrial sectors.

Targeted energy legislation in California (USA)

Professor Steven Chu (Professor at the University of California, Berkley), a former US Secretary of State for Energy, who in his visiting lectures to universities in the UK in 2014 implored researchers to think more ambitiously when we consider the energy sector and what we as humans can achieve in this area.[33] In addition, he also stated the positive effect legislation could have and he cites an example where California introduced new regulations to improve efficiency standards within three years for 'white good electrical items'.[34] This was contrary to economic thought and expectation which stated that prices would increase and white goods would become unaffordable with these technological improvements, and in addition, this could not be achieved within three years. However, after the introduction of the new regulations, not only did engineers meet the new efficiency standards for white goods but they also lowered the cost contrary to the economist view. This is a further example that targeted legislation can have positive effect.

6. CONCLUSION

It is possible to enact energy law that embraces vision, ambition and imagination in delivering a long-term energy policy. More action is needed by individual countries to achieve cross-institutional and political involvement and cooperation in ensuring a deliverable energy policy. In this context, for example, planning legislation for new energy infrastructure projects needs to begin well in advance, while incentives for the development of low-carbon energy infrastructure need to be legislated for quickly so as to encourage investment by the private sector.

Energy law can be a powerful source of remodelling for the energy sector and for ensuring that there is continued investment in new energy infrastructure and in research and development. These two areas can directly contribute to reducing the effects of climate change by promoting and realizing investment and construction in new low-carbon energy assets. In this way, energy law can enable society to meet the goals of the Energy Trilemma that society faces—ie increasing energy security, meeting energy economic aims, and ensuring environmental protection and reduction in CO_2 emissions.

33 Professor Steven Chu, 2014. Nobel Prize winner and former US Secretary of State and his visiting Lecture. Please see the following for an online version: <https://www.youtube.com/watch?v=w4vtJWKF3E8> accessed 17 April 2016.

34 For the paper on this issue in California and where Steven Chu is a co-author please see: RD Van Buskirk and others, 'A Retrospective Investigation of Energy Efficiency Standards: Policies may have Accelerated Long Term Declines in Appliance Costs' 2014 9(11) Environ Res Lett 1–11.

However, determining how a country meets the challenge of the Energy Trilemma and therefore what the energy law will be, is a difficult process. Nevertheless, while there is no common approach that all countries should apply, this article aims to highlight certain theoretical perspectives on energy law which will aid the decision-making process and ensure that energy law begins to consider a wide range of issues and from a number of perspectives. In terms of the challenge of the Energy Trilemma, this article holds that the challenge of the Energy Trilemma is to balance the competing aims of economics (with a focus on cost), politics (with a focus on cost) and the environment, and that this balance can be achieved through effective energy law and policy. The theory of change in energy law advances the premise that in developing energy law it is necessary to think about why it changes and what are the elements of change at international, national and local level. Finally, the article considers the power of energy law, and how the theory of targeted legislation emphasizes the effectiveness of energy law where it focuses in on a certain problem and how this can realize immense value for society and achieve economic, political and environmental aims, and thus achieve a solution for the Energy Trilemma.

It is worth considering the importance of CO_2 emissions and the energy sector. Energy law has not contributed in their reduction; indeed CO_2 emissions are increasing at an accelerated rate from the energy sector over the last century. In comparison to the relative ineffectiveness of energy law to reduce CO_2 emissions, consider the effect of environmental law in reducing emissions. One example is deforestation (land-use change) which used to account for 25 per cent of global emissions and now this figure is just 8 per cent.[35] This provides an example of what to a certain extent lawyers (both practising and academic) can achieve. It provides a further reason why academic researchers have to re-evaluate their discipline to ensure there is a link with practitioners (including Judges), with other disciplines and with policymakers. There is a need to have common paradigms with which to think of energy law, paradigms that are transferable, ones that can be added to, improved and indeed replaced over time.

There are other ways to frame how an energy law scholar should think; however, this article represents a move in a new direction to try and shift the paradigm of thinking behind energy law to one that is more inclusive and tries to bring researchers together to consider what good energy law should consist of. The theories outlined in this article aim to highlight some of what scholars and practitioners should focus on, and present them with thinking-tools or theories of how to do so.

All energy law scholars need to move the discipline forward and consider the theoretical development of energy law, rather than to bring theory from other areas of law to focus on specific problems. This latter exercise will result in solutions to particular problems within the field of energy law, but will mean these solutions do not unite the discipline of energy law and nor will provide a solution to the energy sector in its entirety. It will mean a piecemeal approach to the development of energy law and one that lacks any coherence or common direction forward. In order to finalize the emergence of energy law as its own sub-discipline of law, it needs it own theory to evolve and grow as other sub-disciplines of law do both in theory and in practice. And in particular, one can see the development of environmental law and the growth of its theoretical perspectives and principles. These have been effective in protective of the environment and are frequently referred to by judges in environmental case law. This is the potential of energy law and it is hoped other scholars not only use the theories advance in this article but also build on these and develop their own.

35 T Stocker and others (eds), Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of Intergovernmental Panel on Climate Change, 50–52, 489–94. Cambridge, UK (2013).