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Energy Law and Energy Future in the European Union

Siniša Franjić

Independent Researcher, Osijek, Slavonia, Croatia.

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***Corresponding author:** Siniša Franjić, Independent Researcher, Osijek, Slavonia, Croatia.
Email: sinisa.franjic@gmail.com

Abstract

The European Union is actively promoting Europe's transition to a low-carbon society and updating its rules to facilitate the necessary private and public investment in the transition to clean energy. This should benefit the planet, but also the economy and consumers. The transition to a low-carbon economy aims to create a sustainable energy sector that fosters growth, innovation and jobs while improving the quality of life, increasing choice, strengthening consumer rights and, ultimately, saving household costs. A simplified and harmonized EU approach ensures a truly huge impact in the fight against climate change. Promoting renewable energy sources and improving energy efficiency are keys to reducing Europe's greenhouse gas emissions and meeting its obligations under the Paris Agreement. In addition to ensuring the effective functioning of the EU energy market, energy policy promotes the interconnection of energy networks and energy efficiency. The energy market is facing new challenges in which the share of electricity produced from renewable sources will increase from 25% to 50% in 2030.

Keywords

Energy, Law, Climate Change, Environmental Justice

1. Introduction

Energy law concerns the management of energy resources (Heffron, 2021). 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.

Energy law has now come to the fore in 2021. It is viewed with a holistic approach today whereas before it was divided into many parts—in general in terms of each type of energy source, i.e., oil, gas, coal etc. There is a realisation in the twenty-first 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, it has been pushed high up the political agenda with the advent of climate change and policies concerning energy security. Further, politicians can be credited with pushing the agenda, in part, because high energy prices—mainly electricity prices—have an influence on election outcomes. Today, climate change is a clear issue for society and has contributed to the need for an energy transition which ensures that change is needed in the energy law.

It is no surprise therefore that, as a legal specialty, 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, US and internationally have introduced it as a core and optional subject.

The European Union 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.

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 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.

Of crucial relevance to international energy policy, the EU was widely seen as predisposed towards the export of economic and regulatory norms, as its key means of influence in pursuit of foreign-policy objectives (Youngs, 2009). Reflecting its own experience of market integration, the EU had assumed a lead role in developing a 'deep' trade agenda that sought to address 'behind-the-border' issues by seeking agreements on the making of domestic rules over investment and regulation in non-European states. The EU itself was about the transposing of laws into different national contexts, giving EU foreign policy a tendency to replicate the same logic externally. The influential concept of 'EU external governance' captured this notion of the EU seeking to transfer its own rules and legal norms to other countries and organizations as a form of 'external Europeanization'. It was suggested that energy policy fitted such a model, to the extent that the EU sought to export internal market rules as a means 'to liberate energy supply from the control … of unstable elites and cartels'.

2. International Law

Energy law is derived from three levels of law, international, national and local (Heffron, 2021). The first level can initially take the form of international treaties. These are global agreements signed by a number of countries on particular issues.

The United Nations (UN) driven agreements on climate change have been ongoing 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 US are the prime examples here. In the EU, the EU Commission sets policy and legislative goals in the energy sector that are followed by its Member States. Similarly, the US sets Federal policy and law for its individual states. 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 US 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 US 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.

The regulation of energy activities at the global and regional levels is a task for public international law, which is the system of law governing relations between States (Redgwell et al., 2016). International law governs nearly every aspect of inter-State relations, including matters such as claims to territory, jurisdiction, use of the oceans, and State responsibility. This section considers core elements of public international law—subjects, sources, juris-

diction, responsibility and dispute settlement—in the energy context.

It is generally recognized that international law is created principally by States and that it is concerned primarily with the conduct and relations of States as the main subjects of international law. They possess the primary norm-creating power in the international legal order and qua international legal persons have rights and duties under international law as well as bearing international responsibility for breach of their international obligations. However, as in many other aspects of international life, States are not the sole actors in the energy field: there are international organizations that play a significant role in framing and applying the relevant international norms, and there are other non-State actors assuming increasing importance in this regard, namely multinational enterprises (MNEs), non-governmental organizations (NGOs), and even individuals. Beyond the role of non-State actors (NSAs) as participants in norm generation and implementation, there is the important question of at norm application with increasing attempts to extend the primary rules (of conduct, and of result) and secondary rules (of responsibility/liability/accountability) of international law to corporate NSAs to hold them accountable particularly for breach of human rights and environmental standards. A final general observation is that the boundaries between these international actors are often blurred, not least in the energy context, as State participation in major energy companies serves to illustrate.

3. Climate Change

In 2014, the Intergovernmental Panel on Climate Change (IPCC) warned that continued emission of greenhouse gases would have severe impacts on people and ecosystems (Nabielek, 2020). However, the implementation of climate policies is being delayed. Despite the growing number of policies to mitigate climate change, global emissions have been rising to 'unprecedented levels'. In reaction to this worrying trend, at the Paris climate conference in December 2015, some 195 countries set up a global action plan to put the world on track and avoid dangerous climate change. The Paris Climate Agreement spoke about the 'significant gap' between the effects of countries' mitigation pledges and the pathways required to reduce greenhouse gases. It adopted a legally binding global climate deal: to keep a global temperature rise well below two degrees Celsius. Hence, it has become urgent not only to decide on climate and energy targets, but to actually reach them.

Parties that signed the Paris Agreement are to mitigate greenhouse gas emissions by promoting sustainable development; decarbonizing the electricity supply is among the most important measures. This involves the phasing out of fossil fuel power generation by 2100 and its replacement by renewable and other lowcarbon energy sources. Thus, from the perspective of the IPCC and Paris Agreement, renewable energy is considered a suitable and very promising alternative to fossil energy. This description of the potential contribution of renewable energy has been repeated in climate and energy reports, as well as in policies all over the world. It is expressed in standard unit sizes such as 'CO_2e' 1 or 'Mtoe', which highlight the political goal: to overcome reliance on fossil fuels with regard to greenhouse gas emissions.

This somewhat one-sided view of spatial planning as an instrument 'to pass on' the goals of higher governance levels to local implementation levels is, however, not shared by analysts of government practices in the field of wind energy. They have largely questioned the justification of spatial planning as a supportive influencing variable whose role is to meet energy stipulations decided at higher governance levels. Besides, it has become apparent that the renewal of the energy system increasingly dominates current spatial planning policy agendas in many European countries. These agendas tend to prioritise the 'common good' over and above local concerns; they fail to produce adequate answers to local decisionmakers about development and land use, with which the goals of higher governance levels are often irreconcilable.

Institutional challenges in spatial planning are particularly related to the flexibility and adaptability of its practices, which are needed to supply 'acceptable locations' for renewable energy generation. Here, it is possible to detect similar trends at a European level: targeted emission or energy values are combined with administratively defined spaces, e.g. by putting the zoning of renewable energy generation on regional spatial planning agendas. While renewable energy was formerly a local planning matter, responsibilities have increasingly shifted to higher governance levels. This is in response to a growing awareness that renewables need to be 'tamed' because they are more landintensive, more 'visible' in the landscape, and more decentralised in terms of territorial spread of installations than traditional (carbon-intensive) forms of energy production and distribution.

4. Power System

The power system generates, transports and distributes electric energy economically and reliable to the consumers, with the constraint that both the voltage and frequency are kept constant, within narrow margins, at the load side (Schavemaker et al., 2008). Power quality is a major issue these days, a nearly perfect sine wave of constant frequency and amplitude and always available. Electrical engineering started basically with electric power engineering at the turn of the nineteenth century when the revolution in electrical engineering took place. In a rather short period of time the transformer was invented, electric motors and generators were designed and the step from DC (Direct Current) to AC (Alternating Current) transmission was made. Society was completely changed, first by lighting, rapidly followed by the versatile application of electrical power. In this early period, independent operating power companies used different voltage levels and operated their system at various frequencies. Electrical engineers were among the first to realize that international standardization would become necessary in the modern world.

The constraints on expansion of demand through government legislation have not worked and world energy prices have not increased very much. More oil wells and natural gas reserves have been located and have moved the problem of the natural resources beyond our horizon. However, the ongoing expansion of energy demand will also be constrained by ecological considerations such aslimits to available sites for power stations, heat and water disposal, water availability, air pollution, and possible effects on our climate. The Kyoto agreement in 1997 to reduce the CO_2 emission and the greenhouse effect nowadays influence the political decisions made by the governments of the developed countries. The result is an increase in the application of wind and solar power as a source of renewable energy.

In recent years, concerns about pollution and climate change have raised public awareness that carbon dioxide (CO_2) emissions associated with fossil fuel combustion represent the largest source of greenhouse gas emissions (Dincer et al., 2021). On the other hand, energy security has become complex, due to the combination of rising political issues in major energy-producing countries, resource competition, and record oil prices. As a consequence, various internal frameworks and legally binding agreements have been released, emphasizing the urgent need for lowcarbon technologies, especially those from renewable energy sources. In this framework, the European Union became a worldwide pioneer in promoting renewable energy exploitation with the aim to improve the supply security, competitiveness, and environmental sustainability of renewable sources. The deployment of sustainable emission-free renewables plays an important role for decarbonizing the energy supply. To date, a wide range of onshore renewable energy resources has been promoted for large-scale exploitation, for example, hydro, solar, wind, geothermal, biofuels, and biomass. On the other hand, a huge quantity of clean power can also be provided from offshore renewable energy sources, such as offshore wind, solar energy, and marine renewable energies in the form of surface waves and tidal streams.

5. Energy Legislation

The EU's energy legislation as well as the EU's energy technology and innovation strategy (Strategy Energy Technology Plan—SET), aim at creating an framework conditions that facilitate the evolution of existing as well as developing new lowcarbon technologies that can cope with the specific needs for a stable, cost-efficient and sustainable prospective energy supply (Möst et al., 2021). Moreover, these legislative initiative and strategy promote in particular the deployment of renewable energy sources (RES), the electrification of demand side sectors and improved energy efficiency in the electricity, heat and transport sector. In addition, these measures are framed by additional roadmaps that trigger investments in the development of complementary technologies for energy conversion (electricity and heat provision), transportation and consumption (mobility, buildings, industry, and transport), such as power-to-x technologies, grid infrastructure, and demand side management.

Yet, several technologies, which will play a crucial role in next decades in the EU strategy, challenge the energy system by their intermittent nature. The two most abundant forms of power on earth are solar and wind. Both have been and will be becoming more cost–competitive compared to other energy carriers for electricity generation and thus are key factors in achieving climate reduction targets. Yet, the integration of intermittent renewable energy sources necessitates flexibility in the energy system. A large bundle of technologies may provide the needed flexibility such as energy storage systems, smart grids, adaptation of conventional power plant technologies, and demand side management. These applications are often crosssectoral and can be complemented by power-to-x, such as power-to-heat (e.g., heat pumps, district heating), power-to-transport (e.g., electric mobility, fuel cells), power-

to-gas (e.g., H2, CH4), power-to-fuels, and power-to-industry (e.g., H2 for methanol or ammoniac production) for the electrification of other sectors.

6. Environmental Justice

Sustainability and environmental policies are complex and multidimensional problems, requiring political, economic, business, scientific, legal, and philosophical approaches (Shabliy et al., 2022). Most countries, competent policymakers, and other stakeholders recognize the importance and urgency of climate change mitigation and adaptation, as well as the need for dynamic energy policies advancement and environment-oriented course of principle and immediate climate action. The quality of the environment depends on all stakeholders, and this quality could be also interpreted as a public good consumed by all members of society. At local and international levels, country Parties develop and adopt new best-practice climate policies seeking new solutions in meaningful and constructive climate change dialogue and promotion of environmental justice principles.

The global environmental justice movement presupposes the development, evolution, and advancement of international environmental law. The EU's objective is to be climate-neutral by 2050; the development of the legal energy policy framework of the EU is a process that will enable the changes in environmental markets. The flagship initiative "A resource-efficient Europe" has recently been introduced as part of the European Commission strategy. This initiative outlines the structural changes and technological innovations by 2050, including objectives that define all important goals and targets set by the EU and aimed to be achieved by 2020. The Member States aim at reducing greenhouse gases (GHGs), to reach a 20% share of renewable energy sources (RES), and to get a 20% increase in energy efficiency.

The energy justice concept is also closely related to eight core principles as affordability, availability, transparency, accountability, sustainability, due-process, intragenerational equity, and responsibility. These eight principles could provide practical guidance to policymakers. The global transition to renewable energy sources as one of the climate change mitigation means requires effective energy policy development and advancement, allowing nations to take advantage of emerging economic opportunities and facilitating new forms of energy growth, energy distribution as well as governance. Renewables are expected to be the future competitive source for energy generation; solar energy keeps getting more affordable. Solar energy is getting cheaper than coal, for example, and the cost of solar power continues to decrease rapidly. Coal use in the U.S. and Europe has decreased. However, developing nations continue to use coal that "imposes very large externalities in addition to its contribution to climate change."

7. Future

Energy demand in the world is nowadays growing further out of limits of installable generation capacity (Salvalri, 2020). Therefore, future energy demands should be met and improved efficiently and securely. Energy solutions should be supported by utilizing renewable energy sources. At present, the contribution of renewable energy to the world primary energy is not high to meet the primary energy and electricity supplies. Both developed and developing nations will necessarily continue to rely on fossil fuels in the coming decades. In developing countries, the situation is more inconvenient than that for developed countries. Many developing countries have been apparently trying to restructure their energy sectors. It seems that it is difficult to realize innovations. Cost, market share and policy are the main barriers for the development of renewable energy. In the strategy plans of many countries, the sustainable development in relation to the parameters such as economic, social and industrial is supported by their energy policies. New enabling technologies related to renewable energies will also help to reduce environmental costs, and thus the energy systems will be operated as both securely and economically without environmental problems. New renewable energy markets are surely required in both the wholesale and retail markets.

One of several reasons why projections of our energy future have turned out so often to be wrong is that free will—for better or worse—plays a large role (Dukert, 2009). The "invisible hand" of energy markets doesn't always produce what many economists would call rational behavior, although each separate input may be perfectly explicable. Another reason is that decisions about energy by individuals, corporations, organizations, and governments are often founded on their failure to comprehend adequately all the factors involved—ranging from fundamental realities to unintended consequences.

Our overall attitudes toward energy are not dictated by a central authority, although executive leadership and legislative commitment are both essential for public policies to be effective. One thing that is certain, however, is

that optimized responses that can achieve public consensus must to some extent include “all of the above”, from solar energy to nuclear reactors. This may seem like an inconvenient solution, and it will still be imperfect. It will also involve adjustments, but it is the path to the future that looks least rocky. And it is achievable.

8. Conclusion

Increasing evidence of climate change and increasing energy dependence underscore the European Union’s (EU) efforts to become a low-energy economy and to ensure that the energy consumed is safe, secure, competitive, locally produced and sustainable. In addition to ensuring the effective functioning of the EU energy market, energy policy promotes the interconnection of energy networks and energy efficiency. It deals with energy sources from fossil fuels, through nuclear energy, to renewable energy sources (solar energy, wind, biomass, geothermal energy, hydropower and tidal energy). The energy market is facing new challenges in which the share of electricity produced from renewable sources will increase from 25% to 50% in 2030. But when there is not enough sunlight and wind, it is necessary to produce electricity in quantities needed by consumers, and we can do this by improving the market to meet the needs of renewable energy sources and attract investment in resources such as energy storage, the possibility compensating for variable energy production.

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