Legal tools for addressing uncertainty and managing risks in the energy sector: is there a role for international disaster law?

Imad Antoine Ibrahim*

ABSTRACT

The Covid-19 pandemic has highlighted once again the existing legal vacuums in the energy sector when it comes to addressing various situations such as disaster risk management and reduction. This reality can be seen in various instances where other regulatory frameworks are used instead of energy law. This article seeks to address the existing legal vacuum in the energy field in the context of pre- and post-energy disasters, such as the Covid-19 health disaster resulting in negative consequences for the energy sector. The author argues that international disaster law, taking the Sendai Framework for Disaster Risk Reduction as a case study, can provide guidance when it comes to managing pre- and post-energy disasters scenarios. The author will support this claim by examining the potential use of the Sendai Framework priorities as guidance for policymakers in addressing disasters in the energy field while stressing the need to strike a balance between using existing binding and nonbinding frameworks from other regulatory fields to address the legal gaps and making sure that energy law applies in such situations.

1. INTRODUCTION

Covid-19 has created further challenges for the energy sector that have been added to existing ones. Before the pandemic, 80 per cent of energy across all sectors resulted from conventional energy resources. The pandemic led to a decrease in energy demand and a huge drop in energy investment. All the conventional energy resources were badly hit while acceleration towards low-carbon alternatives occurred. Still, no one can fully estimate what the future of the energy sector might look like, as conventional energy sources may make a recovery or investments in low-carbon technologies may further increase, accelerating the energy transition.1

In this context, there are fears that the Covid-19 pandemic will halt governments’ efforts and the current momentum surrounding energy transition, while others view this pandemic as a potential opportunity to make the necessary changes to secure the energy transition.2

1 R Heffron and others, ‘The Identification and Impact of Justice Risks to Commercial Risks in the Energy Sector: Post COVID-19 and for the Energy Transition’ (2021) Journal of Energy & Natural Resources Law 1, 1.

2 J Urpelainen, ‘Global Climate and Energy Policy after the Covid-19 Pandemic: The Tug-of-War Between Markets and Politics’ in H Brands and F J Gavin (eds), COVID-19 and World Order: The Future of Conflict, Competition, and Cooperation (Johns Hopkins University Press 2020) 135, 137–139.

© The Author(s) 2021. Published by Oxford University Press on behalf of the AIPN. All rights reserved.
Covid-19 is another event that is pushing towards the implementation of the concept of justice in the energy sector, especially as events such as energy incidents or disasters usually result in the adoption of new legislation or a change in legislation, as energy law is at a stage now where its main drivers are infrastructure and justice and not economics or security. The pandemic is expected to affect energy laws at the various levels, given its negative impact on the energy sector. Energy law, particularly at the international level, addresses a matter that is of crucial importance for citizens of developed and developing countries, given the importance of energy to society in general and its various effects, where the pandemic has affected this reality. Energy law regulates the legal issues associated with primary and secondary energy sources, especially the ‘allocation of rights and duties concerning the exploitation of all energy resources between individuals, between individuals and the government, between governments and between states’. Hence, one can see how the pandemic affects energy law given its impact on all energy sources.

The pandemic highlighted once again the existing legal vacuum in the energy sector when it comes to disasters, such as the Covid-19 health disaster, where the absence of legal tools for addressing existing risks and uncertainties was noticed. To that end, this article seeks to offer an alternative solution for managing the energy sector in the case of disasters like this pandemic. In particular, this article seeks to address the following question: can International Disaster Law (IDL), mainly the Sendai Framework for Disaster Risk Reduction, provide guidance when it comes to managing pre- and post-energy disaster scenarios? The author will argue that IDL can offer guidance for energy lawyers seeking to address the legal vacuum in the energy field when it comes to pre- and post-disaster scenarios. The author will support this claim by examining the potential use of the Sendai Framework priorities ‘1) understanding disaster risk; 2) strengthening disaster risk governance to manage disaster risk; 3) investing in disaster risk reduction for resilience or 4) enhancing disaster preparedness for effective response, and to “Build Back Better” in recovery, rehabilitation and reconstruction’ as guidance for policymakers in addressing disasters in the energy field. The author will stress the importance of using such instruments as guidance given the fragmented nature of energy law and the need to strike a balance between using existing binding and nonbinding frameworks from other regulatory fields to address the legal gaps while making sure that energy law applies in such situations.

The article will first examine the interplay between IDL and energy law at the national, regional and international level. Then, it will provide a brief overview of the key components of the Sendai Framework and analyse whether each of the four priorities can be used as a legal tool for addressing uncertainty and managing risks in the energy sector. The article will then consider whether the Sendai Framework priorities can be used as guidelines for the energy sector, taking into consideration the current state of energy law at the various levels.

2. IDL AND INTERNATIONAL ENERGY LAW IN THE CONTEXT OF ENVIRONMENTAL PROTECTION

The relationship between the energy sector and disasters is not novel as experts have dealt with this topic in the last few decades in various situations, mainly in the context of conventional energy such as oil, gas and nuclear energy. Two scenarios used to occur: (i) an energy facility or equipment failure for various reasons including human error, leading to a disaster; and (ii) a disaster occurring affecting an energy facility or
equipment where in certain cases the negative impact further worsened the disaster. Moreover, a third scenario can occur where the use of energy can lead to the avoidance of a specific disaster. An example of the first scenario includes the explosion of the drilling rig Deepwater Horizon in the Gulf of Mexico in 2010, resulting in an environmental disaster due to the oil spill considered the largest in history. An example of the second scenario includes the 2011 Tōhoku earthquake and tsunami, leading to a malfunction in the Fukushima Daiichi Nuclear Power Plant resulting in a nuclear incident due to the melting down of the nuclear reactors. Finally, as an example of the third scenario and even though it has not yet materialized, the use of renewable energy, such as solar and wind energy as an alternative source, is seen as a means for preventing global warming considered as a disaster. These are some of the cases highlighting the interplay between the energy and disaster fields.

The international community as well as legal and non-legal experts are still trying to regulate such situations where complicated debates are taking place in the hope that appropriate legal regimes are established to address the existing gaps. For instance, in the scenario where a natural disaster affects an energy infrastructure such as a nuclear installation, who should be held liable for the occurred damages? Will the operator or state be held liable and what kind of liability would that be? The existing international treaties in place: the 1960 Paris Convention on Third Party Liability in the Field of Nuclear Energy and the 1963 Vienna Convention on Civil Liability for Nuclear Damage grant exoneration in case of severe natural disasters with an opt out option, allowing states to hold operators accountable domestically. In contrast, the 1997 Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage and the 2004 Protocol to Convention on Third Party Liability in the Field of Nuclear Energy do not offer such exoneration. Hence, there are calls for the various states to join the latest binding instruments adopted.

Besides this interplay, there is an indirect relationship between IDL and International Energy Law (IEL) in the general context of the interplay between IDL and international environmental law, where IEL is a subcategory of the latter. IDL and international environmental law are considered as subdisciplines of international public law, addressing states’ inability to provide a response to various events and have been developing in parallel with each framework having its own governance structures and rules. This has led to a lack of coordination between these two legal fields, as IDL is seen as an emergency response, while international environmental law is seen as a long-term collaborative effort. Despite this, current analysis taking place either calls for the creation of synergies between these two fields or sees these synergies as effectively being created through the adoption of new instruments in both fields, such as the Sendai Framework and the Sustainable Development Goals. This unfortunate lack of synergy between IDL and international environmental law affected the relationship between IDL and IEL.

It is also worth mentioning in this context that energy law interacts with various disciplines such as economics and taxation. Despite that, the field did not witness the adoption of cross-border regulations because

11 BK Sovacool, M Kryman and E Laine, ‘Profiling Technological Failure and Disaster in the Energy Sector: A Comparative Analysis of Historical Energy Accidents’ (2015) 90 Energy 2016; N Doytch and Y L Klein, ‘The Impact of Natural Disasters on Energy Consumption: An analysis of Renewable and Nonrenewable Energy Demand in the Residential and Industrial Sectors’ (2018) 37 Environmental Process & Sustainable Energy 37, 37–45.
12 T Karimova, ‘Sustainable Development and Disasters’ in SC Breau and KLH Samuel (eds), Research Handbook on Disasters and International Law (Edward Elgar Publishing 2016) 177, 201.
13 HM Osofsky, ‘Multidimensional Governance and the BP Deepwater Horizon Oil Spill’ (2011) 63 Florida Law Review 1077, 1077–10.
14 SG Burns, ‘The Fukushima Daiichi Accident: The International Community Responds’ (2012) 11 Washington University Global Studies Law Review 739, 741–45.
15 International Renewable Energy Agency, Renewable Energy: A Key Climate Solution (IRENA 2017) 1–7.
16 J Handrlica and V Sancin, ‘Earthquakes in Nuclear Liability Conventions: A Study in International Disaster Law’ (2020) Journal of Energy & Natural Resources Law 1, 15–16.
17 A Telesetsky, ‘Overlapping International Disaster Law: Approaches with International Environmental Law Regimes to Address Latent Ecological Disaster’ (2016) 52 Stanford Journal of International Law 179, 182–84.
18 ibid, 203.
of the absence of holistic thinking, allowing other legal fields to play a more important role on a case-by-case basis.\textsuperscript{19} Hence, even independently, IEL would have left it to IDL to deal with disasters occurring in the energy sector under the scenarios mentioned above. For instance, in the aftermath of the 1986 Chernobyl nuclear incident, the international community adopted several conventions with the objective of preventing the occurrence of nuclear disasters such as the 1986 Convention on Early Notification of a Nuclear Accident; the 1986 Convention on Assistance in the case of a Nuclear Accident or Radiological Emergency and 1994 Convention on Nuclear Safety.

This brief overview highlighted the relationship between IEL and IDL, showing that both fields can benefit from the creation of synergies to address the various scenarios where both fields apply. The following section will examine the Sendai Framework and its priorities as a means of creating such synergy in the context of Covid-19.

3. AN OVERVIEW OF THE SENDAI FRAMEWORK FOR DISASTER RISK REDUCTION

This framework covers ‘risk of small-scale and large-scale, frequent and infrequent, sudden and slow-onset disasters caused by natural or man-made hazards, as well as related environmental, technological and biological hazards and risks’.\textsuperscript{20} It covers risks at all levels and across sectors.\textsuperscript{21} The end goal is the ‘substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries over the next 15 years (from 2015)’.\textsuperscript{22} To ensure the realization of this outcome, the framework requires the ‘implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures’.\textsuperscript{23} The latter must ‘prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience’.\textsuperscript{24} In this context, seven targets have been identified: (i) substantial reduction of global disaster mortality by 2030; (ii) substantial reduction of people affected at the global level by the same year; (iii) reduction of economic loss occurring directly from disasters considering the global Gross Domestic Product by 2030; (iv) substantial reduction of damage caused by disasters to critical infrastructures and reduction in the disruption of basic services by 2030; (v) substantial increase of countries having risk reduction strategies at the national and local level by 2020; (vi) substantially fostering international cooperation with developing countries by supporting them to implement this framework by 2030; and (vii) ‘substantially increase[ing] the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030’.\textsuperscript{25}

The framework establishes guiding principles. States are the main actors responsible for preventing and reducing disaster risk through all kinds of cooperation,\textsuperscript{26} while the responsibility for disaster risk reduction is shared between various actors (central governments, relevant national authorities, etc.).\textsuperscript{27} Several matters are protected through the management of disaster risks mainly ‘persons and their property, health, livelihoods and productive assets’.\textsuperscript{28} Several requirements must be fulfilled such as ‘an all-of-society engagement and partnership’.\textsuperscript{29} Other requirements include ‘coordination mechanisms within and across sectors’ and ‘full

\textsuperscript{19} RJ Heffron, ‘The Global Future of Energy Law’ (2016) 7 International Energy Law Review 289, 290.
\textsuperscript{20} Sendai Framework (n 9) para 15.
\textsuperscript{21} ibid.
\textsuperscript{22} ibid, para 16.
\textsuperscript{23} ibid, para 17.
\textsuperscript{24} ibid.
\textsuperscript{25} ibid, para 18.
\textsuperscript{26} ibid, para 19 (a).
\textsuperscript{27} ibid, para 19 (b).
\textsuperscript{28} ibid, para 19 (c).
\textsuperscript{29} ibid, para 19 (d).
engagement of all State institutions’, while local authorities and local communities are expected to play an important role. A ‘multi-hazard approach and inclusive risk-informed decision-making based on the open exchange and dissemination of disaggregated data’ is required in addition to the coherent ‘development, strengthening and implementation of relevant policies, plans, practices and mechanisms’. Moreover, the focus must be on local and specific characteristics of disaster risks and on ‘addressing underlying disaster risk factors through disaster risk-informed public and private investments’. Other principles include the need to ‘reduce disaster risk by “Building Back Better” and increasing public education and awareness’; ensuring ‘effective and meaningful global partnership and the further strengthening of international cooperation’ and the ‘adequate, sustainable and timely provision of support’ to countries in need.

The framework emphasizes the role of various stakeholders in the reduction of disaster risks, stating that this responsibility is a shared one between state and non-state stakeholders. The latter must play a significant role in supporting a state’s actions and measures for the implementation of this framework at the various levels, in accordance with existing rules and policies. The framework specifies the various categories of stakeholder, public and private, that must play a role and the ways a state should encourage and support their participation. These stakeholders include ‘civil society, volunteers, organized voluntary work organizations and community-based organizations’; women; children and youth; persons with disabilities and their organizations; older persons; indigenous peoples; migrants; academia, scientific and research entities and networks; and business, professional associations and private sector financial institutions and finally media. The stakeholders mentioned above must have specific and time-bound commitments for the establishment of modalities for cooperation as well as the implementation of this framework, through the development of partnerships at various levels. What is more, the stakeholders are encouraged to make their commitments and their implementation public via the website of the United Nations Office for Disaster Risk Reduction (UNDRR).

The framework finally emphasizes international cooperation and global partnership with the main objective of providing much needed support to the ‘least developed countries, small island developing States, landlocked developing countries and African countries, as well as middle-income countries’. Such support should take the form of ‘technology transfer, involving a process of enabling and facilitating flows of skill, knowledge, ideas, know-how and technology from developed to developing countries in the implementation

---

30 ibid, para 19 (e).
31 ibid, para 19 (f).
32 ibid, para 19 (g).
33 ibid, para 19 (h).
34 ibid, para 19 (i).
35 ibid, para 19 (j).
36 ibid, para 19 (k).
37 ibid, para 19 (l).
38 ibid, para 19 (M).
39 ibid, para 35.
40 ibid, para 36.
41 ibid, para 36 (a).
42 ibid, para 36 (a) i.
43 ibid, para 36 (a) ii.
44 ibid, para 36 (a) iii.
45 ibid, para 36 (a) iv.
46 ibid, para 36 (a) v.
47 ibid, para 36 (a) vi.
48 ibid, para 36 (b).
49 ibid, para 36 (c).
50 ibid, para 37.
51 ibid, para 41.
of the present Frame'. In this context, the circumstances of each of the categories mentioned above are considered while South–South cooperation is also empathized. The framework mentions four means for the implementation of such cooperation. These include for instance 'bilateral and multilateral channels, including through enhanced technical and financial support and technology transfer on concessional and preferential terms' and 'bilateral, regional and multilateral collaborative arrangements, including the UN and other relevant bodies'. Indeed, there is a special emphasis on having support from international and regional organizations as well as international and regional financial institutions and donor agencies dealing with disaster risk reduction. The main focus is on the UN and its entities, mainly UNDRR, and on international financial institutions like the World Bank.

4. CAN THE SINDAI PRIORITIES BE USED AS A LEGAL TOOL FOR ADDRESSING UNCERTAINTY AND MANAGING RISKS IN THE ENERGY SECTOR?

The previous section did not examine the four priorities of the Sindai Framework as these priorities will be discussed in detail in this section, highlighting their usefulness for addressing uncertainty and managing risks in the energy sector.

Priority 1: understanding disaster risk

The framework emphasizes the need to understand 'disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment' for the adoption of policies and practices related to disaster risk management. It also expresses that such knowledge can be used for 'pre-disaster risk assessment, for prevention and mitigation and for the development and implementation of appropriate preparedness and effective response to disasters'. Reaching the above-mentioned objectives requires a specific focus at the national and local levels as well as at the global and regional levels. Hence, one can notice the holistic approach adopted by the framework to ensure the understanding of disaster risks at all levels. There are various means mentioned to ensure the understanding of disaster risk management at the national and local levels. These include promoting the 'collection, analysis, management and use of relevant data and practical information and ensure its dissemination'; developing, periodically updating and disseminating, 'as appropriate, location-based disaster risk information'; making 'non-sensitive hazard-exposure, vulnerability, risk, disaster and loss-disaggregated information freely available and accessible, as appropriate' etc. Similarly other means were established at the global and regional levels, including enhancing the 'development and dissemination of science-based methodologies and tools to record and share disaster losses and relevant disaggregated data and statistics'; and promoting and enhancing, 'through international cooperation, including technology transfer, access to and the sharing and use of non-sensitive data and information, as appropriate, communications and geospatial and space-based technologies and related services'.
Disasters can affect the energy sector in various ways. Access to energy may be interrupted as a result of natural or manmade disasters. Examples include the invasion of Kuwait by Iraq in 1990, disrupting the oil supplies in both countries, causing a rise in oil prices globally given the production loss witnessed and Hurricane Sandy in the United States in 2012, affecting electricity access for customers. Moreover, energy demands may not be met because of natural and manmade disasters affecting the energy infrastructure and the supply chain. Examples include the failure of the drillers of the Deepwater Horizon rig to account for the issues and risks shown during the drilling phase resulting in a blowout and an oil spill, as well as the complete loss of electricity service for months in Honduras because of the 1998 Hurricane ‘Mich’. Generally, the negative consequences of energy disasters are huge, as a usual loss of energy affects a great number of people, causes deaths and property damages on a yearly basis. These are among the main consequences of energy disasters that also include ‘power outages, which impact public and private infrastructure, including communication, water, transportation, banking, food refrigeration, and many other systems’. Responses to energy disasters usually happen after their occurrence and are very slow, especially in developing countries, while in numerous cases the lack of technical expertise and the capacity to address these disasters seriously affects the functioning of the country.

Understanding disaster risk management through the lens of the Sendai Framework could be relevant for the management of energy disaster risks, especially as the framework offers means for the implementation of such understanding at the national and local levels as well as at the global and regional levels, where some of the existing provisions were mentioned previously. The Sendai Framework through Priority 1 can offer a new understanding of disaster risks related to the energy sector and means for the implementation of this new understanding.

**Priority 2: strengthening disaster risk governance to manage disaster risk**

The framework stresses the importance of disaster risk governance at all levels to ensure the management of disaster risks in an effective and efficient manner. This requires ‘clear vision, plans, competence, guidance and coordination within and across sectors, as well as participation of relevant stakeholders’. Accordingly enhancing disaster risk governance is incremental for various reasons, mainly prevention, mitigation, preparedness, response, recovery and rehabilitation as well as the strengthening of collaboration and partnerships between existing institutions and mechanisms having the final objective of ensuring disaster risk reduction and the realization of sustainable development. Similarly to Priority 1, the framework establishes means for the realization of Priority 2 at the national and local levels as well as at the global and regional levels. At the national and local levels, the framework calls for instance for mainstreaming and integrating ‘disaster risk reduction within and across all sectors’ and reviewing and promoting the ‘coherence and further development, as appropriate, of national and local frameworks of laws, regulations and public policies’. It also calls for the

---

67 U.S. Energy Information Administration, ‘Effects of Crude Oil Supply Disruptions: How Long Can They Last?’ (March. 30, 2011), <https://www.eia.gov/todayinenergy/detail.php?id=730> accessed 20 February 2021.
68 W Uja, ‘The Effects of Natural Disasters on Energy Infrastructure’ (Lewis & Clark Law School), <https://law.lclark.edu/live/blogs/132-the-effects-of-natural-disasters-on-energy> accessed 20 February 2021.
69 M West, ‘How Deepwater Offshore Drillers Have Failed to Uphold Their End of the Bargain: The Policy Infirmities of BSEE’s Current Oil Spill Response Framework’ (2019) 31 The Georgetown Environmental Law Review. 605, 612–13.
70 JJ Gonzalez, ‘Energy Justice, Law, and Poverty in the Context of Mesoamerican Countries’ in ID Guayo and others (eds), Energy Justice and Energy Law (OUP 2020) 291, 298.
71 G Castaneda-Garza, G Valerio-Urena and T Izumi, ‘Visual Narrative of the Loss of Energy after Natural Disasters’ (2019) 7 Climate 118, 118.
72 A Gatto and C Drago, ‘A Taxonomy of Energy Resilience’ (2020) 136 Energy Policy 11007.
73 See in general, Sendai Framework (n 9) paras 24 and 25.
74 ibid, para 26.
75 ibid.
76 ibid, para 27 (a).
adoption and implementation of ‘national and local disaster risk reduction strategies and plans, across different timescales, with targets, indicators and time frames’. At the global and regional levels, the framework calls for fostering ‘collaboration across global and regional mechanisms and institutions for the implementation and coherence of instruments and tools relevant to disaster risk reduction’. It also calls to ‘promote transboundary cooperation to enable policy and planning for the implementation of ecosystem-based approaches with regard to shared resources’ among many other things.

Disaster risk governance in the energy sector is very challenging given the need to not only regulate each energy sector but to also supervise the regulators responsible for this sector with the general purpose of avoiding disasters. For instance, in the aftermath of the Fukushima nuclear disaster, Japan was forced to examine its governance practices, finding that safety regulations were not well implemented, forcing the country to revisit its entire energy policy. The government found that the disaster was man-made as a result of a ‘culture of “reflexive obedience” and “insularity” on the part of regulatory authorities’. This resulted in a lack of regulatory oversight, despite the ‘decades of civil nuclear power experience and a sophisticated industrial and academic base’. Unfortunately, it seems that an actual focus on disaster risk governance generally and in the energy sector takes place after the occurrence of a disaster. Indeed, the state usually decides to adopt new appropriate regulatory frameworks after the incident. This was the case for instance in Jamaica after the 1988 Hurricane Gilbert, where the rules put in place were not tested until the 2004 Hurricane Ivan and 2007 Hurricane Dean, highlighting the existence of gaps. This is not to say that no positive developments are occurring. For instance, the importance of disaster risk management governance in the energy sector was recognized in the Caribbean in the Regional Comprehensive Disaster Management Strategy and Programming Framework 2014–2024.

The Sendai Framework provides much needed guidance for nations seeking effective disaster risk management governance in the energy sector through the various means for the implementation of Priority 2 where some of these means were mentioned in this section. Nations can benefit from the Sendai Framework to strengthen their disaster risk management governance to tackle the governance of disasters in the energy sector before and after their occurrence, given that such guidance is needed because of the absence of good governance practices in this sector or their outdated nature.

**Priority 3: investing in disaster risk reduction for resilience**

The framework calls for public and private investment in disaster risk prevention and reduction using structural and non-structural measures. The framework sees these measures as ‘essential to enhance the economic, social, health and cultural resilience of persons, communities, countries and their assets, as well as the environment’. These measures accordingly can lead to further economic growth, innovation and job creation and are considered as ‘cost-effective and instrumental to save lives, prevent and reduce losses and ensure

---

77 ibid, para 27 (b).
78 ibid, para 28 (b).
79 ibid, para 28 (d).
80 K Massy, ‘Governance Challenges and the Role of the United States in the New Energy Landscape’ in D Steven, E O’Brien and B D Jones (eds), The New Politics of Strategic Resources: Energy and Food Security Challenges in the 21st Century (Brookings Institution Press 2015) 318, 325.
81 H Nasu, ‘Managing Future Disasters: Japan’s Energy Security and Nanotechnology Regulation’ in S Butt, H Nasu and L Nottage and others (eds), Asia-Pacific Disaster Management: Comparative and Socio-legal Perspectives (Springer 2014) 139, 139.
82 Massy (n 80) 325.
83 ibid, 325.
84 DDP Thompson, Disaster Risk Governance: Four Cases from Developing Countries (Routledge, London 2020).
85 A Flores and L Peralta, ‘The Enhancement of Resilience to Disasters and Climate Change in the Caribbean through the Modernization of the Energy Sector’ (ECLAC Subregional Headquarters for the Caribbean, Studies and Perspectives 84, 2020) 29.
86 See in general Sendai Framework n (9), paras 27 and 28.
87 ibid, para 29.
effective recovery and rehabilitation'.88 Priority 3 offers more means for its implementation at the national and local levels in contrast to the global and regional levels. The framework calls for instance at the national and local level for the allocation of the ‘necessary resources, including finance and logistics, as appropriate, at all levels of administration for the development and the implementation of disaster risk reduction strategies, policies, plans, laws and regulations in all relevant sectors’89 and the promotion of ‘mechanisms for disaster risk transfer and insurance, risk-sharing and retention and financial protection, as appropriate, for both public and private investment in order to reduce the financial impact of disasters on Governments and societies, in urban and rural areas’.90 At the global and regional levels, the framework calls for the promotion of ‘coherence across systems, sectors and organizations related to sustainable development and to disaster risk reduction in their policies, plans, programmes and processes’.91

Investing in disaster risk reduction for resilience in the energy sector is of crucial importance particularly given that the energy sector will be affected by disasters especially as a result of climate change.92 This can include various types of investment, such as investments to reduce dependency on energy;93 investments in renewable energy;94 private sector investments95 and investments in energy infrastructures especially energy generation and distribution systems that are usually built taking the hazard risk into account.96 Investments in the energy sector for energy resilience purposes are needed as there are higher costs for inaction or bad practice in case of a disaster,97 in contrast to investing for instance in resilience in energy infrastructure resulting in an increase in energy security,98 and the deployment of renewable energy technologies for disaster risk reduction.99 One has to also keep in mind that investments in disaster risk reduction in the energy sector are triggered in many cases after the occurrence of disasters especially at the local and regional levels where states attempt to establish resilience oriented energy systems afterwards.100

Also in this context, the Sendai Framework can guide states looking to invest in disaster risk reduction for resilience through the various recommendations mentioned in Priority 3 where examples of these recommendations were provided.101 Such investments are incremental for any nation looking to avoid or address disasters in the energy sector where the list provided in the Sendai Framework is a comprehensive one. A nation, especially a developing country, can draw national policies and rules as well as seek international assistance and collaboration on the basis of this list.

---

88 ibid, para 29.
89 ibid, para 30 (a).
90 ibid, para 30 (b).
91 ibid, para 31 (a).
92 VR Reddy, V Anbumoshi and MJ Devi, ‘Stranded Assets and Protecting Value of Food Chain from Disasters and Other External Shocks’ in V Anbumozhi, F Kimura and S M Thangavelu (eds), Supply Chain Resilience: Reducing Vulnerability to Economic Shocks, Financial Crises, and Natural Disasters (Springer 2020) 281, 282.
93 National Academies, Policy and Global Affairs, Committee on Science, Engineering, and Public Policy, Committee on Increasing National Resilience to Hazards and Disaster, Disaster Resilience: A National Imperative (The National Academies Press 2001) 142.
94 S Griffith-Jones and T Tanner, ‘Financial Crises and Economic Resilience: Lessons for Disaster Risk Management and Resilience Dividends’ in S Surminski and T Tanner (eds), Realising the ‘Triple Dividend of Resilience’: A New Business Case for Disaster Risk Management (Springer 2016) 151, 170.
95 L Mili, ‘Mitigating the Vulnerability of Critical infrastructure in Developing Countries’ in A Kreimer, M Arnold and A Carlin (eds), Building Safer Cities: The Future of Disaster Risk (The World Bank 2003) 273, 275.
96 AK Jha, TW Miner and Z Stanton-Geddes (eds), Building Urban Resilience: Principles, Tools, and Practice (The World Bank 2013) 152.
97 Asian Development Bank, Climate Risk and Adaptation in the Electric Power Sector (ADB 2012).
98 Framework for Resilient Development in the Pacific An Integrated Approach to Address Climate Change and Disaster Risk Management (FRDP) 2017–2030, 3
99 RA Begum, I Komoo and J Pereira, ‘Green Technology for Disaster Risk Reduction’ (2010) International Conference on Biology, Environment and Chemistry, 279-282.
100 Y Ko and others, ‘Energy Transitions Towards Low Carbon Resilience: Evaluation of Disaster-Triggered Local and Regional Cases’ (2019) 11 Sustainability 6801.
101 See in general, Sendai Framework n (9), paras 30 and 31.
Priority 4: enhancing disaster preparedness for effective response, and to ‘Build Back Better’ in recovery, rehabilitation and reconstruction

The framework considers several factors before arguing for this priority mainly the 'increase of people and assets exposure, combined with the lessons learned from past disasters'. Because of that, the framework states the 'need to further strengthen disaster preparedness for response, take action in anticipation of events, integrate disaster risk reduction in response preparedness and ensure that capacities are in place for effective response and recovery at all levels'. The framework pays special attention to the empowerment of women and people with disabilities to ‘publicly lead and promote gender equitable and universally accessible response, recovery, rehabilitation and reconstruction approaches’. It also emphasizes the importance of preparing the recovery, rehabilitation and reconstruction phase before a disaster to ‘Build Back Better’, through ‘integrating disaster risk reduction into development measures, making nations and communities resilient to disasters’. Also, in this context, the framework is adopting means for the implementation of the priority at the national and local levels as well as at the global and regional levels. Examples include at the national and local levels preparing or reviewing and periodically updating ‘disaster preparedness and contingency policies, plans and programmes with the involvement of the relevant institutions’ and investing in, developing, maintaining and strengthening ‘people-centred multi-hazard, multisectoral forecasting and early warning systems, disaster risk and emergency communications mechanisms, social technologies and hazard-monitoring telecommunications systems’. At the global and regional levels, suggestions include developing and strengthening, ‘as appropriate, coordinated regional approaches and operational mechanisms to prepare for and ensure rapid and effective disaster response in situations that exceed national coping capacities’.

Disaster preparedness is a crucial component of disaster risk management that can provide great improvements to infrastructure, especially the critical ones such as energy and electricity infrastructures. This is very important, as the protection of energy systems and assets should be a top priority for any country. This can be noticed for instance in the grants provided by organizations and institutes such as the Global Facility for Disaster Reduction and Recovery that provided a large grant for Iraq for the design of an emergency action plan and monitoring mechanism in the context of 'Iraq Risk Profiling and Building Resilience in the Energy Sector'. The importance of disaster preparedness can be seen in the push for the inclusion of the private sector and the constant trainings provided by organizations like the International Energy Agency to strengthen the emergency response capabilities of various countries, as well as the emphasis on emergency preparedness and response by organizations like the International Atomic Energy Agency.

102 ibid, para 32.
103 ibid.
104 ibid.
105 ibid.
106 ibid, 33 (a).
107 ibid, 33 (b).
108 ibid, 34 (a).
109 KA Khaili and C Patirage, 'A Critical Review on Disaster Preparedness and Management of the Emirati Energy Sector' (2014) 11 Revista Escuela de Administración de Negocios 104, 107.
110 Global Facility for Disaster Reduction and Recovery, ‘Iraq Risk Profiling and Building Resilience in the Energy Sector – Designing Emergency Action Plan and Monitoring Mechanism’ <https://www.gfdr.org/en/iraq-risk-profiling-and-building-resilience-energy-sector-designing-emergency-action-plan-and> accessed 20 February 2021.
111 Environmental and Energy Study Institute, 'Energy Emergency Preparedness: A Critical Federal-State-Private Sector Partnership' (15 March 2017), <https://www.eesi.org/briefings/view/051517states> accessed 20 February 2021.
112 IEA, 'Emergency Response Exercises Ensuring Quick and Effective Response to Major Supply Disruptions', <https://www.iea.org/areas-of-work/ensuring-energy-security/emergency-response-exercises> accessed 20 February 2021.
113 V Fournier, 'Enhancing Emergency Preparedness and Response through Effective Cooperation and Information Exchange' (International Atomic Energy Agency, 26 September 2016), <https:/www.iaea.org/newscenter/news/enhancing-emergency-preparedness-and-response-through-effective-cooperation-and-information-exchange> accessed 20 February 2021.
Nuclear Energy Agency and the Organisation for Economic Co-operation and Development. Still, governments recognize the challenges facing their ability to be prepared for disasters, where for instance the United States recognizes in different reports the challenges facing emergency preparedness for natural disasters and their impacts on conventional energy, the United Kingdom issues guidance to prepare for and respond to energy emergencies while researchers and experts try to address this matter.

The Sendai Framework, through its priority 4 and its means of implementation, can provide much needed guidance concerning disaster preparedness and building back better in recovery, rehabilitation and reconstruction. This is very much needed as countries, even developed ones, as seen in this section, are struggling with this matter in the energy sector.

5. ANALYSIS: USING THE SENDAI FRAMEWORK PRIORITIES AS GUIDELINES FOR THE ENERGY SECTOR

Energy law is being developed at the international, regional and local levels where developments occurring at one level affect the developments at the other levels. IEL emerged mainly because of the inability of domestic law and actors to appropriately regulate the energy markets, requiring rules for all the actors, mainly states and institutions. Still, domestic energy law plays an important role by performing specific functions that IEL is unable to fulfil and vice-versa. IEL has flourished in recent decades due to the ‘privatization and liberalization of energy markets across the globe, the ongoing “energy transition” (primarily related to climate change considerations), and the internationalization of and changes in energy markets’. Energy law is considered as one of the most complicated legal fields, demanding scholars to engage with other disciplines including politics, environmental sciences and engineering, where fields such as politics, economics and the environment are seeking to move energy law in their direction despite the need to balance all these elements. In fact, energy law as well as international law and environmental law contribute together to the regulation of the energy sector. Energy law is currently starting to be viewed through a holistic approach in contrast to the past where it was dealt with in accordance with each type of energy source. This is because of the realization of the importance of the energy sector, leading to a growing literature on the topic in the academic field.

The growing international dimension of IEL led to the development of this field as a separate academic discipline. There are no uniform global rules applicable as ‘there is no single, easily identifiable global

114 Nuclear Energy Agency & Organisation for Economic Co-operation and Development, ‘Towards an All-Hazards Approach to Emergency Preparedness and Response: Lessons Learnt from Non-Nuclear Events’ (NEA No. 7308, 2018), <https://www.oecd-nea.org/jcms/pl_15010/towards-an-all-hazards-approach-to-emergency-preparedness-and-response?details=true> accessed 20 February 2021.
115 National Petroleum Council, ‘Enhancing Emergency Preparedness for Natural Disaster: Government and Oil & Natural Gas Industry Actions to Prepare, Respond, and Recover’ (18 December 2014).
116 Gov.UK, ‘Guidance Preparing for and Responding to Energy Emergencies’, <https://www.gov.uk/guidance/preparing-for-and-responding-to-energy-emergencies> accessed 20 February 2021.
117 P McNally and E Minyard, ‘Emergency Preparedness for Oil and Gas Exploration and Production’ (Paper presented at the SPE E&P Health, Safety, Security and Environmental Conference-Americas, Denver, CO, March 2015), <https://onepetro.org/SPEHSSE/proceedings-abstract/15HSSE/All-15HSSE/SPE-173532-MS/182406> accessed 20 February 2021.
118 RJ Heffron and K Talus, ‘The Development of Energy Law in the 21st Century: A Paradigm Shift?’ (2016) 9 Journal of World Energy Law & Business 189, 193.
119 SW Schill, ‘The Interface between National and International Energy Law’ in K Talus (ed), Research Handbook on International Energy Law (Edward Elgar Publishing 2014) 44, 57.
120 RJ Heffron and others, ‘A Treatise for Energy Law’ (2018) 11 Journal of World Energy Law & Business. 34, 34.
121 Heffron and Talus (n 118) 191.
122 ibid, 193.
123 P Park, International Law for Energy and the Environment (2rd edn, CRC Press 2013) 43.
124 Heffron and Talus (n 118) 191.
125 Wawryk (n 7) 224.
energy market or industry and it is difficult to identify precisely the parameters of the energy markets or industries which can be seen as the subjects of IEL; nor is there one easily identifiable ‘source’ of energy law.\textsuperscript{126} IEL is a fragmented field due the historical development of energy resources and markets.\textsuperscript{127} Moreover, there is a lack of an institutional body globally covering all types of energy resources and phases.\textsuperscript{128} The sources of IEL are (i) treaties and customary international law; (ii) national laws and regulatory principles spreading globally and (iii) soft law ‘guidelines, resolutions, directives, standards or model codes of international bodies.’\textsuperscript{129} Wawryk described IEL as a ‘conglomeration of rules of custom, treaties, national and regional laws, and principles of intergovernmental and non-governmental international institutions, which together regulate the various facets of energy production, supply, consumption and trade.’\textsuperscript{130} Each energy source (oil and gas, nuclear power and renewable energy) forms its own bodies and regulations in the general framework of IEL, while other sources of IEL are rules related to the functioning of electricity and gas markets and European Union energy law. Other sources of energy law include those laws that are directly or indirectly related to the energy sector such as environmental laws; indigenous people law; human rights, especially with regards to universal access to energy; investment laws; dispute settlement resolution regulations; trade law and the regulations related to financing, taxation, subsidies and royalties.\textsuperscript{131}

Despite all these developments, this legal field is considered as a forgotten discipline as there are few legal principles specific to energy law and those that exist are inadequate and inappropriate for the energy transition while energy issues are usually solved through general law principles.\textsuperscript{132} This has led scholars such as Heffron et al. to develop principles for energy law that are ‘1) The Principle of National Resource Sovereignty; 2) The Principle of Access to Modern Energy Services; 3) The Principle of Energy Justice; 4) The Principle of Prudent, Rational and Sustainable Use of Natural Resources; 5) Principle of the Protection of the Environment, Human Health & Combatting Climate Change; 6) Energy Security and Reliability Principle; 7) Principle of Resilience.’\textsuperscript{133} In this context and taking into account the disasters that are occurring in the energy sector, the rules and policies that should cover pre and post disaster scenarios should not be those from other legal fields such as tort law, civil law or even environmental law but rather from the existing binding and nonbinding IDL instruments that have been developed over the years. In particular, instruments such as the Sendai Framework can offer much needed guidance for policymakers seeking to address energy disasters as shown in this article. States can use this framework as guidance in drafting their national disaster policies applicable to the energy sector choosing the appropriate means for the implementation of the various priorities mentioned within the framework without the need to be bound by the framework, given its current nonbinding nature. Even the international community could benefit from the Sendai Framework for the adoption of new energy law principles related to disasters and the implementation of disaster law guidelines within the various energy resources. IDL, through instruments such as the Sendai Framework, offers a roadmap for the energy sector seeking to address pre- and post-disaster scenarios.

6. CONCLUSION

Even before the emergence of Covid-19, there were calls for an energy revolution to transform the energy sector to ensure effective governance at the national, regional and international level.\textsuperscript{134} Covid-19 provided further pressure to speed up the transformation process given the many changes that occurred to the energy

\textsuperscript{126} ibid, 225.
\textsuperscript{127} ibid, 225.
\textsuperscript{128} ibid, 227.
\textsuperscript{129} ibid, 227.
\textsuperscript{130} ibid, 228.
\textsuperscript{131} ibid, 236–54.
\textsuperscript{132} Heffron and others (n 120) 36.
\textsuperscript{133} ibid, 40.
\textsuperscript{134} N Gunningham, ‘Confronting the Challenge of Energy Governance’ (2012) 1 Transnational Environmental Law 119, 119.
sector as a result of the health disaster. These changes include the slump in energy demand and oil prices resulting in decreased investments in coal, oil and gas and increased investment in renewable energies,135 as a result of the slowing of all types of activity requiring conventional energy, such as transport, trade and economic activities.136 In this context, some argue that the impact of this pandemic on the conventional energy sector will not last, in contrast to others that see an energy transition towards a low-carbon economy.137 In fact, the actual and exact impact of Covid-19 on the energy sector has been the subject of numerous articles and studies in the last few months while new studies will emerge in the near future addressing this same issue.

This article provided a new lens through which the impact of this pandemic on the energy sector can be examined, focusing on the role IDL can play to address pre and post disaster scenarios. The author argues that IDL, through its binding and nonbinding frameworks, can play a role in disaster risk reduction and management in the energy field. The Sendai Framework was selected by the author to prove this claim where the main focus was on analyzing the four priority areas of the framework and the way they can be used in the energy sector. Indeed, each of the priority areas of the framework be it: (i) understanding disaster risk; (ii) strengthening disaster risk governance to manage disaster risk; (iii) investing in disaster risk reduction for resilience or (iv) enhancing disaster preparedness for effective response, and to 'Build Back Better' in recovery, rehabilitation and reconstruction can provide a much needed guidance for the policymakers for addressing disasters in the energy field. The author also argued for the use of instruments such as the Sendai Framework as guidance, given the current state of energy law that is highly fragmented and completely nascent as pointed out in the previous section.

The purpose of this article is not only to argue for the use of IDL for disaster risk reduction and management in the energy sector but to also point out the need for a new approach to the energy field given its current status, benefiting from other existing regulatory frameworks. This is not say that such frameworks should take over or replace this field, as is happening in many cases where other legal fields are applied to specific situations in contrast to energy law that should apply, but rather that energy lawyers should integrate elements from other legal fields within the energy sector, especially when there is a legal vacuum like in the case of the rules governing pre and post disaster scenarios in the energy field. Future studies on this topic need to answer specific and general questions. These include specific questions such as which other binding or nonbinding IDL legal frameworks can also provide guidance for the energy sector? More general questions include: how can energy law integrate legal elements from other more sophisticated legal fields while remaining the main regulatory framework applicable to the situation for which these legal elements are relevant?

135 Oxford Business Group, ‘Covid-19 Impact: Energy Sector Year in Review 2020’ (10 December 2020), <https://oxfordbusinessgroup.com/news/covid-19-impact-energy-sector-year-review-2020> accessed 20 February 2021.
136 IEA, ‘Covid19: Exploring the Impacts of the Covid-19 Pandemic on Global Energy Markets, Energy Resilience, and Climate Change’, <https://www.iea.org/topics/covid-19> accessed 20 February 2021.
137 A Muralidharan, ‘COVID-19’s Impact on the Energy Sector’ (Hydrocarbon Engineering, 19 November 2020), <https://www.hydrocarbonengineering.com/clean-fuels/19112020/covid-19s-impact-on-the-energy-sector/> accessed 20 February 2021.