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Energy Law for Decommissioning in the Energy Sector in the 21st Century

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Abstract:

Legal issues around the decommissioning of energy infrastructure have received limited attention by the energy law research community to-date. This short article and special issue focus on decommissioning. Within the special issue there is a focus on decommissioning for oil, gas, nuclear energy and coal infrastructure. This article introduces the topic of decommissioning in the energy sector. It covers the scope of the law for decommissioning and also aligns it with the seven principles of energy law. It also highlights future areas for research and in particular around distributive justice and the role of ethics. At the heart of the legal challenges for decommissioning energy infrastructure lies the important question of who should pay the cost and when. These questions need to be addressed and answered at the outset of a project and not at the end. Finally, the article highlights how decommissioning activity requires an element of interdisciplinary thinking, and lawyers working in this area will have to engage with other disciplines.

Keywords: decommissioning; energy transition; distributive justice; restorative justice; just transition

1. Introduction

Decommissioning in the energy sector is a vital activity for national economies. Poor decommissioning will lead to injustices, for example, in terms of environmental impact, distribution of wealth, public health and is against the practice of sustainability. As a result of these effects and their potential, many countries across the world are realising the importance of ensuring that energy sites of all types are in need of decommissioning. It is an area growing in legal practice but as of yet still lacking in terms of legal literature.

The energy law research community to-date has placed limited importance on the issue of decommissioning of energy infrastructure. This is because society is now entering a phase where energy infrastructure is aging and never before has society had such a problem of this degree of redundant energy infrastructure. A second factor is that worldwide many countries remain in some type of economic recession post the financial crisis of 2007-2009; as a result finance is in short supply and thus national governments are increasingly reluctant to take on the burden of the full cost of decommissioning and are looking to industry to pay for it. It should be noted that decommissioning is an activity that has a long-term orientation which is in conflict with the world's more short-term economics based approach. These two factors have given rise to the need for a new assessment of what decommissioning needs to be done and who is going to pay for it. In legal terms, what law exists to ensure decommissioning happens and is paid for by the appropriate parties needs to be clearly outlined..

Some countries continue to make progress on decommissioning law and practice but there remain significant problems in terms of legislative development and ultimately the distributional issue concerning who pays for the decommissioning. However, in the majority of countries decommissioning remains an afterthought of the energy sector and there is limited or even no decommissioning legislation. This paper which serves also as an editorial of this special issue on decommissioning aims to highlight and progress legal analysis on decommissioning. There are six contributions that were finally accepted after a '*Call for Papers*' in 2017. These six papers (seven including this article) are all very interesting themselves and what is also relevant is that these represent a selection of what leading academics of the energy law academic community are thinking of in terms of decommissioning. In time, it is hoped that future researchers will note the importance of these contributions and also the gaps in terms of what was not contributed.

This article (editorial) serves as a brief introduction to energy law on decommissioning. Section two covers in brief the scope of decommissioning law. It is important to consider how decommissioning law should be introduced and where in the lifespan of a project will it become important. Section three explores the application of energy law principles to decommissioning. Scholars recently have advanced seven core energy law principles[1] and future decision-making in the energy sector should have these energy law principles as a guide and therefore there is a need

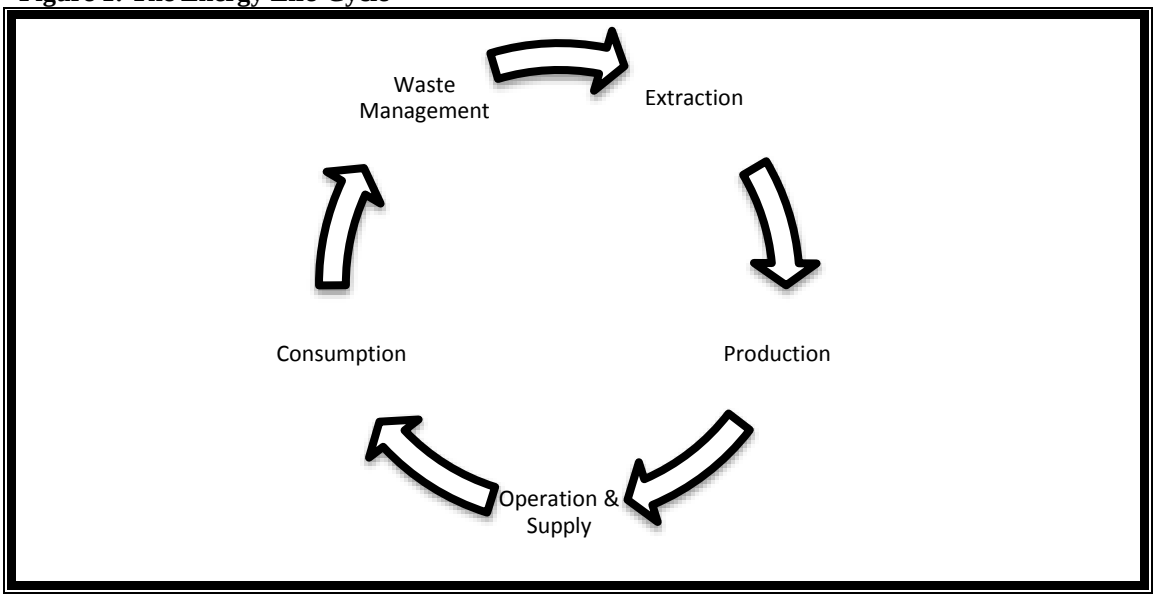
[1] Heffron, R. J., Ronne, A., Bradbrook, A., Tomain, J. P. and Talus, K. 2018. A Treatise for Energy Law. *Journal of World Energy Law & Business*, 11 (1), 34-48.

to think about decommissioning from the start of a project rather than at the very end. The final section explores some of the new areas of research for energy law scholars focusing on decommissioning, and discusses those which include in particular (1) distributive justice and (2) the role of ethics.

2. The Scope of Decommissioning Law

The simplest definition of decommissioning is the withdrawal of or change in a service.[2] Decommissioning is an activity with the energy system, and as identified previously by energy law scholars, it is the final stage of energy system (see Figure 1 below) which has five key stages from extraction to production to operation to consumption and waste management (which includes decommissioning).

Figure 1: The Energy Life-Cycle



Source: Adapted by the authors from the: US EPA, Climate Change and the Life Cycle of Stuff, available at { HYPERLINK "http://epa.gov/climatechange/climate-change-waste/life-cycle-diagram.html" } (last accessed, March 2018).

At its core, decommissioning is about restoration, i.e. returning the energy site to its previous state or as close as possible (given it is accepted that there is some trade-off between energy use and the environment). In essence a justification for decommissioning lies in restorative justice, a justice concept more recently recognised as fundamental to ensuring energy justice.[3] Restorative justice aims to repair the harm done to people and/or society and/or nature.[4]

Energy law for decommissioning legislation is not common in many countries nor is it clear when it should apply. However, law exists that is changing this to a degree. This is in the form of *Environmental Impact Assessment* legislation that requires an

[2] National Audit Office. 2018. What we mean by 'decommissioning'? Available at: { HYPERLINK "https://www.nao.org.uk/decommissioning/before-you-start/what-we-mean-by-decommissioning/" } (last accessed March 2018).
[3] Heffron, R. J. & McCauley, D. 2017. The concept of energy justice across the disciplines. Energy Policy, 105, 658-667.
[4] For more on restorative justice and energy read: *Ibid*, Heffron & McCauley. 2017.

energy project to disclose what are the plans for restoring the site after the energy project ends. This is where in many cases the legal obligation for decommissioning ends, and is why there is a need for specific decommissioning legislation that could be applied to all energy activities.

It needs to be recognised that decommissioning is a future activity and therefore in many cases requires a long-term perspective. Some of the costs cannot be anticipated and this feeds into a reluctance to engage in decommissioning. However, as society has and is encountering more and more old energy infrastructure, this view is becoming outdated. The scientific expertise (around environmental impacts) and engineering capability is increasing every year on decommissioning. Further, this science and engineering expertise applies worldwide and is something all societies can agree on despite cultural, legal and/or societal differences.

Significantly, there is one part of the energy sector that is more advanced than others in relation to decommissioning and that is the nuclear energy sector. In many countries with nuclear power legislation on nuclear decommissioning already exists, and indeed the International Atomic Energy Agency's view of decommissioning is that "*Decommissioning is a normal part of a nuclear facility's lifetime and needs to be considered at the earliest stages of its development.*"[5] Indeed, in these countries, prior to the project receiving final approval, there are clear plans based on law for how the decommissioning process will work (i.e via an EIA) and most importantly who will pay for it. A general best-practice perspective is that a nuclear energy company will pay for the majority or all of the decommissioning through contributing to a decommissioning fund from the moment the nuclear energy plant produces electricity – for example in Sweden.[6] The question needs to be asked why has such legislation not been applied to other energy sources and activities?

In answering the above question, to a degree there has been some obligation put on energy companies of different types for different energy activities; for example, a legal mechanism known as an energy finance reserve obligation (EFRO)[7] for mining companies in the US and Australia. There is a multitude of reports focusing on it in relation to the operation of coal assets in these two countries.[8] For example, in the US,

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[5] IAEA. 2018. Decommissioning of nuclear installations. Available at: { HYPERLINK "https://www.iaea.org/topics/decommissioning" } (last accessed March 2018).

[6] SKB (Swedish Nuclear Fuel and Waste Management Company). 2018. Our owners finance our expenditure. Available at: { HYPERLINK "http://www.skb.com/about-skb/funding/" } (last accessed March 2018).

[7] An EFRO applies to companies with waste obligations—or rather the companies that should have waste obligations; these EFROs are also referred to as 'clean-up obligations' and 'environmental bonds'. See: Heffron, R. J. 2016. *The Global Future of Energy Law*. International Energy Law Review, 7, 290- 295.

[8] See for example the following: (1) International Business Times (Gallucci, M.). 2016. When A Coal Company Goes Bankrupt, Who Is Left To Clean Up The Mess? (14 January 2016). Available at: { HYPERLINK "http://www.ibtimes.com/when-coal-company-goes-bankrupt-who-left-clean-mess-2264097" } (last accessed March 2018); (2) The Guardian (Robertson, J.), 2016. Coal giants abandon unprofitable mines, leaving rehabilitation under threat .(28 January 2016).
Available at: { HYPERLINK "https://www.theguardian.com/environment/2016/jan/29/coal-giants-

under the Federal Surface Mining Control and Reclamation Act (SMCRA),[9] energy companies are required to remediate the lands where mining activity has occurred. However, many companies were allowed to self-bond and therefore when they went bankrupt there was still no finance available for meeting reclamation obligations.[10]

Overall, the problem is that the approach to legislation on decommissioning in the energy sector is very piecemeal and varies significantly for energy sources and/or activities. This general inconsistency of approaches to decommissioning contributes to the injustices outlined earlier in section one, and there is also an effect on the true cost of energy sources and consequently, therefore there is a distortion in terms of the energy choices that a society makes.

3. Decommissioning and the Principles of Energy Law

Energy law as a discipline has been undergoing a rejuvenation[11] and more recently, scholars in the community have advanced a set of core principles.[12] It is important to identify how decommissioning fits in with these principles. Already, decommissioning has been noted as a key activity in the energy system and therefore a key legal area for energy lawyers.[13] Nevertheless in surveying the seven energy law principles, three of them in particular demonstrate a need for decommissioning. In future, decision-making in the energy sector should be guided by these energy law principles and therefore there is a need to think about decommissioning from the start of a project rather than at the very end.

The literature on law and decommissioning is sparse. A significant amount relates to the United Kingdom, which is seen as a leader in relation to nuclear decommissioning and now offshore oil and gas decommissioning with the establishment of the Oil and

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abandon-unprofitable-mines-leaving-rehabilitation-under-threat" } (last accessed March 2018); and (3) Miller, C. G. 2005. Financial Assurance for Mine Closure and Reclamation. (International Council on Mining & Metals). Available at: { HYPERLINK "https://www.icmm.com/document/282" } (last accessed March 2018).

[9] Federal Surface Mining Control and Reclamation Act (SMCRA). Available at: { HYPERLINK "http://www.osmre.gov/lrg.shtm" } (last accessed March 2018). And for Australian rules see: Financial assurance under the Environmental Protection Act 1994. Queensland Government Department of Environment and Heritage Protection. Available at: { HYPERLINK "http://www.ehp.qld.gov.au/assets/documents/regulation/era-gl-financial-assurance-ep-act.pdf" } (last accessed March 2018).

[10] See: (1) Bloomberg (Biesheuval, T., Riseborough, J. and De Sousa, A.), 2015. Why Bankruptcy Might Be the Mining Industry's Last Best Hope (3 December 2015). Available at: { HYPERLINK "http://www.bloomberg.com/news/articles/2015-12-03/why-bankruptcy-might-be-the-mining-industry-s-last-best-hope" } (last accessed March 2018); and (2) ABC Australia News (Lannin, S.). 2015. China economist warns major miners may collapse in 2016 (18 December 2015). Available at: { HYPERLINK "http://www.abc.net.au/news/2015-12-17/china-economist-warns-that-iron-ore-miners-will-collapse/7037802" } (last accessed March 2018).

[11] Heffron, R. J., Roberts, P., Cameron, P. and Johnston, A. 2016. A Review of Energy Law Education in the UK. Journal of World Energy Law and Business, 9 (5), 346-356.

[12] Heffron, R. J., *et al*. 2018.

[13] Heffron, R. J. and Talus. K. 2016. The Evolution of Energy Law and Energy Jurisprudence: Insights for Energy Analysts and Researchers. Energy Research and Social Science, 19, 1-10.

Gas Authority and one of its key focuses being on decommissioning.[14] This literature focuses specifically on the increased costs and a lack of action on nuclear decommissioning[15] and the ongoing development of oil and gas decommissioning regimes with particular reference to the North Sea.[16] One of the more interesting articles however relates to Carbon Capture Storage (CCS) technology – an alternative form of decommissioning – and in the context of the storage sites for the CO_2 (the final part of the CCS chain) and emphasis is placed on '*who pays, for what and how*'.[17] That is the central question that remains unanswered in terms of decommissioning.

Two related areas to energy law are climate change and environmental law, and these are guided by well-established principles. Until recently, energy law had no core set of principles to underwrite energy activities and decision-making from a legal perspective. However, earlier this year, a malice of academics have advanced seven energy law principles which are given below in Table 1. The benefit of such a set of guiding principles is that they contribute to the successful development and application of energy law which in turn promotes positive change, for example, there has been a clear effect from one of the most established environmental principles, i.e. the polluter pays principle. In this context, these principles of energy law can "*act as a guide to policymakers, academics, lawyers, judges and arbitrators when adjudicating, enforcing, making or formulating documentation, laws, regulations, judgments, etc on energy law*[18]".

[14] UK Oil and Gas Authority. 2018. Decommissioning Strategy. Available at: { HYPERLINK "https://www.ogauthority.co.uk/decommissioning/strategy/" } (last accessed March 2018).

[15] See for example, the following: (1) Kunth, B. 1986. Decommissioning of Nuclear Power Plants. Journal of Energy and Natural Resources Law, 4 (2), 107-115; (2) Temple, R. 2005. How the EU could look to Britain on nuclear decommissioning. International Energy Law & Taxation Review, 8, 200-202; (3) Lal, H. 2011. Nuclear decommissioning contracts: the legal and commercial issues. Construction Law Journal, 27(4), 244-258; and (4) Heffron, R. J., Allen, M. and McCauley, D. 2013. A forgotten law and policy issue as independence looms: nuclear waste management in Scotland. Edinburgh Law Review, 17 (3), 411-415.

[16] See for example, the following: (1) Gordon, G., Paterson, J. and Usenmez, E. 2018. UK Oil and Gas Law: Current Practice and Emerging Trends Volume I: Resource Management and Regulatory Law. Edinburgh University Press: Edinburgh, UK; (2) Jackson, S. and Solimano, F. 2016. Decommissioning in the North Sea: navigating the regulatory framework and insuring new risks. Environmental Law & Management, 28 (6), 240-246; (3) Holland, B. and Davar, M. 2016. Decommissioning in the UK continental shelf: decommissioning security disputes. International Energy Law Review, 6, 240-247; (4) Hillyear, S. 2015. Supply chain opportunities in the UK offshore oil and gas decommissioning. Construction Law Journal, 31 (3), 139-147. (5) Davar, M. and Dhirazi, G. 2015. Decommissioning in the UK continental shelf: a litigator's perspective. International Energy Law Review, 5, 192-198; (6) Coulthard, P. 2010. Environmental countdown to decommissioning in the North Sea. Scottish Planning and Environmental Law, 138, 42. (7) Hammerson, M. 2009. Decommissioning offshore oil and gas facilities: industry contracts and security arrangements. Environmental Law & Management, 21 (1), 31-38; and (8) Aldersey-Williams, J. 2008. The Decommissioning Cost Provision Deed: facilitating asset transfers on the UKCS. International Energy Law Review, 5, 169-177.

[17] Heffron, R. J., Downes, L., Bysveen, M., Brakstad, E. V., Tom Mikunda, T., Neele, F., Eickhoff, C., Hanstock, D. and Schumann, D. 2018. Ownership, risk and the law for a CO2 transport network for carbon capture and storage in the European Union. Journal of Energy & Natural Resources Law (forthcoming - DOI: 10.1080/02646811.2018.1442215).

[18] P.48. Heffron, R. J., *et al*. 2018.

Table { SEQ Table * ARABIC }: Principles of Energy Law[19]

Principles of Energy Law
1. **The Principle of Natural Resource Sovereignty** *- The right of a state to use their natural resources in their own national interest* 2. **The Principle of Access to Modern Energy Services** *- Access to energy should be available to all citizens of a nation* 3. **The Principle of Energy Justice** *- The application of human rights across the energy system* 4. **The Principle of Prudent, Rational and Sustainable Use of Natural Resources** *- Natural resources should achieve a balance between economic development and environmental concerns* 5. **The Principle of the Protection of the Environment, Human Health & Combatting Climate Change** *- The use of energy and natural resources should be comply with the triple objective of protecting the environment, public health and climate change mitigation* 6. **Energy Security and Reliability Principle** *- There should be a secure supply of energy that should also be reliable* 7. **Principle of Resilience** *- The different energy activities in the energy system should be resilient so they can plan, recover, and adapt to adverse events*

In particular, principles three, four and five relate to decommissioning. One of the key issues concerning decommissioning is how energy sites and infrastructure are decommissioned. This is based largely on available technology and science, and this will be the same worldwide. There is little to debate concerning the need for decommissioning because the science for it is accepted. Indeed, there is a growing literature on the science, and technology policy issues behind decommissioning,[20] and this indeed is an area where there should be more interaction with lawyers. Further, and from a personal perspective, at different academic, practitioner and interdisciplinary energy events that this author has attended on decommissioning, there is an element of surprise as to why the law has not advanced alongside the development (and need for) of the decommissioning sector.

4. Conclusion: Next Steps for Energy Law & Decommissioning Research

This special issue on decommissioning aims to mark a new start for the energy law community to begin researching in more depth on decommissioning.

[19] P.40. Heffron, R. J., *et al*. 2018.

[20] Some recent examples include in particular the following: (1) Rouse, S., Hayes, P., Davies, I. M. and Wilding, T. A. 2018. Offshore pipeline decommissioning: Scale and context. Marine Pollution Bulletin, 129 (1), 241-244; (2) Suh, Y. A., Hornibrook, C. and Yim, Man-Sung. 2018. Decisions on nuclear decommissioning strategies: Historical review. Progress in Nuclear Energy, 106, 34-43; (3) Topham, E. and McMillan, D. 2017. Sustainable decommissioning of an offshore wind farm. Renewable Energy, 102 (Part B), 470-480; (4) Invernizzi, D. C., Locatelli, G. and Brookes, N. J. 2017. How benchmarking can support the selection, planning and delivery of nuclear decommissioning projects. Progress in Nuclear Energy, 99, 155-164; (5) Perko, T., Monken-Fernandes, H., Martell, M., Zeleznok, N. and O'Sullivan, P. 2017. Societal constraints related to environmental remediation and decommissioning programmes. Journal of Environmental Radioactivity, *In-Press*; (6) Kaiser, M. J. 2017. FERC pipeline decommissioning cost in the U.S. Gulf of Mexico, 1995–2015. Marine Policy, 82, 167-180; and (7) Invernizzi, D. C., Locatelli, G. and Brookes, N. 2017. Managing social challenges in the nuclear decommissioning industry: A responsible approach towards better performance. International Journal of Project Management, 35 (7), 1350-1364.

Decommissioning is not a profit making activity and will require the reallocation of profits and/or finances to it. It is an activity that needs to happen and there is a need for comprehensive legislation to ensure it happens. Further, the need for decommissioning is connected with societies plan to be sustainable and in terms of the United Nation's Sustainable Development Goals.[21]

One of the other aims of this special issue is to demonstrate that decommissioning is also needed for all energy sources and activities across the energy cycle. There is more advanced legislation for some energy sources, for example, for nuclear energy and in many countries for offshore oil and gas, but new legislation is needed for the majority of other energy sources and activities (i.e. for renewable energy and all types of mining activity). Unfortunately, there were no submissions from mining law scholars for this special issue which was a disappointment but it is an area that needs further research. Also, there was an expectation of more submissions from oil, gas and nuclear energy law scholars but this did not materialise either.

As stated earlier, it is clear from the literature that decommissioning is an under researched area but the level and type of submissions received for this special issue confirm this. The activity of energy decommissioning plays an important role in the just transition to a low-carbon economy. 175 nations (from 197 who have signed) have ratified the Paris COP21 agreement and they therefore are committed to developing plans of how they will achieve a low-carbon economy. [22] Decommissioning ensures that the use of energy resources occurs within the conceptual frameworks of distributive, procedural, recognition and restorative justice.[23] Further, it would ensure that energy activities happen in accordance with the principles on energy law. Finally, the development of a decommissioning sector can be an opportunity for the energy sector and create a new area for employment for energy employees from other areas. In essence, the activity of decommissioning has a role to play in the just transition to a low-carbon economy.[24] .

In many ways until society decides who will pay for decommissioning, it threatens to remain an underexplored and funded area of the energy sector. A reluctance to engage in thinking about decommissioning is due to perhaps the consequences of needing to re-evaluate the cost of energy. If full decommissioning costs are known they should be taken into account when deciding what energy choices society should make. This is an area for economists to explore but law can definitely contribute as to clarifying specifically *how* and *who* will pay for decommissioning.

A final research frontier for energy law and decommissioning is the rise of ethics. All across the legal discipline, ethics is rising in importance. One of the leading UK (and possibly EU) Judges of our time, Lord Neuberger noted relatively recently in 2012 (in

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[21] For more on these, please consult: UN. 2018. Sustainable Development Goals. Available at: { HYPERLINK "http://www.un.org/sustainabledevelopment/sustainable-development-goals/" } (last accessed March 2018).

[22] Paris Agreement, UNFCC. 2017. Available at: { HYPERLINK "http://unfccc.int/paris_agreement/items/9444.php" } (last accessed March 2018).

[23] For more on these four forms of justice, see: *Ibid*. Heffron and McCauley. 2017.

[24] For more on this see: Heffron R. J. and McCauley, D. 2018. What is the 'Just Transition'? Geoforum, 88, 74-77.

a keynote speech), that more ethics in legal education is needed and it could be a driver for change.[25] And this is the case in particular in relation to commercial law, where finance, taxation and energy are seeing new waves of responsibility and transparency being introduced into these areas. The energy sector has an additional layer of complexity due to it being a highly interdisciplinary area and so the boundaries of knowledge are improving. No longer can the energy engineer not engage with law, or the lawyer not engage with how a technology works, and likewise, all energy scholars are now clear on the effects and consequences of energy activities. These effects and consequences are clear across the world where the aim is to ensure society remains living within a 1.5° to 2.0° future. The science behind the ill-effects and bad consequences of the energy sector is the driver of a new ethical standard for energy law scholars, where no longer can cultural, economic and social considerations mask different forms of ethical behaviour and standards. The practice of ensuring decommissioning happens will provide a rich research area for energy law researchers focusing on ethics in the energy sector and in general.

[25] Lord Neuberger, 2012. Reforming Legal Education. Lord Neuberger at the Lord Upjohn Lecture, UK Association of Law Teachers (15 November 2012).