Abbott presents a compelling case study of the Medicines Patent Pool[10] to illustrate that the sharing of technology and expertise across nations is plausible despite intellectual property concerns. Ultimately, the chapter reasons that global grid integration is unlikely to begin as an international effort and will probably evolve out of the series of regional grids currently developing. Likewise, Abbot argues, technology transfer should begin with smaller bilateral efforts.

Overall, *International Trade in Sustainable Electricity* offers a number of interesting multi-disciplinary analyses of the challenges associated with increasing international trade and investment in renewable electricity. While some of the chapters fall short of their objectives, the book is at its best in presenting a wealth of viewpoints challenging its readers to engage more fully with all issues – whether they are technical, economic, or political. The book contributes several novel ideas and compels its readers to re-envision the future of the electricity sector as we know it.

Natascha Smith
Green Energy Institute at Lewis & Clark Law School, Portland, Oregon (US)

Transnational Environmental Law, 7:2 (2018), pp. 382–385 © 2018 Cambridge University Press
doi:10.1017/S2047102518000158

Struggling for Air: Power Plants and the 'War on Coal', by Richard L. Revesz & Jack Lienke
Oxford University Press, 2016, 221 pp, £22.99, ISBN 9780190233112

Despite almost half a century of regulation, progress in reducing the emissions from certain segments of the United States (US) energy sector remains stymied by elderly grandfathers refusing to 'shuffle off this mortal coil'.[1] Almost 50 years ago, the US enacted the modern version of the Clean Air Act (CAA).[2] Responding to an increase in public interest on the topic of air pollution, the US Congress passed an ambitious bill that aimed to decouple economic growth from environmental harm and ensure clean, healthy air for all Americans. The CAA empowered the newly created US Environmental Protection Agency (EPA) to set emissions standards and regulate sources of emissions, including power plants. However, the delegated regulatory authority for many common pollutants under the New Source Performance Standards (NSPS)[3] extends only to newly constructed or modified facilities.[4]

10 See website at: https://medicinespatentpool.org ('The Medicines Patent Pool (MPP) is a United Nations-backed public health organisation working to increase access to HIV, hepatitis C and tuberculosis treatments in low- and middle-income countries').

1 William Shakespeare, *Hamlet*, Act III, sc. 1.

2 42 U.S.C. §§ 7401–7671q (2012).

3 The CAA contains several regulatory schemes that regulate emissions from stationary sources. *Struggling for Air* focuses on the NSPS codified in s. 111 of the CAA: ibid., § 7411.

4 s. 111 of the CAA defines 'new source' to mean 'any stationary source, the construction or modification of which is commenced after the publication of [an applicable NSPS]': ibid., § 7411(a)(2). Modification

Existing facilities are generally exempted from most new federal regulations through a concept known as 'grandfathering'. Taking advantage of this grandfathering provision and the regulatory arbitrage opportunity it created, many coal-fired power plants in parts of the US extended their operational lives far beyond their original projected retirement dates, undermining a key assumption that Congress relied on when including the grandfathering provision in the NSPS. To address this issue, the administration of President Barack Obama promulgated three regulations imposing restrictions on grandfathered coal-fired power plants – regulations that critics allege amount to a 'war on coal'.

In *Struggling for Air: Power Plants and the 'War on Coal'*, Richard L. Revesz and Jack Lienke argue that far from conducting a novel 'war on coal', the regulatory actions implemented by the Obama administration were the logical, incremental, and necessary continuation of a multi-decade effort by presidential administrations of both major US political parties to address the issues caused by grandfathered power plants. To develop and support this argument, the authors present a detailed and insightful account of the forces that resulted in the enactment of the Clean Air Act Amendments of 1970[5] and the efforts of subsequent presidential administrations and Congress to address the emissions of air pollutants from large industrial sources. Revesz and Lienke advance the argument that the market distortions caused by the NSPS grandfathering provision have contributed significantly to the failure of the US to achieve clean, healthy air in certain regions and to enact comprehensive solutions to greenhouse gas (GHG) emissions. While *Struggling for Air* focuses on the US, the book offers a cautionary tale for policymakers everywhere seeking to ensure a smooth transition to a new regulatory regime.

The first three chapters set the stage. Chapter 1 provides a quick primer on coal, how it is used to generate electricity, and the emissions produced from the combustion of coal. Chapter 2 documents the 'war on coal' rhetoric that began during President Obama's first year in office and gained steam throughout his presidency. Chapter 3 turns to the 1970 amendments to the CAA. The chapter begins by providing a detailed, concise summary of the confluence of events that led to the passage of a remarkably ambitious environmental law. After explaining how the law came to be, the chapter briefly illustrates how the law regulates the emissions of certain common pollutants from stationary industrial sources, such as power plants, through a combination of uniform ambient air quality and performance standards set by the EPA.

However, as the authors note, Congress limited the authority of the EPA to set performance standards to newly constructed and substantially retrofitted facilities. The chapter proceeds by providing a clear explanation of how the grandfathering provision creates a problematic market distortion by incentivizing continued investment in grandfathered sources while disincentivizing capital investment in newer sources that would be subjected to regulation. The inclusion of the NSPS

is subsequently defined as 'any physical change in, or change in the method of operation of, a stationary source which increases the amount of any air pollutant emitted by such source or which results in the emission of any air pollutant not previously emitted': ibid., § 7411(a)(4).

[5] Pub. L. No. 91-604, 84 Stat. 1676.

https://doi.org/10.1017/S2047102518000158 Published online by Cambridge University Press

grandfathering provision, the authors opine, was a tragic mistake made by Congress – based on the mistaken assumption that grandfathering power plants would not result in their operational lives being extended – an argument that the authors fully explore in the second part of the book.

In Chapters 4 to 6, Revesz and Lienke explore the repercussions of the grandfathering provisions. Chapter 4 begins by discussing the lively game of cat-and-mouse played over the course of several decades by regulators and industry, as regulators sought to limit the impact of the grandfathering provision and industry fought to keep sources as unencumbered as possible from emissions regulations while attempting to extend the operational life of their plants. The authors do a very good job of presenting a clear, high-level view of the complex regulatory scheme that arose as regulators attempted to address the issues presented by grandfathered coal-fired power plants.

The authors also argue that the EPA has not meaningfully addressed power plant rejuvenation by targeting the grandfathering provision through stringent regulations that would result in plants losing their grandfathered exemptions. Instead, the EPA has frequently insulated grandfathered sources from regulation under the NSPS by adopting narrow interpretations of the scope of work that amounts to a modification that would trigger the applicability of the NSPS. Specifically, the authors note that the failure to incorporate a specific termination date for the CAA's grandfathering provision has allowed industry lobbyists to successfully advocate favourable rules in opaque and 'boring' regulatory processes, resulting in power plants operating for over twice as long as their originally anticipated operational life.

In Chapters 5 and 6, Revesz and Lienke explore the pernicious effects of the NSPS grandfathering provision on public health, regional air quality, and climate change. Chapter 5 examines how federal and state governments have responded to two distinct issues relating to pollutants regulated as criteria pollutants under the CAA's national ambient air quality standards (NAAQSs).[6] The first issue concerned general compliance with the NAAQSs and pitted upwind states with coal-fired power plants against downwind states. Shortly after the first NAAQSs were established, coal-fired plants rushed to build taller stacks to ensure compliance with the NAAQSs by dispersing pollutants out of the local area. This was done to avoid regulation under another CAA regulatory scheme that targets areas not in compliance with NAAQSs.[7] The pollutants emanating from these taller stacks drift and cause pollution issues in downwind states. The second issue examined is acid rain. Both issues are in large part fuelled by the emissions of coal-fired power plants covered by the NSPS grandfathering provision. The disparate regulatory responses discussed by the authors highlight the thorny political issues associated with regulating emissions from power plants and the cost of delayed regulation to public health and the environment.

Chapter 6 turns to the issue of climate change and the failed attempt by Congress to pass a cap-and-trade bill that would have provided a framework for the US to

[6] Particulate matter, ground-level ozone, carbon monoxide, lead, sulphur dioxide, and nitrogen dioxide are currently regulated as criteria pollutants.

[7] Because a taller stack does not increase the amount of emissions from a plant, this type of physical change does not count as a modification under the NSPS.

control its carbon dioxide (CO_2) emissions and force market participants to internalize the cost of emitted GHGs. The authors explain that the issue of how to address emissions from grandfathered coal-fired power plants operating far beyond their expected operational lives created a rupture that significantly contributed to the failure of Congress to pass a cap-and-trade bill during the first two years of the Obama administration when Democrats controlled Congress and the White House.

In Chapter 7, Revesz and Lienke conclude, offering a ray of hope going forward. Competition from natural gas, changes in energy-market dynamics, and regulatory efforts from the Obama administration have resulted in the planned closure by 2025 of 80% of the remaining grandfathered coal-fired power plants. Fortunately, while much has changed in the political landscape since *Struggling for Air* was published – including attempts by the current administration of President Donald Trump to stymie or roll back much of the Obama-era regulatory advances – the majority of planned coal-fired power plant closures are driven by market forces, rather than regulatory burdens. Unfortunately, a large number of coal-fired power plants will continue to operate with scant, if any, emission controls. Despite all the progress that has been made, the authors argue that there is still much more that must be done.

Despite the massive shift in the regulatory realm following the 2016 election of Donald J. Trump as US President, *Struggling for Air* remains a valuable resource for those seeking to understand what underlies the so-called 'war on coal' rhetoric and the context surrounding the Trump administration's attempt to undo many of the actions taken by the Obama administration to regulate power plant emissions. As the authors meticulously document, the efforts by the Obama administration were the logical, incremental, and necessary continuation of a multi-decade effort begun by the George H.W. Bush administration, and continued through the administrations of Presidents Bill Clinton and George W. Bush, to address the issues caused by emissions from grandfathered power plants. While the Trump administration, like that of President Ronald Reagan, may try to shield the grandfathered power plants from the CAA, there is only so much that can be accomplished from a deregulatory course of action.

The account by Revesz and Lienke of the struggles in the US to regulate emissions from pre-existing sources should also serve as a cautionary tale for other countries that are developing their own environmental regulations. While the political instinct may be to shield existing facilities from stringent regulatory controls, these instincts should be tempered by the realities that incumbent facilities will use grandfathering provisions not only to ride out their lives free of regulation, but to extend their lives (and perpetuate their emissions) far beyond any natural lifespan. *Struggling for Air* presents a persuasive argument that the overly broad NSPS grandfathering provision has wreaked serious public health and environmental harm, and that the 'war on coal' rhetoric is the last gasp of a moribund industry 'full of sound and fury, signifying nothing'.[8]

Lev G. Blumenstein
Green Energy Institute at Lewis & Clark Law School, Portland, OR (US)

[8] William Shakespeare, *Macbeth*, Act V, sc. 5.

https://doi.org/10.1017/S2047102518000158 Published online by Cambridge University Press