RECLAMATION SECURITY REQUIREMENTS FOR POWER PLANTS IN ALBERTA

A REPORT FOR THE ALBERTA UTILITIES COMMISSION (AUC)

November 2023

Dr Colin Mackie Associate Professor in Business Law School of Law, University of Leeds (UK) Email: <u>c.mackie@leeds.ac.uk</u>

Executive Summary

When the operational life of a wind, solar, thermal, and hydroelectric power plant (collectively 'power plants') ends, the regulatee is often legally required under their license, permit or other authorization to close the site safely and restore it to (or near to) its original condition or to a level that could accommodate another productive use. However, as these reclamation obligations are to be completed in the future – often decades after being imposed – society and the environment are exposed to the risk of the regulatee becoming bankrupt in the interim or simply not having the financial capacity or inclination to perform reclamation as and when required. Should this occur, the burden will, invariably, fall to other stakeholders in the power plant, commonly local communities, taxpayers, and the environment. They will pay metaphorically where the regulator decides that reclamation will not be carried out at public cost. As the land on which the power plant is sited will likely remain in a non-reclaimed state, they will inhabit a lower quality environment. Or, where the regulator decides to undertake the regulatee's unfulfilled reclamation obligations at public cost, society pays for this through reduced levels of state funds available to finance public services. Neither is an appealing prospect and they both harm the sustainability of the energy sector.

A powerful means of reducing, though often not entirely eliminating, the prospect of either outcome materializing is for the regulator to impose reclamation security requirements (RSRs) under the conditions of the regulatee's license, permit or other authorization. Reclamation security is a financial instrument (e.g., a surety bond or bank guarantee) used by a regulatee to evidence its ability to finance performance of its estimated reclamation obligations (and associated expenses) to a regulator. If the regulatee defaults on their obligations, the regulator could access the security to complete the works. However, RSRs of an insufficient amount expose regulators to the risk of there being insufficient funds available. Thus, it is not just the fact that RSRs are mandated that is key, but their quantum and liquidity.

We must, however, recognize a trade-off when designing RSRs. First, stringent RSRs create direct and, potentially, indirect costs for regulatees. Whilst direct costs comprise, for instance, the costs of purchasing the instrument from a third party, indirect costs arise where assets are used for collateral to obtain the instrument and so cannot be used to generate further debt finance. Second, this cost burden can harm the economic competitiveness of a jurisdiction by pushing investors away. Other things being equal, regulatees in jurisdictions with stringent RSRs will be at a competitive disadvantage to those in jurisdictions with lax ones (or where they do not exist) owing to the higher compliance costs of the former. Investors may, as a result, choose to leave the jurisdiction, moving to one more sensitive to their needs.

The issue is that in the presence of lax (or, indeed, no) RSRs, where a regulatee defaults on their reclamation obligations, the costs are often passed to society and the environment (i.e., they are 'externalized'). This is a form of indirect state subsidization. It has this effect as where a regulatee ceases to trade prior to performing reclamation then, in the absence of having provided (effective) security, it has been permitted to place energy on the market without bearing the true social cost of its generation. This confers upon them a competitive advantage over those regulatees that operate within a stringent RSR regime which requires that they internalize their reclamation costs. Thus, as lax (or no) RSRs mimic state subsidization of reclamation, this connects an issue that many classify as purely environmental, to a larger political conversation around economic equity in energy generation at the domestic and international level.

This report details considerations for implementing RSRs for power plants. It is focused on the use of reclamation security as part of the regulatory review process of applications for new power plants. It examines the range of options available based upon analysis of (i) the academic literature on the role and function of RSRs, and (ii) the manner in which RSRs are deployed in the legal frameworks and guidelines of regulators and governments in respect to wind, solar, thermal, and hydroelectric power generation across the globe, specifically in Australia, Canada, England & Wales, France, Germany, Sweden, New Zealand and the US. This permits the full spectrum of options to be outlined, and best practice highlighted. A series of recommendations, a summary of which is set out on the following page, are provided.

It is concluded that a legislative power for Alberta Regulators (the Regulators) to impose RSRs for power plants ought to be enacted. The Regulators may then wish to consider focusing and constraining the discretion that would be available to them under this power through drafting a guideline on reclamation security for power plants in Alberta, along the lines set out in this report. This would take a prescriptive approach to cost estimation, acceptable instruments to satisfy the RSRs and means of accumulating security deposits. It would seek to maximise the prospect of reclamation being performed by the regulatee (and so minimize the prospect for state subsidization) whilst affording important concessions to investors. Ten recommendations are made to ensure an effective implementation of RSRs for power plants:

Recommendation 1: an overarching, guiding principle, the *principle of restorative responsibility*, ought to function as the normative foundation for the design of RSRs for power plants. This seeks to ensure a just allocation of the costs associated with reclamation. Those costs are not to be imposed on others, such as the public, or simply ignored, but are to be assigned by the regulator to the regulatee responsible for them under the legal framework. The (successful) imposition of reclamation costs upon the regulatee through effective RSRs furthers the pre-configured conception of fairness embedded in the principle.

Recommendation 2: the creation of (i) an explicit legislative power for the Regulators to require RSRs for power plants, in conjunction with (ii) a detailed guideline, *Reclamation Security Requirements for Power Plants*, would help to articulate a more prescriptive approach to cost estimation, acceptable instruments and means of accumulating funds for RSRs. The guideline would inform the Regulators' discretion when exercising their power to require RSRs and act as a constraint upon the use of that power.

Recommendation 3: the guideline detailed above ought to set out *the* costing methodology for calculating reclamation costs, with a pro forma, Excel-based cost calculator to be used by independent cost consultants appointed by regulatees. Re-costings ought to be conducted on a 5-yearly basis by these consultants. The cost calculator would permit ready calculation of costings, which were ultimately to be approved by the regulator, and aid comparisons with other comparable projects to probe the integrity of costings.

Recommendation 4: the estimated scrappage and resale value of the infrastructure may be used by the regulatee to reduce the amount of security to be provided to a maximum of 50% of that value, as determined by independent auditor every 5 years. The valuation must reflect any depreciation in value.

Recommendation 5: the Regulators ought to collate costings from, and recouped value following, completed reclamation plans to populate a publicly available benchmarking database which would aid industry and the Regulators. Any improvement in the utilization of RSRs must be supplemented by acquisition of the granular detail of the costs associated with reclamation and the value recouped from it.

Recommendation 6: the *first-best option* for RSRs is for a bank guarantee, purchased from a reputable third party provider situated in Alberta prior to construction, to be used initially as funds accumulated in an escrow account across years 0-9 of the plant's life to build the appropriate target sum in a dedicated capital reserve. The target sum would reflect the estimated cost of the *regulator* performing the approved reclamation plan to cater for the risk of the regulatee's bankruptcy. Interest would be paid on the deposited sums, aiding the generation of a contingency sum of 10% of the estimated reclamation costs.

Recommendation 7: if a regulatee could demonstrate that the *first-best option* would impose 'undue financial hardship' upon it, it could default to *second-best options*. If hardship was evidenced, and accepted, flexibility could be deployed in relation to the payment schedule, enabling the cash deposits to commence at a slightly delayed start date (e.g., year 4). If a regulatee was unable to satisfy the *second-best options*, it ought to reconsider the scale of the proposed power plant development.

Recommendation 8: 'financially strong' regulatees must not to be given greater latitude as to (i) the instruments they may use to satisfy RSRs and (ii) the period over which funds must accrue, than those that are less well positioned financially, as a deterioration in their financial strength can render them entirely unable to perform their reclamation obligations. Financial strength focuses on present-day ability to pay, not ability to pay in the future. The latter is the issue of critical importance given that the project's life may extend (well) beyond two decades, even before lifetime extension or repowering is considered.

Recommendation 9: the reclamation security provided is to be available to the regulatee, with the approval of the regulator, to enable them to perform the works. The regulator ought to be granted access to it, upon the regulatee failing to perform the works within a specified period, to allow it to perform the works itself.

Recommendation 10: Regulators have the power to take a 'first ranking' charge over the power plant, upon the regulatee's default on its reclamation obligations, should Regulators choose to perform the works.

Table of Contents

1	Intr	ntroduction					
2	The	e Function of Reclamation Security Requirements (RSRs) for Power Plants	7				
	2.1	The Justifications for RSRs	7				
	2.2	The Trade Distorting Effect of Lax (or no) RSRs					
		2.2.1 Lax or no RSRs as an indirect subsidy					
		2.2.2 The competitive advantage					
3	Rec	clamation Security					
	3.1	Reclamation Security Instruments	14				
		3.1.1 Deposit of cash and/or asset(s)	14				
		3.1.2 Charge on asset(s)	14				
		3.1.3 Risk transfer-based instruments	14				
		3.1.3.1 Letter of credit	15				
		3.1.3.2 Bank guarantee	15				
		3.1.3.3 Surety bond					
		3.1.4 Financial strength-based instruments					
		3.1.4.1 Self-bond					
		3.1.4.2 Parent company guarantee					
		3.1.5 Reclamation fund	15				
4	RSI	Rs in a Comparative Perspective					
5	Des	signing RSRs for Alberta's Power Plants	71				
	5.1	Towards Regulated Discretion: a guideline on reclamation security	71				
	5.2	A Guiding Principle: the principle of restorative responsibility					
	5.3	Mandatory RSRs for Power Plants: a recommended approach	75				
		5.3.1 The first-best option					
		5.3.2 The second-best option (a)	80				
		5.3.3 The second-best option (b)					
		5.3.4 Rejection of financial strength-based instruments					
		5.3.5 Gradual accumulation of funds: opportunities and threats					
		5.3.6 The extension of responsibility to 'associated' companies					
	5.4	The Quantum of Reclamation Security					
		5.4.1 Forecasting the costs of performing the approved reclamation plan					
		5.4.2 The role of salvage and resale value in RSRs					
		5.4.2.1 The role of the 'net' reclamation cost	89				
		5.4.2.2 The volatility of salvage/resale values	90				
	5.5	Constructing a Mandatory RSR Regime	91				
		5.5.1 A gradual approach	91				
		5.5.2 Exemptions for certain regulatees					

	5.5.3 Minimum levels of security	. 92
	5.6 Drawing Upon Reclamation Security: when, how, and whom	.93
6	Conclusion	. 94
Biblic	ography	. 96

Tables

Table 1. Reclamation So associated risk.	ecurity Instruments: key features, strengths, weaknesses and means of redu	ucing 16
Table 2. Representation	n of jurisdictions, including applicability of their RSRs, covered in the stud	y 25
Table 3. Analysis of reg France, German	gulatory frameworks providing for RSRs in Australia, Canada, England & ny, Sweden, New Zealand and US	Wales, 26
Table 4. Illustration of <i>f</i>	first-best option, assuming estimated reclamation costs of Can\$1m	77
Table 5. Summary of th are based, made	ne recommendations, including their rationale and precedent(s) upon which e in relation to the design of RSRs for power plants in Alberta	n they 78
Table 6. Illustration of a	a second-best option, assuming estimated reclamation costs of Can\$1m	80

Table 7. Illustration of a further second-best option, assuming estimated reclamation costs of Can\$1m. 81

1 Introduction

When the operational life of a wind, solar, thermal, and hydroelectric power plant (collectively 'power plants') ends, the regulatee is often legally required under their license, permit or other authorization to close the site safely and restore it to (or near to) its original condition or to a level that could accommodate another productive use. These reclamation obligations are imposed to achieve a variety of objectives. There may be an aesthetic goal associated with mandating their performance in that the visual impacts of the project on the landscape/viewscapes may be reversed at the expiry of the power plant's operational life (e.g., removal of wind turbines when generation of electricity ends). They may seek to avoid sterilization of agricultural and high value environmental lands, such as native prairie, mountains and wetlands, enabling the site to be returned to its previous use (e.g., agriculture) or employed for some other activity. Reclamation also contributes to the creation of a more circular economy. This requires 'preserving' the function or service that the retired infrastructure is capable of providing, 'preventing its 'technical value' from becoming waste in order that demand for raw materials is drastically reduced.'¹

A regulatory concern, however, is generated by the fact that as these reclamation obligations are to be completed in the future – often decades after being imposed – society and the environment are exposed to the risk of the regulatee becoming bankrupt in the interim or simply not having the financial capacity or inclination to perform reclamation as and when required.² Should this occur, the burden will, invariably, fall to other stakeholders in the power plant, commonly local communities, taxpayers, and the environment. There are usually two possible outcomes in the event of abandonment of a power plant. First, where the regulator decides that reclamation will not be carried out at public cost, the land on which the power plant is situated will likely remain in a non-reclaimed state. In such circumstances, society pays metaphorically through the need for it to inhabit a lower quality environment. Second, where the regulator decides to undertake the regulatee's unfulfilled reclamation obligations at public cost, society pays for this through reduced levels of state funds available to fund public services. Neither is an appealing prospect. The completion of reclamation obligations at private cost (i.e., using the regulatee's own funds) is, thus, not only vital for preserving public funds but essential for delivering more sustainable energy generation.³

A powerful means of *reducing*, though often not entirely eliminating, the prospect of either outcome materializing is for the regulator to impose reclamation security requirements (RSRs) under the conditions of the regulatee's license, permit or other authorization.⁴ For the purposes of this report, reclamation security is to be understood as a financial instrument used by a regulate to evidence its ability to finance performance of its estimated reclamation obligations (inclusive of associated expenses, such as independent assessment/verification of the cost estimate and/or paying for the regulator to audit the site upon completion of the works) to a regulator. Such instruments usually include deposits of funds/assets, charges on assets, risk transfer instruments (e.g., a surety bond or bank guarantee), financial strength-based instruments (e.g., self-bonding and parent company guarantees (PCGs) and reclamation funds.⁵ The regulatee will 'post' the security with the regulator,⁶ with it being released upon the regulatee's performance of reclamation in line with the approved reclamation plan. If the regulatee defaults on their obligations, the regulator could access the security to complete the works, either itself or via a third-party contractor. However, as we shall see, certain instruments are less effective than others and some are 'completely

¹ Diletta Invernizzi, Giorgio Locatelli, Anne Velenturf, Peter Love, Phil Purnell and Naomi Brookes, 'Developing Policies for the End-of-Life of Energy Infrastructure: coming to terms with the challenges of decommissioning' (2020) 144 Energy Policy 111677 1, 5.

² Colin Mackie and Laurel Besco, 'Rethinking the Function of Financial Assurance for End-of-Life Obligations' (2020) 50(7) Environmental Law Reporter 10573, 10574.

³ Raphael Heffron, 'Energy law for decommissioning in the energy sector in the 21st century' (2018) 11(1) The Journal of World Energy Law & Business 189, 194.

⁴ The terms 'bonding' (or bonds), 'financial assurance', 'financial security', and 'financial guarantee' are often used in legislative frameworks and associated guidelines/guidance documents for industry. Whilst these terms may be considered to be interchangeable with reclamation security, the phrase 'reclamation security' or 'security' will be used in this report.

⁵ These instruments, including their characteristics, strengths, weaknesses and means through which the risks associated with each of them may be mitigated, will be considered at depth in Chapter 3. Insurance is only available to cover a fortuity (e.g., environmental damage following a pollution incident), not an event which is foreseen and certain to occur, such as reclamation. It is, therefore, not considered in this report.

⁶ The term 'post' is used here to reflect the fact that not all security instruments are, technically, provided in a physical sense to the regulator. For instance, a regulatee may be allowed to self-bond their obligations (i.e., use their financial strength to evidence ability to finance reclamation) or make a provision in their accounts for the associated costs. In these scenarios, the regulatee merely provides a *promise* to pay to the regulator.

ineffective' in the event of the regulatee's bankruptcy prior to performance of reclamation.⁷ Instrument choice is, therefore, a crucial consideration for a regulator. Equally, RSRs of an insufficient amount expose regulators to the risk of regulatees having insufficient funds for reclamation.⁸ Thus, it is not just the mere fact that RSRs are mandated that is key, but the quantum and liquidity of the security.

We must, however, acknowledge from the outset the trade-off that effective RSRs necessitate. First, stringent RSRs create direct and, potentially, indirect costs.⁹ Whilst direct costs comprise, for instance, the costs of purchasing the instrument, indirect costs will arise where assets are used for collateral and cannot be used to generate further debt finance. Second, this cost burden has noted capacity to harm the economic competitiveness of a jurisdiction by pushing investors away¹⁰ Other things being equal, regulatees in jurisdictions with stringent RSRs will be at a competitive disadvantage to those in jurisdictions with lax ones (or where none exist) owing to the higher compliance costs of the former.¹¹ Investors may, as a result, choose to leave the jurisdiction and move to one more sensitive to their needs.

There is an inherent economic disincentive for regulatees to offer reclamation security *voluntarily*, particularly where it is purchased from a third-party (e.g., a bank), where the regulatee's expected reclamation costs are greater than its assets. This is because part of the price paid for the instrument would cover liabilities which would not have to be paid if the product was not purchased (i.e., the difference between the regulatee's assets and the cost of performing reclamation). Thus, to ensure regulatees possess sufficient private funds to bear their reclamation obligations when required, the implementation of a mandatory RSR regime, and its key features, is the sole consideration of this report.

There are a variety of ways in which RSRs may be catered for within a regulatory framework governing power plants. Legislation may prescribe how ability to pay is to be demonstrated, specifying (i) the instruments deemed acceptable to satisfy the RSRs and (ii) the value of security to be provided.¹² Though, this is, as we shall see, relatively rare. Alternatively, and more commonly, the power for a regulator to impose RSRs may be noted in the legislation but fleshed out in a supplementary guideline/guidance document provided by the government in which its expectations may be set out in far greater detail.¹³ However, often the guideline/guidance document is not drafted in prescriptive terms. Indeed, they are often worded in a way that leaves a high level of discretion to the regulator relating to how – and often *if* at all–security is to be provided. Thus, it is more usual for the discussion and negotiation that takes place between the regulator and the regulatee to bring the reclamation security into fruition (e.g., in relation to the precise form(s) that the security is to take and how the security ought to accumulate, whether by lump-sum or staggered payments). Thus, to a large degree, the security that is (or, indeed, is not) put in place derives from a process of *negotiated agreement* between the regulator and regulatee.¹⁴

We shall see that when constructed thoughtfully and with foresight, RSRs can play a critical role in establishing how and when approved reclamation plans are to be funded, what should happen to the funds, who should have access to them, and when access should be granted. They possess unique regulatory potential to exert control over the way reclamation is to be financed through the law. Without that control, the regulatee may not be sufficiently motivated to set aside funds sufficient to ensure reclamation takes place. As we have seen, where a regulatee defaults on their reclamation obligations, the costs are, invariably, passed to society and the environment (i.e., they are 'externalized' by the regulatee). This ought to be considered a form of indirect state subsidization,¹⁵ but it is often not recognised as such by policy

describes the arrangements for the provision of that security.

¹⁴ David Gerard, 'The Law and Economics of Reclamation Bonds' (2000) 26 Resources Policy 189, 190.

¹⁵ Mackie and Besco (n 2) 10583.

⁷ Jason Malone and Tim Winslow, 'Financial Assurance: Environmental Protection as a Cost of Doing Business' (2018) 93 North Dakota Law Review 1, 3.

⁸ For instance, the Scottish Coal Company Ltd was liquidated in 2013 with the result that approximately £73,000,000 of restoration works was externalised following a wholly inadequate provision of a bond: *Joint Liquidators of the Scottish Coal Company Limited* [2013] CSOH 124 [7].

⁹ Joshua Conaway, 'Be aggressive with wind energy: blow away the decommissioning fears' (2017) 6(2) Oil and Gas, Natural Resources, and Energy Journal 621, 638.

¹⁰ Richard Stewart 'Environmental Regulation and International Competitiveness' (1993) 102 Yale Law Journal 2039, 2041. ¹¹ Ibid 2044.

 ¹² See, e.g., the approach to reclamation security for decommissioning wind turbines taken under the French Environmental Code. Article L515-46 of the Code sets out the requirement for security provision and Annex 1 of Order of 22 June 2020 details a complex and rigid formula for calculating the initial amount of the security. This is set out and discussed in Chapter 3.
 ¹³ See, e.g., the approach to reclamation security for electricity generation from gas and other fuel in Queensland, Australia. Section 308 of the Environmental Protection Act 1994 sets out the requirement for the regulate to provide reclamation security and a separate government guideline. *The Guideline: Financial assurance under the Environmental Protection Act 1994*,

makers and commentators.¹⁶ It has this effect as where a regulatee ceases to trade prior to performing reclamation then, in the absence of its provision of (effective) security, it has been permitted to place energy on the market without bearing the true social cost of its generation; the true cost to society of its generation is reduced artificially.¹⁷ Through the failure of its RSR strategy, the regulator has enabled the regulatee to externalize some (or, potentially, all) of their reclamation costs, creating false price signals for consumers and sending entirely the wrong messages to industry.¹⁸ Those costs should, from a fairness and an efficiency perspective, have been internalized by the regulatee; they should have been incorporated in their business plans, reflected in their pricing and, eventually, borne by consumers.

Indirect state subsidization creates a competitive advantage at the domestic and international level for regulatees trading from jurisdictions with lax (or no) RSRs. Such an advantage is conferred upon them over those regulatees that *have* been required to internalize their own reclamation costs.¹⁹ Thus, as lax (or no) RSRs mimic state subsidization of reclamation, this connects an issue that many classify as purely environmental, to a larger political conversation around economic equity in energy generation.²⁰

This report details considerations for implementing RSRs for power plants in Alberta. It is focused on the use of reclamation security as part of the regulatory review process of applications for new power plants. It examines the range of options available based upon analysis of (i) the academic literature on the role and function of RSRs, and (ii) the manner in which RSRs are deployed in the legal frameworks and guidelines of regulators and governments in respect to wind, solar, thermal, and hydroelectric power generation across the globe, specifically in Australia, Canada, England & Wales, France, Germany, Sweden, New Zealand and the US. This methodological approach permits the full spectrum of options to be outlined, and best practice highlighted. A series of ten recommendations in relation to how RSRs for power plants may best be implemented is provided. It is concluded that an explicit legislative power for Alberta Regulators (the Regulators) to impose RSRs for power plants in Alberta ought to be enacted. The Regulators may then wish to consider focusing and constraining the discretion that would be available to them under this power through drafting a dedicated guideline on reclamation security for power plants, along the lines set out in this report. This would take a prescriptive approach to cost estimation, acceptable instruments to satisfy the RSRs and means of accumulating security deposits. It would seek to maximise the prospect of reclamation being performed by the regulatee (and so minimize the prospect for state subsidization) whilst affording important concessions to investors in Alberta.

2 The Function of Reclamation Security Requirements (RSRs) for Power Plants

This chapter examines the function(s) of RSRs for power plants. The principal justifications for RSRs, specifically their capacity to guarantee performance of reclamation and prospect for 'productive' cost internalization this facilitates, are examined. These, it is argued, point towards the need for effective RSRs to be mandated for all new power plants in respect of which reclamation obligations are imposed upon regulatees under the terms of their permit, license, or other authorization.

2.1 The Justifications for RSRs

The literature presents two distinct normative justifications for RSRs. First, they act as a 'guarantee' for the '*performance* of a known future action' by a regulatee, such as a reclamation, or other performance-

¹⁶ An exception here is the Ontario Ministry of the Environment's recognition, in its guideline on financial assurance, that 'Financial Assurance is a necessary cost of doing business and is needed to internalize the environmental risks that would otherwise be borne by the public. Businesses *should not be subsidized* and should provide their fair share of financial assurance': Ontario Ministry of the Environment, *F-15: Financial assurance guideline* (2011) [6.10.1] (emphasis added) https://www.ontario.ca/document/f-15-financial-assurance-guideline> accessed 5 November 2023.

¹⁷ Mackie and Besco (n 2) 10585.

¹⁸ Colin Mackie and Malcolm Combe, 'Charges on Land for Environmental Liabilities: a matter of 'priority' for Scotland' (2019) 31 Journal of Environmental Law 1 83, 20.

¹⁹ David Wirth, 'The Rio Declaration on Environment and Development: Two Steps Forward and One Back, or Vice Versa? (1995) 29 Georgia Law Review 599, 634-44.

²⁰ Mackie and Besco (n 2) 10576.

related, requirement.²¹ In so doing, they can 'complement' command-and-control regulation.²² To explain, the regulatee 'posts' a specified level reclamation security, using an acceptable instrument(s), with the regulator. They are made to do so, prior to construction of, or taking over the ownership of, the power plant. This is released when the approved reclamation plan is performed by the regulatee to the satisfaction of the regulator. If performance does not occur, the security will be forfeited, and funds used by the regulator to undertake the works and cover associated expenses. Thus, reclamation security engenders performance of the prescribed obligations (the 'command'), reducing but not eliminating the need for enforcement action to be taken by the regulator in the event of their breach (the 'control')²³ This capacity of reclamation security to operate as the crucial point of connection between the regulation of a regulatee by corporate/bankruptcy law, on the one hand, with public law (e.g., energy or environmental law) on the other, is its greatest strength.²⁴ Through ensuring the dedication of funds *sufficient* to perform reclamation, effective RSRs reduce the possibility of strategic use of corporate/bankruptcy law, and its capacity to facilitate lawful unilateral delimitation of the bounds and extent of liability, by the regulatee to avoid performing (and, indeed, paying for) their reclamation responsibilities under public law.²⁵

Second, they act as a 'guarantee' that a regulatee 'can *cover* any present and future environmental costs of his or her activities'.²⁶ Cost coverage is traditionally associated with the economic idea of cost internalization. Cost internationalization occurs when pertinent costs (e.g., those associated with reclamation obligations) are reflected in a regulatee's costs of production or covered in the pricing of its electricity.²⁷ When a regulatee is not required to bear these costs then they do not need to be so reflected.²⁸ They can ignore them in deciding how much energy to produce and at what price to sell as the unpriced costs – negative externalities – are transferred to the environment and wider society.²⁹ This is a form of market failure. When the regulatee is required to 'internalize' those costs, this ensures that they are made 'part of the economic process rather than a forgotten after-effect of it'.³⁰ The costs of providing security, such as purchasing a bank guarantee or making deposits of cash, of a value sufficient to ensure performance of reclamation will be a significant cost of production for any regulatee.

Boyd emphasizes the wider benefits of securing cost internalization via security requirements, asserting that the 'very point' of security is to 'raise' the regulatee's costs by 'forcing the internalization of otherwise avoided obligations.'31 These newly internalized costs will be 'very real' to the regulatee and can be expected to reduce its profitability.³² Note, however, that these are redistributed costs, not new ones, for in the absence of RSRs or in the presence of lax ones, society and the environment itself are, typically, left to bear these costs should the regulatee become bankrupt. According to Boyd, security 'simply redistributes those costs to the polluter.'33 Whilst they may be expected to have an (upward) effect on the cost of the energy generated by the power plant, this will create a more accurate price signal for consumers (and policy makers).³⁴ It is in this way that effective RSRs can generate more informed decision making at an early stage in the project-planning process. The costs associated with reclamation would be factored into business planning as a cost of production, potentially making certain energy projects less appealing from the regulatee's perspective.³⁵ Other projects will become more appealing. Thus, effective RSRs,

²¹ See, e.g., James Boyd, 'Financial Assurance Rules and Natural Resource Damage Liability: A Working Marriage?'

⁽Resources for the Future, Discussion Paper No. 01-11, 2001) 5 (emphasis added) (hereafter 'Boyd, A Working Marriage') <https://www.rff.org/publications/working-papers/financial-assurance-rules-and-natural-resource-damage-liability-a-workingmarriage/> accessed 5 November 2023.

²² Zachary Arnold, 'Preventing Industrial Disasters in a Time of Climate Change: A Call for Financial Assurance Mandates' (2017) 41 Harvard Environmental Law Review 243, 264.

²³ Colin Mackie, 'Planning, Discretion and the Legacy of Onshore Wind' (2023) 43(3) Legal Studies 499, 503.

²⁴ Ibid.

²⁵ Ibid.

²⁶ See, e.g., Malone and Winslow (n 7) 3 and 5 (emphasis added).

²⁷ See, e.g., Anthony Ogus, Regulation: Legal Form and Economic Theory (Oxford: OUP, 2004) p 19.

²⁸ Ibid 35.

²⁹ Ibid 21 and 35.

³⁰ Matthew Humphreys, 'The Polluter Pays Principle in Transport Policy' (2001) 26 European Law Review 5 451, 456. ³¹ James Boyd, 'Financial Responsibility for Environmental Obligations: Are Bonding and Assurance Rules Fulfilling Their

Promise? (Resources for the Future, Discussion Paper No 01-42, 2001) 29 (hereafter 'Boyd, Financial Responsibility') <https://media.rff.org/documents/RFF-DP-01-42.pdf> accessed 5 November 2023

³² Ibid.

³³ Ibid.

³⁴ Rudy Perkins, 'Electricity Deregulation, Environmental Externalities, and the Limitations of Price' (1998) 39 Boston College Law Review 993, 1032-1033.

³⁵ Mackie and Besco (n 2) 10590.

viewed as a type of regulatory intervention, may help market forces steer transition to greener, less environmentally impactful forms of energy. There is also the ensuing incentive for regulatees to develop (legitimate) means of performing reclamation at lower cost, such as through careful selection of the site itself, the materials used and intelligent design of the power plant, including ease of its reclamation.³⁶ This will, in turn, reduce the level of funds to be dedicated to reclamation via the RSRs imposed by the regulator.

The economic idea of cost internalization is closely connected to the logic of the polluter-pays principle of environmental law and policy. This principle, considered a 'backbone' of environmental policy.³⁷ was developed by the Organisation for Economic Co-operation and Development (OECD) in the early 1970s as an economic rule to avoid distortion of international trade.³⁸ When industrialised nations sought to remedy their environmental problems in the late 1960s, there was a concern that some states would use public funds to subsidize private pollution control.³⁹ For states adopting strong environmental protection positions, new costs would be imposed upon their manufacturers.⁴⁰ Thus, state subsidization of those costs would give those companies a significant price advantage in the global market. The (nonbinding) OECD Council Recommendation on Guiding Principles Concerning the International Economic Aspects of Environmental Policies sought to address this.⁴¹ Founded upon the tenet that the polluter, not domestic governments, should bear the expense of pollution prevention and control measures, these costs were to be reflected in the price of goods and services.⁴² It has since transitioned from being a purely economic principle to an established legal principle with a dominant focus upon the ascription of ex post liability.⁴³ The principle's 'economic equity' dimension reflects the original policy rationale for the principle and seeks to establish a common standard to prevent states from giving domestic businesses a competitive edge in world markets through subsidies.44

Lax (or no) RSRs, as detailed above, are a form of state subsidization. The cost savings that they create for regulatees can be direct and/or indirect.⁴⁵ There is a direct saving where a regulate (or regulatees generally within a subsector) are not required to incur a cost associated with evidencing security. For instance, they need not purchase a surety bond or bank guarantee from a third party or make a cash deposit with the regulator. Indirect savings, on the other hand, are created where a regulatee is able to abandon all or part of their reclamation obligations upon bankruptcy or following the regulator's acceptance of a regulatee's failure to reclaim the site to the standard that was agreed in the approved reclamation plan. This 'externalization' of costs may, for instance, have resulted from the regulatee's (or its parent company's) financial strength as evidence of ability to pay and does not require assets to be set aside to fund the works, making it prone to outright failure in the event of bankruptcy.⁴⁶ As Malone and Tim observe, '[w]hen an operator self-bonds and files for bankruptcy, there is often little to zero funds for reclamation.⁴⁷ It is, therefore, seen to 'pose a systemic risk to the environment and taxpayers'.⁴⁸ While the risk is well recognized, as we shall see, various regimes still permit its use.

We must be careful in how far we take cost internalization, as a goal *distinct* to guaranteeing performance, as a justification for RSRs.⁴⁹ Cost internalization is an economic idea, not a legal one. This has implications for how it is to be interpreted and understood in a legal setting, such as how it is reflected in laws or policies which pursue cost internalization as a regulatory goal. The economic idea does not tell

³⁶ Ibid.

³⁷ Dirk Heine, Michal Faure and Goran Dominioni, 'The Polluter-Pays Principle in Climate Change Law: An Economic Appraisal' (2020) 10 Climate Law 94, 95.

³⁸ OECD, 'Recommendation of the Council on the Implementation of the Polluter-Pays Principle' (1974) C(74)223; OECD, 'Recommendation of the Council on Guiding Principles concerning International Economic Aspects of Environmental Policies' (1972) C(72)128.

³⁹ Sanford Gaines, 'The Polluter-Pays Principle: From Economic Equity to Environmental Ethos' (1991) 26 Texas International Law Journal 463 465-466.

⁴⁰ ibid 466

⁴¹ C(72)128 (1972).

⁴² ibid Annex para A.4.

⁴³ Heine et al (n 37) 95.

⁴⁴ Gaines (n 39) 471.

⁴⁵ Mackie and Besco (n 2) 10575.

⁴⁶ Colin Mackie and Valerie Fogleman, 'Self-Insuring Environmental Liabilities: A Residual Risk-Bearer's Perspective' (2016) 16 Journal of Corporate Law Studies 293, 296.

⁴⁷ Malone and Winslow (n 7) 4.

⁴⁸ Ibid.

⁴⁹ Mackie (n 23) 503.

us how or when cost internalization ought to take place. Legislation and/or guidelines/guidance is needed to provide the requisite (legal) shape for, and substance to, this economic idea. It would, nevertheless, be consistent with the literature to treat cost internalization as occurring where regulatees incorporate the estimated costs of reclamation in their accounts,⁵⁰ or take them into account in their decision-making processes.⁵¹ That these costs have been 'internalized' does not mean that the funds necessary for performance exist or, where they do exist, are protected from the claims of the regulatee's creditors should it be unable to pay its debts and become bankrupt. By way of example, a regulatee might internalize their reclamation costs by making provision for them in their accounts. This means of evidencing security, as we shall see, is inherently prone to failure given that it does not require funds to be 'ring fenced' for reclamation, beyond the reach of its creditors, should it enter bankruptcy proceedings. Thus, 'bare' cost internalization (i.e., the regulatee is merely required to reflect the costs in the pricing of its energy) is an inadequate function for RSRs if performance is a regulatory priority. If it is, the funds designated for performance must be segregated from the general body of the regulatee's assets and be readily available to the regulator should they be needed. Mackie and Besco term this 'productive cost internalization'.⁵² This interpretation of internalization facilitates convergence of the two core justifications for RSRs, creating potential to ensure that (i) performance occurs and (ii) energy is priced more accurately.

There is, however, a trade-off. First, stringent RSRs create a direct and, potentially, an indirect cost burden.⁵³ This will weigh more heavily as the requirements increase in stringency. Direct costs comprise, for instance, the costs of purchasing the instrument for the project's operational life. Whilst indirect costs will arise where, for instance, assets are used for collateral and so are unavailable for further debt finance, inhibiting borrowing. This is often considered a hidden cost of RSRs. Second, this cost burden may harm the economic competitiveness of a jurisdiction.⁵⁴ As we have seen, other things being equal, regulatees in jurisdictions with stringent RSRs will be at a competitive disadvantage to those in jurisdictions with lax ones (or where none exist) owing to the higher compliance costs of the former.⁵⁵ This has capacity to impact on the jurisdiction selected for the power plant by energy investors.

Despite the cost burden, effective RSRs ought to be required for all power plants. In their absence, other stakeholders, often local communities, are left to bear the costs if a regulatee defaults on their reclamation obligations. This masks the true cost of the energy generated and the 'externalized costs' provide an indirect subsidy, giving the regulatee an inequitable advantage in the energy market.⁵⁶

2.2 The Trade Distorting Effect of Lax (or no) RSRs

This subsection outlines the tension that exists between (i) stringent RSRs which may work to 'push' potential investors to other jurisdictions and (ii) laxer (or no) RSRs that may 'pull' investors with no intention of undertaking reclamation to the jurisdiction. We shall see that whilst a regulator will want to reduce the risk of regulatees defaulting on their reclamation obligations – thereby protecting agricultural and other high value environmental land – stringent RSRs impose a cost burden on the sector which may impact upon the jurisdiction's attractiveness to prospective investors. A regulator may, on balance, be tempted to choose to rely on lax (or no) RSRs to create conditions amenable to industry to ensure the requisite level of capacity can be installed. Indeed, this type of strategy has been used in the coal and oil and gas sectors of jurisdictions across the globe, where a 'light touch' approach to reclamation security has, traditionally, been deployed to avoid hindering project development.⁵⁷ More on this is said below.

It is certainly correct that stringent RSRs, conceived of as a distinct type of environmental regulation, have the potential to harm the economic competitiveness of a jurisdiction.⁵⁸ Other things being equal, regulatees trading from jurisdictions with stringent FSRs will be at a competitive disadvantage to

⁵⁰ Gaines (n 39) 469.

⁵¹ Michael Faure, 'Economic Aspects of Environmental Liability: An Introduction' (1996) 4 European Review of Private Law Private Law 85, 87.

⁵² Mackie and Besco (n 2) 10591.

⁵³ Conaway (n 9) 638.

⁵⁴ Stewart (n 10) 2041.

⁵⁵ Ibid 2044.

⁵⁶ John Dernbach, 'Sustainable Development as a Framework for National Governance' (1998) 49 Case Western Reserve Law Review 1, 59.

⁵⁷ Mackie (n 23) 501.

⁵⁸ Stewart (n 10) 2041; Kenneth Komoroski, 'The Failure of Governments to Regulate Industry: A Subsidy Under the GATT?' (1998) 10 Houston Journal for International Law 189, 204.

those trading from jurisdictions with lax (or no) FSRs owing to the higher compliance costs of the former.⁵⁹ This raises the concern that jurisdictions may have incentives to rely on lax (or no) RSRs to render companies located there more competitive in the market. It is not just unequal global competition that is fostered by such a strategy, but also unequal domestic competition,⁶⁰ as may occur between states, provinces and territories within the same country. A jurisdiction is also unlikely to give up its competitive position voluntarily by strengthening its RSRs if there is a risk that others will not. As Stewart observes, those that have adopted less stringent environmental standards 'presumably wish to retain whatever economic benefits, including competitive advantages, that such standards confers'.⁶¹

2.2.1 Lax or no RSRs as an indirect subsidy

Traditionally, subsidies at the domestic level have been understood as financial assistance by the state to the private sector through, for instance, government loans at preferential rates, direct capital investments, and forgiveness of government debt.⁶² However, commentators have contended that the term 'subsidy' ought to be construed more broadly to include more *indirect* forms of assistance.⁶³ This could encompass affording cost savings to the private sector through artificially low environmental standards or lax enforcement of them.⁶⁴ The implementation of sector-specific exclusions, exemptions, and special conditions that 'lighten' the regulatory burden of a regulatee (or regulatees generally within a sector) is also be pertinent.⁶⁵ These are, for Simms, 'a special and distinct class of industry subsidy' that is 'paid for by the communities who bear the burden of the impaired natural resource.'66 This could constitute an exemption from a regulatory obligation or its financing, such as the obligation to pay a guarantee - or, through analogy, to provide reclamation security - or a regulator paying for costs that would normally fall on a regulatee (e.g., performing the latter's reclamation obligations).⁶⁷ Dernbach draws these ideas together neatly with the observation that 'externalized costs' - a likely consequence of such exemptions - provide an indirect subsidy that may give the benefitting regulatee(s) a trade advantage.⁶⁸

Lax (or no) RSRs afford cost savings to the private sector and, thereby, exhibit a trade subsidizing effect in three distinct ways. First, regulatees may be spared the expense of purchasing products, such as surety bonds, from third parties or, for instance, making a cash deposit entirely (i.e., there is no legislative power to require RSRs or, there is, but regulatory discretion is exercised *not* to require them). This provides an example of an exemption that lightens the regulatory burden of a specific sector, as articulated by Simms.⁶⁹ Given the large costs often associated with performing reclamation, the savings to a regulatee associated with not being required to provide security can be significant. It represents capital that can be used elsewhere in the business to enhance its profitability.

Second, a cost saving may be created for a regulatee where the level of security provided by them at the point at which they enter bankruptcy is insufficient to cover their reclamation obligations. The shortfall is the saving to the regulatee. The obvious risk with a shortfall is that the costs associated with these unfulfilled obligations will be 'externalized' upon the regulatee's bankruptcy. Either they will be borne by society through the deployment of public funds or by the environment itself through reduced environmental quality (e.g., sterilized agricultural land) where the regulatee does not perform them.⁷⁰ This is the indirect state subsidization. The shortfall may be caused by a variety of factors. The methodology used to determine the amount of security required may be unreliable, such as where estimates provided by

⁵⁹ Stewart (n 10) 2044. The reverse will also be true: Ibid 2056.

⁶⁰ Mackie and Combe (n 18) 102.

⁶¹ Stewart (n 10) 2045.

⁶² Hyung-Jin Kim, 'Subsidy, Polluter Pays Principle, and Financial Assistance Among Countries' (2000) 34 Journal of World Trade 115, 125.

⁶³ Richard King, 'Trade and the Environment: European Lessons for North America' (1996) 12 UCLA Journal of Environmental Law and Policy 209, 222; Kim (n 62) 120; Patrice Simms, 'Furtive Subsidies: Reframing Fossil Fuel's Regulatory Exceptionalism' (2017) 35 Virginia Environmental Law Journal 420, 420-21.

⁶⁴ Kim (n 62) 120.

⁶⁵ King (n 63) 222.

⁶⁶ Simms (n 63) 420-21 and 429.

⁶⁷ Nicolas De Sadeleer, EU Environmental Law and Internal Market (OUP 2014) 436, 439 and 440.

⁶⁸ Dernbach (n 56) 59.

⁶⁹ Simms (n 63) 420-21.

⁷⁰ An exception here would be where an industry fund existed, such as Alberta's Orphan Fund. This provides a source of private-sector funding for the costs associated with the end-of-life obligations of bankrupt licensees of conventional oil and gas wells. The Orphan Fund is financed through levies on operators in the sector, but with increasing reliance on loans from the government of Alberta to aid its work.

regulatees are not verified by an independent auditor and/or by the regulator itself. Or, utilizing the discretion afforded by the drafting of the legislation, and associated guideline/guidance, the regulator may permit funds to accumulate in a segregated account across the operational lifetime of the power plant. The bankruptcy of the regulatee prior to the full accumulation of funds would result in the funds set aside being insufficient to meet the costs of performing reclamation. The earlier the regulatee's bankruptcy occurs in the power plant's operational life, the greater the likely shortfall.

Finally, cost savings may be created for regulatees through the instruments permitted to satisfy RSRs. Legislators may explicitly permit, or regulators may exercise their discretion to accept, instruments such as self-bonding and PCGs (or corporate guarantees) to evidence compliance with RSRs. While some frameworks explicitly prohibit one or both of these, they continue to be tolerated in many others, despite the known risks. This third point connects with the previous two points in the sense that failure of these instruments is likely to result in insufficient funds being available to perform reclamation (i.e., a security shortfall). When this occurs, the prospect for indirect state subsidization arises. However, it ought to be viewed as a point separate to the absence of RSRs, inaccurate estimations of the amount of security required, and inadequate fund accumulation. This is due to the risk of their *outright failure* and the lack of a pecuniary cost for the regulatee (or their parent) when they are utilized to satisfy RSRs.

2.2.2 The competitive advantage

Where a jurisdiction's RSRs are lax (or do not exist) then this may confer a competitive advantage upon regulatees trading from it.⁷¹ Other things being equal, regulatees there will, due to their lower costs of compliance, be advantaged when competing against regulatees trading in more stringent RSR regimes.⁷² Stringency may relate to various factors, including the amount required (e.g., whether the infrastructure's scrappage value may be used to justify a lower security value), when it is to be provided, and the prohibition of certain high-risk but low-cost measures (e.g., PCGs). As we saw in the previous subsection, the competitive advantage may be generated in three distinct ways: a cost saving is created for a regulatee where they are not required to purchase an instrument from a third party or, if they are required to do so, at a low value (and so at a reduced cost); the presence of a security shortfall; and regulatory tolerability of instruments that have the capacity to fail entirely upon the regulatee's bankruptcy. Each of these engender cost savings for regulatees. First, this not only reduces a regulatee's cost of compliance - and so saves them money – but also allows them to *use* those funds more productively than regulatees in regimes with stringent RSRs. An example illustrates the point. Under Ontario's F-15: Financial assurance guideline, created under the legislative authority of the Environmental Protection Act 1990, only regulatees whose parent company (guarantor) is located in the province can utilize the attractive 'letter of guarantee' (e.g., PCG) to satisfy RSRs.⁷³ Regulatees are prohibited from doing so where their parent (or guarantor) is an 'out-of-province, offshore firm'.⁷⁴ Whilst this is clearly intended to ease enforcement, this means that for regulatees that fall into the former category, funds are released and made available to reinvest and grow their business. Regulatees whose guarantor is in the 'out-of-province, offshore' category miss out on this. There is, therefore, a fairly strong degree of inequity in the way in which two regulatees can be treated.

Second, where a regulatee ceases to trade prior to performing reclamation, then, in the absence of effective security, it has been permitted to place (cheaper) energy on the market that does not reflect the true social cost of its generation. They have been allowed to profit from externalizing some (or, potentially, all) of the costs associated with their reclamation obligations. The costs of performing them should, from an efficiency perspective, have been internalized by them.⁷⁵ A competitive advantage is conferred upon that regulatee over those regulatees who *have* been required to internalize their costs.⁷⁶

The effect of these two points can be illustrated with a simple example. It assumes that the reclamation cost estimate is accurate. A regime that creates conditions for a large 'security deficit', which ought to be understood as the difference between the estimated costs of reclamation and the level of

⁷³ Ontario Ministry of the Environment, F-15: Financial assurance guideline (June 2011) [5.4.3] <<u>https://www.ontario.ca/document/f-15-financial-assurance-guideline#:~:text=financial%20assurance%20can%20be%20specified,as%20authority%20for%20financial%20assurance.></u>

⁷¹ Arnold (n 22) 282; Stewart (n 10) 2057; Komoroski (n 58) 204.

⁷² Stewart (n 10) 2044. The reverse will also be true. Ibid 2056.

accessed 5 November 2023.

⁷⁴ Ibid.

⁷⁵ Perkins (n 34) 1033.

⁷⁶ Wirth (n 19) 634-44.

security actually *held* by the regulator, is implemented in one province (Province A). There, self-bonding and PCGs are permitted and for those regulatees that choose to make a cash deposit, funds can accumulate across the project's full operational life. In contrast, a regime that presents little or no security deficit is implemented in two other provinces (Provinces B and C). There, cash deposits reflecting the *full* estimated costs of reclamation must be placed in a bank account in favor of the regulator prior to construction of the power plant or to ownership of it being transferred to a new owner.

The disparity in regimes distorts competition and affects trade between the provinces. The position of regulatees in Province A is strengthened as compared to competing regulatees in Provinces B and C. Regulatees in Province A that self-bond or who benefit from a PCG do not have to bear the costs of providing security. And, through those measures, they (or their parent companies) possess the 'space' to externalize their obligations through bankruptcy. This has the potential to reduce the price of the energy generated in Province A. If regulatees in Province A had been required to provide effective reclamation security (as is required from regulatees in Provinces B and C), then the costs associated with undertaking their obligations would have been borne as a cost of production (i.e., 'internalized' by them). When internalized costs are not reflected in an increased energy price, regulatees must tolerate reduced profitability.⁷⁷ Conversely, energy generated in Provinces B and C, whose regulatees have borne the costs associated with their obligations, is less competitive in Province A as there is a cheaper alternative. Thus, the stringent RSRs in Provinces B and C – which exhibit a low security deficit – have a detrimental effect on the competitiveness of regulatees in those provinces. The reverse is also true. While the general public may benefit from cheaper energy prices as a result of lax RSRs, the effect of these indirect (or, as Simms described them, 'furtive') subsidies is 'to compel communities to pay part of the cost of...[the regulatee's]...profit-making activity...whether or not the affected members of the public consent or themselves realize any substantial benefit.⁷⁸ The environment also bears the burden.

Thus, a regulatee's costs of production, of which reclamation will be a significant component, may be altered dramatically by the stringency of a jurisdiction's RSRs (or lack thereof), including the *approaches* (e.g., instruments and payment schedules) that are permitted in order to satisfy them.⁷⁹ This may impact upon the attractiveness of a jurisdiction as a business location. The degree of subsidization may be a pull factor when subsidization is high and a push factor when the degree of subsidization is low. For instance, as we have seen, self-bonding and PCGs (or corporate guarantees) release funds to be used more productively by regulatees. This means that jurisdictions which tolerate these measures have a distinct advantage in attracting investors over states that do not.⁸⁰ Jurisdictions, thus, have incentives to rely on lax (or no) RSRs as a tool to make their domestic regulatees more competitive in the market.

To build upon the above example, regulatees from Provinces B and C, where RSRs are stringent, may move their operations to Province A to take advantage of its lax RSRs. Or Provinces B and C may relax their regimes to stem such a flow. While Provinces B and C will weigh other factors into the equation, such as the benefits attained through sound environmental policy, it is conceivable that it could lead to a 'race to the bottom' with them loosening their RSRs to reduce the competitive disadvantage in the sector.⁸¹ This may produce short-term gains but is clearly bad for the environment, landscapes, and public funds in the long term. The downside is that provinces, such as A, are also unlikely to give up their competitive position voluntarily by strengthening their RSRs if there is a risk that others will not.⁸² As we have seen, an established means of addressing this type of trade-related issue is to allocate the pertinent costs to regulatees and require their internalization in line with a 'polluter pays' approach.

3 Reclamation Security

This chapter evaluates critically the instruments most commonly permitted under regulatory frameworks to satisfy RSRs in respect of power plants. A regulator may permit instruments to be used individually or in combination. Thus, the regulatee (or a company or companies affiliated to them) could use more than one to evidence capacity to satisfy their RSRs, thereby reducing the risks associated with any particular,

⁷⁷ Charles Pearson, 'Testing the System: GATT + PPP = ?' (1994) 27 Cornell International Law Journal 553, 555-56.

⁷⁸ Simms (n 63) 434 and 444.

⁷⁹ Mackie and Besco (n 2) 10586

⁸⁰ Jeanna Heard, 'Bankruptcy's Role in the Growing Dilemma of Self-Bonding in the Coal Industry' (2017) 34 Emory Bankruptcy Development Journal 205, 174 (emphasis added).

⁸¹ Stewart (n 10) 2058-59.

⁸² Ibid 2045.

individual instrument. The strengths and weaknesses of each instrument will be considered, and the ways in which the associated risks may be reduced (if at all) set out.

It is to be emphasized from the outset that the efficacy of any RSR will, in addition to the instrument needing to be secure in the event of the regulatee's bankruptcy, be determined by the accuracy of the reclamation cost estimate used to calibrate the requisite amount of security. If this proves to be inaccurate, even the most robust instrument will fail to ensure sufficient funds to perform reclamation. Thus, for all instruments, throughout the operational life of a power plant, regulators should secure independent advice, e.g., a third party assessment, at regular intervals, as to the adequacy of amounts detailed in the instrument to ensure the sums provided align with the outstanding reclamation obligations. There is little point in only permitting regulatees to provide the most secure instruments if the cost estimate used to calibrate the amount of security to be held by them is hopelessly wide of the mark.

3.1 Reclamation Security Instruments

The following are the main types of instruments accepted by regulators to satisfy RSRs. As detailed in Chapter 3, regulators may retain discretion to accept other types subject to scrutiny and consideration.

3.1.1 Deposit of cash and/or asset(s)

Cash and/or assets may be deposited by a regulatee with a third party. They may be deposited in a trust in the case of a trust fund and in a bank account in the case of an escrow account. A trust fund is established by a regulatee and managed by a trustee for a beneficiary, which will usually be the regulator but could conceivably be the regulatee and/or landowner (where it is a different entity to the regulatee). The regulatee will deposit cash/assets into the trust. The trustee will distribute them in line with the terms and conditions of the trust deed, the document that creates the trust. A variant of this model is the escrow account. With this instrument, cash is deposited in a segregated account, usually with a bank, in favour of the regulator. The bank will agree to pay the funds to the regulator or, where permitted, the regulatee as per the terms of the agreement that established the account. With either of these instruments, the deposit may be 'lump sum' (i.e., full amount deposited in one go) or 'accumulating' (i.e., requisite sum deposited over a predetermined period, such as years 0-9 of the operational life of the power plant).

These instruments may allow regulatees, only with the regulator's prior approval, to withdraw funds to perform reclamation works. They must allow the regulator to withdraw funds to enable performance of the works should the regulatee default on their obligations.

3.1.2 Charge on asset(s)

A charge on asset is a security interest, in favour of a regulator, over an asset or assets belonging to the regulatee. Whilst it is commonly used in relation to real estate, the term 'asset' ought to be construed broadly to encompass any valuable asset, such as digital assets, intellectual property, wind turbines, solar panels, heavy machinery, stock or vehicles, other assets may also be suitable provided there is a buoyant secondary market for their resale. The ability for a regulator to deploy this instrument would usually be triggered if a regulatee defaults on its reclamation obligations and the regulator decided to perform them itself. Where the regulator *undertook* the requisite reclamation works because the regulatee was either unwilling to carry them out itself timeously or was financially unable to do so, a legislative power to take a charge would enable the regulator to take security over an asset or assets owned by the regulatee in respect of the costs incurred, including accrued interest. If the sum secured remained unpaid, the regulator's power of sale under the charge could be exercised to realise the asset(s) and recover the debt.

3.1.3 Risk transfer-based instruments

Measures which may fall under this category – letters of credit, bank guarantees and surety bonds – are conceptually similar in that their price and availability are determined by the regulatee's financial risk. They are commonly issued for a fixed period of time (e.g., 3-5 years), with the prospect of renewal upon their expiry. All the instruments described below are indemnity agreements which means that they transfer the risk to the provider of incurring costs to the regulator up to the specified figure.

3.1.3.1 Letter of credit

A letter of credit is an agreement by a bank to pay money to a regulator *subject to certain, specified conditions*. The instrument will specify the maximum amount to be paid by the bank and the conditions under which it can be called upon by a regulator. To draw upon the instrument, the regulator will be required to show that it is entitled to the payment, such as evidence of the regulatee's default. If the regulator draws on the letter of credit, it must use the funds for the specified purpose(s). The bank will usually require the regulatee to provide collateral (cash, securities, bonds or other monetary instruments) in the amount of the letter of credit and will also charge the regulatee a premium for providing it.

3.1.3.2 Bank guarantee

A bank guarantee is an *unconditional* agreement (i.e., no conditions imposed) between a regulatee and a bank/financial institution to create a guarantee in favour of a regulator. It is common for the regulatee to be required to provide security (e.g., in cash or its equivalent) to the bank, and pay regular premiums to it, in return for the bank/financial institution agreeing to pay up to a specified figure upon the demand of the regulator. If a regulatee were to default on their reclamation obligations, the bank/financial institution would transfer the funds to the regulator to enable those obligations to be performed.

3.1.3.3 Surety bond

A surety bond is an agreement by a surety (typically an insurance company) to indemnify the purchaser (the 'principal') to a fixed amount. If the regulatee fails to perform its reclamation obligations, the surety will take the place of the regulatee according to the terms of the instrument. The surety will charge a premium for providing the bond and is likely to base its decision to issue the bond on the applicant's financial strength. It also may seek security from it.

3.1.4 Financial strength-based instruments

Self-bonding and PCG (or corporate guarantees) may be considered conceptually similar in that they are usually only permitted by a regulator to satisfy RSRs where the regulatee (or a company associated with them, such as a parent company) is able to satisfy certain financial tests.

3.1.4.1 Self-bond

A self-bond is a type of security provided by the regulatee itself – and not, in contrast to the abovementioned bonds, a financial institution. Notionally, a reserve fund is set up in the accounts of the company that self-bonds. This may be the regulatee, its parent company or other affiliated company. It is sometimes referred to as provisioning in accounts. It is, in essence, a *promise* to cover the regulatee's reclamation obligations. It is essential to note that it does not require regulatees to set aside money or assets. Generally, the ability to self-bond is based on the regulatee's demonstration of financial strength via passing financial tests at regular intervals (e.g., annually). Self-bonding should not be confused with a quite separate requirement, often seen in frameworks of environmental law, for regulatees to evidence the requisite financial strength to carry out obligations specified in an environmental or other permit.

3.1.4.2 Parent company guarantee

A parent company guarantee (PCG) (sometimes known as a corporate guarantee) is a legally binding agreement provided by the regulatee's parent company (or another affiliate) to satisfy the regulatee's reclamation obligations if the regulatee fails to perform them itself. It would be usual for the parent/ associated company to be required to evidence its financial strength (e.g., satisfy certain financial tests.)

3.1.5 Reclamation fund

Regulatees may be permitted to satisfy RSRs through membership of an approved fund. The regulatee, alongside other members, will pay into the fund. The fund could then be called up to satisfy the reclamation obligations of a member that had defaulted on its obligations. In order to be granted membership, a regulatee could be required to evidence a specified amount of reclamation and pay a specified amount into the fund each year. The fund may be structured so that if the amount of an outgoing payment exceeds the monies held by the fund, an additional drawing can be required of its members.

Table 1. Reclamation Security Instruments: key features, strengths, weaknesses and means of reducing associated risk

Instrument	Key Features	Strengths	Weaknesses	Risk Reduction
1. Deposit of Cash and/or Asset(s) (trust funds, escrow accounts and cash deposits)	A trust fund is managed by a trustee for a beneficiary (e.g., the regulator). The regulatee will deposit cash/assets into the trust. The trustee will distribute them in line with the terms and conditions of the trust deed, the document that creates the trust. With an escrow account , cash is deposited in a segregated account, usually with a bank, in favour of the regulator. The bank will agree to pay the funds to the regulator or, where permitted, the regulatee as per the terms of the agreement. With either of these instruments, the deposit may be 'lump sum' (i.e., full amount deposited in one go) or 'accumulating' (i.e., requisite sum deposited over a predetermined period).	 For lump sum deposits, provided deposit reflects the estimated costs of reclamation, and these turn out to be accurate, the prospect of reclamation being performed is high; will not be impacted by regulatee's bankruptcy. For accumulating deposits, where payments are designed appropriately, enhances capacity to ensure that sufficient level of private funds are available to perform reclamation in the event of the regulatee's default (e.g., through bankruptcy). Prompt access to funds, if necessary. Funds/assets 'ring fenced' from the general body of the regulatee's assets, meaning that they are likely to be beyond the reach of its creditors should it enter into bankruptcy proceedings. Through ensuring a segregated body of funds/assets, no need for instruments to be renewed annually. [The risk with instruments that need to be renewed if the regulatee's financial position has deteriorated below an acceptable.] Attaches a 'price', to be understood broadly, as the costs associated with performing the approved reclamation plan and, therefore, facilitates productive cost internalization. This price and, 	 Where balance does not accrue fully until final payment made, instrument may not be sufficient to cover the reclamation costs in the event of the regulatee's bankruptcy prior to full accumulation; the earlier in the payment schedule, the greater the security deficit. Funds/assets deposited are 'sterilized' in the sense that they cannot be used by the regulatee for operational purposes and/or to generate debt finance from a bank. The need for funds/assets to be deposited may result in the regulatee may be so burdened financially by RSRs and associated restrictions on their capital that it may affect their ability to trade. Accumulating deposits will need to be monitored by regulator to ensure that deposits are being made in accordance with the agreed payment schedule. 	 Where deposits accumulate across all/part of power plant's operational life, request supplementary security until full accumulation occurs, e.g., a bank guarantee could be taken out annually to cater for deficit between accumulated sums and estimated reclamation costs. A charge (or other form of security interest) could be taken over the trust fund or escrow account in favour of the regulator to ensure the sums are secure in the event of the regulatee's bankruptcy. Ensure instrument is unconditional i.e., no special requirements to be satisfied before it can be called upon, and payable on demand by the regulator. Instrument must be irrevocable, meaning that it cannot be changed by the regulate without the approval of the regulator. Monitor deposits made into the fund/account by the regulate to ensure that these keep up with the approved payment schedule. Permission must be sought from regulator before funds can be accessed to ensure that regulatee cannot access them without knowledge of regulator.

Instrument	Key Features	Strengths	Weaknesses	Risk Reduction
		 most importantly, its responsiveness to revisions to the costs of performing reclamation by the regulatee could motivate them to find more innovative, efficient means of performing these obligations. Interest on the sums in the escrow account could help to increase the sum therein, thereby providing for a contingency in the event of the reclamation costs being higher than estimated. 		 deemed appropriate, the landowner. In the instrument, include a description of actions that reclamation security covers (e.g., 'This reclamation security is intended to guarantee funding for works required by the Regulator to').
2. Charge over Asset(s)	A charge on asset is a security interest, in favour of a regulator, over an asset or assets belonging to the regulatee. Where regulator must perform reclamation when regulatee is financially unable to do so/bankrupt, instrument enables regulator to take security over an asset or assets owned by the regulatee to the value of costs incurred, including accrued interest. To release capital from the asset(s) secured by the charge, the regulator must exercise the power of sale conferred under the charge. 'Asset' ought to be construed broadly to encompass any high value asset, provided there is a buoyant secondary market for it.	 If the sum secured by charge remains unpaid, regulator's power of sale under instrument could be exercised to realise the asset and recover the debt. Instrument affords a means of securing value tied up in the asset or assets. If financial condition of regulatee deteriorates and it succumbs to bankruptcy, a regulator with a charge over an asset or assets would have direct recourse to that asset/hose assets if full payment of the sums necessary to perform reclamation obligations had not been made/provided for. A <i>first</i>-ranking charge (i.e., one that ranked ahead of other, prior charges taken over the same asset) affords the regulator the greatest level of protection as they would be paid prior to (i) satisfaction of any other charge secured over the same asset and (ii) the regulatee's general creditors. Thus, such a charge both facilitates productive cost internalization and provides 	 As the regulator must find a purchaser in order to realize the funds secured by the charge, its ability to recover reclamation costs incurred will be dictated by prevailing market conditions and demand for that <i>particular</i> asset; the less marketable it is, the lower the prospect of a prompt sale at a desirable price. Where the asset over which a charge is taken may be considered specialist or non-standard, this may result in market being narrower and less active than other market sectors. It may take time for asset subject to the charge to sell, delaying prospect of realising value from it. This may result in the secured funds not being available when required. Where asset cannot be sold, funds cannot be released. There will be a need to follow behind higher ranking charge is not first 	 Seek independent valuation of asset, and advice from surveyor, prior to utilizing charge to ensure asset can accommodate the costs that the regulator seeks to secure. Only use charge in respect of an asset with broad commercial appeal; avoid niche or specialist assets, where at all possible. The greater the commercial appeal, the greater the prospect of finding a buyer at market value. If unsure as to commercial appeal, seek specialist advice, e.g., a chartered surveyor/valuer. Mandate that regulatee maintains appropriate insurance in respect of asset subject to charge to ensure underlying value of asset is not impacted by an accident/natural disaster. Use small- to moderate level of supplementary security, e.g., bank guarantee, to deal with necessary time sensitive restorative measures. This counteracts the risk that assets subject to charge may take time to sell.

Instrument	Key Features	Strengths	Weaknesses	Risk Reduction
		comfort to the regulator that they have an effective means of securing and then recovering the cost of its performance of the regulatee's reclamation obligations should this prove necessary.	 ranking; this may result in insufficient value being available in the asset to enable reclamation costs to be recovered from a single asset. A decision to prioritize charge in 	
		• Provides effective security for reclamation costs where (i) there is sufficient value in the asset and (ii) there is a buoyant secondary market for their resale.	favour of regulator over a charge in favour of a third party, such as a commercial lender, is a decision that a debt owed to society is to be prioritized to a debt owed to the regulatee's creditors. This may be	
		Charges may be taken over 'non- conventional' assets, such as wind or solar farms, or long leases of them.	politically controversial where there is a creditor whose charge, having been 'overreached' by a regulator's prior-ranking charge, no longer secured entire debt owed	
		 A first-ranking charge has capacity to encourage regulatees to fulfil their obligations in order to avoid a charge being placed on their asset(s) or where their financial position does not permit payment by lump sum, to agree a suitable payment schedule. Failing that, exercising their power of sale under the charge would enable the 	 to it. The regulator's charge would deplete pool of assets available to unsecured creditors upon regulatee's entry into bankruptcy proceedings, thus raising policy concerns. The value of asset could decline, 	
		regulator to sell the asset with a view to recovering the debt secured by it.	decreasing security afforded to regulator.The value of asset or assets subject	
		 With a first ranking charge, as potential secured creditors (e.g., banks) would know, prior to lending, that any charge they might take was susceptible to a regulator's charge and (unsecured) 	to the charge may be impacted by regulatee's bankruptcy in the sense that prices fetched at auction may be lower than on the open market by a solvent vendor.	
		trade creditors would know that the charge could deplete the pool of assets available to the general body of unsecured creditors should the regulatee become bankrupt, this could encourage them to be (more) reformed in their due	 Prioritizing charge over third party charges created at an earlier date could impact on the availability and cost of credit. Creditors may be less inclined to advance funds to, or enter into trade with, resplates created in each resplate 	
		diligence, and, in turn, may lead to more responsible business	regulatees engaged in sectors exposed to risk of a charge being taken. Or they may be willing to	

Instrument	Key Features	Strengths	Weaknesses	Risk Reduction
		 practices by regulatees to secure credit. A first ranking charge may complement self-bonding and PCGs, provided that their acceptance requires a specified minimum value of assets to be held in Alberta. 	 do so only at a high interest rate, under stricter trading terms. There may be evasive behaviour by regulatees. It could lead to asset transfers to other group companies. 	
3. Risk Transfer (letters of credit, bank guarantees and surety bonds)	A bank, financial institution or insurer agrees to meet a predetermined level of the regulatee's reclamation obligations; the risk of those obligations not being performed by regulatee is transferred to provider of instrument in return for a premium and, most likely, security being taken over regulatee's assets. Commonly issued for a fixed period of time (e.g., 3-5 years), with the prospect of renewal upon their expiry. This will depend upon regulatee's continuance as an acceptable credit risk.	 Requisite level of security will be available from when the instrument is purchased from the provider, meaning that dangers of waiting for funds to accumulate, as seen with trust funds and escrow accounts, are avoided. Provider of instrument (i.e., bank, financial institution or insurer) will be required to meet its contractual obligations even if regulatee becomes bankrupt. Thus, these instruments ought to be regarded as secure in event of regulatee's bankruptcy. Where level of coverage is sufficient to meet the associated with the regulatee's reclamation obligations, public funds need not be utilized to undertake the works. Prompt access to funds (provided conditions satisfied in the case of letters of credit). As instrument is provided by an independent provider, as opposed to regulatee (self-bonding) or a company affiliated to it (PCG), there is no connection between regulatee's financial health and that of the provider. 	 Where instruments are renewed annually there is a risk that where they are not renewed, the security may 'fall away' requiring regulatee to find an alternative means of evidencing its capacity to bear its reclamation obligations. Where its financial strength has weakened, particularly where it is on the verge of bankruptcy, this is unlikely to be attainable. Due to their coverage of relatively short time periods, these instruments are not well suited to covering obligations arising decades in the future. Regulator will need to ensure instrument is renewed, creating potential for oversight/error. Cost associated with maintaining instrument for operational life of power plant may be burdensome (or, indeed, prohibitively expensive for certain regulatees). Regulatee may be so burdened by cost of premium and obligation to provide assets as security to provider of instrument that that it may struggle to trade. It is not uncommon for collateral of 100% 	 Limit use of risk transfer-based instruments to coverage of reclamation obligations for short periods of time, e.g., to enable trust funds and escrow accounts to accumulate to their agreed level. Instrument can be drafted to require provider to 'pay out' where instrument not renewed but this will have a cost implication in terms of its price and/or need for provision of security. Providers will need to cater for this risk under the price and terms of the product and this type of clause will not be accepted lightly. To avoid risk of provider of letter of credit disputing their liability to 'pay out', regulators should ensure that they are aware of any conditions to be satisfied before provider is required to pay and adhere to these faithfully. Use standard worded clauses to ensure 'triggers' for payment under an instrument align with regulator's expectations. Ensure instruments are irrevocable to prevent regulatees from terminating them without regulator's consent or knowledge

Instrument	Key Features	Strengths	Weaknesses	Risk Reduction
		 Requirements for regulate to provide security to provider prevent nominally capitalized, financially unstable regulatees from running power plants to which potentially expensive reclamation obligations will attach. A price is accorded to the activity. Regulatees are, therefore, required to internalize such costs into their decision as to whether to engage in the development/ownership of a power plant. Attaches a 'price', defined broadly, as the costs associated with performing the reclamation plan approved by the regulator and, therefore, facilitates productive cost internalization. This price and, most importantly, its responsiveness to revisions to the costs of performing reclamation by the regulatee (in the sense that a reduced liability will likely result in a lower priced product, due to the associated reduction in financial risk to the regulator) could motivate them to find more innovative, efficient means of performing these obligations. A surety bond involves regulatee paying a fee to bond provider for issuing bond and not providing cash or other assets as security for bond value, as with a bank guarantee. This may make it more suitable to smaller, less asset rich regulatees. 	 of the value of the product to be demanded. A bank guarantee and letter of credit can tie up regulatee's capital or other assets which the provider requires as security for the instrument. Bank guarantees and letters of credit may not be available to smaller companies that cannot offer security to provider. Where conditions attached to a letter of credit are not satisfied, risk of instrument provider not 'paying out' as expected, meaning that there is a prospect of a deficit in available funds. There may not be a ready market for affordable instruments. Banks and other providers of risk transfer measures may become bankrupt themselves. 	 Include explicit reference to monetary amount that instrument is to cover. Ensure instrument is irrevocable in the sense that it is not able to be changed or reversed by regulatee without consent of the regulator. Ensure that instrument is made in favour of regulator as the only beneficiary. In the instrument, include description of actions that reclamation security covers (e.g., 'This reclamation security is intended to guarantee funding for works required by the Regulator to').

Instrument	Key Features	Strengths	Weaknesses	Risk Reduction
Instrument 4. Financial Strength (self-bonds, parent company/corporate guarantees and provisioning in accounts)	Key Features Promise by regulatee (as with a self- bond or provisioning in accounts) or by their parent company (as with a PCG/corporate guarantee) to meet costs of reclamation obligations. Regulatee (or company with whom they are affiliated, such as their parent company) must usually meet specified criteria to show their financial net worth or credit rating. In frameworks that permit these instruments to satisfy RSRs, underlying assumption is that large, profitable regulatees can bear their reclamation obligations without need to involve third parties, such as financial institutions.	 Strengths Avoids burdening regulatees with onerous RSRs. Regulatees not required to pay a premium or fee or provide security and suffer the associated liquidity constraint. As a result, there will, at least theoretically, be a higher level of capital to invest in the accumulations of funds for performance of reclamation. Put another way, the funds that would otherwise need to be deployed to pay for third party provided security instruments may be used instead to finance reclamation. Regulatees that can utilize these instruments like them as they are, owing to the associate cost savings, placed at a competitive advantage in respect of those regulatees that cannot access them; not only can they provide a cheaper electricity than would be the case if they were required to incur these costs, they can use the funds that would otherwise have needed to be dedicated to purchasing an instrument as capital to run and grow the business. Where funds available to regulatee (or their parent/associate company) are equal or greater than the costs associated with the regulatee's reclamation obligations to be met in full. A PCG contractually overrides the limitation on the parent company's liability for reclamation obligations arising from its 	 Weaknesses Prone to outright failure in the event of bankruptcy. It is inaccurate to present these instruments as 'reclamation security'. The regulatee/parent/associate company is not required to set aside assets or funds to cover their reclamation obligations. No security, in the truest sense of the phrase, is actually provided by the regulatee. This means that the regulatee's assets and funds will be available to its creditors should it enter into bankruptcy. The regulator will likely join the other unsecured, non-preferential creditors at the 'back of the queue' for payment and are likely to receive very little, if nothing at all. Financial strength-based measures are fundamentally unsecure as a result. A guarantee is only as good as the person giving it. If the parent company provides as guarantee for its subsidiary (the regulatee), and the parent subsequently enters into bankruptcy proceedings itself, the guarantee is worthless. The PCG/corporate guarantee is a mere unsecured, contractual obligation to pay (akin to a promise). Does not attach a 'price', defined broadly, as the costs associated with performing the reclamation plan approved by the regulator and, therefore, does facilitate productive cost intermalization. This means that these instruments 	 Risk Reduction These instruments could be used in conjunction with other instruments or could be restricted to certain phases in the operational life of the power plant (e.g., years 0-9). The use of first ranking charges over assets could complement regulatory acceptability of self- bonding provided there was a requirement for regulatees to hold a specified value of assets (e.g., real estate) within Alberta. Regular monitoring, and close oversight, of regulatee's financial position will improve ability of regulator to respond quickly to negative changes in its financial outlook. Private sector experts (e.g., accountants or auditors) could be used to verify data put forward by regulatee, with the cost of doing so borne by the regulatee. Regulatees should notify the regulator immediately if they no longer satisfy financial test or do not hold a reasonable belief that they will be able to continue to do so. Financial data provided must be based on audited accounts prepared according to international accounting standards. To avoid problems associated with enforcing the guarantee against companies registered outside Alberta, consider limiting PCGs to parent commanies registered within

Instrument	Key Features	Strengths	Weaknesses	Risk Reduction
	Key reatures	 conferral of limited liability to shareholders under corporate law). It, therefore, achieves by contract what veil piercing and other liability extending mechanisms seek to achieve through judicial discretion. It may, however, be seen as providing a superior remedy to liability extension as it ensures a degree of financial stability in the regulatee/parent/associate company as certain financial tests must continually be satisfied if the regulatee is to continue to be permitted to benefit from the instrument. The extension of liability cannot guarantee this. The need to continue to satisfy financial tests is likely to motivate regulatees to stay financially strong so as to remain exempt from need to purchase expensive products, such as a surety bond, from third parties. From regulatee's perspective, satisfaction of financial tests accords no price whatsoever to the regulatee's activities; it will be appealing to them precisely for this reason. Given its exposure under contract to the regulatee's reclamation obligations, the parent will, technically, be in a position to set and monitor the regulatee is to are regulatee's perform them. If required, it may exercise its authority over the regulatee if it fails to implement and/or meet certain practices or explore means of reducing these costs legitimately through, for instance, technological innovation. It could 	 Weaknesses to find more innovative, efficient means of performing their reclamation obligations. Where PCGs are subject to an expiry date, the regulator will need to monitor this and renew where necessary. 	 Risk Reduction eases enforcement of the PCG, this means that for regulatees (and their parent companies) located in Alberta, funds are released and made available to reinvest and grow their business. However, regulatees (and their parent companies) located outside of the province miss out on this. There is, therefore, a fairly strong degree of inequity in the way in which two regulatees can be treated. To ensure 'triggers' for payment under the instrument (e.g., PCG) align with the expectations of the regulator standard form clauses should be used in the instrument. Bankruptcy of regulatee should be a 'trigger' for payment under PCG. In the instrument, include an explicit reference to the monetary amount that the reclamation security is to cover. Attention must be paid to expiry dates for PCGs. Ensure that there is sufficient time to renew, if required. In the PCG, include description of actions that reclamation security is intended to guarantee funding for works required by the the Regulator to'). Ensure PCG is unconditional in the sense that no special requirements to be met when calling on it and payable on demand when it falls due.

Instrument	Key Features	Strengths	Weaknesses	Risk Reduction
		do so by, for instance, replacing the regulatee's directors.		 Ensure PCG is irrevocable in the sense that it is not able to be changed or reversed by parent with the regulator's approval. Ensure that PCG is made in favour of the regulator as the only
				beneficiary.
5. Reclamation Funds	 Fund will, generally, pay for reclamation, but may also permit fund administrators to pursue defaulting regulatees for reimbursement of reclamation expenses. The sole means of financing reclamation funds should, if they are to be consistent with the policy driving the polluter-pays principle of environmental law, derive from taxes or charges against regulatees engaged in the operation of power plants in Alberta. Funds are typically created to deal with a particular type of activity e.g., wind, solar, hydro <i>or</i> thermal. 	 Where a reclamation fund does not receipt support from the state, it has the capacity to ensure that private funds can be drawn upon to perform reclamation as and when required. Prompt access to funds if necessary. Requirements upon regulatees who wished to obtain membership of the fund could be set out, such as in relation to the need to remain capable of satisfying certain financial tests. Additionally, or alternatively, intended members could be required to provide evidence of a predetermined level of (supplementary) reclamation security. Attaches a 'price', defined broadly, as the costs associated with performing the reclamation plan approved by the regulator and, therefore, facilitates productive cost internalization. This price and its responsiveness to revisions (i) to the costs of contributing to the fund; and/or (ii) the quantum of, and instruments accepted to satisfy, supplementary RSRs, could motivate them to find more innovative, efficient means of performing these obligations. 	 Only necessary where other, 'front line' security instruments fail. The existence of a 'back up' fund distracts from the regulatory priority of ensuring that 'first line' instruments are robust and sufficient. Attention should be trained on the effectiveness of front line measures as opposed to establishing solutions for dealing with their failure. Societal fatigue with funds due to their known likelihood of needing to be publicly financed to survive. Funds are often reliant on loans from government to sustain their existence. The cost of performing reclamation is shared by the regulatee and the industry covered by the fund. Thus, they appear to run counter to the frameworks of liability based upon it. [As detailed in Chapter 5, funds would be contrary to the <i>principle of restorative responsibility</i>, the normative guide proposed in this report to function as the overarching principle to steer the design of FSRs.] 	 Supplementary security could be required from regulatees before they were granted membership to the Fund. The Fund could create guidelines/guidance on (i) how to calculate reclamation costs and (ii) how to ensure that supplementary security is rendered secure. The polluter-pays principle could, in fact, be furthered in circumstances where administrators of the fund can seek reimbursement from the member responsible for the unfulfilled reclamation obligations. Though, this will not be possible where the member is bankrupt or is otherwise unable to pay. Larger contributions from members could be sought in the early years, thus, increasing the prospect of the fund being in a position to 'pay out' if and when required. Larger contributions could be required from larger regulatees, as determined by the scale of their power plants. Poorly performing members could be expelled. This would prove problematic for them if membership of a fund was

Instrument	Key Features	Strengths	Weaknesses	Risk Reduction
		Fund could be structured to confer a right to pursue a defaulting regulatee for a cost recovery action.	 Funds often exhibit bureaucratic inefficiencies which hinder the ability to readily finance reclamation. Fund maintenance is notoriously difficult and ability to secure adequate contributions from the sector relies on continued political will, which may fade. If a regulatee was permitted to pass its liability on to the fund and carry on as usual, not only would the polluter-pays principle be implemented inadequately but there would be little incentive for regulatees to bear their reclamation obligations. The administrative costs associated with tailor-made contributions may be high. Where supplementary security is needed for membership of the fund, the weaknesses associated with that particular category of instrument is generated (e.g., the use of a bank guarantee may impose indirect costs on operators, such as a high degree of liquidity constraint, which may restrict the availability of capital). 	required to operate a power plant; exclusion from the fund could, for instance, result in the permit being suspended or rescinded.

4 RSRs in a Comparative Perspective

This chapter critiques a range of RSRs for power plants in Australia, Canada, England and Wales, France, Germany, Sweden, the United States and New Zealand. These jurisdictions provide the opportunity for lessons to be learned from best practice in regulatory frameworks across North America, Europe and Australasia, with many examples being drawn from other Common Law jurisdictions. These were selected to elucidate best practice and illustrate the range of options available.

The legislation which confers the power to impose RSRs, the activities in relation to which they apply (e.g., wind and/or solar), the instruments that may be used to satisfy the RSRs and how the amount of the security required is to be calculated are captured. The strengths and weaknesses of the legal framework and associated guidelines/guidance as they pertain to RSRs are examined. RSRs applicable to *offshore* renewable energy projects are included for analysis. The reason for this is that as the state is often the 'decommissioner of last resort' in respect of installations placed in the marine environment, the laws and guidelines in place to cater for their proper decommissioning tend to be particularly detailed in scope and stringent in rigour and so useful to this onshore-focused study of RSRs.

	Country	Jurisdictional applicability of RSRs	Sectoral applicability of FSRs		
1	Australia	Federal	Offshore renewables		
2	Australia	New South Wales	Onshore wind; generation of electricity by plant based on, or using, any energy source other than wind power or solar power (e.g., hydroelectric, and thermal); gas turbines; internal combustion engines; and energy recovery techniques		
3	Australia	Queensland	Electricity generation using gas or other fuel		
4	Australia	Victoria	Renewable energy production and storage		
5	Canada	Nova Scotia	Marine renewables (ocean waves, tides, currents, and offshore wind)		
6	Canada	Nova Scotia (County of Colchester)	Onshore wind		
7	Canada	Ontario	Onshore solar, wind, bioenergy and thermal		
8	England & Wales	N/A	Offshore renewable energy installations		
9	England	N/A	Onshore wind and solar		
10	France	N/A	Onshore wind		
11	Germany	Federal	Offshore renewables		
12	Sweden	N/A	Onshore renewables and offshore renewables		
13	United States	Federal	Hydroelectric		
14	United States	Federal	Renewables projects on Outer Continental Shelf		
15	United States	Federal	Wind and solar projects on federal land		
16	United States	Connecticut	Onshore wind		
17	United States	Maine	Solar		
18	United States	Tennessee	Solar		
19	United States	West Virginia	Onshore wind and solar		
20	New Zealand	N/A	Onshore wind		

Table 2. Representation of jurisdictions, including applicability of their RSRs, covered in the study

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
1.	Australia	Offshore renewables (includes offshore wind, offshore solar, wave energy plants and undersea electricity interconnectors)	Offshore Electricity Infrastructure Act 2021, s. 117 (the Act) Further detail in relation to security is provided in the Offshore Electricity Infrastructure Regulations 2022, s. 37 (the Regulations)	Under s 117(1) of the Act, the holder of a licence for which there is a management plan ' <i>must</i> , at all times while the licence is in force', provide financial security 'sufficient to pay any costs, expenses and liabilities that may arise in connection with, or as a result of: (a) the decommissioning of licence infrastructure; and (b) the removal of equipment and other property from the licence area or a vacated area; and (c) the remediation of the licence area and vacated areas, and any other area affected by activities carried out under the licence.' The regulator must approve a management plan before a commercial licence can be approved (s 42(1)(f)). If a person is required to provide financial security and does not, they commit an offence (s 118). If a licence is transferred, then the transferor must comply continue to provide financial security under s 117(1), as if they still held the licence, until the licence ceases to be in force or the Minister gives notice them (the Regulations, s. 37(2)).	A yet unpublished set of 'second stage' regulations will contain arrangements for financial security, including accepted instruments. The Department of Climate Change, Energy, the Environment and Water intends to consult on the second stage of regulations in late 2023 and for the regulations to come into force in the first quarter of 2024: <u>see further</u> . An amount: (a) received as financial security; or (b) recovered from a financial security provided for the purposes, is to be credited to the Offshore Infrastructure Registrar Special Account (s 119(3) of the Act).	A yet unpublished set of regulations (expected to be published in Q1 of 2024) will contain arrangements for financial security.	 Strengths Where there is a management plan in place, there is a legislatively mandated financial security requirement for the entire period in which license is in place; security 'must' be in place. This means that there is no discretion not to require financial security. Statutory source of legislative requirement for financial security, supplemented by a further regulation. There will, in due course, be a regulation that deals specifically with financial security. This has the opportunity to reflect the 'state of the art'. Any financial security received by the state is placed in a dedicated account, ensuring that is secure and will be available when required. Weaknesses It is premature to critique the regime given the regulation dealing with financial security is not yet in place. We don't know the detail of the regime. Despite the Act coming into force on 2 June 2022, there is still no regulation/guidance on financial security requirements. This means that licenses issues between 2

Table 3. Analysis of regulatory frameworks providing for RSRs in Australia, Canada, England & Wales, France, Germany, Sweden, New Zealand and US

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
							June 2022 and the date that the new regulation deal with financial security may possess less than optimal security requirements. Security requirements ought to be provided for under any new legislative framework to be implemented. Delay equals risk. They cannot be an afterthought.
2.	New South Wales, Australia	Onshore wind turbines, the generation of electricity by means of electricity plant that is based on, or uses, any energy source (other than wind power or solar power), gas turbines, internal combustion engines and energy recovery techniques. It is to be noted that solar power is <u>not</u> covered. See Schedule 1 of the <u>Protection of</u> the <u>Environment</u> <u>Operations Act</u> <u>1997</u> for activities in respect of which a licence is required. Clause 17 deals with electricity generation.	Protection of the Environment Operations Act 1997 (PEO Act), Part 9.4 Financial assurances, ss 296-307According to s 298(1) of the PEO Act, the conditions of an environment protection licence 'may' require the holder or former holder of a licence to provide a financial assurance before it assurance before it issues, suspends or revokes the licence or before it approves of its surrender.Should the regulator choose to require financial assurance, this will be by way of condition(s) attached to the license (PEO Act, s 296(1)).Protection of the Environment Operations (General) Regulation 2022 makes explicit reference to	Purpose of financial assurance is 'to secure or guarantee funding for or towards the carrying out of works or programs' required by/under a licence (PEO Act, s 296(1)). A financial assurance is not to operate 'as a mere penalty' for a contravention of the law or the conditions of a license (PEO Act, s 296(2)). According to s 299 of the PEO Act, the regulator <u>cannot</u> require financial assurance to be provided <i>unless</i> it is satisfied that the condition is justified having regard to: (a) the degree of risk of environmental harm associated with the activities under the licence, or (b) the remediation work that may be required because of activities under the licence, or	 Under s 298(2) of the PEO Act, one or more of the following forms of security may be used: a bank guarantee (from an Australian financial institution), a bond (e.g., surety bond) or another form of security that the appropriate regulatory authority 'considers appropriate' and specifies in the condition. An unconditional bank guarantee is the EPA's 'preferred' option as it 'provides greatest certainty in accessing funds in default events' (<i>Financial Assurance Policy</i>, p. 10). The bank guarantee is, therefore, the first best option. The surety bond is the second best, alternative option: Ibid, p. 10. If a regulatee wishes to provide a financial assurance by 'another form of security' (i.e., other than a bank guarantee or a surety bond), it must seek the EPA's approval. The EPA may permit another form of security if, for example, the regulatee can demonstrate that the security will provide the EPA' 	The amount of financial assurance is to be as determined by the regulator (PEO Act, s 300(1)). The regulator must not require financial assurances of an amount that 'exceeds the total cost of carrying out the relevant work or program' (PEO Act, s 300(2)). That is 'the amount that, <i>in [the regulator's]</i> <i>opinion</i> , represents a <i>reasonable</i> estimate of the total likely costs and expenses that may be incurred in carrying out the work or program required by or under [the PEO] Act for which the financial assurance is required, including the likely <i>costs</i> and <i>expenses</i> of that authority in directing and supervising the carrying out of the work or program.' (PEO Act, s 300(2)). The regulator 'may' require the holder or former holder of a licence who is required to give a financial assurance	 Strengths This framework ought, subject to certain caveats detailed below, to be considered the 'state of the art' in terms of its rigour and the care, foresight and thoughtfulness in which it has been put together. A legislative power to require security plus guidelines detailing (i) the regulator's policy relating to security; and (ii) the way the independent cost estimate is to be provided, distinguish it from other, equivalent frameworks and render it as somewhat of exemplar to other regimes. Covers a wide range of power plants and so is not unduly narrow in scope. A 'preferred' instrument is indicated, setting a clear standard as to what is expected of regulatees. The instruments permitted, namely bank guarantee and surety bond, are two of the most secure instruments available in the event of the regulatee's bankruptcy.

Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount		Commentary
		two key guidelines published by the NSW Environment Protection Authority (EPA) in May 2022: the <i>Financial</i> <i>Assurance Policy</i> and the <i>Estimating</i> <i>financial assurances:</i> <i>Guideline on</i> <i>Independent</i> <i>Assessment of Costs</i> <i>(the Guideline).</i> As set out in the <i>Financial Assurance</i> <i>Policy</i> (p 2), 'Financial assurance is not mandatory for every person or company subject to a regulatory instrument. The EPA has the <i>discretion</i> to exercise its legal powers to require a financial assurance and will take a risk based <i>approach</i> to deciding whether a financial assurance is likely to be required. This aligns with the EPA's risk- based licensing framework which will help to ensure that regulated actions receive an appropriate level of regulation based on the level of risk they pose.' Financial assurance requirements for regulated activities are accessible via the EPA's public registers.	 (c) the environmental record of the holder/former/proposed holder of the licence, or (c1) the financial capacity of the holder/former/proposed holder of the licence, or (d) any other matters prescribed by regulations (this includes the adequacy of financial assurances already provided by the same person to the regulator in respect of same or substantially the same works or programs: see Protection of the Environment Operations (General) Regulation 2022, s 155(b)). Appendix A of the document, <i>Financial Assurance Policy</i> (pp 16-22), provides a methodology for assessing risk in tabular form. It lists the factors the EPA will use to determine the risk of potential liabilities arising from the regulatee's actions. The risk factors are split into the three categories: low, medium and high. The following risks are covered: risk of environmental performance risk; and financial capacity. There is considered to be 'low risk' if all 1 risk categories in Appendix A are assessed as low 	with 'unconditional access to funds' if the regulatee defaults on their obligations (<i>Financial</i> <i>Assurance Policy</i> , p. 10). The EPA may consider accepting financial assurance in instalments if the regulatee can demonstrate 'financial hardship' in meeting their financial assurance requirements (<i>Financial</i> <i>Assurance Policy</i> , p. 9). If a regulatee is unable to provide the financial assurance, the EPA will consider whether the regulatee has the financial capacity to comply with its obligations under its (proposed) licence and whether it is a 'fit and proper person or company' to hold a licence (<i>Financial</i> <i>Assurance Policy</i> , pp. 9-10).	to providean independent assessment of the cost of the relevant work or program for which the assurance is required. (PEO, s 300(3)). The <i>Financial Assurance</i> <i>Policy</i> (p. 9) states that '[g]enerally, the EPA <i>will</i> require you to provide an independent assessment of the cost of carrying out the actions.' The independent assessment will help the EPA determine the appropriate amount of financial assurance. The EPA has developed the <i>Guideline</i> to help regulatees obtain an independent cost assessment. In Appendix B (pp. 25-29), it provides a 'Sample format for preparing the cost estimate – shut down and decommissioning and closure/rehabilitation phases'. The cost estimate must be undertaken in accordance with the <i>Guideline</i> . The regulatee is responsible for engaging a registered company auditor to undertake the independent assessment and provide the report to the EPA (<i>Guideline</i> , p. 7). The <i>Guideline</i> also includes templates for the auditors' report.	•	The discretion to permit 'other' instruments to be used is curtailed to the extent that they must provide the EPA with 'unconditional access to funds' if the regulatee defaults on their obligations. An independent cost assessment, which informs the amount of security to provided, is required. The <i>Guideline</i> clarify that certain powers under the PEO Act will, generally, be exercised (e.g, the power to require an independent audit <i>will</i> , generally, be exercised). The likely costs and expenses of the regulator's direction and supervision of the works is to be incorporated into the security amount, providing a safeguard to public funds should this be necessary. Level of security to be provided is reconsidered every 5 years, enabling the level required to respond to increases or decreases in estimated reclamation costings. Sample format for preparing the cost estimate provided, aiding standardisation of costings and easy comparisons with the costings of others. Costs must take account of inflation and contingency in the region of 10-20% of total estimated costs needed. Transparency as financial assurance requirements for regulated activities are accessible via the EPA's public registers.

Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
		If the amount of financial assurance claimed or realised by the regulator is not sufficient to cover all the costs and expenses concerned, the regulator may recover the excess from the holder/former holder of the licence as a debt in any court of competent jurisdiction (PEO Act, s 303(8)).	 Financial assurance is <i>unlikely</i> to be required. There is 'medium risk' if the risk categories in Appendix A are assessed as a mixture of low and medium. Financial assurance <i>may</i> be required. There is 'high risk' if any risk category in Appendix A is assessed as high. Financial assurance is <i>likely</i> to be required. The regulator may carry out, or direct or supervise the carrying out by another person of, any work or program covered by any financial assurance required by the conditions if the holder or former holder of the licence fails, in the opinion of that authority, to carry out that work or program in accordance with the conditions of the licence (s 302(1)). The regulator may recover or fund the reasonable costs or expenses in carrying out any work or program (including directing and supervising it) by making a claim on or realising the financial assurance or part of it (s 303(1)). 		Costs, which must take into account of the effects of inflation, must be estimated using the best data available at the time (e.g., as determined through direct measurement, engineering studies, previous experience, quotations from suppliers/contractors and recognised experts, such as in the case of sale proceeds in respect of retired infrastructure) and must be referenced and verifiable. This means that costs must be based on quantifiable industry rates as applied to <i>site specific</i> assumptions. According to the <i>Guideline</i> (p. 6), an independent assessment of costs consists of two steps: 1 a cost estimate to calculate a reasonable estimate of the costs of carrying out the action in respect of which the financial assurance is required; and 2 an independent assessment to provide the EPA with confidence that the cost estimate is reasonable. The EPA will review whether the value of the financial assurance requirement is adequate every five years (or more regularly if the licence	 Weaknesses Financial assurance is not mandatory for every regulatee. The EPA retains discretion to exercise its legal powers to require a financial assurance. Security cannot be required unless certain criteria (see below) are present. The EPA may consider accepting financial assurance in instalments if the regulatee can demonstrate 'financial hardship' in meeting their financial assurance requirements. However, no guidance is provided on what 'hardship' means, or when it would be satisfied. It is also somewhat counterintuitive to permit regulatees experiencing such hardship to pay in instalments, without some other form of supplementary security to be put in place. The EPA take a <i>risk based</i> approach to deciding whether a financial capacity' of the regulatee being one of the criteria. This is understood as the 'financial health' of the person or company responsible for carrying out the actions (<i>Financial Assurance Policy</i>, p. 16). A person or company is likely to be of sound financial health where, for example, 'financial statements for the past 3 years report a strong financial position' (Ibid p. 22).

Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
			determine disputes about calling on or using a financial assurance (PEO Act, s 307).		requires) (Financial Assurance Policy, pp. 9- 13). The Guideline acknowledges that as the cost estimate is forward looking and so it involves uncertainty. Thus, a degree of judgement is needed. Assumptions will be required where precise measurement of elements of the cost estimate are not possible. However, the Guideline (p. 10) states that '[a]ny uncertainty in the cost estimate should be clearly identified and explained' and a contingency amount in the cost estimate to address this uncertainty must be provided. It notes that 'contingencies of 10% to 20% of total estimated costs are commonly applied to actions in overseas jurisdictions'. The contingency level may be adjusted over time where costs become more certain. According to the Guideline, a verification may be undertaken when an audit cannot be performed, as would be the case where the auditor has concerns about specific aspects of the cost estimate, such as whether all cost items are included. A verification involves an auditor performing procedures that the regulate, the auditor and the regulate, and the area on so	However, no guidance is provided on what strong means, other than the potential for an auditor's report to identify any 'matters of concern' (Ibid). The <i>Financial Assurance Policy</i> (p. 22) indicates that '[t]here may be some areas of concern about the person or company's financial health' where the 'sector is experiencing an economic downturn or similar businesses are winding up'. As detailed in Section 5.2.2, this is a troublesome approach given the consequences of a regulatee's financial deterioration for its capacity to perform its reclamation obligations. The inclusion of 'financial capacity' as a matter which will influence the regulator's decision whether or not security is required is one of the significant weaknesses of/holes in what is otherwise a carefully put together regulatory framework.

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
						that the auditor can provide factual findings on the cost estimate. It is an alternative independent assessment to an audit, as the auditor is not forming a conclusion on the cost estimate.	
3.	Queensland, Australia	Electricity generation using gas or other fuel	Environmental Protection Act 1994 (EPA), s 308 According to s 426 of the EPA, a person must not carry out an 'environmentally relevant activity [ERA] unless the person holds, or is acting under, an environmental authority for the activity. The <u>Guideline:</u> <u>Financial assurance</u> <u>under the</u> <u>Environmental</u> <u>Protection Act 1994</u> (the <u>Guideline</u>), describes the arrangements for financial assurance for prescribed 'Environmentally Relevant Activities' (ERAs) under the Environmental Protection Act 1994. An activity prescribed under section 19 is an 'environmentally relevant activity' (EPA, s18(c)).	Under s 308(1) of the EPA, the regulator (the Department of Environment and Science) 'may' impose a condition on an environmental authority that the holder must not carry out, or allow the carrying out of, a relevant activity under the authority unless the holder has paid a financial assurance to the regulator. According to s 308(2), the condition may require the financial assurance to be given as security for: (a) compliance with the environmental authority; and (b) costs and expenses, or likely costs and expenses, or likely costs and expenses, or likely costs and expenses in taking action to prevent or minimise environmental harm, or rehabilitate or restore the environment, in relation to the carrying out of an activity for which an EPA assurance or scheme assurance has been given.	 Under Schedule 4 of the EPA, 'security' includes: bond, deposit of an amount as security, guarantee, indemnity or other surety, insurance, mortgage and undertaking Under the <i>Guideline</i>) (p. 8) regulator 'may decide what form of [financial assurance] is required'. The <i>Guideline</i> (p. 9) states that 'Departmental policy <i>requires</i> [financial assurance] to be a financial institution's undertaking in the form of an unconditional, irrevocable and on demand guarantee.' 'Cash may be accepted in limited circumstances, subject to approval by the department' (Ibid, p. 9). An instrument will only be acceptable where it is: 'unconditional; immediately payable on demand and payable without reference to another person and available until all	According to s 310(1) of the EPA, the regulator must decide the amount and form of financial assurance required under a condition of an environmental authority. In making the decision, the regulator ' <i>must</i> have regard to the financial assurance guideline' (EPA, s 310(3)). The approved calculation method is outlined in Appendix A of the <u>Guideline</u> . In summary this method involves: Step 1 : the total (i.e., 100%) rehabilitation liability must first be calculated for the environmental authority, for all significantly disturbed land, as per Appendix A. For example, costs must be a site-specific and independently certified, <i>third-party</i> quote or a contracted rate to undertake the full extent of work necessary to meet all environmental authority conditions including the following activities: (a) decommission and remove all infrastructure and	 Strengths Much like the framework applicable in NSW described above, Queensland's approach, <i>subject to certain</i> <i>caveats detailed below</i>, affords as further example of sound practice. Not only does the regulator have the power to require security, the manner in which the relevant discretion is to be exercised is informed by a guideline detailing the regulator's policy relating to security, with a sample cost estimation methodology provided for use by regulatees/their consultants. The regulator indicates the <i>requisite</i> instrument – a bank guarantee – which is one of most secure instruments available should the regulatee become bankruptcy. The availability of a discount (up to 30% of total estimated reclamation liability) is available to the regulate if certain criteria can be satisfied. This means that the framework can provide incentives to draw investors to the jurisdiction. Value inherent in the infrastructure (e.g., salvage/resale) cannot be used

Jurisdictio	n Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
		s 19 states that a regulation may prescribe an activity as an environmentally relevant activity (ERA). Environmental Protection Regulation 2019 sets out prescribed ERAs in Schedule 2, with Part 3 dealing with 'Energy related services'. This establishes that generating electricity by using gas or other fuel at a specified rated capacity is a prescribed ERA.	impose the condition <u>only if</u> it is satisfied the condition is justified having regard to: (a) the degree of risk of environmental harm being caused, or that might reasonably be expected to be caused, by the activity; and (b) the likelihood of action being required to rehabilitate or restore and protect the environmental harm being caused by the activity; and (c) the environmental record of the holder.	obligations have been performed' (Ibid, p. 22)	terminate all services (b) constituent tasks or activities required for rehabilitation. Project management costs must also be included. 10% of the total rehabilitation liability is recommended. The <i>Guideline</i> (p. 22) provides that the total rehabilitation liability must <u>not</u> 'assume that the liability can be reduced or offset by deducting the value of on-site infrastructure or other assets (including scrap metal)' as this does not satisfy the requirements for an acceptable form of financial assurance'. The regulator does not accept the reduction or offset of infrastructure, assets or scrappage value 'due to risks and uncertainty associated with the department's ability to inherit and on-sell these assets and commercial factors (i.e., depreciation and saleability) which could affect the value of the item' (Ibid, p. 22). Step 2 : If applicable, apply a discount. The maximum allowable discount is 30%. The <i>Guideline</i> (p. 22) provides that '[i]n recognition of the low incidence of non- compliance, low risk of default, and good environmental	 to reduce the level of security to be provided. An independent cost assessment, based on the cost of a <i>third party</i> undertaking the work, informs the amount of security to provided, is required. This provides safety in the event of the regulatee becoming bankrupt as so being unable to undertake the works itself. Whilst it may be able to do so cheaper if it carried the works out itself, Queensland's approach deals with the prospect that the regulatee is bankrupt/defunct. Project management costs must be included in the total reclamation liability, with 10% recommended, furthering safeguarding public funds in the event of the regulatee's bankrupty. The likely expenses that the government may incur in taking action to rehabilitate or restore the environment, should the holder fail to meet their environmental obligations, is incorporated into the security amount, providing a safeguard to public funds should this be necessary. Regulator can request amount of security to be changed by regulate, enabling the level provided to reflect changes in circumstances. Sample format for preparing the cost estimate provided, aiding standardization of costings and easy comparisons with the costings of others.

Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
					performance/lower risk of environmental harm by some operators', a discount system is utilized by the regulator so that regulatees	• A wide range of instruments can be used to satisfy the security requirements, making this attractive to industry.
					regulator so that regulatees 'may reduce the amount of financial assurance payable 'to an amount below 100% rehabilitation liability for significantly disturbed land'. The ability to use this discount 'is subject to mandatory pre-requisites and the amount of discount attainable is based on a number of criteria (e.g., <i>sound financial health</i> , measures undertaken to reduce rehabilitation liability/risk of	 Weaknesses Covers narrow range of power plants, as understood for the purposes of this report (i.e., electricity generation using gas or other fuel). The framework is difficult to navigate, particularly in relation to establish what prescribed ERAs are. Security is not mandatory for every regulatee. The regulator retains discretion to exercise its local neuron to exercise its local neuron to exercise.
					environmental harm etc.)' (Ibid, p. 22). These are listed in Appendix B. The 'Financial' discount category (Ibid pp. 25 and 27), for example, provides a 10% discount where an environmental authority holder submits certified documentation to demonstrate <i>sound financial</i> <i>health</i> and a declaration that the costs of rehabilitation have been adequately budgeted for. The threshold is not high. The annual fees	 Its legal powers to require security. Security cannot be required unless certain criteria (see below) are present. No need for regular reconsideration of security requirement (though, the regulator can request that it be changed). The regulator takes a <i>risk</i> based approach to deciding whether security is likely to be required, meaning that not all regulatees will be required to provide it. Value inherent in the inforture (a a
					must be up to date and holder must be solvent and not in external administration (i.e., liquidation, voluntary administration, under supervision of a court- appointed trustee). The previous year's annual financial statements must	salvage/resale) cannot be used to reduce the level of security to be provided. However, a discount on the level of security to be provided, of up to 10% of the total estimated reclamation liability, is available to the regulatee if it can demonstrate sound

Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amounthave been audited by asuitably qualified financialauditor if it is to be assessedfor evidence of a soundfinancial position (Ibid p.27).Step 3: Calculate proposedfinancial assurance amount.The final financialassurance can be calculatedby subtracting the discountamount from the 100%rehabilitation liabilityamount.The regulator hasdeveloped a resourceEstimated RehabilitationCost (ERC) calculator tohelp facilitate consistencyin calculating financialassurance.The regulator cannotrequire financial assuranceof an amount that exceedsthe amount representing thetotal likely costs andexpenses that may beincurred in carrying outrehabilitation of, or torestore and protect, theenvironment because of	Commentary 'financial health'. As detailed in Section 5.2.2, this is a troublesome approach given the consequences of a regulatee's financial deterioration for its capacity to perform its reclamation obligations. The inclusion of 'financial capacity' as a matter which will influence the presence of a discount is a weaknesses, albeit it a relatively small one given that cap of the discount at 10%, in what is otherwise a sound regulatory framework.
					environmental harm that may be caused by the prescribed ERA (EPA, s 310(4).	
					The administering authority may, at any time, require the holder of an environmental authority for which financial assurance has been given to change the amount of the financial assurance (EPA, S 315(1)).	

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
4.	Victoria, Australia	Renewable energy production and storage (security requirements relate to marine and coastal Crown land used for these projects).	Marine and Coastal Act 2018, s 71	The Minister, in giving a consent under section 70, 'may' impose a condition on a consent (to use or develop, or undertake works on, marine and coastal Crown land) requiring the person to provide a bond 'as security for the carrying out of the use, development or works' (s 71(1)). The condition requiring a bond may provide that the whole or part of the sum is forfeited if there is any failure by the person to carry out a use, development or works in accordance with the consent 'to the satisfaction of the Secretary' (s 71(3)). Any forfeited sum must be used by the Secretatary 'for the purposes of rehabilitating, rectifying or reinstating <i>the land</i> ' (s 71(4)). Any money paid must be returned to the person on a date specified in the consent to the consent to the consent to the set of the set of the set of the purposes of relabilitating the land' (s 71(4)).	 According to s 71(4), the Minister 'may' impose the condition on the consent directing the person: to deposit with the Secretary a sum of money fixed by the Minister within a specified period of time; and to 'give an undertaking' to pay that sum with security 'in a form determined by or in accordance with the consent'. Money may be paid into a Consolidated Fund (s 71(6)). 	s 71(4) provides that value of the security is to be 'fixed by the Minister'.	 Strengths Broad legislative power to require a bond, enabling Minister to deal with uncertainty through possession of wide discretion; discretion equals flexibility. From the regulatees perspective, there appears plenty of scope to negotiate the terms of the security offering with the regulator, thereby increasing the attractiveness of the regime to investors. As the works must be 'to the satisfaction of the Secretary', high level of discretion retained to ensure the works are of satisfactory quality. Where money is paid into a Consolidate Fund, it will be secure in the event of the regulatee's bankruptcy. Weaknesses Whilst the Act confers a power under s 80 to create regulations on issues relating to consents, no regulation exists in relation to security. High levels of discretiony. High levels of discretiony are discretion at the first place, (ii) the amount of the security is required in the first place, (ii) the amount of the security, and (iii) the instruments that may be used to supporting the undertaking to provide security. There is no guideline/guidance published by the Government of Victoria providing further detail on security requirements. There
	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
----	------------------------	--	--	---	---	---	---
							 is, for instance, no detail provided in relation to security requirements in Victoria's March 2020 <u>Marine and Coastal Policy</u> document. Not clear how Minister is to exercise their discretion in relation to security, resulting in a lack of certainty for applicants and a loss of transparency for stakeholders.
5.	Nova Scotia, Canada	Marine renewable energy (covers ocean waves, tides, currents and offshore wind)	Marine Renewable- energy Act (MRE Act), Chapter 32 of the Acts of 2015 (as amended) The Statement of Best Practices for In-Stream Tidal energy Development & Operation (p. 24) notes as follows: 'The larger the degree of uncertainty, the greater the potential risk to regulators, and this has direct implications for developers. Regulators have a hierarchy of options to address risk, including the provision of more mitigation, closer monitoring, and the frequency of reporting. In some circumstances, regulators may also require a financial security to ensure that the necessary measures are implemented. The determination of acceptable risk considers the nature / magnitude / duration of	Under s43(1) of the MRE Act, a licence holder or permit holder shall, 'in respect of the activity authorized by the licence or permit, provide financial or other security or carry insurance, or do both, as may be required by the Minister.' The Minister may determine 'the manner in which, and the conditions under which, any security that is provided may be forfeited or returned, in whole or in part. (MRE Act, s 43(2)). In relation to the licence awarded to <u>BigMoon</u> <u>Canada Corporation</u> , under condition 11.3(a) provides that '[t]he License Holder shall maintain financial security for the orphaned in- stream tidal energy generator at Berth D within the FORCE Marine Renewable- electricity Area, on terms and conditions acceptable to the Minister, until such time retrieval and disposal has been executed in accordance	There appears to be no guideline or guidance document that provides detail on the power of the Minister to obtain financial security from the regulatee. In relation to the licence awarded to <u>BigMoon Canada Corporation</u> , "Performance Security" means: • a certified cheque, • government guaranteed bonds, • debentures, • term deposits, • certificates of deposit, • trust certificates or investment certificates The above must assigned to the Nova Scotia Minister of Finance. It also includes: • irrevocable and unconditional letter of credit, • irrevocable letters of guarantee, • performance bonds or • surety bonds These must be in a form acceptable to the Minister.	Under s43(1) of the MRE Act, a licence holder or permit holder shall, 'in respect of the activity authorized by the licence or permit, provide financial or other security or carry insurance, or do both, as may be required by the Minister.' Under the s 10(1) of the Marine Renewable-Energy General Regulations, N.S. Reg. 8/2018 (the Regulation), the 'estimated cost of site rehabilitation and decommissioning of any generator, cable or other equipment or structure intended to be constructed, installed or operated within the permit area' is to be contained in an application for a demonstration permit under clause 35(1)(c) of the Act. However, the Regulation expresses no requirement (i) for the applicant to provide security for decommissioning and site reclamation or (ii) to	 Strengths There is a legislative power available to the regulator to require security from a regulatee. The power to require security is being utilized in practice, as seen from the license awarded to BigMoon Canada. As per the BigMoon Canada Corporate security requirement, the instruments permitted to be used are (with the exception of the irrevocable letters of guarantee, i.e., PCGs) robust and may be considered to be secure in the event of the regulatee's bankruptcy. The regulator possesses significant discretion as to (i) the type (i.e., instruments) and (ii) the amount of security that can be provided (but see comments below about excessive discretion). A wide range of instruments can be used to satisfy the security requirements, making this attractive to industry.

Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
		the impact, as well as the sensitivity of the components of the marine environment likely to be impacted.' There are no references to security in Nova Scotia's <u>Marine</u> <u>Renewable Energy</u> <u>Strategy</u> .	with an approved Decommissioning, Abandonment and Rehabilitation Plan. Under condition Plan. Under condition Plan. Under conditions acceptable to the Minister within sixty (60) days of notice of an approved Project Development Decommissioning, Abandonment and Rehabilitation Plan for the decommissioning of four (4) in-stream tidal energy generators and associated infrastructure at Berth D within the FORCE Marine Renewable-electricity Area.	 Under condition 11.5 of the BigMoon Canada Corporation license, '[t]he Minister may determine the form, and for greater certainty the terms and conditions, in which financial security is provided, including any of the following forms: Electronic transfer, cash deposit, or cheques made payable to the Minister of Finance, which the Province in its absolute discretion may cash at any time Government guaranteed bonds, debentures, term deposits, certificates of deposit, trust certificates or investment certificates assigned to the Minister of Finance irrevocable letters of credit, irrevocable letters of guarantee, performance bonds or surety bonds in a form acceptable to the Minister. 	evidence to the regulator how it intends to finance it. The cost submission required under s 10(1) would provide a useful benchmark against which to require the requisite amount of security.	 Weaknesses According to the <i>Statement of</i> <i>Best Practice</i>, security is only required in 'some' circumstances, meaning that there will be projects in respect of which no security whatsoever is required. This exposes the project to abandonment risk, as per the abandonment of OpenHydro's <u>Cape Sharp Tidal' turbine</u> in the Minas Passage (which the BigMoon Canada Corporate performance security is intended to address). While the regulator has a general discretionary power to require that a regulate provide financial or other security and/or carry insurance, there are no security requirements pertaining specifically to decommissioning, abandonment, and rehabilitation under that Act nor under the Regulation. There is no guideline/guidance setting out the regulator's expectations as to security provision, meaning that its discretion is unbounded. Lack of transparency in relation to approach to security provision under the framework.

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
6.	Municipality of the County of Colchester, Nova Scotia, Canada	Onshore Wind	Chapter 56 Wind Turbine Development By-law By-law applies to all Large Scale Wind Turbines and all Small Scale Wind Turbines including those existing prior to the effective date of the By-law (s 1.3). The <u>Municipal</u> Planning Strategy of the Municipality of the County of Cumberland, contains a security requirement near identical to that of the Municipality of the County of Colchester for onshore wind projects. Security requirements for the reclamation of onshore wind projects can also be found in s 6(f) of the <u>County of</u> <u>Victoria Wind Turbine</u> <u>Licensing</u> Development By-law <u>February 2014</u> : 'The decommissioning plan shall outline how the applicant will ensure funding is available to carry out the decommissioning and reclamation of the wind turbine facility and site by posting a bond or providing other financial guarantee acceptable to the	According to s 4.1(e), a licence for a wind Turbine shall be issued by the Development Officer 'subject to' the requirements that a decommissioning bond is provided. Under s 2.7, the purpose of the "Decommission Bond" is to 'secure the Decommissioning Plan'. According to s 10.5(a)(iii), at the end of the operational life of a project or part thereof, if the regulator finds that the decommission plan has not been carried out in a satisfactory way, the regulator may call upon the Decommissioning Bond to cover the costs of decommissioning in accordance with the decommissioning plan.	 According to s 2.7, the following instruments are acceptable: a bond identifying the Municipality as the beneficiary issued by a recognized surety licensed to carry on business in Nova Scotia, or comparable other form of surety acceptable to the Municipality in its sole discretion. 	According to s 2.7, the Bond shall be in the amount of not less than one hundred and twenty-five (125%) percent of the estimated present-day cost to decommission the Wind Power Project, <u>less</u> the estimated present day scrap value of the Wind Power Project. The estimated values shall be provided by a licensed engineer licensed to practice in Nova Scotia and/or by another individual deemed appropriate by the regulator (s 2.7). In the event the Decommissioning Bond does not cover the cost of Decommissioning, the owner and/or operator shall be responsible for the remaining costs and shall be immediately payable upon demand by the regulatee (s 10.5(a)(iv)). Any costs not recovered shall form a lien against the regulatee's property (s 10.5(a)(iv)).	 Strengths The Municipality has taken proactive steps to cater for security provision in the onshore wind sector, creating a bye law (with security requirements) to deal with end of life issues. Mandatory requirement for security under bye law. A surety bond, the instrument explicitly mentioned in s 2.7, is known to be secure in the event of the regulatee's bankruptcy. The regulator reserves discretion to allow other instruments, provided they are 'comparable'. The costs of the estimated present day scrap value of the infrastructure can be used to reduce the bond amount, enabling value in the infrastructure to be used approved by the regulator. At 125% of the estimated decommissioning costs, the bond is of a value that can accommodate (i) an unexpected rise in decommissioning costs and/or (ii) a fall in the value of the infrastructure, at the end of the project's life. Weaknesses The value of the infrastructure is to be taken at <i>present</i> day

Municipality of the County of Victoria.' Municipality of Victoria.' Municip
 County of Victoria.² County of Victoria.²
 depreciation in value of the infrastructure during its lifetime. This is exacerbated by the fact that there is no need to have the infrastructure during the life of the project. Essentially, the value of a brand new turbine is the stated value of the cliven that this value has a direct bearing on the value of the security provided, this is a significant weakness in the provision of security under this framework. In addition to the above, the value of the infrastructure is to be retired up to be the risk that the estimated value of the framework. In addition to the above, the value of the risk that the setimated value of the infrastructure for the 25 million to the above. In addition to the above, the value of the infrastructure is to be retired (in the present) may not be the true value when the infrastructure is to be retired (in the future). There is no need for demonstration to the besenting that the is in the future).
 infrastructure during its liftime. This is exacerbated by the fact that there is no need to have the infrastructure revalued during the life of the project. Essentially, the value of a brand new turbine is the stated value of the stated to the security provided, this is a significant weakness in the provision of security under this framework. In addition to the above, the value of the infrastructure can be volatile and difficult to estimate, meaning that there is the risk that the estimated value of the retred (in the future). There is no need for discussion to be be retred.
 Interme This is exacerbated by the fixet that there is no need to have the infrastructure revalued during the life of the project. Essentially, the value of a brand new turbine is the stated value of the project. Given that this value has a direct bearing on the value of the project, this is a significant weakness in the provision of security under this framework. In addition to the above, the value of the infrastructure can be volatile and difficult to estimate there is the the risk that the estimated value (in the present) may not be the true value with there. There is no need for decomposition of the risk that the set is the trait the value of the infrastructure is the restinated value (in the present) may not be the true value whon the infrastructure is the project.
 by the fact that there is no need to have the infrastructure revalued during the life of the project. Essentially, the value of a brand new turbine is the stated value of the 25+ year life of the proyiest. Given that this value has a direct bearing on the value of the security provided, this is a significant weakness in the provision of security under this framework. In addition to the above, the value of the infrastructure can be volatile and difficult to estimate, meaning that there is the risk that the estimated value of the true value when the infrastructure is to be retired (in the future). There is no need for
 In addition to the above, the value of a brand method in the state of the single and the project. Essentially, there is a significant the significant weakness in the provided, this is a significant weakness in the provided the infrastructure can be volatile and difficult to estimate, meaning that there is the risk that the estimate there is the risk that the significant weakness in the present) may not be the true value when the infrastructure). There is no need for
 For each of the of the original project. Essentially, the value of a brance we tarbor is the stated value of the infrastructure for the 25+ year life of the project. Given that this value has a direct bearing on the value of the security provided, this is a significant weakness in the provision of security under this framework. In addition to the above, the value of the infrastructure can be evolutile and difficult to estimate, meaning that there is the trisk that the estimated value (in the present) may not be the true value when the infrastructure is to be retired (in the future). There is no need for
 of both Lesional new turbine is the stated value of the stated value of the stated value of the security field of the project. Given that this value has a direct bearing on the value of the security provided, this is a significant weakness in the provision of security under this framework. In addition to the above, the value of the infrastructure can be volatile and difficult to estimate, meaning that there is the risk that the the true value when the infrastructure is to be retired (in the further). There is no need for decomprised to be provided to be provided.
 Stated value of the infrastructure for the 25+ year life of the project. Given that this value has a direct bearing on the value of the security provided, this is a significant weakness in the provision of security under this framework. In addition to the above, the value of the infrastructure can be volue and difficult to estimate meaning that there is the risk that the estimated value (in the present) may not be the riture value when the minfrastructure is to be retired (in the future). There is no need for
 infrastructure for the 25+ year life of the project. Given that this value has a direct bearing on the value of the security provided, this is a significant weakness in the provision of security under this framework. In addition to the above, the value of the infrastructure can be volatile and difficult to estimate, meaning that there is the risk that estimated value (in the present) may not be the true value when the infrastructure is to be retired (in the future). There is no need for decomprised for
 life of the project. Given that this value has a direct bearing on the value of the security provided, this is a significant weakness in the provision of security under this framework. In addition to the above, the value of the infrastructure can be volatile and difficult to estimate, meaning that there is the risk that the estimated value (in the present) may not be the true value when the infrastructure is to be retired (in the future). There is no need for
 this value has a direct bearing on the value of the security provided, this is a significant weakness in the provision of security under this framework. In addition to the above, the value of the infrastructure can be volatile and difficult to estimate, meaning that there is the risk that the estimated value (in the present) may not be the true value when the infrastructure is to be retired (in the future). There is no need for decommissioning costs to be
 on the value of the security provided, this is a significant weakness in the provided, this is a significant weakness in the provided, this is a significant weakness in the provided, this is a significant weakness. In addition to the above, the value of the infrastructure can be volatile and difficult to estimate, meaning that there is the risk that the estimated value (in the present) may not be the true value when the infrastructure is to be retired (in the future). There is no need for decomprisioning costs to be
 provided, this is a significant weakness in the provision of security under this framework. In addition to the above, the value of the infrastructure can be volatile and difficult to estimate, meaning that there is the risk that the estimated value (in the present) may not be the true value when the infrastructure is to be retired (in the future). There is no need for decomprisoning costs to be
 weakness in the provision of security under this framework. In addition to the above, the value of the infrastructure can be volatile and difficult to estimate, meaning that there is the risk that the estimated value (in the present) may not be the true value when the infrastructure is to be retired (in the future). There is no need for decommissioning costs to be
 security under this framework. In addition to the above, the value of the infrastructure can be volatile and difficult to estimate, meaning that there is the risk that the estimated value (in the present) may not be the true value when the infrastructure is to be retired (in the future). There is no need for decommissioning costs to be
 In addition to the above, the value of the infrastructure can be volatile and difficult to estimate, meaning that there is the risk that the estimated value (in the present) may not be the true value when the infrastructure is to be retired (in the future). There is no need for decompriseioning costs to be
 In addition to the above, the value of the infrastructure can be volatile and difficult to estimate, meaning that there is the risk that the estimated value (in the present) may not be the true value when the infrastructure is to be retired (in the future). There is no need for decommissioning costs to be
 Value of the infrastructure can be volatile and difficult to estimate, meaning that there is the risk that the estimated value (in the present) may not be the true value when the infrastructure is to be retired (in the future). There is no need for decompriseioning costs to be
estimate, meaning that there is the risk that the estimated value (in the present) may not be the true value when the infrastructure is to be retired (in the future). • There is no need for decommissioning costs to be
 the risk that the estimated value (in the present) may not be the true value when the infrastructure is to be retired (in the future). There is no need for decommissioning costs to be
 There is no need for decommissioning costs to be
be the true value when the infrastructure is to be retired (in the future). • There is no need for decommissioning costs to be
 infrastructure is to be retired (in the future). There is no need for decommissioning costs to be
 (in the future). There is no need for decommissioning costs to be
There is no need for decommissioning costs to be
decommissioning costs to be
reassessed at any point during
the life of the project.
Given that decommissioning
costs cannot be changed, and
the value of infrastructure is
framework has no real
canacity to respond to (i) an
increase in decommissioning
costs or (ii) a decrease in the
value of the infrastructure. It
may well be the case that the
requirement that the bond, to
be 125% of the estimated
decommissioning costs, is
actually not sufficient to cover

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
7.	Ontario, Canada	Renewable energy (solar, wind, bio- energy and thermal)	Environmental Protection Act, RSO 1990, c E.19 (the EPA) (under s 1(1), "regulated person" means a person who holds a renewable energy approval, licence or permit) Regulatees need a <u>Renewable Energy</u> <u>Approval (REA)</u> from the Ministry of the Environment, Conservation and Parks for most solar, wind or bio-energy projects in Ontario. Regulatees do not need a Renewable Energy <u>Approval for some</u> classes of small-scale wind and solar. <u>F-15: Financial</u> <u>assurance guideline</u> (the <i>Guideline</i>) explains what financial assurance is, when it applies and how to calculate it. It specifies how financial assurance requirements are to be administered by the Ministry of the Environment. The legislative authority for its creation is the EPA, ss 131 to 136 and 176.	 According to s 132(1) of the EPA, the Director 'may' include in an approval or order in respect of a works a requirement that the person to whom the approval is issued or the order is directed to provide financial assurance to the Crown in right of Ontario for any one or more of, the performance of any action specified in the approval or order; measures appropriate to prevent adverse effects upon and following the cessation or closing of the works. Under para 3.3. of the <i>Guideline</i>, financial assurance is required to ensure that funds are available for the 'performance of environmental measures specified in approvals, orders or regulations'. For renewable energy projects, financial assurance requirements are discretionary on the part of the Program Director (<i>Guideline</i>, 3.4(b) and 4.1). Under s 136(1) of the EPA, the Director by order may require the performance of environmental measures for which the Crown holds financial assurance and may 	 Under s 131 of the EPA, 'financial assurance' means one or more of: cash a letter of credit from a bank negotiable securities issued or guaranteed by the Government of Ontario or the Government of Canada a personal bond accompanied by collateral security the bond of an insurer a bond of a guarantor, (other than an insurer) an alternative agreement Under para 3.7 of the <i>Guideline</i>, financial assurance requirements should be: Sufficient to pay for all potential costs associated with conditions in an order or approval; and Easily accessible when the Ministry needs to use it. The form of financial assurance to be provided is to be chosen by the Program Director based on consultation with other Ministry staff and the regulated party (<i>Guideline</i> , there are three basic forms of financial assurance: Standard, Non-standard and Unacceptable. Forms can either be cash or non-cash within the classifications.	 s 132(1)(a) of the EPA provides that the Director may include in an approval or order in respect of a works a requirement that the regulatee provide financial assurance in respect of 'the performance of any action specified in the approval or order'. Section 6 of the Guideline presents steps, procedures, concepts and information requirements to determine amounts of financial assurance to be provided to the Ministry for various types of orders, approvals, activities, sites and facilities. Para 6.3 of the Guideline asserts that amounts of financial assurance are based on costs of activities to comply with conditions and requirements in an order, approval or regulation. Under section 6.2.1 of the Guideline, where more than one method or technique exists to achieve the specified conditions, tasks, requirements or objectives in an order or approval, the amount of financial assurance required may be based on the least-cost option which is environmentally acceptable regardless of which method is actually chosen by the proponent. 	 Strengths A legislative power to require security in addition to an exceptionally helpful and detailed <i>Guideline</i> on the use of financial assurance renders this framework a clear example of best practice. Indeed, no other framework comes close to provision of the detail/coverage that the <i>Guideline</i> provides. Many/most eventualities are catered for in the Guideline. Clear indication of acceptable and non-acceptable instruments, with the regulator maintaining some discretion to accept others if a compelling case can be made. Enables funds to be built up over years, with interest paid on the funds used to growth amount of security. Firm position taken in relation to claims by regulatees that security requirements will cause undue hardship. It is explicit in its assertion that security is a 'necessary cost of doing business' and is needed to ensure that costs are not externalized to the public. As recommended in this report, the Guideline states that '[b]usinesses should not be subsidized and should provide their fair share of financial assurance.' Position taken implicitly on the use of salvage/resale value being used to reduce the level of security to be provided. This is not permitted as '[v]alues of saleable materials

Jurisdiction Sector Source of Power Purpose	Instruments accepted	Amount	Commentary
Jurisuiction Sector Source of Power Purpose The Guideline is explicitly referred to in the Regulation 359/09 in relation to anaerobic digestion and thermal treatment but ngd in relation to wind projects. require the use of th mancial assurance Reg 359/09 covers certain onshore and all offshore wind projects. Under s 136(4), upo is an certain onshore and all offshore wind projects. Under s (136(4), upo is an certain onshore and all offshore wind projects. The Guideline provides a firm foundation from which to determine financial assurance requirements for affshore wind projects. There is a Technical Guide to Renevable Energy Approvals (the Technical Guide). Under para 3.6 of th Guideline, financial assurance can be ap provide an incentiv regulated parties to implement compliance actions returned to the regu provide an incentiv section 7 of the Environmental Climate Change (MOECC)] also has the authority under section 132 of the Environmental Section 7 asserts that '[w]hile well-planed and well-managed renevable energy generation focilities are Para 6.8.1 of the Gu assurance facility, or as othe regulation, all requi francial assurance facility, or as othe generation focilities are	Instruments acceptedeStandard forms: are always acceptable and include:ures.• Cash;n theby themay, (a)• Irrevocable letters of creditby the• Surety bonds; andmay, (a)• Negotiable securities issued by or guaranteed by provincial or federal government.eNon-standard: not generally recommended but may be accepted if a proponent makes a compelling case. They include:ures.• Any security or collateral accepted by the Program Director;e• Agreements, contracts or other non-standard forms of financial assurance with conditions stated in the order or approval;ideline by reed for a site, hould be ory form ins• Marketable securities or other negotiable securities or <td>Amount Section 6.7.1 provides that '[w]here the planning period of an order or approval is four or more years or when there is a known future date for closure, clean-up or remediation, <i>discounting</i> of future costs is permitted. This means that 'regulated parties can provide an initial amount of financial assurance that can grow by means of interest paid on cash deposits or through annual increases in non- cash forms until the balance reaches the amount needed for the specified compliance activities in the future' (Ibid). Para 6.10.1 provides that '[r]egulated parties sometimes ask to have financial assurance obligations reduced because of financial hardship. Some regulated parties may ask to provide only a fraction of the total financial assurance required at the outset of their operation until they "build up their business" or "can better afford the financial assurance." Parties who ask for such considerations should be reviewed carefully before an approval is issued. They could be vulnerable to failure if economic conditions deteriorate and could constitute a risk of leaving a site remediation problem with little or no</td> <td> and widely.' A wide range of instruments can be used to satisfy the security requirements, making this attractive to industry. Weaknesses No mandatory requirement for security; currently discretionary. Where the planning period is more than 4 years, or there is a known date for closure, discounting is permitted. This means that the regulatee can provide an initial amount of financial assurance that can grow (e.g., by means of interest paid on cash deposits) until the balance reaches the amount needed for the specified compliance activities in the future. The obvious risk with this strategy, when supplementary security is not required, is that there will be a security shortfall if the regulatee becomes bankrupt prior to full accumulation. If no supplementary security is/can be required, this is a significant weakness of an otherwise impressive framework. PCGs from parent companies situated in Ontario are permitted, despite the known risks of outright failure of this instrument in the event of the parent's financial demise. Regulatees whose parent </td>	Amount Section 6.7.1 provides that '[w]here the planning period of an order or approval is four or more years or when there is a known future date for closure, clean-up or remediation, <i>discounting</i> of future costs is permitted. This means that 'regulated parties can provide an initial amount of financial assurance that can grow by means of interest paid on cash deposits or through annual increases in non- cash forms until the balance reaches the amount needed for the specified compliance activities in the future' (Ibid). Para 6.10.1 provides that '[r]egulated parties sometimes ask to have financial assurance obligations reduced because of financial hardship. Some regulated parties may ask to provide only a fraction of the total financial assurance required at the outset of their operation until they "build up their business" or "can better afford the financial assurance." Parties who ask for such considerations should be reviewed carefully before an approval is issued. They could be vulnerable to failure if economic conditions deteriorate and could constitute a risk of leaving a site remediation problem with little or no	 and widely.' A wide range of instruments can be used to satisfy the security requirements, making this attractive to industry. Weaknesses No mandatory requirement for security; currently discretionary. Where the planning period is more than 4 years, or there is a known date for closure, discounting is permitted. This means that the regulatee can provide an initial amount of financial assurance that can grow (e.g., by means of interest paid on cash deposits) until the balance reaches the amount needed for the specified compliance activities in the future. The obvious risk with this strategy, when supplementary security is not required, is that there will be a security shortfall if the regulatee becomes bankrupt prior to full accumulation. If no supplementary security is/can be required, this is a significant weakness of an otherwise impressive framework. PCGs from parent companies situated in Ontario are permitted, despite the known risks of outright failure of this instrument in the event of the parent's financial demise. Regulatees whose parent

Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
		not expected to pose environmental risks at the time of decommissioning, the ministry will use its powers of compliance enforcement and the requirement for financial assurance, <i>as</i> <i>appropriate</i> , to ensure risks are managed. ³		 All bonds which are not transferable; Bank accounts held by the regulated party or joint bank accounts held by the Ministry and the regulated party; Insurance policies for long-term projects or landfill sites; and Guarantees from out-of-province, off-shore firms. Form of financial assurance offered by a proponent that is either standard or non-standard should be considered unacceptable until reviewed and approved (<i>Guideline</i>, para 5.44) 	financial assurance. <i>Financial Assurance is a</i> <i>necessary cost of doing</i> <i>business and is needed to</i> <i>internalize the</i> <i>environmental risks that</i> <i>would otherwise be borne</i> <i>by the public. Businesses</i> <i>should no be subsidized</i> <i>and should provide their</i> <i>fair share of financial</i> <i>assurance.</i> (emphasis added). Section 6.10.2 states that '[o]perators of waste processing or recycling facilities may also ask to deduct the estimated market values of saleable materials that are on their site from required financial assurance. The Program Director may, as a condition in an order or approval, deduct the estimated volume or weight of secondary materials that may be sold or otherwise removed free of charge from the removal cost calculationsValues of <i>saleable materials may not</i> <i>be used because market</i> <i>values of saleable materials</i> <i>rapidly and widely.</i> Also prices and values of materials are difficult to verify and buyers of saleable materials often reject loads altogether if they contain contaminating materials. Documentation should be provided in the form of letters, contracts or written commitments from	 province can utilize the highly attractive PCG to satisfy RSRs. However, regulatees whose parent (or other guarantor) is located outside the province and offshore, are prohibited from doing so. Whilst this is intended to ease enforcement, this means that for regulatees that fall into the former category, funds are released and made available to reinvest and grow their business. The 'out-of-province, offshore' category of regulatee misses out on this entirely. There is, therefore, a fairly strong degree of inequity in the way in which two regulates can be treated. With the exception of the acceptance of PCGs from parent companies situated in Ontario, the security requirements under this framework are stringent (and this is undoubtedly an exceptionally positive feature of them). However, there may be scope to offer to use scrappage/resale of the infrastructure to reduce the level of security to provided, ensuring that there is independent oversight of the means of valuation and that the full estimated value cannot be used to reduce the level of security. The system, like any system, hinges on the accuracy of the underlying cost estimate. Whilst regulatees are responsible for providing cost

Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount receivers or other legitimate firms that they will take the materials off-site free of charge.' Section 6.8.5 provides that '[t]he financial assurance account balance should be reviewed annually to ensure that it has been increased from year to year. The Financial parameters and cost items that are used to calculate financial assurance should be reviewed at least every	Commentary estimates for the relevant compliance activities, the regulator must verify these 'to the extent possible'. This requires the regulator to possess staff with the requisite degree of skills, in the requisite volume, to ensure that security requirements are accurate and that bottlenecks in applications are not created.
					three years or as specified by the Program Director in order to ensure that the financial assurance is sufficient to cover the estimated costs.' Section 6.4.4 provides that 'all data and estimates provided in the financial assurance Proposal will be	
					 reviewed to ensure: Reasonableness; Completeness, in that all activities and associated costs have been included in the submission to address the conditions or terms of an order or approval; Appropriateness of financial parameters (inflation and discount rates); and Accuracy of computations.' 	

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
8.	England and Wales	Offshore renewable energy installations (OREIs) (covers windfarms; wave; and tidal generation devices)	Energy Act 2004, s. 106(4). According to s 106(4), the Government's power to approve a decommissioning programme subject to conditions includes a power to approve it subject to a condition that the person who submitted the programme: (a) 'provides such security in relation to the carrying out of the programme, and for his compliance with the conditions (if any) of its approval, as may be specified'; and (b) 'provides that security at such time, and in accordance with such requirements, as may be specified'. The regulator at the time, the Department for Business, Enterprise and Industrial Strategy (BEIS), provided a guidance document: <i>Decommissioning of Offshore renewable Energy installations Under the energy act 2004: Guidance notes for industry (England and Wales) (March 2019) (Guidance Notes). Chapter 9 deals with 'Financial Securities'.</i>	According to section 8.1.4 of the <i>Guidance Notes</i> , the purpose of the financial security 'is to enable BEIS to decommission should the owner fail to do so and where there are no other parties liable for decommissioning. It proceeds to state that its 'prime objective' with regards to the provision of financial security is to 'ensure the Government and the taxpayer are insulated as far as possible against the cost of having to step in if all other relevant parties fail to decommission (<i>Guidance</i> <i>Notes</i> , [9.1.4]). The government is the decommissioner of last resort and will (where it is absolutely necessary) step in to meet any outstanding costs of decommissioning offshore renewable projects. Taxpayer intervention will be in exceptional cases only and BEIS will always explore where an associated corporate body such as a parent company, the landlord or administrator (or others) may potentially be in line to decommission before the risk passes to government and the taxpayer. The <i>Guidance Notes</i> refers explicitly to the polluter- pays principle on more than one occasion. For instance,	 Under s 114(2) the term 'security' includes (i.e., the list is not exhaustive): a charge over a bank account or any other asset a deposit of money a performance bond or guarantee an insurance policy a letter of credit and a letter of comfort. The <i>Guidance Notes</i> state that 'it is for the responsible person to submit details of the security they propose to provide with their decommissioning programme' (<i>Guidance Notes</i> , [9.3.1]). The <i>Guidance Notes</i> state that 'this guidance is not intended to be prescriptive as to how a developer/owner reserves or pays for the cost of decommissioning' and there are many different ways for a company to ensure the necessary money is made available at the appropriate time' (<i>Guidance Notes</i> , [9.2.4]) This said, the <i>Guidance Note</i> expresses views on the acceptability of different means of providing security, offering a more nuanced approach to the interpretation of "security" under section 114. The Guidance Notes states that '[f]or any security to be acceptable, appropriate arrangements must be in place to assure BEIS that such funds will be available to the Government if needed' (<i>Guidance Notes</i> , [9.2.5])	The Guidance Notes assert that 'the estimated decommissioning costs will inform the financial security levels that are required to be made available to the Secretary of State (Guidance Notes [8.1.4]). They also make clear that 'the cost estimate and financial security levels will need to cover the amount it would cost BEIS to organise and fund decommissioning' (Guidance Notes provide that '[i]ndependent audit of estimated decommissioning costs (and of the financial security proposed or available to meet them) may be required, either directly of developers/owners or by BEIS appointing independent third-party experts' (Guidance Notes, [8.9]). The need for, timing and frequency of such audits will be determined on a case by case basis. A Model Framework for a decommissioning programme in provided in Annex C of the Guidance Notes and a Cost breakdown example template is provided in Annex E.	 Strengths A logical, largely robust framework that integrates a statutory power to require security with useful, easy to digest <i>Guidance Notes</i> setting out expectations as regards cost estimation and the provision of financial security. Cost estimates template and model framework for decommissioning programme provided, which will aid regulatees generate cost estimates with a degree of consistency between them. Prospect for independent audit of decommissioning costs and financial security. The cost estimate and security levels must cover the amount it would cost the <i>government</i> to organize and fund decommissioning, not regulatees. This may be significantly higher than if the costs were calculated based on regulatees undertaking the work themselves. It does, however, protect public funds in the event of the regulatee's bankruptcy and need for the government to step into their shoes to complete the work. The acceptable financial instruments are some of the most secure in the event of the bankruptcy of the regulatee. The government is unable to re-use infrastructure should decommissioning fall to it, the level of security provided must reflect any recycling or disposal costs and the potential for re-use should be

Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
		It is to be noted that BEIS existed until 2023 when it was split to form the Department for Business and Trade (DBT), the Department for Energy Security and Net Zero (DESNZ) and the Department for Science, Innovation and Technology (DSIT). Whilst the <i>Guidance Notes</i> were drafted by BEIS, DESNZ will be the regulator of offshore renewables projects in English & Welsh waters moving forward. Further protection is provided under section 110A of the Act where security has been provided under an approved decommissioning programme 'by way of a trust or other arrangement' (s 110A(1)). This excludes application of the Insolvency Act 1986 (or any other enactment or rule of law) from reaching that security and preventing or restricting it from being applied in accordance with the trust or other arrangement (s 110A(4)). The aim of this provision is to protect funds already	at section 9.1.1, it states as follows: 'The decommissioning provisions in the Act reflect BEIS' view – taking into account our international obligations – that the application of the Act is broad and can apply to a person who constructs, extends, operates or uses an installation or related electric line, and that these persons should be responsible for ensuring that it is decommissioned at the end of its useful life, and should be responsible for meeting the costs of decommissioning (the "polluter pays" principle).' Security must remain in place until the regulator confirms that the decommissioning programme is accepted as being complete (<i>Guidance</i> <i>Notes</i> , [9.5.3])	This may be through a funding deed which ring-fences funds, a trust arrangement or other mechanisms depending on the type of security (Ibid). BEIS states that [i]f this cannot be confirmed we will not accept the arrangement.' (Ibid). Proposals will be considered on a case-by-case basis (<i>Guidance</i> <i>Notes</i> , [9.4]). The <i>Guidance Notes</i> state that '[t]he type of security likely to be acceptable will depend on a number of factors, including but not limited to the maturity of the technology, the <i>financial strength</i> of those responsible for decommissioning and other commercial factors' (<i>Guidance</i> <i>Notes</i> , [9.4]) Furthermore, The timing of security arrangements 'will be dependent on similar factors' (Ibid), and explicit reference is made to the fact that 'BEIS will also take into account the <i>financial strength</i> of the organisations named in the decommissioning programme' in determining the timing of security provision ([9.7.6]). The following are referenced explicitly as 'acceptable' instruments in section 9.4: • Upfront Cash: held in an account where deductions could not be made without the prior agreement; could include a third-party escrow account, a trust account, or direct payments; interest not payable on funds held.	not offset scrappage value from their total cost assumptions as BEIS 'does not consider that it is appropriate to rely on estimates of scrap value as a form of security because the value can fluctuate substantially and therefore is not reliable' (<i>Guidance</i> <i>Notes</i> , [8.7]). From payment of the first security onward, the regulatee 'should review its decommissioning programme annually to make sure the financial security provision is on track to meet the expected cost of decommissioning programmes are to include a contingency sum unless the regulatee can provide evidence that this is already factored into existing cost estimates (<i>Guidance Notes</i> , [8.2]). Cost estimates should include any recycling or disposal costs (<i>Guidance Notes</i> , [8.3]). VAT must be factored into financial securities where necessary (<i>Guidance Notes</i> , [8.4]).	 excised from the costing underpinning it. VAT must be built into any security provided as the government cannot recover VAT should they – or, more accurately, contractors appointed by them – 'step in' to complete the works of insolvent or recalcitrant developers/owners. Contingency to be incorporated into decommissioning costing, adding further protection to public funds if the decommissioning costs are larger than expected. As its value can fluctuate significantly, the scrappage value of the OREI cannot be offset from cost estimations. This means that it is unable to be used to reduce the level of security. Whilst the installation will have a scrappage value and this may reduce decommissioning costs for developers/owners, this is not deemed to be relevant to cost estimation and security provision. [Note, however, the comment below about this also be a weakness of the regime]. A wide range of instruments can be used to satisfy the security requirements, making this attractive to industry. Weaknesses There is a heavy reliance on the financial strength of the regulatee to determine (i) the type of security to be provided and (ii) the timing at which it

Jurisdict	on Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
		set aside for decommissioning from the reach of creditors of the person responsible for decommissioning. It does, however, have no effect in respect of funds that have not yet been set aside.		 Cash Reserving: cash to be held in an account where deductions could not be made without the prior agreement of government; this would include a third-party escrow account, or a trust account or alternatively through direct payments. 		must be provided. As detailed above, and in Section 5.3.4. of this report, there is an inherent danger in relaying on a regulatee's current financial position when making decisions about the financing of reclamation that will take place many years in the future.
				 Letters of Credit/Bank Guarantees/Performance Bonds: acceptable if they possess certain features, such as being irrevocable and payable on demand. The following instruments are not 		• The regulatee is merely encouraged to review its decommission programme annually (after the first security payment is made) to ensure that the accumulation of security is on track to finance decommissioning; there is no legal obligation to
				 Reserving cash in regulatees own accounts, even if it is separated from the company's operating accounts ([9.4.1.]). 		 Whilst an independent audit of decommissioning costs and financial security 'may' be required, there is no legal requirement for it.
				• Parent Company Guarantees (PCGs): not normally accepted although we reserve the right to consider them <i>in</i> <u>'exceptional</u> circumstances' (9.6.1]).		The prohibition on using scrappage/resale value of the retired infrastructure means that the value inherent in the asset, albeit only at the point of retirement, is 'locked in' for the duration of the project
				There is no explicit mention of letters of comfort in the government guidance.		 Whilst included in the project. Whilst included in the definition of security in s 114, it should be noted that letters of comfort are highly problematic as they are merely intended to give 'comfort' to a party – in this context, BEIS – through the provider assuming, 'not a legal liability' to ensure payment (or performance) of obligations under an agreement, 'but a moral agreement, 'but a moral with the provider assuming and the provider assuming and the provider assuming and the provider assuming.' The payment (or performance) of obligations under an agreement, 'but a moral agreement, 'but a mor

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
							(Kleinwort Benson Ltd v Malaysia Mining Corp [1989] 1 WLR 379, 391). That they do not even express a contractual promise to pay, calls into question the legitimacy of their inclusion within the Act's definition of 'security'.
9.	England	Onshore renewable energy projects (esp. solar and wind)	Town and Country Planning Act 1990, ss 70 and 106 In contrast to offshore wind (governed by the Energy Act 2004), there is no energy- specific legislative framework for the reclamation of onshore wind or solar in England. Instead, planning decision- makers must utilise their general planning control powers under the Town and Country Planning Act (TCPA) 1990, specifically planning obligations and related enforcement powers. s 70(1)(a) provides that where an application is made to a local planning authority [LPA] for planning permission, either unconditionally or subject to such	There is no central government guidance on need for reclamation security for onshore wind and solar projects in England. Nor do any local planning authorities publish their own guidance on reclamation security for renewables projects. Empirical research conducted on 275 onshore wind projects in England (Mackie, 2023) found that in most instances, decommissioning and site restoration (DSR) bonds (i.e., reclamation security) was used to cover the projects 'net' decommissioning costs. This is the difference between two estimates <i>provided by the applicant:</i> (i) DSR costs per MW of installed capacity/per turbine; and (ii) the infrastructure's salvage or resale value per MW of installed capacity/per turbine. For example, if the developer estimates that DSR will cost £60,000 per	There is no central government guidance on acceptable instruments for reclamation security for onshore wind and solar projects in England. Nor do any local authorities publish their own guidance. Mackie (2023) found that the most commonly accepted measures were as follows: Cash deposit Letter of credit Bank guarantee/bond Surety bond Other financial arrangement' (sometimes this catch-all category included parent company guarantees).	 There is no central government guidance on the requisite value of reclamation security for onshore wind and solar projects in England. Nor do any local authorities publish their own guidance on this. Mackie (2023) found that: Only three (3) projects, representing 31.6 MW of installed capacity and 27 turbines, contained a condition mandating a decommissioning and site restoration (DSR) bond. The average bond value per MW of installed capacity was £5,291 (per turbine it was £3,175). Forty (40) projects, representing 609.2 MW of installed capacity and 277 turbines, contained a planning obligation relating to a DSR bond. There was wide variation in average 	 Strengths Statutory power empowers, albeit implicitly, LPAs to require security from regulatees. Seemingly a high level of discretion available to LPAs, given that they can impose security requires 'as they see fit'. However, in reality, this is curtailed by planning policies on the use of planning conditions and case-law which limits the scope and application of such conditions. A wide range of instruments can be used to satisfy the security requirements, making this attractive to industry. Local authorities can attract investors to the jurisdiction by lowering their security requirements at all [Note, however, the risk of abandonment with this type of strategy]. Weaknesses No central or local government guideline/guidance on the use

Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
		conditions as they think fit'. s 106(1)(d) provides that any person interested in land in the area of a LPA may, by agreement or otherwise, enter into an obligation ('a planning obligation'), 'requiring a sum or sums to be paid to the authority on a specified date or dates or periodically'.	turbine and believes that £40,000 can be recouped from each turbine in scrappage, the (negative) net DSR cost would be £20,000 per turbine.		bond values per MW of installed capacity across LPAs. The average bond value per MW of installed capacity across the dataset of planning obligations was £8,221 (per turbine it was £18,244).	 of security for reclamation in the onshore wind and solar sector; increases discretionary space afforded to LPAs significantly as a result. Wide variation of requirements for security across LPAs, with the LPA with the greatest number of wind turbines (East Riding of Yorkshire Council) having one of the lowest average security requirements. The requirement for regulates to provide a bond in rare. Mackie (2023) found that security provision achieved using planning conditions and planning obligations was present in only 15.6% of onshore wind projects in England (43 of 275). They were required by planning decision-makers in 10.5% of projects (29 of 275) and volunteered by developers in 4.7% (13 of 275). For one project, it was no known whether it was required or volunteered. Average security values are nowhere near high enough to guarantee that DSR will occur. The function of security provision in the sector is principally to cover a project's net DSR costs, an exercise of judgement prohibited in England's offshore wind sector. There, volatility of salvage/resale values results in them being deemed too unreliable to act as a 'form of security'. Applicants for planning permission calculate the

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
10.	France	Onshore wind	Environmental Code, Article L515-46 ('From the start of production, and then for the following accounting years, the operator or the owning company provides the necessary financial guarantees. The amount of these financial guarantees shall be reassessed periodically, taking into account, in particular, inflation.') Order of 22 June 2020 amending the requirements relating to electricity production installations using the mechanical energy of the wind within an installation subject to authorisation under section 2980 of the legislation on installations classified for the protection of the environment (the Order) merges the amended orders of 26 August 2011 relating to electricity production installations using mechanical wind energy within an installation subject to authorisation under section 2980 of the legislation on classified installations for the protection of the	 Article R515-101 provides that the financial guarantee is to cover, in the event of default by the operator during the restoration of the site, the operations provided for in Article R. 515-106, specifically the dismantling and reclamation of a site after operation by way of the following activities: The dismantling of production facilities; The excavation of all or part of the foundations; The restoration of the land unless the owner wishes to maintain it in its current state; The reuse, recycling, recovery or, failing that, the disposal of demolition or dismantling waste in the channels duly authorised for this purpose; The intervention of a company to certify the implementation of the operations provided for in points above. 	 According to Article R515-101, the financial guarantees required under 515-46 shall be provided in accordance with the conditions laid down in Article R. 516-2. Article R516-2 provides that the operator may choose from the following types of guarantee: a written undertaking by a credit institution, a finance company, an insurance undertaking or a mutual guarantee company; a deposit in the hands of the Caisse des dépôts et consignations; a private guarantee fund, proposed by a sector of activity and whose adequate financial capacity is defined by order of the Minister responsible for classified installations; the written commitment, providing an independent guarantee, of the natural or legal person which owns more than half of the capital of the operator or which controls the operator (e.g., the regulatee's parent company). The guarantor <i>must himself</i> be the beneficiary of a written commitment from a credit institution, a finance company, an insurance undertaking, a mutual guarantee fund or have made 	Annex 1 of the Order sets out a formula for calculating the initial amount of the financial guarantee. Annex I provides as follows: IThe initial amount of the financial guarantee for an installation shall correspond to the sum of the flat-rate unit cost (Cu) of each wind turbine component of that installation: $M = \sum (Cu)$ where: -M is the initial amount of the financial guarantee for an installation; -Cu is the flat-rate unit cost of a wind turbine, calculated in accordance with the provisions of II of Annex I to this Order. It corresponds to the dismantling and restoration operations of a site after operation provided for in Article R. 515-36 of the Environmental Code. IIThe flat-rate unit cost of a wind turbine (Cu) shall be fixed by the following formulas: (a) where the installed unit capacity of the wind turbine is less than or equal to 2 MW:	 Strengths Whilst updates to the laws detailing the means of calculating security provision are complex to navigate, the framework fits together nicely in that there is a legislative obligation to provide security in conduction with a further law which specifies how the amount of the guarantee is to be calculated. France is the only jurisdiction in the study that set out a formula for calculating the level of the guarantee. The use of a formula for calculating the guarantee straightforward and not time consuming. Scope for regulatees to underestimate their reclamation costs and overstate the salvage/resale value in the infrastructure is eliminated. There is a clear willingness to revise current means of estimating the amount of the guarantee to be provided initially and at the time of updating following a change, taking into account the unit power of the wind turbines. As the means of calculating the guarantee is published in a law, there is a bigh degree of transparency as to how much security is to be provided.

Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
		environment and of 26 August 2011 as amended relating to the restoration and provision of financial guarantees for electricity production facilities using the mechanical energy of the wind. It modifies the formula for calculating the amount of the financial guarantees to be provided initially and at the time of updating following a change, taking into account the unit power of the wind turbines.	Where the operating company that is a subsidiary, default on their obligations, the liability of the parent company may be sought (Environmental Code, Article R515-101, III).	a deposit in the hands of the Caisse des dépôts et consignations.	Cu = 50,000 (b) where its installed unit capacity of the wind turbine is greater than 2 MW: Cu = 50,000 + 10,000 * (P- 2) where: -Cu is the initial amount of the financial guarantee of a wind turbine; -P is the installed unit capacity of the wind turbine in megawatts (MW). IIIn the event of renewal of all or part of the installation, the initial amount of the financial guarantee for an installation shall be updated according to the power of the new wind turbines. The updating is the subject of a prefectural decree adopted in the form of Article L. 181-14 of the Environmental Code. The amount of the financial guarantees required and the procedures for updating this amount are set out in the installation authorisation order. An update of the initial financial guarantee of an installation in operation at a specified intervals.	 Where the regulate default on their obligations, the liability of the parent company may be sought, ensuring a further means of protecting public funds in the event of the regulatee's default. The amount of the financial guarantees is reassessed periodically, taking into account, in particular, inflation. Instruments permitted to satisfy the security requirements can be considered secure in the event of the regulatee's bankruptcy. Weaknesses The estimated costs of reclamation do not inform the amount of security to be provided. With the exception of its differentiation according to installed unit capacity, flat rate unit costs are used, meaning that costings are not differentiated according to the particular <i>siting</i> of the wind turbines. The amount of the guarantee cannot, therefore, incorporate costs such as the transportation of the decommissioned infrastructure to an appropriate treatment facility. It is, therefore, a 'one size' fits all approach to setting the level of the guarantee, which ensures an industry minimum level of security to be provided by regulatees. Guarantee is only required from the start of production,

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
							 meaning that there is a risk of abandonment if the regulatee were to enter bankruptcy after the turbines were erected by before production had started. Whilst a parent company may be pursued for the obligations of a subsidiary that had defaulted on them, the parent may be in no better position to pay if it is also in financial difficulties/bankrupt.
11.	Germany	Offshore wind	Offshore Wind Energy Act (WindSeeG 2017), s 58	Under s 58(3), the Federal Maritime and Hydrographic Agency (FMHA) can order the lodging of an appropriate security in the planning approval decision or the planning consent in order to ensure the fulfilment of the obligation to remove the facilities. The regulatee shall lodge the security stipulated in the planning approval decision or the planning consent <i>before</i> the commencement of the construction of the installation and shall provide proof of this to the FMHA (Annex to s 58(3)). Where the regulator has ordered the lodging of a security, when the planning approval decision or the planning consent is transferred to another party responsible for the project, the party previously responsible for the project shall remain responsible for the removal of the facilities until the other party	 Under the Annex to s 58(3), the type of the security is to be selected such that the purpose of the security is always fulfilled. The regulator can commission expertise from third parties regarding the type the security and its review. The regulatee shall bear the costs of this (Annex to s 58(3), s 3). Under s 232(1) of the German Civil Code, a person who is required to provide security may do so: by the deposit of money or securities, by the pledge of claims that are registered in the Federal Debt Register or the Debt Register of a Land, by the pledge of movable things, by the creation of ship mortgages on ships or ships under construction which are register or a ship construction register, 	Under the Annex to s 58(3), the regulator shall decide on the level of the security. According to s 58(3) of FMHA, the purpose of the security is to 'ensure the fulfilment of the obligation to remove the facilities.' The scope and the level of the security payment shall be measured such that sufficient funding shall be available 'for the dismantling of the installation in line with the planning approval decision or the planning consent' (Annex to s 58(3), s 5) The regulator can commission expertise from third parties regarding the scope of the security and its review, with the regulatee baring the costs of this (Annex to s 58(3), s 3). The financial security shall be reviewed at least every four years by the planning approval authority with a view to the maintenance of	 Strengths Legislative power to require security from a regulatee. The regulatee is required to lodge the requested security before the commencement of the construction of the installation, meaning that the risk seen with the French framework (i.e., abandonment after turbines erected but before energy production commences) is resolved. Risks relating to the transfer of ownership of the project to a new owner are dealt with by holding the current owner responsible for maintaining the security until security is provided by the new owner. A wide range of instruments can be used to satisfy the security requirements, making this attractive to industry. Independent assessment, at the cost of the regulatee, may be sought in relation to the type and amount of security to be provided by the regulatee. Financial security is to be reviewed 'at least every four

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
				responsible for the project has lodged a security and the planning approval authority has determined its suitability (s 58(4)).	 by the creation of mortgages on plots of land within Germany, by the pledge of claims for which there is a mortgage on a plot of land within Germany, or by the pledge of land charges or annuity land charges on plots of land within Germany. The Annex to s 58(3) states that in place of the above security payments, can be demanded or approved as an equivalent security: the provision of a guarantee from the company group, a guarantee or another promise of payment by a bank company reserves can be approved to the extent that they are safeguarded against insolvency and are unreservedly available for the purpose of the security should the security be called. 	the real value of the security; it shall be adjusted if the relationship between the security and the desired purpose of the security has substantially changed (Annex to s $58(3)$, s 6). If the review shows that the security must be increased, the regulator can give the regulate a deadline of at most six months for the provision of the increased security (Annex to s $58(3)$, s 6). If the review shows that the security must be reduced, the regulator the security (Annex to s $58(3)$, s 6). If the review shows that the security must be reduced, the regulator must release without delay the security which is no longer required (Annex to s $58(3)$, s 6).	 years', ensuring the requisite level can be amended to reflect increased/decreased cost projections. Weaknesses Whilst there is a short annex to the FHMA which provides further detail on security provision, there is no government/regulator guideline or guidance, such as can be found in the likes of Ontario, NSW or England and Wales, which provides detailed elaboration on the provision of security. No real detail on how level of bond is to be calculated; the regulator retains a high level of discretion to determine this. Instruments that can be used to satisfy security require, such as the 'the provision of a guarantee from the company group' (i.e., PCG), are prone to outright failure in the event of the parent's bankruptcy, creating a high risk of abandonment should that event materialize.
12.	Sweden	Onshore and offshore renewables	The Environmental Code, Part 4, chapter 16, s 3 (as supplemented by the Enforcement Code, s 25)	According to Part 4, Chapter 16, of the Environmental Code, the validity of a permit, approval or exemption may be made subject to the requirement that the person who intends to pursue the activity must furnish a security for the costs of after-treatment and any other restoration measures that may be necessary as a result (s 3).	Under s 25 of the Enforcement Code, the security to be provided shall comprise a pledge or guarantee. The guarantee shall be presented as a principal debtor and if it is entered into by two or more persons together, be joint and several. If a bank or other comparable financial institution provides	According to s 3 of Part 4, chapter 16, the Environmental Code, amount of security to be required is for 'costs of after-treatment and any other restoration measures that may be necessary as a result.' If there is cause to assume that the security furnished is no longer sufficient, the	 Strengths Legislation provision detailing power for regulator to require security. Costs of after-treatment and any other necessary can be secured. Additional security can be required if the existing level is not sufficient.

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
				Securities shall be examined by the regulator and lodged with the county administrative board.	security, an undertaking may be accepted by the financial institution to satisfy the obligation to which the security shall relate. The security shall be taken into care by the Enforcement Service.	authority which is considering the application for a permit, approval or exemption may require an additional security to be furnished (Ibid).	The regulator retains a high level of discretion to determine the requisite amount of security. <u>Weaknesses</u>
							 Little to no detail provided on how reclamation costs are to be determined and how the level of security is to be calculated. There is no government/regulator guideline or guidance, such as can be found in the likes of Ontario, NSW or England and Wales, which provides detailed elaboration on provision of security. Much like the German and English frameworks, no real detail on how level of security is to be calculated; the regulator retains a high level of discretion to determine this. This discretion is not always helpful in that it can be used to attract investors by setting low (or no) requirements for security.
13.	United States	Hydroelectric	Federal Power Act (FPA)	No explicit reference to the need for reclamation security in the FPA. As a matter of practice, the regulator, the Federal Energy Regulatory Commission (the Commission), <i>can</i> require that the licensee file a 'financial assurance plan'. It can do so by including this as an article (or what might be term a condition in other jurisdictions) in	No instruments specified in FPA. Details are, however, specified in particular decisions made by the Commission. See, e.g., <u>PacifiCorp, 144 FERC</u> ¶ <u>62,239</u> , at art. 307 (2013): the financial assurance plan 'must include, at a minimum, financial statements, including a balance sheet, income statement, and a statement of actual or estimated cash flows over the license term which provide evidence that the	FPA makes no mention of how the amount of security is to be determined. Details are, however, specified in particular decisions made by the Commission. See, e.g., <u>PacifiCorp. 144</u> <u>FERC ¶ 62,239</u> , at art. 307 (2013): the financial assurance plan 'shall identify that the licensee has the funds necessary to operate and maintain the	 Strengths The lack of explicit statutory power to require security has been addressed through, in some (rare) instances, inserting a condition into the regulatee's licenses that they should evidence that they have the funds available to undertake reclamation. For example, a condition has been inserted into licenses that, at least 90 days before starting

Juri	isdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
				hydroelectric licenses that it grants. Whilst there are instances where this has been required, it ought to be considered <u>rare</u> . See, e.g., <u>PacifiCorp, 144</u> <u>FERC ¶ 62,239</u> , at art. 307 (2013): The licensee 'shall filea Financial Assurance Plan, for Commission approval. The plan shall identify that the licensee <i>has</i> <i>the funds necessary to</i> <i>operate and maintain the</i> <i>project</i> , and identify those project facilities that would be removed, secured in-place, or otherwise modified to ensure public safety and any other measures needed to protect environmental resources in the event the licensee cannot complete project restoration or is unable to operate the project once restoration is completed.' <u>Kenai Hydro, LLC, 168</u> <u>FERC ¶ 61,125</u> , at P 109 and art. 207 (2019): the licensee must file with the Commission for approval, the licensee's documentation for the project financing. The documentation must show that the licensee 'has acquired the funds, or commitment for funds, necessary to construct the project in accordance with this license. The documentation must include, at a minimum, financial statements, including a	licensee has sufficient assets, credit, and projected revenues to cover project operation and maintenance expenses, and any other estimated project liabilities and expenses. The financial statements must be prepared in accordance with generally accepted accounting principles and signed by an independent certified public accountant.' Furthermore, art 307 provides that '[s]ubsequent to Commission approval of the financial assurance plan, the licensee shall file documentation that it has obtained (i) a bond or (ii) equivalent financial instrument that ensures the licensee has the financial means necessary to implement the financial assurance plan.' According to art 307, the licensee 'shall maintain the bond or equivalent financial instrument throughout the term of the license. The licensee shall file annually by January 1 of each year a report documenting that the bond or equivalent financial instrument will remain in effect for the ensuing year.' Similar requirements in Marseilles Land and Water Co., 137 FERC ¶ 62,235 at P 80 n.46 (art 316). In relation to when the instrument is to be provide see e.g., Marseilles Land and Water Co., 137 FERC ¶ 62,235 at P 80 n.46 (art 316).	project, and identify those project facilities that would be removed, secured in- place, or otherwise modified to ensure public safety and any other measures needed to protect environmental resources in the event the licensee cannot complete project restoration or is unable to operate the project once restoration is completed.' Furthermore, arti 307 provides that '[1]he plan must provide evidence that the licensee has sufficient assets, credit, and projected revenues to cover project operation and maintenance expenses, and any other estimated project liabilities and expenses.' The plan shall also include an 'itemized cost estimate, prepared by a registered engineer, for those project facilities that would be removed, secured in-place, or otherwise modified in the event the licensee cannot complete project restoration or is unable to operate the project once construction is completed.' Similar requirements in Marseilles Land and Water Co., 137 FERC ¶ 62,235 at P 80 n.46 (art 316). Kenai Hydro, LLC, 168 FERC ¶ 61,125, at P 109 and art. 207 (2019):	 any ground-disturbing activities, the licensee shall file documentation that they have obtained a bond or equivalent financial instrument that ensures the licensee has the financial means necessary to implement the financial assurance. The regulator appears to be taking steps to address the lack of mandatory requirements for security provision by undertaking a public consultation on the issue. Though, as of yet, no formal guidance has been published. Cost estimated to be provided by an engineer, not the regulatee itself. This reduces the prospect of deliberate under-costing. Weaknesses The Commission has conceded that requirements that regulatees provide a bond is <u>'rare'</u>. There is no statutory power under the FMA to require security, nor is there any guideline/guidance on how (i) reclamation costs are to be calculated, and (ii) how and when reclamation security is to be provided; the regulator retains an extremely high degree of discretion, which has resulted in very few security requirements being asked for, but a significant number of projects (88) being abandoned. Even where a financial assurance plan is required

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
				balance sheet, income statement, and a statement of actual or estimated cash flows over the license term which provide evidence that the licensee has sufficient assets, credit, and projected revenues to cover project construction, operation, and maintenance expenses, and any other estimated project liabilities and expenses. As of December 2020, the Commission was aware of around 88 non-operational projects. A licensee's lack of financial resources is often a key factor in a project becoming non-operational. In January 2021, the Commission invited comments on what changes, if any, the Commission should make to its practices for requiring financial assurance measures in licenses and other authorizations for hydroelectric projects. No formal guidance on this issue has yet been published.	documentation that the licensee has obtained a bond or equivalent financial instrument that ensures the licensee has the financial means necessary to implement the financial assurance). Kenai Hydro, LLC, 168 FERC ¶ <u>61,125</u> , at P 109 and art. 207 (2019): the licensee must not commence project construction associated with the project before the filing of the documentation for project financing is approved.	documentation for project financing must show that the licensee has 'acquired the funds, or commitment for funds, necessary to construct the project in accordance with this license. The documentation must include, at a minimum, financial statements, including a balance sheet, income statement, and a statement of actual or estimated cash flows over the license term which provide evidence that the licensee has sufficient assets, credit, and projected revenues to cover project construction, operation, and maintenance expenses, and any other estimated project liabilities and expenses.'	(e.g., in Marseilles and Kenai Hydro), the regulatee need only show that they have the funds necessary to perform the works. They are not actually required to provide security in respect of those costs. The exception was PacifiCorp, where a bond was required.
14.	United States	Renewable energy projects on the Outer Continental Shelf	<u>Title 30 Chapter V</u> <u>Subchapter B Part 585</u> <u>Subpart E</u> sets out financial assurance requirements for commercial leases in respect of renewable energy projects on the Outer Continental Shelf.	 § 585.515(a) provides that the financial assurance instrument 'must guarantee compliance with all terms and conditions of the lease'. According to § 585.525(a), any bond or other acceptable financial assurance instrument that a regulatee provides must be payable to BOEM upon demand and 	 Approved financial assurance instruments are set out in <u>\$\$</u>. 585.526 to 585.529. surety bond issued by an approved surety other types of security instruments provided BOEM determines that such security protects BOEM to the same extent as the surety bond; 	According to <u>§ 585.517(a)</u> , BOEM will base the determination for the amounts of the Site Assessment Plan (SAP) and the Operations Plan (COP), and decommissioning financial assurance requirements on estimates of the cost to meet all accrued lease obligations.	Strengths • Legislative power to require security, supplemented by significant detail provided in the legislative framework itself as to the regulator's requirements as to security provision. Little need for further guideline/guidance document given the volume of

Jurisdiction Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
	§ 585.520 sets out financial assurance requirements for limited lease, rights of way grant, or rights-of- use and easement (RUE) grant. The focus of analysis in this report will be commercial leases. The relevant regulator is the Bureau of Ocean Energy Management (BOEM).	'guarantee compliance of all lessees, grant holders, operators, and payors with all terms and conditions of the lease or grant, any subsequent approvals and authorizations, and all applicable regulations'. <u>§ 585.535(a)</u> provides that BOEM may call for forfeiture of all or part of the bond, pledged security, or other form of guaranty if after notice and demand for performance, the regulatee refuses or fails, within the timeframe prescribed, to comply with any term or condition of its lease or grant, other authorization or approval, or applicable regulations; or the regulatee defaults on one of the conditions under which BOEM accepted the bond. According to <u>§ 585.537(a)</u> , if BOEM determines that the regulatee's bond or other security is forfeited, it will collect the forfeited amount and use the funds to bring the lease into compliance and correct any default.	 U.S. Department of Treasury securities; Cash in an amount equal to the required dollar amount of the financial assurance, to be deposited and maintained in a Federal depository account of the U.S. Treasury by BOEM; Certificates of deposit or savings accounts in a bank or financial institution organized or authorized to transact business in the United States that meets specified criteria; Negotiable U.S. Government, State, and municipal securities or bonds having a market value of not less than the required dollar amount of the benefit of BOEM; Investment-grade rated securities having a Standard and Poor's rating of AAA or an equivalent rating from a nationally recognized securities rating service having a market value of not less than the required dollar amount of the financial assurance and maintained in a Securities Investors Protection Corporation insured trust account by a licensed securities brokerage firm for the benefit of BOEM; Investment-grade rated securities rating service having a market value of not less than the required dollar amount of the financial assurance and maintained in a Securities having a Standard and Poor's rating of AAA or an equivalent rating from a nationally recognized securities rating service having a market value of not less than the required dollar amount of the financial assurance and maintained in a Securities rating service having a market value of not less than the required dollar amount of the financial assurance and maintained in a Securities Investors Protection Corporation insured trust account by a licensed securities brokerage firm for the benefit of BOEM; Insurance, if its form and function is such that the 	 § 585.516 sets out the financial assurance requirements for each stage of a commercial lease: Before BOEM will issue a commercial lease or approve an assignment of an existing commercial lease, the regulatee must provide a \$100,000 minimum, lease-specific financial assurance. Before BOEM will approve a regulatee's SAP, a supplemental bond or other financial assurance, in an amount determined by BOEM, will be required if BOEM determines that this is necessary due to the complexity, number, and location of any facilities. Before BOEM will approve the regulatee's COP, a supplemental bond or other financial assurance, in an amount determined by BOEM, based on the complexity, number, and location of all facilities involved in the planned activities and commercial operation. The supplemental financial assurance requirement is in addition to the lease- specific bond and, if applicable, the previous supplement associated with SAP approval. Before BOEM will allow the regulatee to install facilities approved in its 	 detail comprised within the legislative framework itself. Wide array of means of satisfying security requirements, which will be attractive to industry. Any bond provided must be payable on demand. Three levels of security provision catered for: (i) an industry-wide minimum security requirement; (ii) one relating to the SAP; and (iii) one related to the COP. In theory, this type of approach can really be used to differentiate the security to be provided by a regulatee. Security is required before installation of facilities. The requisite amount of security is reassessed to determine whether it is sufficient. Weaknesses Little to no detail provided on how reclamation is to be costed; this is left to the discretion of the regulator. An array of instruments are permitted to satisfy security requirements that are prone to outright failure in the event of the regulate (e.g., financial strength test) or their parent company's (e.g., PCG) financial deterioration/bankruptcy. That these types of instruments may be utilized is, perhaps, the greatest, and most troubling, feature of this framework.

Jurisd	ction Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
				 lunding or enforceable pledges of funding are used to guarantee performance of regulatory obligations in the event of default on such obligations by the lessee; financial strength and reliability to meet financial assurance requirements. BOEM will make this determination based on audited financial statements, business stability, reliability, and compliance with regulations; third-party guaranty provided that the guarantor meets specified criteria and submits an agreement meeting specified criteria. The agreement must guarantee compliance with the obligations of all lessees and operators and grant holders; or a lease-specific decommissioning account in a federally insured institution provided that funds may not be withdrawn from the account without BOEM's written approval. 	 bord or other financial assurance, in an amount determined by BOEM based on anticipated decommissioning costs, is required. BOEM must approve any schedule for providing the appropriate financial assurance coverage. According to § 585.517(b), BOEM determines the amount of the supplemental and decommissioning financial assurance requirements on a case-by- case basis. The amount of the financial assurance must be no less than the amount required to meet all lease obligations, including he estimated cost of facility decommissioning, as required by 30 CFR part 285, subpart I. If the regulatee's cumulative potential obligations and liabilities increase or decrease, BOEM may adjust the amount of supplemental or the decommissioning financial assurance (§ 585.517(c)). If the amount collected under the bond or other security is insufficient to pay the full cost of corrective action, BOEM may take or direct action to obtain full compliance and recover all costs in excess 	 Financial strength is a determinant of whether security is to be provided/purchased, meaning that if the financial position of the regulate deteriorates, and the regulate deteriorates, and the regulate further security, a third party provide may not be willing to offer a product due to the now unacceptable financial risk which the regulate represents. As security is permitted to accumulate, this raises the risk that should the regulatee become bankrupt prior to full accumulation, that there will be a security shortfall which the regulate may not be able to 'plug'.

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
						of the forfeited bond from the regulatee or any co- lessee (<u>§ 585.537(b)</u>)	
15.	United States	Wind and solar projects on federal land	Federal Land Policy and Management Act of 1976 (FLPMA), s 504(i)According to National Policy for Rights-of- Way Bonding (IM 2019-013), a bond will be required for all new commercial or non- commercial or non- commercial uses, rights-of-way (ROW) grants, and land use 	Under FLPMA, the Bureau of Land Management (BLM) can issue easements, leases, licenses, and permits to occupy, use or traverse public lands for particular purposes. The BLM generally refers to all such rights-of-way as 'grants'. According to s 504(i), where the Secretary deems it appropriate, it 'may' require a holder of a right-of-way to furnish a bond, or other security, satisfactory to the Secretary to secure all or any of the obligations imposed by the terms and conditions of the right-of-way or by any rule or regulation of the Secretary concerned. BLM Guidance states that BLM, in fact, 'requires a Performance and Reclamation bond for <i>all</i> solar energy projects to ensure compliance with the terms and conditions of the right-of-way (ROW) authorization.' The power to require security is, therefore, always utilized for solar. In separate <u>Guidance</u> , it states: 'BLM approval of a bonds <i>is a requirement</i> for solar and wind energy projects prior to the BLM approval of a Notice to Proceed (NTP) or approval	 According to s 504(i) of FLPMA, the following measures are acceptable: bond, or other security, satisfactory to the Secretary According to <u>Title 43</u> Subtitle B Chapter II Subchapter B Part 2800 Subpart 2801 § 2801.5, acceptable bond instruments include: cash, cash, cashier's or certified check, certificate or book entry deposits, negotiable U.S. Treasury securities, surety bonds from the approved list of sureties payable to the BLM. irrevocable letters of credit payable to the BLM and issued by banks or financial institutions organized or authorized to transact business in the United States are also acceptable bond instruments. an insurance policy can also qualify as an acceptable bond instrument, provided that the BLM is a named beneficiary of the policy, and the BLM determines that the insurance policy will guarantee performance of financial obligations and was issued by an insurance carrier that 	According to s 504(i) of FLPMA, the bond or other security is to 'secure all or any of the obligations imposed by the terms and conditions of the right-of- way or by any rule or regulation of the Secretary concerned' (s 504(i)). When BLM issues leases for solar and wind facilities within 'designated leasing areas' under 43 C.F.R. Subpart 2809, specific requirements in relation to performance and reclamation bond apply. These are set out in Title 43 Subtitle B Chapter II Subchapter B Part 2800 Subpart 2809 § 2809.18(e), with the values set as follows: (1) Solar: a bond in the amount of \$10,000 per acre prior to written approval to proceed with ground disturbing activities. (2) Wind: a bond in the amount of \$10,000 per authorized turbine less than 1 MW in nameplate capacity or \$20,000 per authorized turbine less than 1 MW in nameplate capacity or \$20,000 per authorized turbine less than 1 MW in nameplate capacity or \$20,000 per authorized turbine less than 1 MW in nameplate capacity or sound disturbing activities.	 Strengths Legislative power to require security, supplemented with significant detail in the legislative framework itself as to the regulator's requirements as to its provision. The legislative framework itself provides a vast amount of detail, effectively replacing the need for a separate guideline/guidance document. Security, as a matter of regulatory practice, is required for all solar (and, it seems, wind) projects. Wide array of means of satisfying security requirements, which will be attractive to industry. For designated leasing areas, standard, industry-wide bond values are set, reducing the time and expense involved in the estimate of reclamation costs and their confirmation by the regulator. Bonds to be provided before construction begins. For leases outside designated areas, salvage value can be used to reduce the bond amount. High risk instruments, such as PCGs are prohibited from being used. For leases outside of designated areas, shond values are set, reducing the set of the set of the set of the set of set of designated from being used.

Jurisdiction	Sector Source of Powe	Purpose	Instruments accepted	Amount	Commentary
	Subchapter B Part 280 Subpart 2805 § 2805.20 applies.) to begin ground disturbing activities.' This suggests that bonds are required for all solar and wind projects.	has the authority to issue policies in the applicable jurisdiction and whose insurance operations are organized or authorized to transact business in the United States. The BLM will <u>not</u> accept a corporate guarantee (e.g., a guarantee provided by a parent company or other company associated with the regulatee) as an acceptable form of bond instrument. According to <u>Title 43 Subtitle B</u> <u>Chapter II Subchapter B Part</u> <u>2800 Subpart 2801 § 2801.5</u> , 'performance and reclamation bond' means the document provided by the holder of a right- of-way grant or lease that provides the appropriate financial guarantees, including cash, to cover potential liabilities or specific requirements identified by the BLM for the construction, operation, decommissioning, and reclamation of an authorized right-of-way on public lands.	 (3) For testing and monitoring sites authorized under a development lease, a bond in the amount of \$2,000 per site prior to receiving written approval to proceed with ground disturbing activities. BLM will adjust the solar and wind energy development bond amounts every 10 years using the change in the IPD–GDP for the preceding 10-year period. For BLM issues leases for solar and wind facilities outside of designated leasing areas, § 2805.20 applies. § 2805.20(a)(3) provides that the bond amount will be determined based on the preparation of a Reclamation cost estimate (RCE), which the BLM may require the regulatee to prepare and submit. The estimate must include the cost <i>BLM</i> to administer a reclamation contract and will be reviewed periodically for adequacy. § 2805.20(a)(3) states that 'BLM may also consider other factors, such as salvage value, when determining the bond amount.' 	 cost estimates, making them more likely to cover those costs than a standardised value. Moreover, the costing is to reflect BLM undertaking the work, not the regulate, increasing the likelihood of the works being carried out at private cost should the regulate go bankrupt. Bond values are adjusted, albeit only every 10 years. Weaknesses For leases in 'designated leasing areas', the bonds are of a standardized, amount, meaning that they are not directly related to the costs of reclamation. This means that they may not be sufficient to cover the actual cost of reclamation, resulting in an increased abandonment risk. Whilst salvage value may be used to reduced to bond value, there is no guidance on how this is to be calculated and who is permitted to calculate it (e.g., the regulatee, an independent valuer of the regulator). As bond values are only adjusted every 10 years, there is a risk that the regulatee's financial position may weaken to the point that it is not viable for them to provide additional security if the adjustment indicates that this is necessary; 10 years is a long time to wait for an adjustment.

Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
					The BLM will periodically	
					review the bond for	
					adequacy and may require a	
					decreases in the value of an	
					existing bond or other	
					acceptable security at any	
					time during the term of the	
					grant or lease (§	
					2805.20(a)).	
					Under § 2805.20(a)(5),	
					bond components that must	
					be addressed when	
					amount include but are not	
					limited to: the	
					decommissioning, removal,	
					and proper disposal, as	
					appropriate, of any	
					improvements and	
					facilities; and interim and	
					final reclamation, re-	
					and soil stabilization	
					and son staomzation.	
					Under § 2805.20(b), if the	
					regulatee holds a grant for	
					solar energy development	
					outside of designated	
					leasing areas, they must	
					provide a performance and	
					the BI M issuing a Notice	
					to Proceed, BLM will	
					determine the bond amount	
					based on the RCE and it	
					must be no less than	
					\$10,000 per acre that will	
					be disturbed.	
					Under § 2805.20(c), if the	
					regulatee holds a grant for	
					wind energy development	
					outside of designated	
					leasing areas, they must	
					provide a performance and	

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
						reclamation bond prior to the BLM issuing a Notice to Proceed. BLM will determine the bond amount based on the RCE and it must be no less than (i) \$10,000 per authorized turbine less than 1 MW in nameplate capacity or (ii) \$20,000 per authorized turbine equal to or greater than 1 MW in nameplate capacity.	
16.	Connecticut, United States	Onshore wind	Conn. Agencies Regs. § 16-50j-94	Conn. Agencies Regs. § 16- 50j-94(i)(6) provides that any application for a certificate for a wind turbine facility or petition for a declaratory ruling for a wind turbine facility shall contain a decommissioning plan for the proposed site and any alternative sites that 'shall' include 'financial assurance to ensure that sufficient funds are available for decommissioning the facility.' Connecticut does not have similar regulations for solar projects.	Conn. Agencies Regs. § 16-50j- 94(i)(6) provides that financial assurance may include: a performance bond, surety bond, letter of credit, corporate guarantee, escrow, deposit, insurance, certificate of deposit, domestic security, trust, any combination of such financial devices, any other form of financial device that is acceptable to the Council to ensure sufficient funds are available for decommissioning the facility.	Conn. Agencies Regs. § 16- 50j-94(i)(5) provides that any application for a certificate for a wind turbine facility or petition for a declaratory ruling for a wind turbine facility shall contain a decommissioning plan for the proposed site and any alternative sites that 'shall' include 'an estimate of the total cost of implementing the decommissioning plan calculated by a certified professional engineer based on the projected useful life and the <i>projected salvage</i> value of the facility'. The bond will be required to cover this cost estimate, i.e., cover the 'net' decommissioning cost of the facility. In estimating of the cost of implementing the decommissioning plan, whilst it must be calculated by a certified professional engineer based, the	 Strengths Legislatively mandated requirement that security <i>must</i> be provided ensure that sufficient funds are available for decommissioning the facility. Costing of decommissioning and salvage values are to be carried out by a professional engineer, suggesting that expertise will be brought to bear on the calculation. A wide range of instruments can be used to satisfy the security requirement, which will be attractive to industry. Permitted use of salvage values allows value 'locked in' in the infrastructure to be released and used productively. Weaknesses The level of detail provided in the legislation is extremely brief, rendering it somewhat problematic. It really only states that security is to be required to 'ensure that

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
							'secure' the net decommissioning costs of the project, meaning that there is very little financial protection in the event of the guarantor's bankruptcy. This will be exacerbated where regulatee's own engineers is permitted to undertake the calculations.
17.	Maine, United States	Solar energy	An Act to Ensure Decommissioning of Solar Energy Developments, §3495(2)).	Financial assurance is required for the 'the total cost of decommissioning' (§3495(2)). According to §3494(3), the decommissioning plan must 'include demonstration of current and future financial capacity, which must be unaffected by the owner's or operator's future financial condition, to fully fund decommissioning in accordance with an approved decommissioning plan'. The plan, if implemented, must result in successful decommissioning of the solar energy development, including the restoration of farmland sufficient to support resumption of farming or agricultural activities (§3495(1)). According to §3493, upon a transfer of ownership of a solar energy development subject to an approved decommissioning plan (which will be subject to security requirements), a person that transfers ownership of the	According to §3495(3), the person identified in the plan as responsible for decommissioning must demonstrate financial assurance, in the following forms: • performance bond, • surety bond, • irrevocable letter of credit or • 'other form of financial assurance' acceptable to the environmental permitting entity.	Financial assurance is required for the 'the total cost of decommissioning', with decommissioning being defined in §3491 as meaning 'the physical removal of all components of a solar energy development, including but not limited to solar panels and associated anchoring systems and foundations to a depth of at least 24 inches or to the depth of bedrock, whichever is less, and other structures, buildings, roads, fences, cables, electrical components or associated facilities and foundations to a depth of at least 24 inches or to the depth of bedrock, whichever is less, to the extent the components of the development are not otherwise in or proposed to be placed in productive use or otherwise authorized to remain in place by the environmental permitting entity.' According to §3495(2), the decommissioning plan must require that the financial assurance be updated 15	Strengths • Legislatively mandated requirement that reclamation security must be provided. • The accepted instruments ought to be regarded as secure in the event of the regulatee's bankruptcy (provided that the 'other form of financial assurance' instrument does not enable self-bonding, provisioning in account and PCGs to be deemed 'acceptable' by the regulator). • Security requirements to be reassessed at year 15 and then at 5 yearly intervals, meaning that security requirements could be increased if required. Weaknesses • • There is a distinct lack of detail in the framework, including no guidance on (i) who is to cost decommissioning, or (ii) whether the regulator is to approve that costing. There is, for instance, no expressed need for the costing to be independently verified. • There is no reference to how the salvage value of the infrastructure ought to be

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
				development remains jointly and severally liable for implementation of the plan until the environmental permitting entity approves transfer of the decommissioning plan (and associate security provision) to the new owner or operator.		years after approval of the plan and no less frequently than every 5 years thereafter. Updates to financial assurance must be submitted to the environmental permitting entity on or before December 31st of the year in which such updates are required.	 treated for the purposes of the security requirement. If it is not permitted to be used, this means that there is value 'locked in' to the infrastructure that could be used more productively. If it can be used, it is not clear the extent to which it can be used. The regulate is required to demonstrate their 'financial capacity', which is problematic given that this can change markedly, potentially very quickly. As discussed in Section 5.3.4 of this report, frameworks that use financial strength/capacity as a criterion for permit approval decisions are exposed to the decline in the regulatee's capacity to finance reclamation should that financial capacity decline. If self-bonding, provision in accounts and PCGs are permitted – and it may, given the reference to 'financial capacity' in the legislation, be the case, there are risks associated with this, as we have seen in analysis of frameworks detailed above.
18.	West Virginia, United States	Onshore wind and solar projects	The West Virginia Wind and Solar Energy Facility Reclamation Act, §22-32-4(a)(3).	§22-32-1(b) provides that 'the Legislature declares it to be the public policy of the State of West Virginia to eliminate the present danger resulting from abandoned wind generation facilities and solar generation facilities and that in order to provide for the public health, safety, and welfare, it is necessary to enact legislation	 According to §22-32-3(h), 'Bond' means, a surety bond letters of credit escrow accounts any other arrangement The caveat to the 'any other arrangement' category is that the instrument must 'represent a financial guarantee from the 	According to §22-32-4(f), to determine the amount of a bond required 'the DEP shall take into account the report submitted with an application and assess a bond value <i>based upon the</i> <u>total disturbed acreage</u> of land upon which the wind generation or solar generation facility is operated, <u>less</u> salvage	 <u>Strengths</u> Legislatively mandated requirement that reclamation security must be provided to achieve specified policy goals. The accepted instruments ought to be regarded as secure in the event of the regulatee's bankruptcy (provided that the 'any other arrangement)

Jurisdictio	n Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
			to those ends by requiring companies that construct and operate wind generation facilities and solar generation facilities to post bonds and execute agreements sufficient to cover the costs of decommissioning and reclamation in the event they are abandoned after closure.' §22-32-1(b) provides that 'the most efficient manner by which to protect the citizens of the State of West Virginia is to require that wind generation facilities and solar generation facilities secure bonding sufficient to pay for all decommissioning and reclamation costs of the property on which wind generation facilities are operated.' According to §22-32-4(a)(3), within 12 months of a wind generation facility <u>commencing</u> commercial operation, the owner shall 'provide the [Department of Environmental Protection (DEP)] with any other necessary information in accordance with this article and rules adopted pursuant to this article <i>in order for the department to determine bond requirements in accordance with this section'</i> .	owner of a wind generation facility or solar generation facility to meet decommissioning requirements as established in this Act'.	value: Provided, That the amount of the bond required shall not exceed the total projected future cost of decommissioning, less salvage value.' \$22-32-4(1) provides that '[o]nce every five years, the owner of a wind generation facility or solar generation facility may submit an amended plan for the DEP's approval. As part of the submission, the owner of a wind generation facility may also apply to the DEP for a reduction in the amount of the decommissioning bond applicable to the wind energy facility or solar generation facility. The owner's application to the DEP must include written evidence of a reduction in the total disturbed acreage upon which the facility is sited and a modification fee of \$50 per megawatt of nameplate generation capacity.'	 category does not enable selfbonding, provisioning in account and PCGs to be deemed 'acceptable' by the regulator). Security requirements to be reassessed at 5 yearly intervals, meaning that security requirements could be increased if required. Permitted use of salvage values allows value 'locked in' in the infrastructure to be released and used productively. Weaknesses If self-bonding, provision in accounts and PCGs are permitted under the 'any other arrangement' category, there are risks associated with this, as we have seen in analysis of frameworks detailed above. Whilst the security requirement can go down, it does not seem able to be increased by the regulater, creating the risk that there may not be sufficient funds to enable reclamation to be undertaken by the regulatee. That security amount 'shall not exceed the total projected future cost of decommissioning, less salvage value' brings into sharp focus the importance that the estimation of salvage value plays in the stability of the security requirements under the framework and, in turn, the ability of that security to ensure that reclamation takes place. Whilst salvage value can be

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
				§22-32-4(k) provides that if the owner of a bonded wind generation facility or solar generation facility transfers ownership of the facility to a successor owner, the first owner's bond must be released after 90 days. The new owner of a bonded facility shall submit any necessary bond within 90 days after transfer of ownership or be subject to penalties in accordance with this section. The new owner of an unbonded facility shall submit any necessary bond within 90 days after transfer of ownership or be subject to penalties in accordance with this section.			 used to reduce the security amount, there is no information provided on how that salvage value is to be calculated (with the exception of it needing to be calculated by an independent professional engineer). For instance, can the current value before used, or must the value reflect the inevitable depreciation that will occur during the life of the project. As the security cannot exceed the net decommission cost, there is no assurance that the security will be able to guarantee that decommissioning takes place, for reasons discussed in chapter 5. Security need not be provided until 12 months after the facility has commenced operations, meaning that if the regulatee were to become bankrupt before that period there will be no security in place.
19.	Tennessee, United States	Solar	<u>Tenn. Code § 66-9-207</u>	According to § 66-9- 2079(c)(1), a solar power facility agreement ' <i>must</i> require the grantee to obtain and deliver to the <i>landowner</i> financial assuranceto secure the performance of the grantee's removal and restoration obligations'. § 66-9-2079(d) does not prohibit a local government from regulating solar power facilities pursuant to its zoning authority, except that a local government shall not	 According to § 66-9-2079(c)(2), acceptable forms of financial assurance include one or more of the following: surety bond collateral bond irrevocable letter of credit parent guaranty cash cashier's check certificate of deposit bank joint custody receipt approved negotiated instrument 	According to § 66-9- 2079(c)(1), a solar power facility agreement must require the grantee to obtain and deliver to the <i>landowner</i> financial assurance in the following amounts to secure the performance of the grantee's removal and restoration obligations: (A) No less than 5% of the decommissioning cost on the date the solar power	 <u>Strengths</u> Legislatively mandated requirement that reclamation security must be provided to the <i>landowner</i>. The accepted instruments ought to be regarded as secure in the event of the regulatee's bankruptcy (with the exception of the PCG). Permitted use of salvage values allows value 'locked in' in the infrastructure to be released and used productively.

Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
JUTISDICTION	Sector	Source of Power	impose removal or restoration obligations or require financial assurance securing such obligations that are more stringent than or additional to those provided for in this section. § 66-9-2079(e) states that a provision of a solar power facility agreement that purports to waive a right or exempt a grantee from a liability or duty established by this section is void unless the landowner and the grantee are affiliated entities. According to § 66-9- 2079(b)(1), all solar power facility agreements 'must provide, at a minimum, that the grantee shall, upon or prior to the expiration or termination of the solar power facility agreement, safely remove or cause the removal of all components of the solar power facility located on the premises, except for any electrical or communications lines buried more than three feet (3') below the surface grade of the land, and restore the land comprising the premises to, as near as reasonably possible, its condition as of the date of the commencement of construction of the solar power facility.'	• a combination of the above.	Amount facility commences commercial operation. (B) No less than 50% of the decommissioning cost on 10th anniversary of the date the solar power facility commences commercial operation. (C) No less than the decommissioning cost (i.e., 100%) on the 15th anniversary of the date the solar power facility commences commercial operation. § 66-9-2079(a)(1) asserts that 'decommissioning cost' means 'the estimated cost of performing the removal and restoration obligations set forth in [§ 66-9- 2079(c)], <i>less the estimated salvage value of the components of the solar power facility as of the date of removal'.</i> Thus, the financial assurance, which is to be provided to the landowner, permits salvage value of the retired infrastructure to be 'set off' from the gross decommissioning cost, i.e., the bond is to cover the net decommissioning cost.	 Salvage value is to be taken at the date of removing the infrastructure, thus indirectly indicating that deprecation is to be provided for. A stepped approach to the provision of security will be attractive to industry as it spreads the financial burden of providing it across the first 15 years of the projects life. Security provision through to the mid-life of the project is far safer that permitting accumulation into the late life of the project. Weaknesses As the security is provided to the landowner, the regulator may not have access to it should the landowner, in turn, not be in a position to perform decommissioning. 95% of the decommissioning costs have no security against them for the first 10 years of the project's operation, evidencing a serious risk in the event of the regulatee's bankruptcy during this period. 45% of the decommissioning costs have no security against them for the first 15 years of the project's operation, evidencing a serious risk in the event of the regulatee's bankruptcy during this period. APCG may be used, generating the risks associated with this, as we have seen in analysis of frameworks

	Jurisdiction	Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
							• That the security is to cover the net decommissioning cost brings into real importance the role that the estimation of salvage value plays in the stability of the security requirements under the framework and, in turn, the ability of that security to ensure that decommissioning takes place. Whilst the salvage value is to be taken as the value when the infrastructure is removed, there is no requirement for it to be valued by an independent expert, meaning that it is prone to being overstated if the regulatee calculates it.
20.	New Zealand	Resource consent (including onshore renewables)	Resource Management Act 1991 (RMA), s 108	Under s 108(1), a resource consent 'may' be granted on 'any condition that the consent authority considers appropriate'. A resource consent 'may' include any 1 or more of the following conditions: (a) a condition requiring that a financial contribution be made: (b) a condition requiring provision of a bond (and describing the terms of that bond) (s 108(2)). Under s 108A, a bond required under section 108(2)(b) may be given for the performance of any 1 or more conditions the consent authority considers	The regulator has discretion under s 108A(1)(e) to 'require the holder of the resource consent to provide such security <i>as the</i> <i>consent authority thinks fit</i> for the performance of any condition of the bond'. The regulator can require the holder of the resource consent to provide a guarantor (<i>acceptable</i> <i>to the consent authority</i>) to bind itself to pay for the carrying out of a condition in the event of a default by the holder or the occurrence of an adverse environmental effect requiring remedy (s 108A(1)(f))	Government guidance on the RMA states that '[t]he value of the bond should be based on the estimate cost of the works subject to the bond.' (p 29) The regulator has discretion under s 108A(1)(e) to 'require the holder of the resource consent to provide such security as the consent authority thinks fit for the performance of any condition of the bond'.	 <u>Strengths</u> Legislative power to require that reclamation security be provided. The regulator retains discretion to determine the instruments to be used, meaning that the is scope to ensure that only secure instruments are offered. The regulator retains discretion to calculate the amount of security to be provided, meaning that it can ensure that a sufficient level is provided on a case-by-case basis. <u>Weaknesses</u> Whilst there is government guidance on the RMA, there is very little guidance provided therein on the

Jurisdi	tion Sector	Source of Power	Purpose	Instruments accepted	Amount	Commentary
			 appropriate and may continue after the expiry of the resource consent to secure the ongoing performance of conditions relating to long-term effects, including: (a) a condition relating to the alteration or removal of structures: (b) a condition relating to remedial, restoration, or maintenance work: (c) a condition providing for ongoing monitoring of long- term effects. Government guidance on the RMA states that '[t]he purpose of a bond is to ensure that an event such as restoration occurs, not to solve compliance issues' (p 29). 			 costing of works and the value of security to be provided. The regulator maintains absolute discretion in relation to how the value of the bond is to be calculated, raising issues of transparency for stakeholders and certainty for regulatees. There is no requirement for security provision to be reassessed at regular intervals, meaning that security requirements cannot be increased if required. There is, at least not explicitly, any capacity to use of salvage values to 'unlock' capital in the infrastructure to enable is to be released and used productively. The obligation is place, principally, upon the regulator to calculate the value of the security, meaning that if the regulator does not have the staff with the requisite skills and experience, and in sufficient volume, the calculation of security values could create a bottleneck in applications for permits.

5 Designing RSRs for Alberta's Power Plants

This chapter sets out options available to the Regulators in relation to how RSRs for power plants could be designed to ensure they are effective and enforceable, particularly in the event of the bankruptcy of the regulatee. A set of ten recommendations are provided, a summary of which is captured in Table 5 below. We saw in Chapter 2 that a crucial consideration is the risk, leading from implementation of *overly* stringent RSRs, of Alberta becoming less competitive in comparison to jurisdictions with which it competes economically. A strategy to mitigate this risk is set out. Finally, the question as to when and how the reclamation security may be drawn upon, if needed, and by whom, is examined.

5.1 Towards Regulated Discretion: a guideline on reclamation security

In this section, it is suggested that there is a need for a legislative power to be enacted to enable the Regulators to require RSRs. The Regulators may also wish to consider informing the discretion that will be available to them under that power through drafting a guideline on reclamation security for power plants, much like we saw New South Wales (NSW), Queensland and Ontario do in Chapter 4. The most effective frameworks considered there combined the use of a legislative power to require RSRs with a guideline on security, with these interacting seamlessly. The proposed guideline would articulate a necessarily more prescriptive approach to cost estimation, acceptable instruments and means of accumulating funds in RSRs. It would seek to maximise the prospect of the approved reclamation plan being performed by regulatees and so minimize the prospect for indirect state subsidization.

We saw from Chapters 1 and 4 that it is common for legislation to confer substantial discretion upon regulators in relation to the need for security, the amount, instruments permitted and timing of payments (i.e., lump sum or accrued) should it be required from a regulatee or a company associated with them. In such circumstances, the legislation does not cater for the specificities of security provision. Often, it would merely state that the regulator 'may' require the regulatee to provide security for their reclamation costs. It was rare for the legislation to state that security 'must' be provided. It is usually the guideline/guidance issued by the regulator (though, often this did not exist) and, more importantly, the subsequent discussion and negotiation that takes place with the regulatee following presentation of their proposed means of financing the reclamation plan to the regulator that brings the security into fruition. We saw that they will, invariably, bargain between themselves in relation to the precise form(s) that the security is to take and how it ought to accumulate. Thus, to a large degree, the security that is conditioned derives from a process of *negotiation* between the parties.⁸³ A crucial issue for a regulator, and the society and the environment that it represents, relates to the threshold at which the risk of default by a regulatee is deemed *unacceptable*. In the absence of a clear articulation of this, a regulator will have too great a degree of discretion in negotiating reclamation security proposals. The acceptability of the risk is a *political* decision but one with implications for the environment and economic equity in energy generation. The higher the acceptable risk, the greater the likelihood of abandonment by the regulatee. If this occurs, the state indirectly subsidizes the project.

The requisite characteristics of RSRs, such as their value, need for reviewal and permitted instruments (e.g., bank guarantee or cash deposit), will often matter of judgement for the regulator. The balance is a delicate one. Through their designation of funds for reclamation, stringent RSRs reduce the recognised risk of abandonment as a result of the regulatee's financial deterioration.⁸⁴ The stringency of the RSR will likely correlate negatively with abandonment risk. Equally, RSRs are a long-term cost burden for regulatees. The Government of Ireland does not recommend the use of RSRs in Ireland's onshore wind sector for this reason.⁸⁵ Whilst in its guidance on decommissioning offshore renewable energy installations (OREIs), the UK's Department for Business, Energy and Industrial Strategy (BEIS)⁸⁶ asserted that whilst security reduces the risk of regulatees defaulting on their reclamation

⁸³ Gerard (n 14) 190.

⁸⁴ Ibid 189.

⁸⁵ Government of Ireland, Draft Revised Wind Energy Development Guidelines (December 2019) 139.

⁸⁶ BEIS existed until 2023, when it was split to form the Department for Business and Trade (DBT), the Department for Energy Security and Net Zero (DESNZ) and the Department for Science, Innovation and Technology (DSIT). DESNZ will be the regulator for offshore renewable energy infrastructure in English & Welsh waters moving forward.
obligations, '[a]t the same time, we do not want to hinder the development of [projects].⁸⁷ This statement helps to explain the rationale behind the largely discretionary nature of RSRs in many jurisdictions. Security requirements can hinder the development of power plants and this may not be desirable to a regulator as it may compromise its ability to reach its energy targets.

The Regulators will be aware that the way that they exercise their discretion could influence whether Alberta is chosen for a proposed power plant development or whether investors relocate to another province (or country) more sensitive to their needs.⁸⁸ Thus, there is a connection between the rigor of RSRs and the ability of regulators to meet their renewable energy targets. In the absence of a unified approach within Canada, regulatees can capitalise on differences in approach taken within different provinces or territories. Indeed, Ferrell and DeVuyst⁸⁹and Conaway⁹⁰ observe that, other things being equal, regulatees can acquire a cost advantage over those operating in more stringent regimes by moving to jurisdictions with weak (or absent) RSRs. It might, therefore, be expected that regulatees will, other things being equal, select sites for power plants located in a province/territory where RSRs were lax and associated cost burden lower.

Approaches welcoming to investors certainly benefit a strategy of securing more energy from, for instance, renewable sources. There is, however, the danger that in the drive to facilitate the essential transition to greener, cleaner sources of energy generation – to ensure the requisite level of capacity can be installed – a regulator may be tempted to exercise its discretion generously to accept security that is amenable to investors to entice them to construct and operate power plants in the jurisdiction. We saw this in a variety of frameworks examined in Chapter 4. For instance, in England's onshore wind sector, the local authority with the highest number of wind turbines with its area of jurisdiction, East Riding of Yorkshire Council, had the second lowest average bond value. For solar projects in Tennessee, regulatees need only provide security in respect of the project's net reclamation costs and they can do so through a PCG. And BOEM's governance of offshore wind projects in the Outer Continental Shelf permitted large, financially strong regulatees to self-bond, despite the known risks associated with this.

Whilst use of discretion in this way may enhance a jurisdiction's capacity to facilitate the generation of greater levels of electricity by enabling a reduction in market entry costs for investors, it is likely to result in abandonment risk being ignored or, at the very least, deemed of lesser importance than it ought to be.⁹¹ The indirect consequence may be that regulatees are unable to fund reclamation. This strategy is seen elsewhere in the energy sectors, such as oil and gas, of many nations. There, historically, there has been a 'light touch' approach to security for reclamation to avoid hindering development of projects deemed desirable at a particular point in time.⁹² For example, under the framework governing decommissioning in the UK's offshore oil and gas sector, the power to mandate security is so rarely invoked that, as of January 2019, regulatees had only been required to set aside £844 million.⁹³ The total estimated cost of decommissioning UK Continental Shelf upstream oil and gas infrastructure is currently £40 billion.⁹⁴ Thus, the security provided covers only 2.11% of the total estimated liabilities. Despite the existence of a legal power to require regulatees to provide security, it has proven to be exceptionally rare for it to be required from regulatees in this sector, which is a concern.

⁸⁷ Department for Business, Energy and Industrial Strategy (BEIS), *Consents and planning applications for national energy infrastructure projects; guidance on regulations covering new power generating plants and wayleaves* (last updated December 2021) https://www.gov.uk/guidance/consents-and-planning-applications-for-national-energy-infrastructure-projects accessed 5 November 2023.

 ⁸⁸ Kenneth Gifford, 'Moulding Discretion: How Courts Can Help' (1985) 16 Western Australian Law Review 229, 229.
 ⁸⁹ Shannon Ferrell and Eric DeVuyst 'Decommissioning wind energy projects: an economic and political analysis' (2013) 53 Energy Policy 105, 108.

⁹⁰ Conaway (n 953) 638.

⁹¹ Mackie (n 23) 501.

⁹² Ibid.

⁹³ National Audit Office, Oil and gas in the UK – offshore decommissioning (25 January 2019) [3.12]

https://www.nao.org.uk/reports/oil-and-gas-in-the-uk-offshore-decommissioning/> accessed 5 November 2023.

⁹⁴ North Sea Transition Authority, *UKCS Decommissioning Cost and Performance Report 2023* (August 2023) 8 <<u>https://www.nstauthority.co.uk/news-publications/ukcs-decommissioning-cost-and-performance-report-2023/</u>> accessed 5 November 2023.

To be clear, it is not being suggested that the discretion of the Regulators be removed or unduly inhibited. Discretion is heralded by Booth⁹⁵ and Tewdwr-Jones⁹⁶ as a valued attribute of a land use planning system for it confers flexibility and ability to cope with an uncertain future, two features that are essential to delivering Alberta's energy future. It is essential that the Regulators retain discretion. The trade-off is an absence of certainty for stakeholders as to the prospect of reclamation taking place.⁹⁷ This is where problems can emerge, however. Though, it is suggested that what the Regulators should be driving for is a degree of 'regulated discretion' in that whilst legislation may create a power to impose RSRs – *with that power exercised as standard practice* – a published guideline on reclamation security for power plants would help to 'focus'⁹⁸ their discretion and act as a 'constraint'⁹⁹ upon it. Regulatees would know, in advance of an application for a new power plant, what was likely to be expected of them, and society would trust that the framework was going to ensure that power plants would be 'reversed' at the end of their operational lives, protecting land, landscapes and public funds.

5.2 A Guiding Principle: the principle of restorative responsibility

In designing RSRs, it prudent for this process to be informed by an overarching principle which captures the societal, economic and environmental importance of ensuring that reclamation, in line with the approved reclamation plan, is performed by regulatees as and when required. Utilizing an environmental principle in this way can help to reflect 'forceful ethical considerations' and it can carry 'moral weight'.¹⁰⁰ The polluter-pays principle, for instance, expresses a moral judgement about the allocation of responsibility for environmental protection in society.¹⁰¹ It is suggested that is somewhat misleading to describe the owner of a wind or solar project as a 'polluter'. It may be more accurate to describe the duty to which such a regulatee is under as one governed by the *principle of restorative responsibility*. This is a phrase coined by the author of this report. It is proposed to stimulate debate and discussion amongst stakeholders as to the appropriate principle(s) that should inform regulatory approaches taken to designing RSRs; the title should not act as a distraction to debate on its necessity.

To operationalize the *principle of restorative responsibility* is to conceptualize reclamation as a distinct *task* to be performed in the future: to close the site safely and restore it to (or near to) its original condition or to a level that could accommodate another use. Reclamation connects regulators and regulatees to other stakeholders in the project, including the environment, landowners, local communities, and wider public.¹⁰² Regulators impose reclamation obligations to protect those stakeholders. Regulatees undertake to perform them, facilitating that protection through timely completion of the task in line with the reclamation plan. The *principle of restorative responsibility* seeks to ensure a just allocation of the costs associated with their performance. Those costs are not imposed on others, such as the public, or simply ignored, but are assigned to the regulatee deemed responsible for them under the legal framework. The imposition of reclamation costs upon them via effective RSRs of adequate value furthers the pre-configured conception of fairness embedded in the principle.

Furtherance of the principle would necessitate that the RSRs must *guarantee* that the approved reclamation plan will be performed in every respect by the regulatee at its own private cost. By this it is meant that (i) the estimated cost for performing the works, including associated expenses (e.g., independent audit of the costing) upon which the RSR is set, and (ii) the instruments accepted by the regulator to satisfy the RSR, must be capable of ensuring that the legal duty imposed upon regulatees (or, where relevant, 'extended' to an associated company) will be discharged by them. Where the task of performing reclamation is ascribed to a regulatee, it is subject to a prospective responsibility under

⁹⁵ Philip Booth, *Controlling Development: certainty and discretion in Europe, the USA and Hong Kong* (London: UCL Press 1996) 5-6.

⁹⁶ Mark Tewdwr-Jones 'Discretion, Flexibility, and Certainty in British Planning: Emerging Ideological Conflicts and Inherent Political Tensions' (1999) 18 Journal of Planning Education and Research 244, 248-249.

⁹⁷ Booth (n 95) 5-6.

⁹⁸ Philip Booth, 'Planning and the rule of law' (2016) 17 Planning Theory & Practice 3 344, 356.

 ⁹⁹ Philip Booth, 'The Control of Discretion: planning and the common-law tradition' (2007) 6(2) Planning Theory 127, 139.
 ¹⁰⁰ Eloise Scotford, *Environmental Principles and the Evolution of Environmental Law* (Hart 2017) 35 and 36.

¹⁰¹ Gaines (n 39) 496; Nicholas Ashford and Charles Caldart, *Environmental Law, Policy, and Economics: Reclaiming the Environmental Agenda* (MIT Press 2008) 175.

¹⁰² Mackie and Besco (n 2) 10595.

the public law – a *legal* duty – to perform them.¹⁰³ This duty will be traceable to the legal framework(s) governing the project and certainly to their permit, license, or other authorization. That approval may be seen to reflect the terms upon which society tacitly allows the power plant to be constructed and operated by the regulatee and, where relevant, its successors. The regulatee knowingly and willingly accepted those terms in building the power plant and ought not to be able to vary them unilaterally and retrospectively through strategic use of bankruptcy law to avoid their responsibilities under them.¹⁰⁴

The unique role of the *regulator* in ensuring that reclamation is delivered is underplayed in most accounts of the regulatory function of RSRs.¹⁰⁵ Many legal frameworks and, more importantly, the guidance that is (or is not) published alongside them, are just not structured to confer the power to secure performance. This is due to the inherent flexibility they traditionally accord to regulatees to provide security at a time and in a manner that is commercially convenient to *them* as opposed to what is best in terms of delivering the approved reclamation plan. Nevertheless, whilst the regulator and regulatee are subject to quite separate prospective responsibilities, they share a common goal: timely completion of the approved reclamation plan at private cost. The regulatee's prospective responsibility is their duty under public law, ascribed prospectively, to *perform* their reclamation obligations.¹⁰⁶ A regulator ought to be viewed as subject to a prospective responsibility that is complementary to that of the regulatee. This is to ensure, on behalf of society and the environment, that the approved reclamation plan is performed on time and at private cost.¹⁰⁷ The regulator will discharge this duty through obtaining an appropriate guarantee from the regulator to that effect. This not only requires that the (often discretionary) power to require security be exercised, but the regulator reflect carefully on the requisite *level* of reclamation security, the *instrument(s)* used to satisfy the RSRs, and the *period* over which security can accrue when making their final decision. To remain in compliance with that duty, the regulator ought to demand that revised, independently verified, cost estimates be undertaken at 5 yearly intervals to ensure the RSR is sufficient. Should a deficit emerge, the regulator would need to seek further security from the regulatee to 'plug' that gap. Equally, where the security held was shown to exceed the estimated cost, the excess would be returned to the regulatee.

That RSRs must guarantee performance of reclamation offers a stable normative position from which to draft legislation and an associated guideline for RSRs for power plants in Alberta. The *first-order* function of RSRs ought to be to *empower* regulators and regulatees to discharge the specific legal responsibilities – or duties – ascribed to each of them.¹⁰⁸ It will, for instance, be entirely counterproductive for the permissible instruments (e.g., self-bonding and PCG) to weaken the prospect of performance arising. Reclamation obligations that have been defaulted upon by a regulatee are a burden society bears where the regulator is unable (due to budgetary constraints) or unwilling (so avoid setting an unhelpful precedent in the sector) to perform itself. Thus, while performance of reclamation obligations is both the regulatee's and the regulator's responsibility, where this does not occur it becomes *society's* problem. Society relies on the *regulator* to prevent this from materializing.¹⁰⁹

The empowering quality of RSRs is most effectively achieved through ensuring sufficient capital reserves are ring-fenced by regulatees from the claims of their creditors in bankruptcy.¹¹⁰ The forced segregation of funds necessary to create this reserve helps to generate the *second-order* function of RSRs: productive cost internalization.¹¹¹ This function, which is dependent upon successful delivery of the *first-order* function, enables furtherance of the venerable policy objectives that the OECD emphasized in originating its conception of the polluter-pays principle. Recall that this was engendering more rational, sustainable consumption and production patterns and avoiding distortions in international trade and investment. The latter objective is particularly pertinent given the trade subsidizing effect that lax (or no) RSRs exhibit, as articulated in Chapter 2. This idea of productive cost internalization need not, however, be fostered under the guise of a 'polluter pays'-styled principle as seen in framework

- ¹⁰⁶ Ibid 10577.
- ¹⁰⁷ Ibid.

¹⁰⁹ Ibid 10599.

¹⁰³ Ibid 10595.

¹⁰⁴ Ibid 10596.

¹⁰⁵ Ibid.

¹⁰⁸ Ibid.

¹¹⁰ Ibid 10577.

¹¹¹ Ibid 10600.

detailing RSRs in the offshore renewables sector of England & Wales. It could (and, it is suggested, should) be comprised under the *principle of restorative responsibility* as described in this chapter. To do so would avoid the need to displace common conceptions of the polluter-pays principle as primarily being a retrospective, liability-focused principle of environmental law, as described by Heine et al.¹¹²

It must be acknowledged that whilst a *risk* of abandonment is ever present, this must not be overplayed as it legitimizes poor RSR practice.¹¹³ The risk is created by a variety of factors. Given the uncertainties involved in costing reclamation, there is a real prospect of a deficit arising between the reclamation costs (as performed) and the estimated costs, which will have influenced the amount of the reclamation security required by the regulator. Where this shortfall cannot be met by the regulatee due to, for example, its weakened financial position, and no other parties can be held liable for it, it will fall to taxpayers who will either pay in financial terms or metaphorically where the site remains in an unreclaimed state. And a security measure, such as a surety bond, could fail in the event of the surety's bankruptcy or failure to comply with its terms. Or the regulatee may become insolvent prior to full accumulation of funds. Aside from the currently high likelihood of the cost estimate proving inaccurate, the risk of default can be controlled to a large extent through restricting the range of acceptable security instruments to those that exhibit low risk to taxpayers and limiting the period over which funds are permitted to accrue. It is to the issue of instrument choice that we turn to in section 5.3.

Prior to their consideration, it is important to deal with the argument that security is unnecessary where the regulatee contends that the site will always be deployed for generating energy. That may (or may not) be their initial intention, but that intention may change. The harsh reality is that in the absence of RSRs, the site will as a matter of fact *always* be a power plant should the regulatee default on reclamation and public funds not be deployed to perform the requisite works. It will be left to rust in situ, sterilizing the land, impacting viewscapes and 'locking in' materials that could be reintegrated into the economy. RSRs provide assurance that the site will be returned to (or close) to its former state. In any event, given the rate of technological evolution, current technologies, including means of generating electricity, can soon become outdated. Thus 'always' should be approached with a degree of scepticism.

5.3 Mandatory RSRs for Power Plants: a recommended approach

This section outlines the recommended approach to implementing mandatory RSRs for power plants. The instruments that ought to be permitted and prohibited from being used to satisfy RSRs will be detailed, including provision of a rationale as to why. It is recommended that a combination of financial instruments ought to be deployed, with this being influenced by the stage of the project and the commercial risks for the regulatee. The need for legislatively mandated RSRs under the law of Aberta to be 'fleshed out' through a guideline on reclamation security for power plants is discussed.

In the previous subsection, we saw that the *principle of restorative responsibility* requires that RSRs must guarantee that the approved reclamation plan will be performed in every respect by the regulatee on time and at their own cost. This means that the estimated reclamation costs which inform the amount of security required and the instruments accepted to satisfy the RSR must be capable of ensuring that the legal duty imposed upon regulatees will be discharged by them. When evaluating the capacity of an instrument to guarantee performance of reclamation, we see a weak-to-strong form *spectrum of likelihood* that this will occur, with self-bonding and PCGs at one end (weak) of the spectrum and full, upfront cash deposits with a regulator at the other (strong).¹¹⁴ Different measures sit at various points along this spectrum.¹¹⁵ The closer the marker is to the weak end, the greater (and the more *unacceptable*) the risk to public funds, with the reverse also being true. The tolerable level of risk is, ultimately, a *political* decision but one that, as we have seen, has implications not only for the risk of the power plant being abandoned but for domestic and international trade and investment in Albert'a

¹¹² Heine et al (n 37) 95

¹¹³ Colin Mackie and Anne Velenturf, 'Trouble on the horizon: Securing the decommissioning of offshore renewable energy installations in UK waters' (2021) 157 Energy Policy 112479, 9.

¹¹⁴ Government Accountability Office (GAO), *Environmental Liabilities: EPA Should Do More to Ensure That Liable Parties Meet Their Cleanup Obligations* (2005) GAO-05-658, 42-43 <<u>https://www.gao.gov/assets/250/247469.pdf</u>> accessed 5 November 2023.

¹¹⁵ Ibid.

electricity sector.¹¹⁶ The acceptability of the risk of abandonment ought to be guided by the placement of (1) a particular instrument and (2) the timing of the security accumulation, on this spectrum.

Where the original reclamation cost estimate is accurate – and this, in itself, is no easy task – certain measures, when utilized properly (i.e., an adequately capitalized escrow account segregated from the regulatee's assets, outside its administrative control, and accessible only by the regulator), increases the likelihood that reclamation will be performed at the regulatee's private cost, even in the event of its bankruptcy. However, as we shall see, as soon as performance is rendered conditional upon the *financial strength* of the regulatee or some third party, such as providers of bonds, bank guarantees, and/or a parent or affiliate company, then the financial value (and overall legal credibility) of that guarantee wanes. Unless specific and sufficient assets or funds are ring-fenced from the reach of that entity's creditors, there is the risk that they may be unable to bear those costs if their financial position deteriorate. It is not just regulatees and their parent or affiliate companies that are exposed to the risk of bankruptcy; banks and insurers can and do become bankrupt.¹¹⁷ Thus, performance can only ever really be *guaranteed* where a fully funded capital reserve *dedicated* to reclamation is mandated via RSRs.

The recommendations made are prescriptive, which is often unwelcomed by industry. This is never truer than where it results in increased (albeit not *new*) costs for regulatees. Only when such a system is implemented will the necessary works actually be performed consistently by regulatees, the distortion of trade and investment redressed, and more responsible, sustainable corporate conduct across the sector encouraged. We must learn lessons from the regulatory failure witnessed in the coal and oil and gas sectors. For the sake of society and the environment, the same mistakes cannot be made. The following sections/subsections address the detail of the recommendations made in relation to RSRs.

5.3.1 The first-best option

A bank guarantee purchased from a reputable third-party provider, situated in Alberta, ought to be used initially as funds accumulated in line with a strict timeline to achieve the desired target sum. Bank guarantees are well suited for environmental responsibilities with quantifiable costs.¹¹⁸ They are the 'preferred' instrument of choice for the EPA in NSW, with its *Financial Assurance Policy* stating that the instrument 'provides greatest certainty in accessing funds in default events'.¹¹⁹ Whilst Queensland's Department of the Environment and Science's *Guideline: Financial assurance under the Environmental Protection Act 1994* states that 'Departmental policy *requires* [financial assurance] to be a financial institution's undertaking in the form of an unconditional, irrevocable and on demand guarantee.'¹²⁰ It is recognized as a particularly safe, stable means of evidencing security for reclamation.

The target sum would reflect the estimated cost of the *regulator* supervising and directing the approved reclamation plan. Whilst this will be more expensive than if the estimation was done based on the regulatee undertaking the works itself, it must be so as should the regulatee enter bankruptcy proceedings, it will be unable to perform its reclamation obligations. The costing must reflect this very real risk. This was, for instance, recognized in the approach taken by BEIS in its governance of the decommissioning of offshore renewable energy infrastructure in English and Welsh waters under the Energy Act 2004.¹²¹ BEIS existed until 2023, when it was split to form the Department for Business

¹¹⁶ Mackie and Velenturf (n 113) 9.

¹¹⁷ Boyd, Financial Responsibility (n 31) 39.

¹¹⁸ Valerie Fogleman, *Improving financial security in the context of the Environmental Liability Directive* (May 2020) No 07.0203/2018/789239/SER/ENV.E.4, 59 https://circabc.europa.eu/ui/group/3b48eff1-b955-423f-9086-

<u>0d85ad1c5879/library/01708073-da51-4db7-8049-6e7141c901f4/details</u>> accessed 5 November 2023.

¹¹⁹ NSW Environment Protection Authority, *Financial Assurance Policy* (May 2022) 10 <<u>https://www.epa.nsw.gov.au/-/media/22p3721-financial-assurance-</u>

policy.pdf?la=en&hash=17A07EDFDDBDF2ED399D3DFA682A46C1AA57106A#:~:text=A%20financial%20assurance%20is%20a,to%20provide%20a%20financial%20assurance.> accessed 5 November 2023.

¹²⁰ Department of Environment and Science (DES) (Queensland Government), *Guideline: Financial assurance under the Environmental Protection Act 1994* (March 2023) 9 (emphasis added)

<<u>https://www.des.qld.gov.au/policies?a=272936:policy_registry/era-gl-financial-assurance-ep-act.pdf</u>> accessed 5 November 2023.

¹²¹ Department for Business, Energy and Industrial Strategy (BEIS), *Decommissioning of Offshore Renewable Energy Installations under the Energy Act 2004: Guidance notes for industry* (England and Wales) (March 2019) [8.1.4] <<u>https://assets.publishing.service.gov.uk/media/5f5b2724e90e0718e212a22d/decommisioning-offshore-renewable-energy-installations-energy-act-2004-guidance-industry_l_pdf</u>> accessed 5 November 2023.

and Trade (DBT), the Department for Energy Security and Net Zero (DESNZ) and the Department for Science, Innovation and Technology (DSIT). DESNZ will be the regulator for offshore renewable energy infrastructure in English & Welsh waters moving forward. It is also the position taken by the EPA of NSW under its governance of the generation of electricity by means of electricity plant.¹²²

In line with the approaches taken by the EPA of NSW and BEIS, a contingency of 10% of the reclamation cost estimate is to be incorporated into the security requirement to cater for the potential for the cost to increase/be larger than estimated. The costing, which ought to follow the methodology detailed in the guideline, would be subject to verification by an *independent* auditor, with the regulator providing its final approval on its adequacy. If a regulatee did not have the financial strength to acquire the bank guarantee on its own, a parent or other associated company may assist. As illustrated in Table 4 below, the sum secured by the bank guarantee would decrease proportionately in line with an increase in the accumulating cash deposits. This would be permissible only across years 0-9, with the funds accumulating in full, with interest on them supplementing the deposit, by the end of that period. If this did not occur, their operations should be suspended until the deficit was redressed. Interest would accrue on the cash deposited in the account. Once it reached 10% of the cost estimate, which would operate as an appropriate contingency in the event of the true cost of reclamation being higher than envisioned, any excess amount would be returned to the regulatee on an annual basis during the operational life.

A bank guarantee must be used *in conjunction* with an accumulating cash deposit as the use of either instrument in isolation is prone to failure; the provider of the bank guarantee may not be willing to renew it, whilst the bankruptcy of the regulatee prior to full accumulation will result in a shortfall. It must be recalled that the mere purchase of a bank guarantee does not, in itself, actually contribute to the regulatee's *own* financing of reclamation; the instrument merely provides for the risk of the regulatee's non-performance to be transferred to the provider, in return for continuous payment fee and provision of security to it by the regulatee. In order for the regulatee to actually be able to finance their reclamation obligations, they will need to save separately for this. This is why the accumulating cash deposit is so crucial; it ensures that the regulatee is *forced* to save for their reclamation obligations, providing the necessary level of external legal control over the manner in which this saving is to occur.

Any solution to a societal problem will attract criticism. The aim of presenting the highly simplified scenario set out in Table 4 is to illustrate the potential in using the strengths of one measure to counteract the weaknesses of the other, engendering a RSR strategy that maximises the likelihood that reclamation is performed on time and at the private cost of the regulatee but in a manner that does not place an unacceptable financial burden on them so as to render Alberta unattractive to investors.

Year	Cash deposit (Can\$)	Accumulated Cash Deposit (Can\$)	Value (Can\$) of bank guarantee
Year 0*	100,000	100,000	900,000
Year 1	100,000	200,000	800,000
Year 2	100,000	300,000	700,000
Year 3	100,000	400,000	600,000
Year 4	100,000	500,000	500,000
Year 5	100,000	600,000	400,000
Year 6	100,000	700,000	300,000
Year 7	100,000	800,000	200,000
Year 8	100,000	900,000	100,000
Year 9	100,000	1,000,000***	0
	Can\$1,000,000**		

Table 4. Illustration of *first-best option*, assuming estimated reclamation costs of Can\$1m

* Year 0 is to be understood as referring to the day on which construction of the power plant began or, where relevant, the day on which ownership of an existing power plant was transferred to the new owner.

** Account is not taken of inflation in this simplified scenario but it would need to be in practice.

*** Interest on this sum would be permitted to accumulate up to a sum of 10% of the reclamation cost estimate as a contingency.

¹²² Protection of the Environment Operations Act 1997 (NSW), s 300(2).

Table 5. Summary of the recommendations, including their rationale and precedent(s) upon which they are based, made in relation to the design of RSRs for power plants in Alberta

Recommendation	Rationale	Precedent(s)
Recommendation 1: an overarching, guiding principle, the <i>principle of restorative responsibility</i> , ought to function as the normative foundation for the design of RSRs for power plants.	This principle, designed by the author of this report, seeks to ensure a just allocation of the costs associated with the task of reclamation. Those costs are not to be imposed on others, such the public, or simply ignored, but are assigned by the regulator to the regulate responsible for them under the legal framework. The (successful) imposition of reclamation costs by the regulator via effective RSRs furthers the pre-configured conception of fairness embedded in the principle.	As to the use of a guiding principle to steer a regulator's imposition of security requirements see, e.g., BEIS, <i>Decommissioning of Offshore Renewable Energy Installations under the Energy Act 2004: Guidance notes for industry</i> (England and Wales) (March 2019). There, it is the 'polluter-pays' principle that is used. This recommendation is derived from research conducted by Mackie and Besco (2020).
Recommendation 2: the creation of (i) an explicit legislative power for the Regulators to require RSRs for power plants, and (ii) a detailed guideline, <i>Reclamation Security Requirements for Power Plants.</i>	The guideline would help to articulate a more prescriptive approach to cost estimation, acceptable instruments and means of accumulating funds for RSRs. It would inform the discretion of the Regulators when exercising the explicit legislative power that would be available to them to require RSRs and act as a constraint upon their use of that power.	See e.g., NSW Environment Protection Authority, <i>Financial Assurance</i> <i>Policy</i> (May 2022) and Department of Environment and Science (Queensland Government), <i>Guideline: Financial assurance under the</i> <i>Environmental Protection Act 1994</i> (March 2023), for examples of dedicated security guidelines.
Recommendation 3: the guideline ought to articulate the methodology for calculating reclamation costs, with a pro forma, Excel-based cost calculator to be used by independent cost consultants appointed by regulatees.	The estimated costs of performing reclamation, which are <i>crucial</i> to the effectiveness of RSRs, must be conducted on a 5-yearly basis by an <i>independent</i> auditor, appointed by the regulatee, in line with the guideline. A pro forma Excel cost calculator, capable of modification for project specific characteristics, ought to be created as it would permit ready calculation of costings ultimately to be approved by it and aid comparison with other projects to probe their integrity.	See e.g., NSW Environment Protection Authority, <i>Estimating financial assurances: Guideline on Independent Assessment of Costs</i> (May 2022) and Department of Environment and Science (Queensland Government), <i>Guideline: Financial assurance under the Environmental Protection Act 1994</i> (March 2023) for examples of costing methodologies & calculators.
Recommendation 4 : the estimated scrappage and resale value of the infrastructure may be used by the regulatee to reduce the amount of security to be provided to a maximum of 50% of that value, as determined by independent auditor every 5 years. The valuation must reflect any depreciation in value.	Providing a concession (or security 'discount') to investors that is directly connected to the value inherent in the energy infrastructure, as determined by an independent valuer in line with the proposed guideline, provides a far safer, more stable means of empowering regulatees to comply with RSRs that are designed to minimize abandonment risk than enabling regulatees to demonstrate their purported financial strength or use PCGs. It seeks to ensure investors are not discouraged from taking forward energy projects in Alberta.	As to the ability to utilize the estimated scrappage/resale value of the infrastructure, see e.g., the US Bureau of Land Management's governance of wind and solar projects on federal land under the Federal Land Policy and Management Act of 1976 (FLPMA), Connecticut's governance of onshore wind under Conn. Agencies Regs. § 16-50j-94 and West Virgina's governance of onshore wind and solar projects under the West Virginia Wind and Solar Energy Facility Reclamation Act.
Recommendation 5: the Regulators ought to collate costings from, and recouped value following, completed reclamation plans to populate a publicly available bench-making database that could aid both industry and Regulators when submitting and reviewing costings/valuations.	Any improvement in the utilization of RSRs must be coupled with the acquisition by the Regulators of the <i>granular</i> detail of the costs associated with reclamation and value recouped from the infrastructure. These measures facilitate the acquisition of this data.	No existing precedent for this. This recommendation is derived from research conducted by Mackie and Velenturf (2021).
Recommendation 6 : the <i>first-best option</i> for the RSRs for power plants is for a bank guarantee, purchased from a reputable third-party provider situated in Alberta, to be used initially as funds accumulated in an escrow account across years 0-9 of the plant's life to achieve the appropriate target sum in the dedicated capital reserve. The target sum would reflect the estimated cost of the regulator performing the approved reclamation plan to cater for the risk of the regulatee's bankruptcy. Interest would be paid on the	Bank guarantees are known to provide a high level of certainty that funds may be accessed by a regulator in the event of the regulatee's default. It is essential that they are used in conjunction with an accumulating cash deposit as the use of either instrument in isolation is prone to failure. The cash deposit requirement also forces the regulatee to 'save'. The target sum reflects the estimated cost of the regulator performing the approved reclamation plan as should the regulatee enter	As to bank guarantees being 'preferred' see, e.g., Queensland's Department of the Environment and Science's <i>Guideline: Financial</i> <i>assurance under the Environmental Protection Act 1994</i> (April 2023). As to the need for the costs to be calculated based on the <i>regulator</i> performing them see, e.g., BEIS, <i>Decommissioning of Offshore</i> <i>Renewable Energy Installations under the Energy Act 2004: Guidance</i>

Recommendation	Rationale	Precedent(s)	
deposited sums, aiding the generation of a contingency sum of 10% of the estimated reclamation costs.	bankruptcy proceedings, it will be unable to perform its reclamation obligations.	notes for industry (England and Wales) (March 2019).	
Recommendation 7 : if a regulatee that could demonstrate that the <i>first-best</i> option would impose 'undue financial hardship' upon it, it could default to second-best options. If hardship was evidenced, and accepted, flexibility could be deployed in relation to the payment schedule, enabling the cash payments to commence at a slightly delayed start date (e.g., year 4). If a regulatee was unable to satisfy the second-best options, it must reconsider the scale of the proposed power plant development.	The <i>first-best option</i> may be unattainable for certain socially valuable projects. A regulatee could be so burdened by RSRs and associated restrictions on their capital and/or operations that it may no longer be able to operate at a profit. Some regulatees, particularly smaller ones, may be forced to withdraw from the market. This may be seen as anti-competitive and, potentially, unfair. This complaint need not be fatal to the case for mandatory RSRs. It merely demonstrates the need for flexibility in setting the tone of the RSR.	As to the capacity for demonstrated 'financial hardship' to inform a more flexible delivery of security provision, see e.g., NSW Environment Protection Authority, <i>Financial Assurance Policy</i> (May 2022)	
Recommendation 8: 'financially strong' regulatees must not to be given greater latitude as to (i) the instruments they may use to satisfy RSRs and (ii) the period over which funds must accrue, than those that are less well positioned financially.	Financial strength ought not to be a relevant criterion for the Regulators when imposing RSRs as a deterioration in their financial strength can render them entirely unable to perform their reclamation obligations. Financial strength focuses on <i>present-day</i> ability to pay, not ability to pay in the future. The latter is the issue of critical importance given that the project's life may extend (well) beyond two decades, even before lifetime extension or repowering is considered.	This recommendation is derived from research conducted by Mackie and Fogleman (2016). As to the inability to reserve cash in own accounts (and, therefore through analogy, self-bond or make provision in own accounts) see e.g., <i>BEIS, Decommissioning of Offshore Renewable Energy Installations under the Energy Act 2004: Guidance notes for industry</i> (England and Wales) (March 2019) [9.4.2]. However, it must be acknowledged that that framework <i>does</i> offer concessions in terms of security provision where 'financial strength' can be evidenced. It is, therefore, not a precedent as such for this recommendation.	
Recommendation 9 : the reclamation security provided is to be available to the regulatee, with the regulator's prior approval, to enable them to perform the works. The Regulators ought to be granted access to it, upon the regulatee failing to perform the works within a specified period, to allow it to perform them itself.	This enables the necessary access by the regulatee to the funds that have been set aside to finance the performance of reclamation, provided that the funds are to be used solely for that purpose. In the event of the regulatee not performing the works, as may be the case if they are bankrupt, it is essential that the regulator can access the security to enable the works to be performed with the use of these funds.	See, e.g., New Zealand's governance of resource consents, including renewable energy projects, including provisions catering for the regulator's access to the regulatee's contributed security under s 108 of the Resource Management Act 1991.	
Recommendation 10 : regulators ought to have the power to take a 'first ranking' charge over the power plant, upon the regulatee's default on its reclamation obligations, should a regulator choose to perform the works.	Where a regulator chooses to perform reclamation in the event of the regulatee being financially unable to perform them itself (e.g., it is bankrupt), the existence of this first ranking charge would enable the regulator to take security over an asset or assets owned by the regulatee to the value of costs incurred, including accrued interest, in performing those works. Where there are assets available upon which the charge may be taken, this may give comfort to the regulator that the costs which it incurs (i.e., through employing public funds) will be recoverable. To release capital from the asset(s) secured by the charge, however, the regulator must exercise the power of sale conferred under the charge.	Under the <i>Chapter 56 Wind Turbine Development By-law</i> of the Municipality of the County of Colchester, Nova Scotia, in the event the decommissioning bond not covering the cost of decommissioning, the owner and/or operator is responsible for the remaining costs and they shall be immediately payable upon demand by the regulatee (s 10.5(a)(iv)). Any costs not recovered shall form a lien against the regulatee's property (s 10.5(a)(iv)). No existing precedent for the 'first ranking' (or 'super lien') nature of the proposed charge over asset(s) in the regulatory frameworks examined in this report. This recommendation is derived from research conducted by Mackie and Combe (2019).	

A central feature of the *first-best option* is that cash representing the estimated costs of performing the approved reclamation plan is placed in a segregated bank account in favor of the regulator. As Dana and Wiseman observe, '[r]eserving [a] pool of money is critical because, absent such funds, there is a high likelihood that operators or public actors will never undertake environmental remediation.¹²³ Used in conjunction with a bank guarantee that decreases in value from years 0-9, an accumulating cash deposit across years 0-9 in a separate account is well placed to empower regulatees to perform reclamation and, in turn, facilitate productive cost internalization. They are also the clearest examples of measures that show the regulatee has the ability and intention to bear the costs of their reclamation obligations, two crucial characteristics of effective RSRs.¹²⁴ A regulatee could purport to demonstrate ability to pay through satisfying financial tests as per the requirements of self-bonding or making provision in their accounts. However, that ability will evaporate if their financial position deteriorates. They may (or may not) have an initial intention to pay. Even where that intention existed at the outset, it may change following certain events, such as a drop in the price of energy or contraction in demand. The point to emphasize is that whilst a regulator may believe that it can gauge the regulatee's ability to pay, it cannot gauge the regulatee's intention to pay.¹²⁵ It is recommended that an instrument should not be accepted by a regulator unless *both* the ability and intention of the regulatee to pay can be ensured through the external legal control generated under RSRs. Without that control, the regulatee may not be motivated to provide the type and amount of security necessary to perform reclamation.

5.3.2 The second-best option (a)

The *first-best option* may be unattainable for certain socially valuable projects. A regulatee could be so burdened by RSRs and associated restrictions on their capital and/or operations that it may no longer be able to operate at a profit. Some regulatees, particularly smaller ones, may be forced to withdraw from the market. This may be seen as anti-competitive and, potentially, unfair. This complaint need not be fatal to the case for mandatory RSRs. It merely demonstrates the need for flexibility in setting the tone of the RSR. Thus, it could be deemed tolerable to enable regulatees that could demonstrate that the *first-best option* would impose '*undue* financial hardship' upon them to default to a *second-best option*. This would, however, be at the sole discretion of the regulator. It would not be sufficient to just plead such hardship. It would have to be proven, with the regulator also taking into account the overall social utility of the proposed power plant. If hardship was present, and accepted by the regulator, flexibility could be deployed in relation to the payment schedule, enabling the cash payments to commence at a delayed start date (e.g., year 4). If a regulatee was unable to satisfy the *second-best options*, it may need to consider the scale of the proposed project and, most likely, reduce it in size.

Year	Cash deposit (Can\$)	Accumulated Cash Deposit (Can\$)	Value (Can\$) of bank guarantee
Year 0*	0	0	1,000,000
Year 1	0	0	1,000,000
Year 2	0	0	1,000,000
Year 3	0	0	1,000,000
Year 4	0	0	1,000,000
Year 5	100,000	100,000	900,000
Year 6	100,000	200,000	800,000
Year 7	100,000	300,000	700,000
Year 8	100,000	400,000	600,000
Year 9	100,000	500,000	500,000
Year 10	100,000	600,000	400,000
Year 11	100,000	700,000	300,000

Table 6. Illustration of a second-best option, assuming estimated reclamation costs of Can\$1m

¹²³ David Dana and Hannah Wiseman, 'A market approach to regulating the energy revolution: assurance bonds, insurance, and the certain and uncertain risks of hydraulic fracturing' (2014) 99(4) Iowa Law Rev 1523, 1530.

¹²⁴ Mackie and Velenturf (n 113) 10.

¹²⁵ Ibid.

Year	Cash deposit	Accumulated Cash Deposit	Value (Can\$) of bank guarantee
	(Can\$)	(Can\$)	
Year 12	100,000	800,000	200,000
Year 13	100,000	900,000	100,000
Year 14	100,000	1,000,000***	
	Can\$1,000,000**		

* Year 0 is to be understood as referring to the day on which construction of the power plant began or, where relevant, the day on which ownership of an existing power plant was transferred to a new owner.

** Account is not taken of inflation in this simplified scenario but it would need to be in practice.

*** Interest on this sum would be permitted to accumulate up to a sum of 10% of the reclamation cost estimate as a contingency.

5.3.3 The second-best option (b)

An alternative option is to spread the cash deposits over a longer period (e.g., across 9-18 years).

Table 7. Illu	stration of a furthe	r second-best option.	assuming estimated	reclamation co	osts of Can\$1m

Year	Cash deposit (Can\$)	Accumulated Cash Deposit (Can\$)	Value (Can\$) of bank guarantee
Year 0*	0	0	1,000,000
Year 1	0	0	1,000,000
Year 2	0	0	1,000,000
Year 3	0	0	1,000,000
Year 4	0	0	1,000,000
Year 5	0	0	1,000,000
Year 6	0	0	1,000,000
Year 7	0	0	1,000,000
Year 8	0	0	1,000,000
Year 9	100,000	100,000	900,000
Year 10	100,000	200,000	800,000
Year 11	100,000	300,000	700,000
Year 12	100,000	400,000	600,000
Year 13	100,000	500,000	500,000
Year 14	100,000	600,000	400,000
Year 15	100,000	700,000	300,000
Year 16	100,000	800,000	200,000
Year 17	100,000	900,000	100,000
Year 18	100,000	1,000,000***	0
	Can\$1,000,000**		

* Year 0 is to be understood as referring to the day on which construction of the power plant began or, where relevant, the day on which ownership of an existing power plant was transferred to a new owner.

** Account is not taken of inflation in this simplified scenario but it would need to be in practice.

*** Interest on this sum would be permitted to accumulate up to a sum of 10% of the reclamation cost estimate as a contingency.

5.3.4 Rejection of financial strength-based instruments

When determining the acceptability of proposed means of financing a reclamation plan, the focus on the perceived financial strength of a regulatee ought to be considered inherently dangerous given the well-known risk that its deterioration poses for their ability to complete the works. This would be directly applicable to financial strength-based instruments. Furthermore, as we saw in Chapter 4, jurisdictions deploying a risk-based approach to RSRs (e.g., NSW) may not require 'financially strong' regulatees to provide security at all or to do so in reduced amounts. This, for reasons that will become clear, is not advisable given the risk of project abandonment in the event of their bankruptcy.

Despite the prevalence of self-bonding and PCGs in the frameworks described in Table 3,¹²⁶ these instruments (along with provisioning in accounts) should be prohibited explicitly under any guideline on reclamation security for power plants if the environment and public funds are to be protected. It may not be considered advisable for the Regulators to retain discretion to accept them, even in 'exceptional' circumstances, a caveat incorporated into BEIS' guidance¹²⁷ which permits restricted use of PCGs for offshore renewable projects in English & Welsh waters.¹²⁸ These instruments do not cater for the dedication of funds/assets for reclamation and ought to be prohibited for this simple reason. That a regulate has 'provided' reclamation security means little if they have merely secured a guarantee from their parent. A guarantee is only as good as the person giving it, meaning that it may prove worthless if the parent company/wider corporate group collapses. As self-bonding and PCGs do not require assets or funds to be ring-fenced to finance the future works, they are notoriously fragile in the event of the bankruptcy of the regulatee or its parent company.¹²⁹ The perceived efficacy of these instruments rest on the tenuous assumption that satisfaction of certain financial tests or ratios render the regulatee (or an affiliate, such as a parent or subsidiary) able to meet the costs of their future environmental obligations.¹³⁰ Self-bonding may work when a sector is 'booming and resilient'.¹³¹ It is, however, 'uniquely susceptible to complete failure', 132 and can (and regularly does) backfire spectacularly if prices fall, demand wanes, and the sector's resilience deteriorates.¹³³ For example, in the US coal sector, Peabody Energy entered into bankruptcy with recognized reclamation obligations of approximately \$2 billion, with only \$600 million covered by surety bonds and other guarantees.¹³⁴ The remainder were self-bonded.¹³⁵ As a result, it was able to discharge around \$745 million of its liabilities in bankruptcy,¹³⁶ with 'state regulators [accepting] a mere 17 cents on the dollar' with respect to the self-bonded obligations.¹³⁷ If the regulatee (or their parent) enters into bankruptcy, their assets will, generally, be available to its creditors. As we have seen from the Peabody Energy example, the prospect of the regulator, positioned as an unsecured creditor, receiving anything, let alone a sum close to what is needed to complete the works, is often extremely low. If self-bonding or a PCG fails due to bankruptcy, this will lead to indirect state subsidization, as described above at section 2.2.

Where a regulator permits a regulatee to use its financial strength to satisfy RSRs, this renders the *process* of evidencing it of significant regulatory importance. Yet this is susceptible to problems related to how it is to be determined. Under some approaches, such as NSW's,¹³⁸ specified requirements, published in guidelines/policies, must be satisfied to evidence it. In other systems, such as the approach in the offshore renewable energy sector of England & Wales, no criteria are published in BEIS' guidance to facilitate objective determination as to when regulatees will be deemed to possess the requisite 'financial strength' (i.e., what it means, in legal terms, to be *financially strong*).¹³⁹ This creates a risk of differential treatment between regulatees, or at the very least a feeling of such treatment, and

¹²⁶ See, e.g, Ontario's permissive approach to PCGs provided by 'in province' parents in its governance of renewables projects under the Environmental Protection Act, and the associated guidance document, *F-15: Financial assurance guideline*: Ontario Ministry of the Environment (n 73) [5.4.2]. ¹²⁷ Whilst DESNZ is now the regulator of offshore renewable energy projects in English & Welsh waters, the guidance

¹²⁷ Whilst DESNZ is now the regulator of offshore renewable energy projects in English & Welsh waters, the guidance published by BEIS will continue to be referred to as 'BEIS' guidance' and 'BEIS, *Guidance Notes for Industry*' in this report as it was drafted and implemented initially by BEIS and continues to be badged as a BEIS document.

¹²⁸ BEIS, *Guidance Notes for Industry* (n 121) [9.6.1].

¹²⁹ Mackie and Fogleman (n 46) 296.

¹³⁰ Ibid 308.

¹³¹ Heard (n 80) 211.

¹³² Ibid
¹³³ Ibid 238.

¹³⁴ Joshua Macey and Jackson Salovaara, 'Bankruptcy as Bailout: Coal Company Insolvency and the Erosion of Federal

Law' (2019) 71 Stanford Law Review 879, 928.

¹³⁵ Ibid.

¹³⁶ Ibid 933.

¹³⁷ Ibid 929.

¹³⁸ See, e.g., NSW's Protection of the Environment Operations Act 1997, s 299(c1) and Appendix A of NSW EPA, *Financial Assurance Policy* (n 119).

¹³⁹ See e.g., BEIS, *Guidance Notes for Industry* (n 121) [9.4] ('The type of security likely to be acceptable will depend on a number of factors, including...the financial strength of those responsible for decommissioning'). However, no criteria to gauge financial strength are set out in the guidance notes.

for subjectivity – and potential bias – to enter decision-making as to whether the threshold has been met.¹⁴⁰ The lack of transparency may generate disquiet amongst regulatees and potential investors.

The presumption is that the figures presented are accurate, but this may not be the case. Companies in the energy sector are known to 'engage in financial gimmickry by overvaluing assets, undervaluing liabilities, or pushing liabilities off balance sheet in order to appear solvent and continue operating'.¹⁴¹ Where regulatees do not adopt transparent, uniform accounting procedures in deriving the relevant financial data, this will lead to difficulties in ensuring equality of treatment between them. Inaccuracy may be unintentional.¹⁴² Where a regulatee struggles to capture its liabilities accurately where its activities are wide-ranging and carried out across different jurisdictions, it may be difficult, if not impossible, for a regulator to verify the figures presented.¹⁴³ Inaccuracies may also be intentional, with some regulatees deliberately attempting to portray their financial position to be healthier than is the case to avoid having to pay for security instruments.¹⁴⁴ A simple means of doing so would be to inflate asset values artificially through using questionable valuation techniques, or merely by taking assets at historic values when that value was higher than their current market value.¹⁴⁵ The figures presented may not, therefore, reflect the regulatee's true financial position.¹⁴⁶ Whilst accounting may not be fraudulent in many cases, accounting fraud is relatively common amongst small companies and those in financial trouble.¹⁴⁷ It may only be discovered when it is too late. And the prospect of a formerly large, financially stable energy company becoming financially distressed and portraying a stronger balance sheet than its finances would dictate is entirely possible, Enron being a notable precedent.¹⁴⁸

If the Regulators were to accept financial strength as a means of evidencing RSRs, they must be willing and able to subject the data presented by regulatees to the requisite level of analysis. This is time intensive and expensive and will become more so where ownership structures of power plants are complex. The interpretation, verification, and monitoring of the financial data would necessitate that their employees possess sufficient financial expertise – and in adequate volume.¹⁴⁹ If this was not the case, additional staff, with the requisite skills, may be required. Or it could be that the task could be outsourced to the private sector. This may be so but precedents from other sectors demonstrate that questionable accounting practices may be utilized. The risk of it is real and its implications significant.

It is, therefore, recommended that 'financially strong' regulatees ought not, despite their protestations, be given greater latitude by the Regulators as to (i) the instruments they may use to satisfy RSRs and (ii) the period over which funds must accrue, than those that are less well positioned financially. This is because deterioration in their financial strength will likely render them unable to perform reclamation. Financial strength should not be a relevant criterion in a regulator's decision as to the acceptability of an instrument or timing of the accrual of security. It focuses on present-day ability to pay, not ability to pay in the distant future. The latter is the issue of critical importance in relation to power plants where the project's life may extend (well) beyond two decades, even before lifetime extension or repowering is considered. If concessions are to be granted to regulatees, and it is recommended that they *must* to avoid an overly stringent RSR regime repelling investors, these should relate to favourable treatment of salvage/resale value and/or the period over which funds accrue.

5.3.5 Gradual accumulation of funds: opportunities and threats

We have seen that gradual accrual of security creates a risk of security shortfall should a regulatee become bankrupt prior to full accumulation of funds. Nevertheless, it may be appropriate in certain instances, and ought to be acceptable in Alberta, *subject to the caveats described in this subsection*.

¹⁴⁰ Mackie and Velenturf (n 113) 7.

¹⁴¹ Macey and Salovaara (n 134) 934.

¹⁴² Mackie and Fogleman (n 46) 304.

¹⁴³ Mackie and Velenturf (n 113) 7.

¹⁴⁴ GAO (n 114) 44.

¹⁴⁵ Mackie and Velenturf (n 113) 7.

¹⁴⁶ Mackie and Fogleman (n 46) 308.

¹⁴⁷ Boyd, 'Financial Responsibility' (n 31) 63.

¹⁴⁸ Erica Beecher-Monas, 'Enron, Epistemology and Accountability: Regulating in a Global Economy' (2003) 37 Indiana Law Review 141, 153.

¹⁴⁹ Mackie and Fogleman (n 46) 307.

Accrual during the mid-life period – that is years 10-15 or 10-20 – is the preferred funding mechanism for developers/owners of offshore wind projects.¹⁵⁰ In the UK's offshore renewables sector, BEIS' guidance asserts that for 'large scale commercial deployments that receive a predictable revenue stream...and involve a proven technology with low operating risk', whilst a secure, segregated decommissioning fund that accrues *early in*, or *during the middle of*, the life of an installation is likely to be acceptable, one that accrues late into the operating life will not.¹⁵¹ The risk to which a 'late-life' prohibition seeks to guard against is that in the final stages of the project, after its profitability has been maximized, regulatees may enter bankruptcy proceedings in order to avoid their obligations.¹⁵² Whilst an improvement upon late-life accrual, the obvious risk with reliance on mid-life accrual as the sole means of financing reclamation is that it no security whatsoever is provided in the first 10 years of the project's operational life. This means of financing reclamation is exposed to outright failure in the event of the bankruptcy of the regulatee in the 0–9-year window. Even if funds begin to accumulate from year 10, if the regulatee enters bankruptcy before the scheduled end of the installation's operational life, then they will not accumulate in full. The earlier that bankruptcy occurs in years 9-24 of the project's life, the greater the extent of the likely security shortfall. This is why accrual, say, in equal instalments (or variations of this), across the plant's operational life is not an advisable RSR strategy. Assuming reclamation costs of Can\$1.000,000, and an operational life of 25 years, the regulatee's bankruptcy at end of year 9 would result in a security shortfall of Can\$600,000 (60% of the total reclamation costs).

Gradual accumulation of funds is amenable to industry as it allows regulatees to spread their reclamation costs across a number of years.¹⁵³ However, *on its own*, its acceptance by a regulator increases the risk (i) of a security shortfall and (ii) that regulatees will not perform reclamation as agreed. This could result in an inferior level of reclamation being performed, with a regulator's hand being forced into accepting this through the inability of the regulatee to finance the approved reclamation plan.¹⁵⁴ Or, it may be the case that no works are carried out where the regulatee becomes bankrupt. In either scenario, an indirect cost saving – the shortfall – is created. In both instances, the costs associated with unfulfilled obligations under the approved reclamation plan are 'externalized' upon a regulatee's financial deterioration or bankruptcy, contrary to the guiding *principle of restorative responsibility*. The exception here would be where there was an industry fund that would take on the financial responsibility for the reclamation obligations of a defunct regulatee. Such a fund may be financed through levies on regulatees in the sector, but there are precedents that these funds rely on loans from the government to aid their work and, therefore, are not advisable. The cash accumulation permitted under the *first* and *second-best options* provides an appropriate balance between managing abandonment risk and setting RSRs that do not place undue financial burden on regulatees.

5.3.6 The extension of responsibility to 'associated' companies

The Regulators may wish to consider a legislative provision which permits the extension of responsibility to a company (or companies) associated with the regulatee. For example, under section 105(2)(b) of the UK's Energy Act 2004, the appropriate Minister may give 'notice' to a body corporate 'associated' with a regulatee requiring a decommissioning programme to be submitted by them. And, utilizing the powers conferred under section 106(4), the appropriate Minister may require that it provides security in respect of the programme. One body corporate is 'associated' with another if one of them controls the other or a third body corporate controls both of them (s 105A(3)). The former would encompass a parent company or other majority shareholder. The latter would encompass a situation where companies X and Y were subsidiaries of Z. X and Y would be 'associated' for the purposes of section 105A(3). The notice may be served if the appropriate Minister is 'not satisfied that adequate arrangements (including financial arrangements) have been made by the responsible person to ensure that a satisfactory decommissioning program will be carried out' (s 105A(1)(b)).

¹⁵⁰ Eva Topham and David McMillan, 'Sustainable Decommissioning of an Offshore Wind Farm' (2017) 102 Renewable Energy 470, 477.

¹⁵¹ BEIS, Guidance notes for industry (n 121) [9.7.3] (emphasis added).

¹⁵² Mackie and Velenturf (n 113) 7.

¹⁵³ Ibid 8.

¹⁵⁴ Ibid 8.

The intention behind this power to 'extend' liability is to increase the likelihood that reclamation obligations are financed at private cost by widening the range of responsible persons. This may prove useful where the associated company's *available* assets are sufficient to cover the requisite level of security. However, its utility may begin to fade when it is utilized post-construction as there can be no assurance that they will be any better financed than the regulatee and they may, in fact, be facing similar financial pressures.¹⁵⁵ Its assets may already be secured to other debts or may have been transferred strategically and pre-emptively at an earlier date to another company, a simple and entirely lawful evasion tactic. The likelihood of this outcome may be considered high given the potentially large liability lurking in the background. We must, therefore, be pragmatic and realistic as regards the degree of comfort that we should take from the presence of such a power under any proposed legal framework.

Nevertheless, when these powers are used diligently and timeously, they may prove useful in responding to the increasing complexity of the ownership structures of power plants.¹⁵⁶ Many large energy projects may not be taken forward by a single, independent developer. The large scale of a project may result in the utilization of joint ventures between developers conducted through specifically created common service companies that will have no trading history. Thus, the emergence of fragmentation in the ownership of power plants may result in a growing number and range of organizations with whom the Regulators may be required to interact. The power described above could ameliorate the risks associated with fluidity in the ownership of a power plant by ensuring that sufficient security remains in place to fund the approved reclamation programme as and when required.¹⁵⁷ It should not detract from prioritizing implementation of effective, front-line RSRs by regulatees.

5.4 The Quantum of Reclamation Security

This subsection examines how the requisite amount of reclamation security ought to be calculated, including how this relates to the standard of reclamation. It explores whether the salvage value of the retired infrastructure ought to be permitted to be used to lower the value of the reclamation security to be provided by the regulatee. This, it is submitted, is central to the regulatory success of RSRs for power plants. The risk of abandonment associated with permitting the *regulatee* to calculate (i) the costs of reclamation and (ii) the salvage/resale value of retired infrastructure, will be highlighted, with the need for independent cost estimation/valuation core to an efficacious regime emphasized. It will be suggested that a concession (or discount) should be provided to investors that is directly connected to the value inherent in the energy infrastructure, as determined by an independent valuer in line with the proposed guideline. This provides a far safer, more stable means of empowering regulatees to comply with RSRs designed to minimize abandonment risk, in line with the *principle of restorative responsibility*, than enabling them to demonstrate their purported financial strength or use PCGs. Finally, the issue of the frequency at which the amount of reclamation security ought to be reassessed will be discussed.

5.4.1 Forecasting the costs of performing the approved reclamation plan

This subsection considers best practice in forecasting reclamation costs. It has been emphasized in this report that whilst improved utilization of RSRs is crucial to the sustainability of the energy sector, this will not *itself* be sufficient to ensure performance of the approved reclamation plan at the private cost of regulatees. As detailed above, if the reclamation cost estimate proves to be inaccurate, there will be a security shortfall that regulatees may, at short notice, be required to 'plug'. This may not be possible where their financial position is weak or their cashflow restricted. In such circumstances, they may be considered unlikely to have funds at their disposal to subsume the deficit or the third-party from whom the security product was purchased (e.g., in the case of a bank guarantee being utilized to satisfy the RSR, the bank) may be unwilling to increase the value of that product. There is also the alluring prospect of entering bankruptcy proceedings to offload expensive reclamation obligation. The experience of other sectors, such as coal mining, indicates that the prospect of regulatees bearing their reclamation obligations in full may be low. Nevertheless, some regulatees will, for the time being at least, have a direct interest in remaining active and trusted in the market. They may, therefore, be incentivized to

¹⁵⁵ Ibid 3.

¹⁵⁶ Ibid 4.

¹⁵⁷ Ibid 4.

reduce the prospect for the reputational damage that may arise from failing to meet their reclamation obligations and limitations in terms of applications for future licenses that this may cause.

It is recommended that the Regulators utilize the cost estimate, with the requisite methodology being set out in the proposed guideline, relating to the approved reclamation plan to determine the level of security to be provided. Plans ought to be reviewed at 5 yearly intervals, and regulatees must be legally required to modify the level of security provided where the review indicates that the current amount is insufficient to meet their obligations or there is a significant risk of default.

It has been emphasized that any improvement in the utilization of RSRs must be coupled with the acquisition by regulators of the granular detail of the costs that arise upon, and following, performance of the plan. Currently 'hidden' costs must be exposed. The effort expended will be rewarded by greater protection of public funds and ensuring a more concrete application of the *principle* of restorative responsibility, as articulated in this report. This said, reclamation costs are widely recognized as difficult to estimate reliably, particularly where a sector is relatively nascent (e.g., onshore wind and solar projects), there is a lack of experience in undertaking large-scale reclamation projects, and there is an array of variables, including costs of equipment, tools, and techniques used to carry out the reclamation.¹⁵⁸ These factors go to the very heart of constructing a reliable, defensible estimate. Whilst parts of the reclamation process will continue to be significantly under-costed, other parts risk continuing to be entirely uncosted. Regulatees have little commercial incentive to estimate reclamation costs accurately, at least not for costings that must be passed to the regulator.¹⁵⁹ The greater the estimated cost, the greater the level of reclamation security that is likely to be required from them by the regulator. The greater the level of security required, the greater the financial burden that they must shoulder. Thus, in situations of uncertainty – and costing *is* currently uncertain at present – regulatees may place their estimate at the lower end of the spectrum to alleviate this burden.¹⁶⁰

Whilst a regulator often reserves a right to obtain an independent audit of a cost estimate,¹⁶¹ currently an auditor may, given the above factors, struggle to challenge all but the most obvious underestimations. The prospect of this is noted in the NSW EPA's guidelines for estimating reclamation costs for renewable energy projects. This provides that if the auditor cannot perform an audit on a cost estimate, such as when they have concerns about particular aspects of the cost estimate (e.g., whether or not all cost items are actually included), the regulatee should contact the EPA and discuss whether an alternative independent assessment, such as a 'verification', is acceptable.¹⁶² Essentially, a verification involves an auditor performing procedures that the regulatee, the auditor and the EPA agree on so that it can provide factual findings on the cost estimate.¹⁶³

The prospect for potentially deliberate under-costing may be expected to reduce as experience grows and as regulators acquire greater levels of intelligence in relation to completed reclamations as to the *actual* costs incurred by regulatees.¹⁶⁴ This will take time. Two strategies may be employed to facilitate this at greater speed. First, a condition could be imposed under *new* permits, licenses or other authorizations requiring regulatees to forward to the regulator a report providing, inter alia, a detailed cost breakdown for the reclamation works once complete. A failure to do so would be an offence. Unless the terms of an *existing* permit, license or other authorization could be varied to achieve the same result, reliance would need to be placed on regulatees volunteering this information once they were privy to it. If a culture of openness and data sharing can be embedded by regulators, the prospect of this materializing is enhanced. Academia may have a role to play. For instance, it could assist regulators in collating costings from completed reclamations – or precedents – to populate a publicly available benchmarking database that could aid both industry and regulators (and, potentially, those in other provinces/territories) when submitting and reviewing costings respectively. This would maintain

¹⁵⁸ Ibid 8.

¹⁵⁹ Mackie (n 23) 518.

¹⁶⁰ Mackie and Velenturf (n 113) 7.

¹⁶¹ See, e.g., Germany's governance of offshore wind projects under the Offshore Wind Energy Act (WindSeeG 2017), specifically 'Annex to s 58(3)', s 3.

¹⁶² NSW EPA, Estimating Financial Assurances: Guideline on Independent Assessment of Costs (May 2022) 7 and 14 <<u>https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/licensing/22p3730-estimating-financial-assurance-guideline.pdf?la=en&hash=54F45176722803325C89254125C40D016551EECA</u>> accessed 5 November 2023.
¹⁶³ Ibid 14.

¹⁶⁴ Mackie and Velenturf (n 113) 8.

independence and objectivity. Regulators in other provinces/territories may do the same, with information being shared. There would be a corresponding obligation upon regulatees to show that these precedents had been adopted in their cost estimates. Or, where not, an explanation as to why.

Second, the Regulators may wish to consider investing time and resources in developing pro forma cost calculators that regulatees (or their consultants) would need to populate, in line with a guideline on financial assurance, and send to the regulator (i) upon submitting their application for a new permit, license or other authorization and/or (ii) at regular intervals during the life of the project. It is important that much of the core content of these spreadsheets is of standardized format, where possible, to enable probing and ready comparison with costings provided by other regulatees. It is, however, clear that all projects are, to a degree, different, meaning there must be flexibility in how these costs can be constructed. The key point to emphasise is that standardization permits *comparison*. Differentiation will not. Whilst development of these cost calculators may take time and require capital investment, they have genuine potential to operate, alongside utilization of 'safe' instruments, as the principal means through which the sustainability of the electricity sector in Alberta is enhanced/ensured. To put it in perspective, the bankruptcy of a single regulatee could, where the RSR was too low due to a wholly inadequate reclamation cost estimate, cost the Alberta taxpayers millions of dollars. The deployment of a fraction of this sum, to enable standardized, transparent and comparable approaches to reclamation costing in the sector could have helped to avoid such a result. In designing this spreadsheet, the Regulators could learn from how other jurisdictions, such as England and states in Australia, had built their spreadsheets. Examples of these cost estimate spreadsheets, including the 'Sample format for preparing the cost estimate – shut down and decommissioning and closure/rehabilitation phases' issued by the EPA of NSW, the 'Estimated Rehabilitation Cost (ERC) calculator' created by Queensland's Department of Environment and Science, and the 'Cost breakdown example template' provided by BEIS, is provided via links in Table 3. Cost estimates should be Excel-based (or equivalent) so they are readily accessible by regulators, regulatees, consultants, and other stakeholders (e.g., interested members of the public). These completed cost calculations should be publicly available via the regulator's website. With time, rigorous use of standardized cost calculators and use of intelligence gathered from completed reclamations will engender a clearer, more detailed understanding of costings.

If the Regulators were to take responsibility for checking costings presented by regulatees, their employees must have the requisite skills, knowledge, and experience to undertake the task of accurately and independently estimating the cost of performing reclamation obligations.¹⁶⁵ If this was not currently the case, then either existing staff would need to be retrained and redeployed to costing teams or new staff, with the requisite skills and experience, must be employed.¹⁶⁶ They must also have access to the necessary information and most advanced tools for collating and analysing information. There will be a cost associated with them. This could be covered by charging fees for costs to be reviewed by the regulator. If inexperienced employees reviewed costings, their decisions may be misguided; some regulatees would be prevented from entering the market owing to an excessively high costing, whilst others may be permitted to enter the market when costs are underestimated. This real risk must be avoided if abandonment risk is to be reduced and Alberta's economic competitiveness maintained.

It may be that the data and experience needed to arrive at an accurate estimation, and to do so at the speed and scale necessary to avoid bottlenecks in applications, is more likely to be present in the private sector.¹⁶⁷ Specialist consultants may possess the requisite expertise. This raises the question of who pays the consultant and whether they then have an incentive to work to client expectations.¹⁶⁸ There is a risk that they could be co-opted by the regulatee, compromising their professional integrity and independence. There are a variety of solutions to remedy such concerns. These could include (randomized) nomination by the regulator from a pool of accredited consultants, with the assessment being financed through a fee being charged for the processing of reclamation plans, and not by the regulatee directly. There may also be criminal sanctions for fraudulent assessments.

¹⁶⁵ Ibid 7.

¹⁶⁶ Ibid.

¹⁶⁷ Colin Mackie, 'The Regulatory Potential of Financial Security to Reduce Environmental Risk' (2014) 26(2) Journal of Environmental Law 189, 206.

¹⁶⁸ Ibid.

The capacity of private sector consultants to function as neutral outsiders may, if the possibility of co-option is controlled, confer a high degree of objectivity in the cost estimation process.¹⁶⁹ The regulator will still have a role to play in gauging the relative adequacy of the estimate and giving final approval.¹⁷⁰ Whilst they may not hold the requisite expertise to scrutinize the result, as detailed above, the passage of time may permit them to collate a database of precedents against which the reasonableness of a calculation may be benchmarked. In any event, enhancing the numbers, skills, and experience of those tasked with reviewing submitted reclamation costings will be crucial. Incentives could be provided by regulators to encourage engineers and quantity surveyors to undertake further training/qualifications in costing, thereby increasing the pool of talent to undertake this crucial task.

5.4.2 The role of salvage and resale value in RSRs

This sub-section considers the role that the salvage and resale value of the retired infrastructure ought to play in determining the amount of reclamation security to be provided by the regulatee. This, in the author's view, is central to regulatory success of RSRs for power plants in Alberta. Sensitivity to the value in the infrastructure provides a counterbalance to the increased (albeit not new) costs that will be imposed upon regulatees (and associated companies) because of the measures proposed in this report. It provides one important, relatively low risk, transparent means of ensuring that energy investors are not repelled from Alberta due to a perception that its RSR regime is overly stringent. It is intended to function as a concession (a security 'discount') to empower regulatees to utilize productively the value that may be inherent in their project's infrastructure, with independent valuations ensuring objectivity.

The Regulators may wish, subject to the caveats below, to consider enabling regulatees to use up to 50% of the estimated scrappage/resale value of the infrastructure to reduce the level of security that they are required to provide. A maximum of 50% would leave sufficient headroom for a substantial decline in these values. The problems with enabling a regulatee to estimate the value themselves would be addressed by only permitting an *independent* valuer, whose services would be subcontracted directly by the regulator from a pool of registered valuers but paid for by regulatees that wished to utilize scrappage/resale value to reduce their plant's RSRs. The valuation could be provided anonymously to prevent co-option. The guideline on reclamation security called for in this report might comprise rules or standards against which to conduct the valuation. All valuations would be collated and populated in a benchmarking database. In time, it would be expected that comparables could aid the generation of accurate valuations. In order to facilitate a truly effective system, the Regulators might consider requiring regulatees, upon completion of their reclamation obligations, to submit evidence (e.g receipts) to them detailing the value *actually* recovered in scrappage/resale from the infrastructure. This would then be reflected in the benchmarking database and valuers would be required to incorporate these into their estimations/valuations or make it clear why they believed that it was not appropriate to do so. The valuations must be repeated at regular intervals, with 5 yearly, valuations in line with global precedents.

With this recommendation in mind, we will now turn to the risks associated with enabling *regulatees* being permitted to estimate their own salvage/resale values, something that should not be permitted. Indeed, as we saw in Chapter 4, several regulatory frameworks were silent on whether salvage values were to be estimated independently or by the regulatee themselves.¹⁷¹ This silence would suggest that valuations may be permitted to be undertaken by the regulatee. Indeed, determining whether security was needed and, if so, its value, based on the salvage/resale values of wind turbines provided by developers was common in the approach taken by LPAs in England's onshore wind sector.¹⁷² The commentary below is intended to warn of the risks of overreliance on the use of salvage/resale value in determining (i) the need for RSRs, and (ii) if RSRs are needed, the amount of security to be provided. It is submitted that regimes whose RSRs strategies are *entirely* reliant on the value inherent in the infrastructure, such as England's onshore wind sector, are misguided and expose

¹⁶⁹ Ibid 211.

¹⁷⁰ Ibid.

¹⁷¹ For example, under Connecticut's governance of the decommissioning of onshore wind projects, through Conn. Agencies Regs. § 16-50j-94(i)(5), 'an estimate of the total cost of implementing the decommissioning plan' must be calculated by a 'certified professional engineer', with this estimated being 'based on the projected useful life and the projected salvage value of the facility'. It does not make clear whether the engineer may be an employee of the regulatee/applicant.

¹⁷² Mackie (n 23) 518.

agricultural and other high value lands to the risk of sterilization and viewscapes being impacted unless public funds are deployed to reclaim the site in the event of the regulatee's default.

5.4.2.1 The role of the 'net' reclamation cost

There will often be significant monetary value in certain energy infrastructure once retired, such as in the copper and steel salvaged from decommissioned wind turbines or solar panels. There will also be potential resale value in the growing second hand market for infrastructure (e.g., second hand turbines or solar panels) and for specific components of it, such as nacelles, blades and blade bearings. This value is often captured in the regulatory use of 'net' reclamation cost. This is the difference between two estimates usually provided by an applicant for a permit, license or other authorization at the application stage: (i) reclamation costs (plus associated expenses, such independent verification); and (ii) the infrastructure's salvage or resale value. For example, if an applicant estimates that reclamation will cost Can\$60,000 per wind turbine and claims that Can\$40,000 can be recouped from each turbine through a combination of scrappage and resale of certain components, the (negative) net reclamation cost would be Can\$20,000 per turbine. There will be a neutral value where the scrappage/resale value equals the estimated reclamation cost and a positive one where the former exceeds the latter.

The concern is that where regulatees are permitted to estimate the net reclamation cost there is an inherent financial incentive for them to underestimate reclamation costs, overestimate scrappage or resale value or do both.¹⁷³ The closer the net cost is to zero, the more beneficial that this is to them as it will strengthen their claim that security is unnecessary or, if it is to be mandated, its amount should be low. The not insignificant cost burden, which they would otherwise shoulder had they been required to purchase an instrument to cover the whole or part of the cost of reclamation or make cash deposits, is alleviated. Where estimates are manipulated, the true net reclamation cost may be larger than expected, resulting in the prospect of regulatees failing to perform reclamation if the 'deficit' cannot be financed.¹⁷⁴ The regulator may then need to 'step in' to the shoes of the regulatee to undertake the works and would likely seek to recover value from the infrastructure in salvage and/or resale. This prospect is catered for under Queensland's governance of electricity generation using gas or other fuel under the EPA 1994. The document, *Guideline: Financial assurance under the Environmental Protection Act 1994*, provides that the estimated total rehabilitation (reclamation) cost must incorporate the regulator's project management costs, which reflects the costs to the government to project manage, schedule or oversee the works, with 10% of the total rehabilitation liability being the recommended figure.¹⁷⁵

However, as a 'one off' (or rare) participant in the scrap market or market for, for example, retired turbines or their component parts, the regulator may have the same network of contacts that a 'repeat player' (e.g., wind farm owner) may have at their disposal to secure an optimal recovery of value from the infrastructure. The sum recouped from the infrastructure's salvage or resale value by the regulator may, therefore, be quite significantly lower than the regulatee may be able to recoup itself. A regulator may, as a result, be advised to appoint a specialist private contractor to act on their behalf to recoup a higher level of value. This will come at a cost to it. There will, for example, be the contractor's project management costs, other administrative expenses associated with this and payment of relevant taxes, with each of these overheads reducing the sums that may be recouped through this process. It may, therefore, be prudent to mandate incorporation of a project management fee in cost estimations.

RSRs that are limited to coverage of net reclamation costs conceptualize the infrastructure as an *asset* capable of facilitating productive cost internalization: value realised from salvage/resale can help pay for the costs associated with reclamation.¹⁷⁶ The obvious point, however, is that reclamation must take place before the value inherent in infrastructure can be realised through sale or salvage, meaning there may be some delay in recouping it. This aside, the argument would run that reclamation security will be unnecessary as the regulatee is considered to be sufficiently incentivized to perform reclamation for it would be 'irrational' for it to 'walk away' from such an asset.¹⁷⁷ This assumes either a neutral or positive net costing. If, however, the salvage/resale value was less than the estimated

¹⁷³ Mackie (n 23) 518.

¹⁷⁴ Ibid.

¹⁷⁵ DES (n 120) 22.

¹⁷⁶ Mackie (n 23) 518.

¹⁷⁷ Ferrell and DeVuyst (n 89) 110.

reclamation costs, security should be required to cover the 'deficit' to keep the incentives of regulatees 'aligned' with the goal of the regulator: that reclamation takes place on time and as agreed, at private cost.¹⁷⁸ They may not, otherwise, be incentivised to perform reclamation, especially if those costs could be externalized through strategic entry into bankruptcy proceedings at a time convenient to them.

5.4.2.2 The volatility of salvage/resale values

A RSR strategy built on covering net reclamation costs is a regulatory judgement with known abandonment risk.¹⁷⁹ The degree of abandonment risk may correlate closely with the degree to which the salvage/resale value is permitted to reduce the actual level of security to be provided by the regulatee. The higher the value permitted, the higher the risk there will be insufficient funds available. The issue is that there is uncertainty as to how much reclamation will cost and how much value may be recouped. Whilst the infrastructure *will* have a salvage value, it is notoriously volatile.¹⁸⁰ It will be difficult to predict with accuracy what it will be in 25 years or so. Nevertheless, in England – and it would be expected in other jurisdictions – it is often presented by applicants, and understood by some regulators, as covering most, if not all, of the project's reclamation costs.¹⁸¹ Even the UK Government, when costing electricity generation for onshore wind, somewhat unhelpfully adopts the 'simplifying assumption' that decommissioning costs are *equal* to the infrastructure's scrap value.¹⁸² This certainly is a simple assumption but it is an inherently unstable one given the risks that it involves. Inexperience in the reclamation of power plants in many jurisdictions means that actual levels of value recouped from infrastructure are poorly understood. There are just not the precedents yet to prove it convincingly.

It is of note that 'net' costing is not permitted to inform bonding practices in relation to the offshore renewables sector in England and Wales. BEIS' guidance states that whilst developers may assume that scrappage will reduce net decommissioning costs for their internal rate of return calculations, '[d]evelopers/owners should not offset scrappage value from their total cost assumptions' as 'BEIS does not consider that it is appropriate to rely on estimates of scrap value as a form of security *because the value can fluctuate substantially and therefore is not reliable*.'¹⁸³ The most likely explanation for the differential practice is that in contrast to onshore wind, the UK Government is the 'decommissioner of last resort' for offshore wind infrastructure.¹⁸⁴ It is, therefore, incentivized to ensure that public funds are protected through taking a more precautionary approach to security requirements. This comprises the creation of an explicit statutory power to require security and the publication of a detailed guidance document for industry that covers security provision. If 'net' costing is deemed too risky for the UK Government, it is not clear why it should be a risk that local communities must bear.

We saw from the comparative study of RSRs in Chapter 4 that a number of frameworks permitted salvage/resale value to be deducted from the estimated reclamation costs for the purposes of determining the requisite level of security.¹⁸⁵ For these frameworks, the scope of RSRs is limited to covering a project's 'net' reclamation cost. In England's onshore wind sector, for example, the rarity with which security is required suggests that LPAs view the infrastructure as capable of securing performance of reclamation or at least the bulk of it. The infrastructure could even be conceptualized as a *quasi-bond* of sorts, i.e., an asset of fluctuating value that acts as a kind of *informal* security should reclamation be defaulted on by the regulatee. Indeed, in England, the provision of formal security (i.e., a bank guarantee) is often a peripheral regulatory tool. Conditions imposing reclamations requirements under planning permissions, and the LPA's powers of enforcement against the quasi-bond in the event

<https://www.gov.uk/government/publications/beis-electricity-generation-costs-2020> accessed 5 November 2023.

¹⁷⁸ Ibid 112.

¹⁷⁹ Mackie (n 23) 518.

¹⁸⁰ William Stripling, 'Wind energy's dirty word: decommissioning' (2016) 1 Texas Law Review 95, 134.

¹⁸¹ Mackie (n 23) 518.

¹⁸² BEIS, *Electricity Generation Costs 2020* (August 2020) 18 (emphasis added)

¹⁸³ BEIS, *Guidance notes for industry* (n 121) 31 (emphasis added).

¹⁸⁴ United Nations Convention on the Law of the Sea (UNCLOS), Arts 60(3) and 80.

¹⁸⁵ Municipality of the County of Colchester, Nova Scotia (Chapter 56 Wind Turbine Development By-law, s 2.7) (onshore wind); England (Town and Country Planning Act 1990, ss 70 and 106) (onshore wind); US (Federal Land Policy and Management Act of 1976 (FLPMA) and Title 43 Subtitle B Chapter II Subchapter B Part 2800 Subpart 2805 § 2805.20(a)(3)) (wind and solar projects on US federal land but outside of designated leasing areas); Connecticut, US (Conn. Agencies Regs. § 16-50j-94(i)(5)) (onshore wind); West Virginia, US (The West Virginia Wind and Solar Energy Facility Reclamation Act, §22-32-4(f)); and Tennessee, US (Tenn. Code § 66-9-2079(a)(1)) (onshore wind and solar projects).

of their breach,¹⁸⁶ are the primary one. This may comprise the regulator entering the site, performing reclamation, and then recovering its costs by recouping salvage/resale value from the retired, now decommissioned infrastructure. That plan of action, utilized in respect of 84.4% of the 275 English onshore wind projects examined in an empirical study of RSRs in the sector, is unregulated as there are no 'rules' to determine the quasi-bond's value.¹⁸⁷ It also an inherently unreliable one given (i) incentives to inflate it artificially to reduce the cost burden and (ii) the volatile nature of its value.¹⁸⁸ These factors limit the capacity of the quasi-bond to facilitate performance of reclamation. The advantage is it comes with a reduced (or no) long-term cost burden for regulatees, which they will welcome, and it also beneficial to a government intent on expanding capacity to generate electricity from renewables.¹⁸⁹ It may, however, be concluded that, in England and, indeed, in many of the jurisdictions which permit the use of net reclamation costs to inform security values, the reduced abandonment risk afforded by RSRs has been sacrificed deliberately, to enable lower entry costs for market participants.

An issue of importance to the proper treatment of salvage/value has emerged in England. There, the ability of regulatees to finance reclamation of onshore wind projects has been called into question. In 2015, concerns were raised in Parliament that some could be abandoned.¹⁹⁰ Shell companies, with weak financial standing, were being used.¹⁹¹ The subsidiary's balance sheet would comprise the project's physical assets but this was offset by a large loan from a parent company, resulting in a net liability.¹⁹² If the loan from the parent is secured against these assets (i.e., the infrastructure), the parent will be the primary (and, potentially, sole) beneficiary of the salvage/resale value. Regulators should be aware that this type of practice may take place, meaning that any assertion by the regulatee that there is a high level of value in the retired infrastructure is somewhat empty. The next step would be to establish whether any other party had security registered against the asset(s). Regulators would, if they were to permit salvage/resale to reduce the level of security, need to take further steps to ensure that security could not subsequently be taken over the assets by any other party unless the regulator approves.

5.5 Constructing a Mandatory RSR Regime

In this section, a variety of arguments that may be put forward by stakeholders in relation to the construction of a mandatory RSR regime are considered and, ultimately, rejected.

5.5.1 A gradual approach

A mandatory RSR regime could be introduced gradually. A timeline for implementation could be set with those power plants whose abandonment would be most controversial in society (e.g., due to their impact on pristine rural viewscapes) being introduced first. An order of sectoral/sub-sectoral priority and a timetable for the publication of legislation and guideline that will dictate RSR requirements for each sector/sub-sector could be set out. Alternatively, RSRs could only be required for specified regulated activities, with those evidencing the highest levels of reclamation costs being prioritized first. The mandatory regime could then be extended at a future date.

A gradual approach exhibits a number of benefits. First, it permits regulatory efforts to be focused upon the activities which are deemed most problematic by the regulator. This may be seen as an effective use of limited regulatory resources. Secondly, successful implementation of mandatory RSRs for these activities will ensure that the requisite funds are available for the most troublesome power plants. Thirdly, it allows a mandatory regime to develop organically and for difficulties to be resolved over time, including around the accuracy of costings, and independent verification, of approved reclamation plans. Indeed, complete implementation of a system could take a number of years.

¹⁸⁶ Town and Country Planning Act, ss 179(1) (enforcement notice) and 187A(2) (breach of condition notice).

¹⁸⁷ Mackie (n 23) 519.

¹⁸⁸ Stripling (n 180) 134.

¹⁸⁹ Rebecca Windemer and Richard Cowell, 'Are the impacts of wind energy reversible? Critically reviewing the research literature, the governance challenges and presenting an agenda for social science' (2021) 79 Energy Research & Social Science 102162, 5.

¹⁹⁰ HC Deb vol 598 col 1384 21 July 2015.

¹⁹¹ ibid.

¹⁹² ibid.

This could give both industry and regulators time to acclimatize to a new system and allow for security products to be prepared and tailored for when they will be required industry wide.

There are, however, drawbacks with such an approach. First, if the most troublesome activities are deemed a regulatory priority, it will delay the requirement for a significant proportion of industry to provide security. It, therefore, fails to ensure that *all* regulatees can 'pay' for their reclamation obligations. Secondly, the longer the time taken to implement the reclamation security system fully, the greater the prospect that unfulfilled reclamation obligations will arise in the interim. This report has emphasized the wider societal, political and economic impacts associated with these types of strategies.

It is submitted that given the array of legal frameworks, including associated guidelines/guidance, that mandate RSRs for power plants, there is a wealth of precedents upon which to build an effective RSR regime in Alberta and so a gradual approach may not be considered necessary.

5.5.2 Exemptions for certain regulatees

An additional or alternative measure could be to exempt regulatees from coverage where the risk of default was low, such as where there were deemed to be high levels of salvage value in the infrastructure once retired. Or it may, for example, be argued that it would be disproportionate to mandate RSR for all regulatees who operate a power plant at a small scale. Various factors could be used to determine the level of risk: the estimated costs of the reclamation obligations or the specific activity being carried out (e.g., 'small scale' wind or solar projects). There could be certain exemptions, such as regulatees who operate power plants likely to have estimated, independently audited, reclamation costs of <Can\$250k.

Exceptions, such as these, could offer a number of benefits. First, a significant barrier to mandatory RSRs arises from the contention that it would have a disproportionate impact on small businesses.¹⁹³ By exempting regulatees whose reclamation liabilities are deemed low to moderate, a mandatory regime need not favour the largest regulatees. Secondly, an approach could be deployed whereby a straightforward implementation was adopted whereby regulators need not examine the individual circumstances of each regulatee beyond their possession of a (verified) cost estimation.

However, exceptions may have detrimental effects, including increased abandonment risk. If the exclusion of low risk regulatees is viewed as an option distinct from a gradual approach then it may be viewed as permitting an excessive level of risk to remain externalized. To take a practical example, ten regulatees each with liabilities of Can\$249,999, and so just below the threshold for mandatory RSRs, amounts to a not insignificant sum which would be externalized where the regulatees possessed insufficient assets to finance performance of reclamation from their own funds.

5.5.3 Minimum levels of security

RSRs may be categorised as standard or responsive. Requiring all regulatees in the sub-sector to hold the same level of reclamation security, such as specified level of funds in an escrow account, would be an example of a standard RSR system. Statutorily imposed minimum standard RSRs are, invariably, set at a somewhat arbitrary level. Responsive systems gain their 'responsiveness' from the fact that they are directly related to the estimated cost of the regulatee's reclamation obligations (and associated expenses) The RSR could, for instance, reflect, for instance, the regulator's best estimate of the costs associated with a third party's performance of the approved reclamation plan. A third party's costs may be included in the calculation given that they may need to be appointed if the regulatee is bankrupt. Responsive RSRs increase or decrease in line with revisions to the cost estimate, providing market-based incentives for regulatees to reduce their reclamation obligations through enhanced design, efficiencies or enhanced technological processes. As the indirect costs associated with depositing the assets, particularly the degree of liquidity constraint, is likely to be proportionate to the RSR, there is a strong incentive to reduce reclamation costs where this may lead to a reduced RSR.

A mandatory RSR regime could require regulatees to maintain a minimum level of security. The regulator could, as is in France and on federal land in the United States, specify an *industry-wide* minimum amount of reclamation security which must be provided (e.g., Can\$50k per 2MW turbine).

There are distinct difficulties associated with setting minimum levels of coverage. If an industry-wide minimum is specified, the amount will either be too large or too small as one size does

¹⁹³ Boyd, Financial Responsibility (n 31) 27.

not fit all. If the requirement is set at too high a level, 'this will impede new entry and permit the existing firms to charge monopoly prices'.¹⁹⁴ The *true* level of security necessary for any given regulatee can, of course, only be determined once reclamation has actually taken place. Coverage levels that are too high may be seen as inefficient uses of resources given that they tie up capital which could be used elsewhere but provide no further social benefit.¹⁹⁵ Conversely, where coverage is too low, it will neither guarantee performance of reclamation or the productive internalization of the costs associated with the regulatee's reclamation obligations that must take place. The regulatee will, however, continue to be liable for the costs of reclamation even where this exceeds the minimum level of reclamation security. And if the regulatee were to enter bankruptcy, the net of liability under a framework could extend to parent or affiliate companies. However, as detailed above, it is an open question whether the cumulative assets of all liable parties could be drawn upon to meet the liability. This is far from guaranteed.

5.6 Drawing Upon Reclamation Security: when, how, and whom

This subsection will consider when and how the reclamation security may be drawn upon, if needed, and by whom. Recommended constraints on such access will be detailed.

The security should be provided directly to the regulator, as opposed to the landowner, as this will maximise the prospect of its preservation in the event of the financial demise of both the regulatee and the landowner. Where the regulatee has provided cash to the regulator, the regulatee ought to be permitted to withdraw it upon the production of evidence (e.g, provision of invoices) that they will utilize those funds for reclamation. They should also be required to demonstrate, through provision of contractor estimates, that any remaining funds will be sufficient for the residual infrastructure to be removed. Regulators may, in line with BEIS' practice, wish hold back some funds pending completion of a satisfactory post-reclamation report. This is to cover the risk that further works may be required. For these regulatees, the period of liability ought to end when the regulator determines that they have met all of their obligations under the permit, license or other authorization. If so, any security held by the regulator, after payment of the full cost of the works, will be returned to the regulatee.

If, however, at the end of the operational life of a power plant, whether this is due to the project coming naturally to the end of its permitting period or due to the bankruptcy of the regulatee, the regulator does not believe that the approved reclamation plan has been carried out in all respects, then it should be obliged to write to the regulatee requiring them, or their appointed representatives, to take the steps necessary to do so, at their own cost, within a specified period of time. The regulatee may seek a reasonable extension of this time period, not to be unreasonably refused by the regulator. If the regulatee does not complete the approved reclamation plan as requested, and within the specified time period, the regulator ought to be permitted to enter the land to take the necessary steps, on behalf of the regulatee, to ensure that the approved reclamation plan is fulfilled. The regulator would be permitted to utilize the reclamation security provided by the regulatee to perform these works. If the amount of the reclamation security is not sufficient to finance the regulator's performance of the works, the regulatee will remain responsible for the outstanding costs and those sums should be payable upon the demand of the regulator. The regulator would be permitted to recover those costs from the regulatee, including through instigating legal proceedings, if necessary. Any outstanding sums could be secured against the asset(s) of the regulatee, in the form of a first ranking charge. The regulator would possess a power of sale over the asset(s) secured by the charge which it may invoke to recover the sums that it had incurred.

The security provided ought to be made available to the regulator as a priority. The Regulators may wish to consider granting the landowner access to the security to perform the reclamation obligations of a regulatee that has defaulted on them. To do so would reduce the need for the regulator to carry out the works itself, relieving it of the burden, in time and resources, of doing so. It would, however, create the risk that the landowner might, in turn, go bankrupt after receiving the funds with the consequential result that the security that had been provided by the regulatee would disappear.

¹⁹⁴ Frank Easterbrook and Daniel Fischel, 'Limited Liability and the Corporation' (1985) 52 University of Chicago Law Review 89, 114.

¹⁹⁵ Boyd, Financial Responsibility (n 31) 37.

6 Conclusion

This report provided considerations for implementing RSRs for power plants in Alberta. Its focus was on the use of reclamation security as part of the regulatory review process of applications for new power plants. It examined the academic literature on the role and function of RSRs and manner in which they are deployed in legal frameworks and policies of regulators and governments in respect to wind, solar, thermal, and hydroelectric power generation across the globe. Regulatory frameworks providing for RSRs in Australia, Canada, England & Wales, France, Germany, Sweden, New Zealand and the US were selected to elucidate best practice and to illustrate the wide range of options available.

It was recommended that an explicit legislative power for the Regulators to impose RSRs for power plants in Alberta ought to be enacted. The Regulators may wish to consider focusing and constraining the discretion that such a power would confer upon them. They may do so through drafting a dedicated guideline on reclamation security for power plants, along the lines set out in this report. This would take a prescriptive approach to cost estimation, acceptable instruments to satisfy the RSRs and means of accumulating security deposits. It would seek to maximise the prospect of reclamation being performed by the regulatee whilst affording important concessions to investors in Alberta.

When constructed thoughtfully and with foresight, RSRs can play a critical role in establishing how and when approved reclamation plans are to be funded, what should happen to the funds, who should have access to them, and when access should be granted. They possess unique regulatory potential to exert control over the way reclamation is to be financed through law. Without that control, the regulatee may not be sufficiently motivated to set aside funds sufficient to ensure reclamation takes place. However, when designed poorly, or where RSRs are not mandated, then where a regulatee defaults on their reclamation obligations, the costs are, invariably, passed to society and the environment (i.e., they are 'externalized' by the regulatee). This a form of indirect state subsidization. The regulatee has been permitted to placed energy on the market without bearing the true social cost of its generation. These costs should, from a fairness and an efficiency perspective, have been internalized by them.

Furthermore, it was emphasized that in designing RSRs, regulators face an inevitable tradeoff. First, stringent RSRs create a direct and, potentially, indirect cost burden that could harm the economic competitiveness of Alberta. Other things being equal, regulatees in jurisdictions with stringent RSRs will be at a competitive disadvantage to those in jurisdictions with lax ones (or where none exist) owing to the higher compliance costs of the former. This may impact on an investor's decision in relation to the jurisdiction (e.g., province, territory, state or country) that they will invest in. It was demonstrated that it was important to search for concessions for investors that would strike that optimal balance between (i) ensuring that reclamation was performed at the private cost of the regulatee, on time and as requested, and (ii) enabling regulatees to utilize value inherent in their infrastructure and/or to spread the costs of providing security. Whilst instrument choice and independent cost calculation was essential to ensuring reclamation takes place, the ability to reduce the security provided by a specified percentage of the scrappage/resale value of the infrastructure and spreading payments over a 10 year period was crucial to creating a regulatory environment that was appealing to investors.

Ten recommendations were made to ensure an effective implementation of RSRs:

Recommendation 1: an overarching, guiding principle, the *principle of restorative responsibility*, ought to function as the normative foundation for the design of RSRs for power plants in Alberta.

Recommendation 2: the creation of (i) an explicit legislative power for the Regulators to require RSRs for power plants, and (ii) a detailed guideline, *Reclamation Security Requirements for Power Plants*, that would help to inform their discretion when imposing RSRs.

Recommendation 3: the guideline ought to articulate the methodology for calculating reclamation costs, with pro forma, cost calculators to be used by independent cost consultants.

Recommendation 4: the scrappage/resale value of the infrastructure may be used to reduce the amount of security to be provided to a maximum of 50% of that value, provided it was independently derived.

Recommendation 5: The Regulators ought to collate costings from, and recouped value following, completed reclamation plans to populate a publicly available bench-making database for regulators, regulatees and independent cost consultants to utilize.

Recommendation 6: a bank guarantee to be used initially as funds accumulated in an escrow account across years 0-9 of the plant's life to achieve the appropriate target sum in a segregated capital reserve.

Recommendation 7: if a regulatee could demonstrate 'undue financial hardship', it could default to second-best options e.g., cash payments to commence at a slightly delayed start date (e.g., year 4).

Recommendation 8: 'financially strong' regulatees must not to be given latitude as to (i) the instruments they may use to satisfy RSRs and (ii) the period over which funds must accrue.

Recommendation 9: regulatees ought, with the prior approval of the regulator, to have access to the reclamation security to perform the works. A regulator would be granted access to that security if the regulatee failed to perform the works within a specified period.

Recommendation 10: regulators ought to have the power to take a 'first ranking' charge over a power plant if, upon the regulatee's default on its reclamation obligations, the regulator chooses to perform the works.

Bibliography

Arnold, Z., 2017. Preventing Industrial Disasters in a Time of Climate Change: A Call for Financial Assurance Mandates. Harvard Environmental Law Review. 41, 243–296.

Ashford, N., Caldart, C., 2008. Environmental Law, Policy, and Economics: Reclaiming the Environmental Agenda. MIT Press.

Beecher-Monas, E., 2003. Enron, Epistemology and Accountability: Regulating in a Global Economy. Indiana Law Review. 37, 141–211.

Department for Business, Energy & Industrial Strategy (BEIS), 2020. Electricity Generation Costs 2020. Available from: https://www.gov.uk/government/publications/beis-electricity-generation-costs-2020 (Accessed 5 November 2023).

BEIS, 2019. Decommissioning of Offshore Renewable Energy Installations under the Energy Act 2004 - Guidance notes for industry (England and Wales). Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/916 912/decommisioning-offshore-renewable-energy-installations-energy-act-2004-guidance-industry__1_.pdf. (Accessed 5 November 2023).

BEIS, 2018. Consents and planning applications for national energy infrastructure projects; guidance on regulations covering new power generating plants and wayleaves (last updated Sept. 6, 2018). Available from: https://www.gov.uk/guidance/consents-and-planning-applications-for-national-energy-infrastructure-projects. (Accessed 5 November 2023).

Booth, P. 2016. Planning and the rule of law. Planning Theory & Practice. 17 (3), 344.

Booth, P. 2007. The control of discretion: planning and the common-law tradition. Planning Theory. 6 (2), 127

Booth, P. 1996. Controlling Development: Certainty and Discretion in Europe, the USA and Hong Kong. London: UCL Press.

Boyd, J. 2001. Financial Assurance Rules and Natural Resource Damage Liability: A Working Marriage? Resources for the Future. Discussion Paper No. 01-11. Available from: https://www.rff.org/publications/working-papers/financial-assurance-rules-and-natural-resource-damage-liability-a-working-marriage/. (Accessed 5 November 2023).

Boyd, J., 2001. Financial Responsibility for Environmental Obligations: Are Bonding and Assurance Rules Fulfilling Their Promise? Resources for the Future. Discussion Paper No. 01-42. Available from: https://media.rff.org/documents/RFF-DP-01-42.pdf. (Accessed 5 November 2023).

Conaway, J., 2017. Be aggressive with wind energy: blow away the decommissioning fears. Oil and Gas, Natural Resources, and Energy Journal. 2 (6), 621–649.

Dana, D.A., Wiseman, H.J., 2014. A market approach to regulating the energy revolution: assurance bonds, insurance, and the certain and uncertain risks of hydraulic fracturing. Iowa Law Rev. 99 (4), 1523–1593.

Dernbach, J.C., 1998. Sustainable development as a framework for national governance. Case Western Reserve Law Review 49 (1), 1–103.

Department of Environment and Science (Queensland Government), 2023. Guideline: Financial assurance under the Environmental Protection Act 1994. Available from https://www.des.qld.gov.au/policies?a=272936:policy_registry/era-gl-financial-assurance-epact.pdf> (Accessed 5 November 2023).

Department of Environment and Science (Queensland Government), 2023. Guideline: Financial assurance under the Environmental Protection Act 1994. 1-29. Available from: https://www.des.qld.gov.au/policies?a=272936:policy_registry/era-gl-financial-assurance-ep-act.pdf. (Accessed 5 November 2023).

De Sadeleer, N. 2014. EU Environmental Law and Internal Market. Oxford University Press.

Easterbrook, F., Fischel, D., 1985. Limited Liability and the Corporation. University of Chicago Law Review. 55 (1), 89–117.

Faure, M. 1996. Economic Aspects of Environmental Liability: An Introduction. Eur Rev Private L 4 85–110.

Ferrell, S., DeVuyst, E., 2013. Decommissioning wind energy projects: An economic and political analysis. Energy Policy. 53, 105–113.

Fogleman, V. 2020. Improving financial security in the context of the Environmental Liability Directive. No 07.0203/2018/789239/SER/ENV.E.4/ Available from: https://circabc.europa.eu/ui/group/3b48eff1-b955-423f-9086-0d85ad1c5879/library/01708073-da51-4db7-8049-6e7141c901f4/details (Accessed 5 November 2023).

Gaines, S., 1991. The polluter-pays principle: from economic equity to environmental ethos. Tex. Int. Law J. 26 (3), 463–496.

Gerard, D., 2000. The Law and Economics of Reclamation Bonds. Resources Policy 26, 189–197.

Gifford, K., 1985. Moulding Discretion: How Courts Can Help. Western Australia Law Review 16, 229–238.

Government of Ireland, 2019. Draft Revised Wind Energy Development Guidelines. Available from: https://www.gov.ie/en/publication/9d0f66-draft-revised-wind-energy-development-guidelines-december-2019/. (Accessed 5 November 2023).

Government Accountability Office (GAO), 2005. Environmental Liabilities: EPA Should Do More to Ensure That Liable Parties Meet Their Cleanup Obligations. GAO-05-658. Available from: https://www.gao.gov/assets/250/247469.pdf (Accessed 5November 2023).

Heard, J. 2017. Bankruptcy's Role in the Growing Dilemma of Self-Bonding in the Coal Industry. 34 Emory Bankruptcy Developments Journal. 34, 205–241.

Heine, D., Faure, M., & Dominioni, G. 2020. The polluter-pays principle in climate change law: An economic appraisal. Climate Law, 10 (1), 94–115.

Heffron, R.J., 2018. Energy law for decommissioning in the energy sector in the 21st century. Journal World Energy Law Business 11 (1), 189–195.

Humphreys, H., 2001. The Polluter Pays Principle in Transport Policy. European Law Review. 26 (5), 451–467.

Invernizzi, D.C., Locatelli, G., Velenturf, A.P.M., Purnell, P., Love, P.E.D., Brookes, N.J.,

2020. End-of-life of energy infrastructure: coming to terms with an unavoidable Problem. Energy Policy 144 111677, 1–7.

Kim, H-Jin., 2000. Subsidy, Polluter Pays Principle, and Financial Assistance Among Countries. Journal of World Trade. 34, 115–141.

King, R., 1996. Trade and the Environment: European Lessons for North America. UCLA Journal of Environmental Law and Policy 14, 209–245.

Komoroski, K, 1998. The Failure of Governments to Regulate Industry: A Subsidy Under the GATT?'. Houston Journal for International Law. 10, 189.

Macey J., Salovaara, J., 2019. Bankruptcy as Bailout: Coal Company Insolvency and the Erosion of Federal Law. Stanford Law Review. 71 (4). 879–962.

Mackie, C., 2023. Planning, Discretion and the Legacy of Onshore Wind. Legal Studies. 43 (3), 499–522.

Mackie, C., Velenturf, A.P.M., 2021. Trouble on the horizon: Securing the decommissioning of offshore renewable energy installations in UK waters. Energy Policy 157 112479, 1–12.

Mackie, C., Besco, L., 2020. Rethinking the function of financial assurance for end-of-life obligations. Environment Law Reporter 50 (7), 10573–10603.

Mackie, C., Combe, M., 2019. Charges on Land for Environmental Liabilities: a matter of 'priority' for Scotland. Journal of Environmental Law. 31 (1), 1 83–108.

Mackie, C., Fogleman, V., 2016. Self-Insuring Environmental Liabilities: A Residual Risk-Bearer's Perspective. 16 Journal of Corporate Law Studies. 16 (2), 293–332.

Mackie C. 2014. The Regulatory Potential of Financial Security to Reduce Environmental Risk. Journal of Environmental Law. 26(2), 189-214.

Malone, J., Winslow, T., 2018. Financial Assurance: Environmental Protection as a Cost of doing Business. North Dakota Law Review. 93 (1), 1–56.

National Audit Office (NAO), 2019. Report by the Comptroller and Auditor General, Oil and Gas in the UK – Offshore Decommissioning. HC 1870 Session 2017-2019. Available from: https://www.nao.org.uk/wp-content/uploads/2019/01/Oil-and-gas-in-the-UK-offshore-decommissioning.pdf. (Accessed 5 November 2023).

New South Wales Environment Protection Authority, 2022. Financial Assurance Policy. (Available from: https://www.epa.nsw.gov.au/-/media/22p3721-financial-assurance-policy.pdf?la=en&hash=17A07EDFDDBDF2ED399D3DFA682A46C1AA57106A#:~:text=A%20fin ancial%20assurance%20is%20a,to%20provide%20a%20financial%20assurance.) (Accessed 5 November 2023)

NSW Environment Protection Authority, 2022. Estimating financial assurances: Guideline on Independent Assessment of Costs. Available from: https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/licensing/22p3730-estimating-financial-assurance-guideline.pdf?la=en&hash=54F45176722803325C89254125C40D016551EECA (Accessed 5 November 2023).

North Sea Transition Authority. 2023. UKCS Decommissioning Cost and Performance Report 2023. (Available from: https://www.nstauthority.co.uk/news-publications/ukcs-decommissioning-cost-and-performance-report-2023/) (Accessed 5 November 2023).

Ogus, A.I., 2004. Regulation: Legal Form and Economic Theory. Hart Publishing, Oxford, UK.

Ontario Ministry of the Environment, 2011. F-15: Financial assurance guideline. (Available from: https://www.ontario.ca/document/f-15-financial-assurance-guideline#:~:text=financial%20assurance%20can%20be%20specified,as%20authority%20for%20fina ncial%20assurance.) (Accessed 5 November 2023).

Pearson, C. 1994. Testing the System: GATT + PPP = ?. Cornell Int'l L J. 27 (3), 553–575.

Perkins, R., 1998. Electricity deregulation, environmental externalities, and the limitations of price. Boston Coll. Law Rev. 39 (4), 993–1059.

Scotford, E., 2017. Environmental Principles and the Evolution of Environmental Law. Hart.

Simms, P.L., 2017. Furtive Subsidies: Reframing Fossil Fuel's Regulatory Exceptionalism. Virginian Environmental Law Journal. 35, 420–473.

Stewart, R.B., 1993. Environmental Regulation and International Competitiveness. Yale Law Journal. 102, 2039–2106.

Stripling, W.S., 2016. Wind energy's dirty word: decommissioning. Texas Law Review. 95 (1), 123–151.

Topham, E., McMillan, D., 2017. Sustainable Decommissioning of an Offshore Wind Farm. Renewable Energy. 102, 470–480.

Tewdwr-Jones, M. Discretion, flexibility, and certainty in British planning: emerging ideological conflicts and inherent political tensions (1999) Journal of Planning Education and Research 18, 244.

Windemer, R., Cowell, R., 2021. Are the impacts of wind energy reversible? Critically reviewing the research literature, the governance challenges and presenting an agenda for social science. Energy Research & Social Science 79 102162 1–11.

Wirth, D.A. 1995. The Rio Declaration on Environment and Development: Two Steps Forward and One Back, or Vice Versa? Georgia Law Review 29, 599–653.