European Union Network for the Implementation and Enforcement of Environmental Law

Financial Provision for Environmental Liabilities

Practical Guide

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Introduction to IMPEL

The European Union Network for the Implementation and Enforcement of Environmental Law (IMPEL) is an international non-profit association of the environmental authorities of the EU Member States, acceding and candidate countries of the European Union and EEA countries. The association is registered in Belgium and its legal seat is in Brussels, Belgium.

IMPEL was set up in 1992 as an informal Network of European regulators and authorities concerned with the implementation and enforcement of environmental law. The Network's objective is to create the necessary impetus in the European Community to make progress on ensuring a more effective application of environmental legislation. The core of the IMPEL activities concerns awareness raising, capacity building and exchange of information and experiences on implementation, enforcement and international enforcement collaboration as well as promoting and supporting the practicability and enforceability of European environmental legislation.

During the previous years IMPEL has developed into a considerable, widely known organisation, being mentioned in a number of EU legislative and policy documents, e.g. the 7th Environment Action Programme and the Recommendation on Minimum Criteria for Environmental Inspections.

The expertise and experience of the participants within IMPEL make the network uniquely qualified to work on both technical and regulatory aspects of EU environmental legislation.

Information on the IMPEL Network is also available through its website at: www.impel.eu

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Executive Summary

At a meeting of the Network of heads of European Environment Protection Agencies (EPA Network) in Oslo in 2014, it was recognised that the cost of dealing with environmental liabilities arising from industrial operations too often fell to the public purse as a result of the failure of financial provisions. A project was set up to identify what forms of financial provision are most likely to deliver secure and sufficient cover which is available to the regulator when needed.

The project aims were the generation of a better understanding of the availability and suitability of financial tools. This should result in improved protection of the environment and the public purse, whilst ensuring compliance with the polluter pays principle and encouraging operator investment in pollution prevention.

The work comprised five main components:

- A questionnaire-based survey, which generated 150 responses;
- A workshop of technical experts, which was attended by about 40 delegates;
- Follow-up interviews and interaction with a range of specialists with knowledge of the subject;
- Publication of the project report; and
- Production of a practical guide.

The 2016 IMPEL Report on *Financial Provision – Protecting the Environment and the Public Purse* reports on year one of the project which consisted of evidence gathering. It identifies approaches to financial provision across Europe and beyond., the types of financial provision available and the strengths and weaknesses of each. Case studies are provided where financial provision worked and which show that it potentially protects against the problem of abandoned liabilities. There are also cases where financial provision failed to cover the costs of restoration or pollution remediation because it was not secure, sufficient or available when required showing the importance of adhering to these principles when implementing financial provision. Preliminary conclusions are provided, addressing the scope of the problem, the acceptability and availability of suitable financial provision mechanisms, common approaches across Europe, and the role of regulators in ensuring financial provisions work in practice.

The guide is the result of year two of the project and delivers on the ultimate project aim. It has been produced by a team of experienced practitioners and academics covering the relevant law, insurance and technical fields, under the European Network for the Implementation and Enforcement of Environmental Law (IMPEL), with the support of the European Commission. It has been peer reviewed by a wider IMPEL project team and by the IMPEL Cross Cutting Expert Group. The team also wish to acknowledge the valuable input received from:

- the European Commission's Environmental Liability Directive National Experts Group
- environment ministries and environment protection agencies across Europe; and
- the Alberta Energy Regulator.

The guide was updated in 2018 to take account of IMPEL report 2018/20 which provides an evaluation of the potential for wider application of three methods for calculating the cost of unforeseen liabilities.

This practical guide is intended as a reference document for regulators. It does not prescribe what a regulator should do. Instead, it aims to provide information to assist regulators in making better decisions about financial provision for environmental obligations and liabilities. In this way, it should contribute to improved protection of the environment and

the public purse, promote compliance with the polluter pays principle and encourage operator investment in pollution prevention.

The guide identifies issues to consider in the decision-making process when assessing financial provision, and assists regulators and other users in finding successful solutions. It also highlights the importance of ongoing maintenance and monitoring of financial provision to ensure successful delivery of that financial provision when required and provides examples of usage and guidance internationally. The three main parts of the guide provide:

1) information on the calculation of the amount of financial provision including links to available tools and template;
2) a detailed breakdown of the key advantages and disadvantages of each financial provision, together with recommended checks for financial provision in general and for each financial provision; and
3) examples of usage and guidance.

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1 Introduction

1.1 Purpose of the guide

This practical guide is intended as a reference document for regulators. It does not prescribe what a regulator should do. Instead, it aims to provide information to assist regulators in making better decisions about financial provision for environmental obligations and liabilities. In this way, it should contribute to improved protection of the environment and the public purse, promote compliance with the polluter pays principle and encourage operator investment in pollution prevention.

The guide identifies issues to consider in the decision-making process when assessing financial provision, and assists regulators and other users in finding successful solutions. It also highlights the importance of ongoing maintenance and monitoring of financial provision to ensure successful delivery of that financial provision when required.

Section 1 provides the legal background and underlying principles of financial provision.
Section 2 explains terminology and acronyms.
Section 3 gives an overview of financial provision systems.
Section 4 provides information on the calculation of the amount of financial provision.
Section 5 is a detailed breakdown of the key advantages and disadvantages of each financial provision, together with recommended checks.
Section 6 contains advice on the monitoring of financial provisions and enforcement.
Section 7 is concerned with other approaches to provide for environmental liability, such as extended liability and general funds.
An annex provides examples of usage and guidance.

The guide has been produced by a team of regulators, academics and consultants, under the European Network for the Implementation and Enforcement of Environmental Law (IMPEL), with the support of the European Commission. It has been peer reviewed by the project team and by the IMPEL Cross Cutting Expert Group.

1.2 Legal background

There has been an increase in the number of legislative requirements for financial provision for environmental liabilities in recent years. More jurisdictions are requiring financial provision for more types of operations.

Legislative requirements for financial provision are covered in some detail in the 2016 IMPEL Report on *Financial Provision – Protecting the Environment and the Public Purse*, and generally arise from:

- EU Directives and Regulations (for example the Landfill Directive, Mining Waste Directive, Transfrontier Shipment of Waste Regulation and Geological Storage of Carbon Dioxide Directive),
- International conventions, and
- Domestic legislation.

Operators and industries may also choose to acquire financial provision on their own initiative as part of good business practice.

The European Commission has issued guidance (for example, on financial provision mechanisms for the Geological Storage Directive) but Member States generally have discretion in determining the type of financial provision mechanism acceptable to satisfy EU requirements. Some Member States publish domestic legislation or guidance which sets out the types of mechanisms that are acceptable, in which circumstances, and in some cases may specify the amount. Some regulators may supplement financial provisions with other provisions aimed at restricting the accumulation of liabilities. An example of this is the charging of non-refundable fees for inactive inventory by the Alberta Energy Regulator.

It is important to recognise that there is no single approach that can be applied to any given situation in terms of the provision and delivery of financial provision. The interaction between company law, insolvency law and environmental law is complex and differs between countries. Mechanisms which work in one jurisdiction may pose unexpected problems in another due to differences in a range of factors, including legal traditions as well as national legislation. In addition, the mechanisms that are available may vary. Other factors that determine the types of mechanisms that are acceptable to regulators may include the nature of the environmental liability (foreseen or unforeseen), the financial profile of the liability, the nature of the operation and the experience of the regulator with that particular type of measure. **Users of this guide are advised to establish these facts for their country, industry, operator and liability**.

Financial provision is not a panacea and the protection afforded by financial provision may be limited, in particular in the case of illegal activities. Certain illegal activities (e.g. dumping of waste) occur completely outside of the permitting and legal systems under which financial provisions are established. Illegal activities may also compromise the sufficiency and legal security of financial provisions even when they are in place. An example is the abandonment of a waste processing site where waste is stockpiled in excess of the permit limits; the financial provision would not be sufficient if it was calculated based on the permit limits. Illegal activities may also invalidate financial provisions from a legal perspective due to exclusion clauses for illegal acts. There is some discussion in Section 8 on other approaches to environmental liability, which is relevant to enforcement of illegal activities.

1.3 Principles

EU environmental law and policy is based on the precautionary principle and on the principles that:

- preventive action should be taken;
- environmental damage should as a priority be rectified at source; and
- the polluter should pay.

The preventive principle provides that operators should take measures to avoid damaging the environment. If prevention fails and a pollution incident happens, the polluter pays principle provides that the person who caused the environmental damage should pay for its remediation and restoration. If an operator cannot bear the costs of its environmental obligations due to its incapacity to pay in full or its insolvency or dissolution, the public purse and the environment are put at risk. The environment and public purse can be protected by putting effective financial provision in place at the outset of the operator's activities to cover such environmental liabilities as and when they arise.

Where financial provision is put in place, the operator provides and maintains evidence that adequate financial resources will be available to meet the costs of restoration or clean-up. In cases where either there is an environmental incident or a company can no longer meet its obligations due to its incapacity to pay in full or its insolvency or dissolution, the financial provision may be able, depending on its terms and conditions, to be called upon by another party such as a regulator, to cover the relevant costs.

To be effective, financial provision must be:

- **secure** for the duration of an operator's activities, and, in the event of an operator's insolvency or dissolution, funds must be available to discharge the environmental liabilities;
- **sufficient** to cover all of the environmental liabilities; and
- **available** to the relevant person, such as the regulator, to discharge the environmental liabilities when required.

If these conditions are not satisfied, the financial provision may fail. It is essential that the financial provision is established on a sound economic and legal basis in the first place and maintained and monitored thereafter.

2 Terminology and acronyms

For the purposes of this guide, the meanings of the key terms used are as follows.

'Bank guarantee' is a guarantee issued by an approved bank pursuant to an agreement between the bank and an operator whereby the bank agrees to provide funds to the relevant regulator named in the agreement from collateral provided by the operator if the operator does not fulfil the environmental obligations stipulated in the agreement.

'Cash deposit' is money deposited by an operator with a third party (e.g. in a bank account) and legally secured so that it can only be used for the intended purposes. For the purposes of this practical guide this includes 'escrow accounts'.

'Charge on asset' is a mortgage/charge over a specific asset in favour of a regulator which enables the charge holder to exercise their power of sale over the asset if an operator defaults on its obligations.

'Collateral' refers, for the purposes of this guide, to funds or assets pledged as security by the operator (or a company associated with them, such as a parent company) in respect of a guarantee by a financial institution, to be forfeited in the event of the operator's default under the guarantee.

'Cost profile' is the pattern of closure, restoration and aftercare costs over time for mines and landfills. A cost profile can also be known as a financial profile.

'Environmental impairment liability insurance' is insurance specially tailored to environmental liabilities including liabilities under the Environmental Liability Directive.

'Environmental liabilities' are costs relating to environmental obligations.

'Environmental obligations' are obligations on operators relating to environmental protection, such as closure, restoration and aftercare following cessation of an activity or clean-up and restoration in the event of an incident/accident.

'Financial institution guarantee' is a guarantee provided by a financial institution (e.g. a bank or surety) to pay if an operator defaults on its obligations. This includes 'bank guarantees', 'letters of credit', 'surety bonds' and 'performance bonds'.

'Financial provision' is the establishment of a source of funding for liabilities under environmental law or an environmental permit, licence or other authorisation. The terms **'financial guarantee'** and **'financial security'** can also be used. For the purposes of this document these three terms can be read interchangeably.

'Foreseen liabilities' are environmental liabilities that are known to arise. They include development, closure, restoration, remediation, decommissioning and aftercare of installations, activities or sites, or the costs of repatriation.

'Incident/accident' is a change from normal operating conditions with actual or potential negative consequences.

'Insolvency' refers to a situation where the operator enters into legal proceedings because it does not have adequate financial viability to meet its liabilities.

'Letter of credit' is a guarantee issued by an approved bank pursuant to an agreement between the bank and an operator whereby the bank agrees to provide funds to the relevant regulator named in the agreement from collateral provided by the operator if the operator does not fulfil the environmental obligations stipulated in the agreement.

'Mutual fund/pool' is a group financial provision arrangement under which the group pays the obligations of an operator who is a member of the mutual/fund or pool if the operator defaults on its obligations.

'Parent company guarantee' is a guarantee by the parent of the operator to pay or fulfil the operator's obligations if the operator defaults.

'Performance bond' is an indemnity agreement for a specified amount issued by an approved bank, other financial institution or surety. The provider of the bond agrees to pay the relevant regulator up to the amount of the bond, as specified in the bond, if the operator defaults on its environmental obligations.

'Self-provision' is financial provision by the operator itself. This includes 'provisioning in accounts' and 'self-insurance'.

'Surety bond' is a bond issued by a surety (usually an insurance company) pursuant to an agreement between the surety, an operator or its parent company, and the relevant regulator in which the surety agrees to carry out the obligations specified in the agreement up to the specified amount if the operator defaults on those obligations. Surety bonds may be payment bonds, in which case the surety agrees to pay the regulator up to the amount specified by the bond, or performance bonds, in which case the surety agrees to perform the activities on which the operator has defaulted up to the monetary limit of the bond. The surety charges the operator a premium for the bond, thus basing the ability to obtain one on the operator's financial strength rather than collateral provided by it to the surety.

'Unforeseen liabilities' are environmental liabilities arising from incidents/accidents.

Acronyms and initialisms used in this practical guide are:

EPA An environment agency or environmental protection agency

EU European Union

FP Financial provision

HoPS Heads of Planning Scotland

IMPEL European Union Network for the Implementation and Enforcement of Environmental Law

IOPC Fund International Oil Pollution Compensation Fund

3 Overview of financial provision systems

There is a range of possible approaches to financial provision for environmental liabilities, and significant variation in implementation internationally, including within the EU. This reflects the variation in the type and number of operators that are subject to the various financial provision systems, the variability in financial provision solutions available, and the resources available for implementation.

For example, a system that covers a small number of very high risk operators may be very restrictive in the types of financial provisions allowed and have a high level of regulator involvement and scrutiny, but this may not be appropriate or practical for large numbers of lower risk operators.

The type of liability may also influence the approach. Site-specific approaches with individual oversight by regulators would not be unusual for landfills and mines given the inevitable and often large closure, restoration and aftercare liabilities involved. However, cover for liabilities from unforeseen incidents across a very large number of facilities might require a broad financial based solution such as the development of a fund or insurance. In these circumstances, the details may be specified more generally with the operator or pool being responsible to ensure it is in place subject to periodic and random checks. A different approach may be required to cover scenarios where the potential liability may extend over a long period of time; for example, well decommissioning, monitoring and aftercare.

These are matters for regulators themselves to determine subject to the relevant legislation. The guidance given here is for information purposes only and is intended to point regulators to the matters that are most significant for consideration.

There is a range of financial provisions available, some of which are best applicable to foreseen liabilities, some to unforeseen liabilities and some to both. It is important for a regulator to know what is available in terms of practical implementation but also to be assured that the approach meets the three principles outlined in Section 1.3.

The regulator may need specialist legal and financial advice and access to knowledge of the financial provision markets. This support may need to be obtained from external sources. Past experience of the successes and pitfalls associated with financial provision can be invaluable. Regulators would benefit from building knowledge on the types of financial provision that have worked and under what circumstances, and for which types of liability. A detailed explanation of the range of financial provisions is provided in Chapter 5.

The overall approach to defining the need for and scope of financial provisions is set out in Figure 1 below. Initially, it is important to define the range of scenarios that would create liability, and that need to be covered. These include:

- **'Foreseen liabilities'**, which are liabilities that are known to arise. They include development, closure, restoration, remediation, decommissioning and aftercare of installations, activities or sites, or the costs of waste repatriation.
- **'Unforeseen liabilities'**, which are environmental liabilities arising from incidents/accidents.

Defining the appropriate amount of provision is crucial. If financial provision is secure and available but in an inadequate amount, then the public purse may be required to meet the shortfall, and the process will not be fully successful. It may be possible to point to the standard works and associated

costs necessary to manage and mitigate foreseen liabilities, but the level of financial provisions needed for unforeseen liabilities is more difficult to determine.

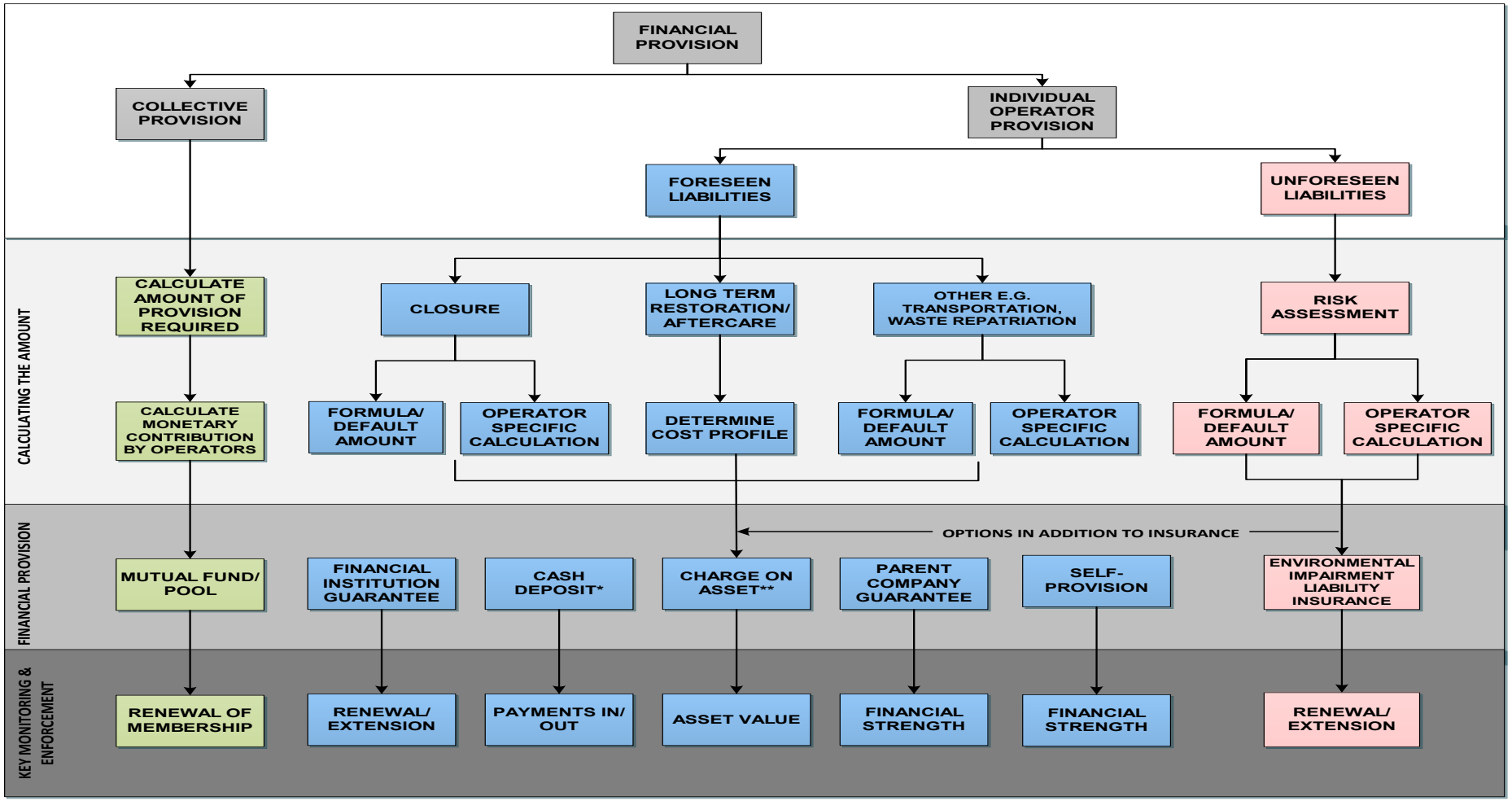
The timing of the availability of the provision is also important. For facilities that are subject to progressive closure, financial provision needs to reflect the partial closure works as well as the final stage of closure, and the period of aftercare. The duration of the aftercare period needs to be determined, with landfill sites typically being considered to require aftercare financial provisions for at least 30 years. In other circumstances – for example, oil and gas wells – the liability (e.g. potential for leakage) may extend well beyond the lifetime of the operation and decommissioning of the well.

In terms of the legal certainty of the financial provision, one of the most important factors is ensuring that the financial provision is protected in the event of operator insolvency or dissolution, as this is often when it is required.

It is worth noting that a combination of financial provisions may be used by operators to cover the full liability. Examples of such scenarios are:

- covering foreseen liabilities with one financial provision (e.g. cash deposit) and unforeseen liabilities with another (e.g. environmental impairment liability insurance);
- covering the gap with, for example, a financial institution guarantee while a cash deposit is accumulating; and
- using a variety of insurance products to achieve full cover for unforeseen liabilities.

Figure 1. Overall approach to defining the need for and scope of financial provisions



*A COMBINATION OF FINANCIAL PROVISIONS MAY BE REQUIRED WHERE A CASH DEPOSIT IS ALLOWED TO BUILD UP OVER TIME UNTIL THE VALUE OF THE DEPOSIT IS SUFFICIENT TO MEET THE LIABILITY.
**A COMBINATION OF FINANCIAL PROVISIONS MAY BE REQUIRED WHERE A CHARGE ON ASSET IS USED DUE TO ITS ILLIQUIDITY.

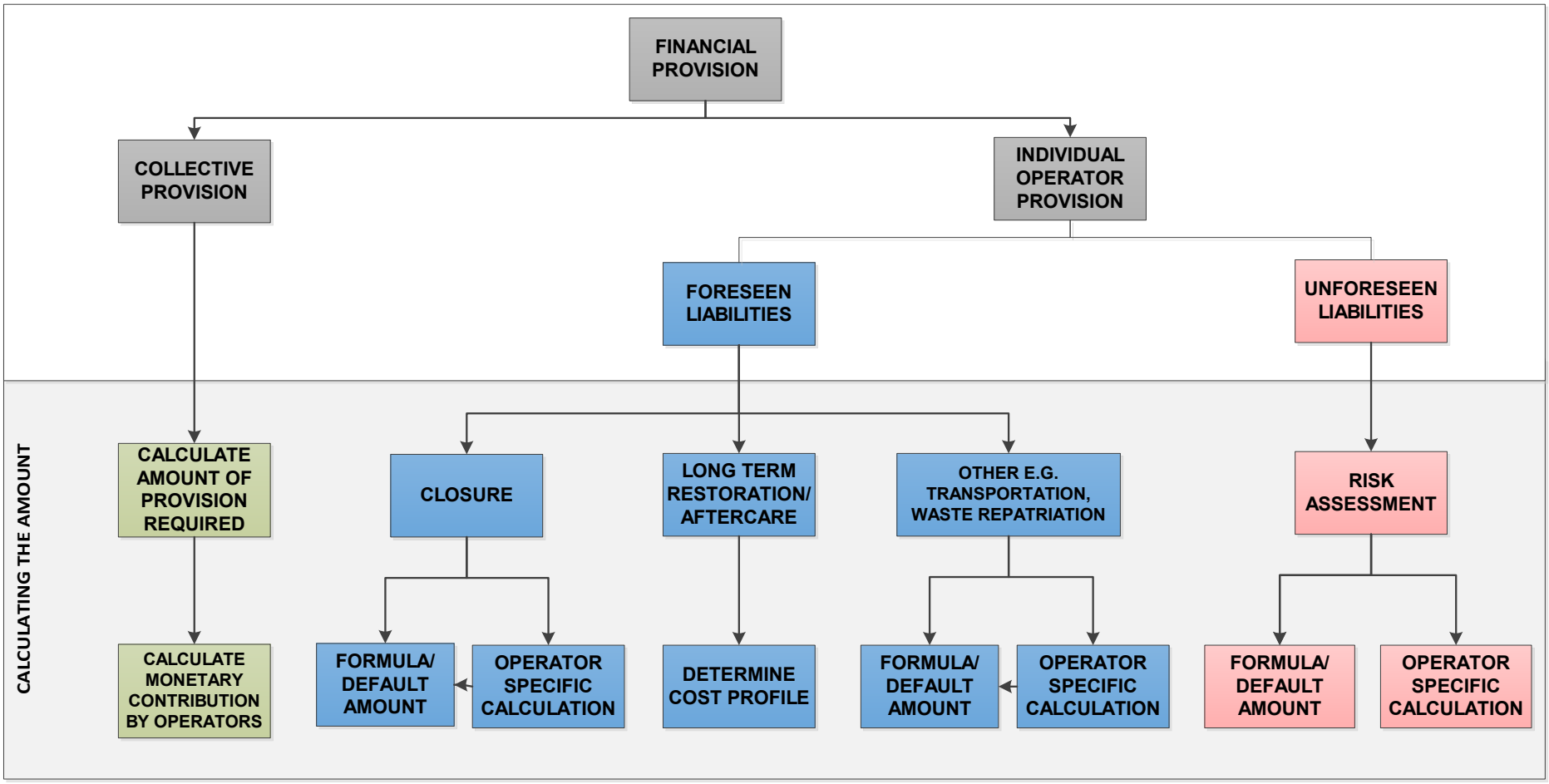
4 Calculating the amount of financial provision required

4.1 Overall approach

This section provides advice on calculating the amount of financial provision to ensure that it will be adequate to meet the liabilities.

The process for determining the amount of cover is illustrated in Figure 2.

Figure 2. Process for determining the amount of cover



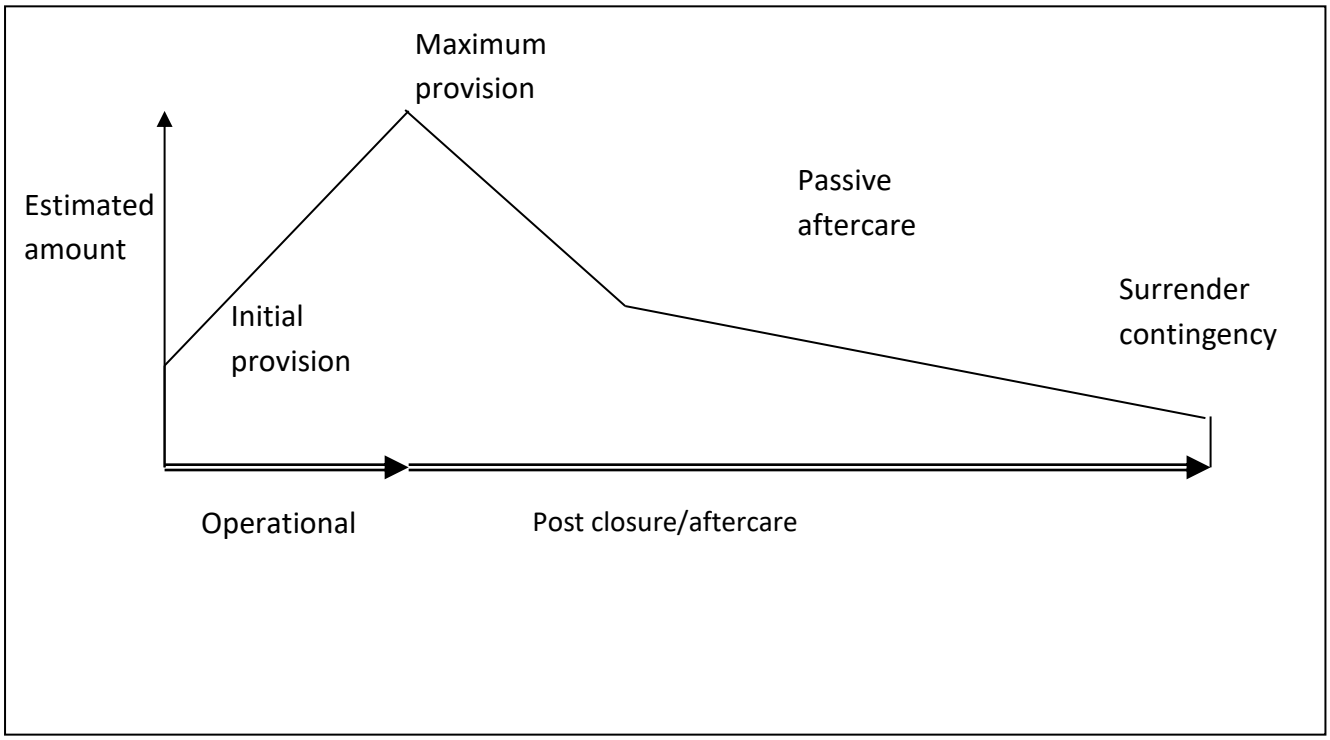
The following are general principles to consider in relation to calculating the amount of financial provision required.

The scope of the exercise should be clear and be informed by law and guidance.

For unforeseen liabilities, for example under the Environmental Liability Directive, it should be clear whether complementary and/or compensatory remediation, as well as primary remediation, is covered. A risk assessment should then be undertaken to allow the determination of the maximum estimated liability.

For foreseen liabilities, it is important to establish whether the liability remains the same throughout the life of the operation (for example, a waste treatment centre) or whether the liability is going to change throughout the life of the operation (for example, a landfill or a mine). In the case of mines and landfills the closure, restoration and aftercare costs extend over long periods and change over time. Key points throughout the duration of the operation (e.g. initial liability, maximum liability) and the ultimate end date should be established. This pattern of costs can be referred to as the 'cost profile' (see Figure 3).

Figure 3. Typical cost profile for a landfill



4.2 Calculation of the amount of financial provision

There are two overall approaches to calculating the amount of financial provision required.

- **Formulas and default amounts**

  The calculation of the amount of financial provision by formula or by reference to default amounts can be set out by regulators through law or guidance. It is typically done for simple operations where liability is relative to a small number of factors such as the area of the operation, quantity of waste held or quantity of pollutants held.

  The difficulties associated with calculating unforeseen liabilities might also be overcome by specifying default amounts through benchmarking using simple formulas or for unforeseen liabilities by reference to claims history.

- **Site-specific calculations**

  Site-specific calculation is typically for more complex operations such as mines and landfills. It is typically done by reference to specifications in law or guidance. The calculation may be made by an operator or a third-party expert, and can be subject to verification by a regulator or third-party expert.

  Site-specific calculations are attractive in terms of robustness but they can be resource-demanding for operators and regulators.

Provision of guidance and templates for documenting the risk assessment and risk management measures improves the quality and timeliness of calculations and streamlines verification by regulators or third parties. The Irish EPA 'Guidance on assessing and costing environmental liabilities' contains such templates.

It is also worth noting that financial provision by way of a mutual fund/pool may avoid altogether the need to attribute amounts to individual operations, as the concern relates to the amount of liability arising from the relevant sector as a whole over time.

Whichever approach is used, there is a need to undertake regular monitoring to ensure that the amount is accurate, given the large number of variables over time. Monitoring is considered further in Section 7.

4.3 Calculation for unforeseen liabilities

For unforeseen liabilities the calculation should:

- typically be based on the maximum potential liability as determined by a risk assessment;
- allow for the scenario where a third party needs to complete the works, to provide for cases where the liability is abandoned; and
- apply any legally required formulas or default amounts.

In some cases a contingency may be included to allow for costs associated with legal fees/penalties and delays.

The risk assessment and calculation may be made by an operator or third-party expert, and may be subject to verification by a third-party expert or a regulator. The extent to which this is done depends on the regulatory requirements and the level of concern about the quality of calculations versus the increasing resource that verification demands.

Key factors to include in costing for unforeseen liability

Type of Operation	Costs
Unforeseen liabilities	▪ Immediate emergency measures ▪ Environmental damage assessment ▪ Primary remediation (restoration to baseline) ▪ Complementary remediation (of a different resource) ▪ Compensatory remediation (for interim losses)

4.3.1 Calculation of costs for unforeseen liabilities – resources

Some published resources are available for the calculation of unforeseen liabilities. The online resources identified by the IMPEL project are summarised below. An evaluation of the potential for wider application of the Dutch, Irish and Spanish methods (IMPEL report 2018/XX is available at https://www.impel.eu/projects/financial-provision-what-works-when/.

4.3.1.1 Spain, Mora Model

In Spain, under the Environmental Liability Directive, there is a legal requirement for operators to carry out a risk assessment to identify the operation's risk scenarios, to score those scenarios based on the probability of occurrence and an environmental damage index, and then to select the scenario that represents 95% of the risk.

The **Ministerio de Agricultura y Pesca, Alimentación y Medio Ambiente** (Spain) has developed a computer application (Modelo de Oferta de Responsabilidad Ambiental (MORA), 2017) for calculating potential environmental damage costs. The MORA model is a follow-on non-mandatory tool for calculating potential environmental damage costs. It requires information on the place where the damage would occur, the agent causing the damage (e.g. fuel, fire), the extent of natural resources affected (e.g. numbers of species, quantities of soil or water) and the reversibility of damage. The MORA model contains environmental data for Spain, selects the best remediation method (which can be adjusted) and contains unit rate costs for the remediation methods. The receptors considered are water (groundwater, rivers, sea), soil, species and habitats. Its greatest potential is as an *ex-ante* methodology, although it could be used to assist with evaluations *ex-post*.

Many sectors are reported to have developed electronic risk analyses for their industry that connect with the MORA application, automatically retrieving estimated restoration costs for their risk scenarios, which is very useful for risk management purposes. Further information is provided at the following link: Modelo de Oferta

de Responsabilidad Ambiental (MORA), 2017. The English version of the MORA and IDM models is available at https://servicio.mapama.gob.es/mora/login.action?request_locale=en.

4.3.1.2 Ireland

Ireland has also developed guidance ('Guidance on assessing and costing environmental liabilities') for costing potential liabilities arising from incidents (i.e. unforeseen liabilities). The first step is a standard risk assessment (based on International Standards Organisation standards) to identify, analyse and evaluate plausible risks for treatment. The guidance provides non-exhaustive lists of risks that typically arise under the headings: fuel storage; bulk storage and handling (chemicals, solvents, milk, etc.); production; waste management; air abatement; waste water treatment; drainage; landfill; fire; weather; traffic; and legacy. The risks are ranked in priority based on the product of their likelihood and consequence scores. Mitigations are then proposed, risk owners assigned and implementation timeframes specified.

The second step is the identification, quantification and costing of the plausible worst-case scenario. This is the potential event that poses the maximum environmental liability (i.e. highest consequence score from above). The plausible worst-case scenario is described in detail in terms of the following:

- types of materials lost
- quantity of materials lost
- pathways involved
- nature and extent of impact
- control and remediation measures required

The costing must cover the environmental aspects of an event, e.g. stopping it, preventing further emissions/pollution, clean-up of emissions/pollution caused. It does not include other costs that, though associated, are non-environmental, e.g. legal fees/penalties and business interruption.

The Irish paper-based methodology is similar in principles and sequence to the Spanish MORA model above. The guidance is been considered for production as an electronic tool.

4.3.1.3 Netherlands

The Dutch model has been developed as a tool for the competent authorities responsible for issuing permits for Seveso companies and IED Annex I-category 4 companies (chemical industry) in the Netherlands to help determine the amount of financial security needed to cover the costs of remediation of environmental damage. A google translation of the Dutch model is provided in Annex II. The Dutch model is available at https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/rapporten/2016/11/22/financiele-zekerheidstelling-voor-milieuschade-bij-majeure-risicobedrijven/Financi%C3%ABle+zekerheidstelling+voor+milieuschade+bij+majeure+risicobedrijven.pdf.

An English translation of Chapter 4 (which contains the method) is provided in Annex II of IMPEL report 2018/XX which is available at https://www.impel.eu/projects/financial-provision-what-works-when/.

The approach is underpinned by the assumption that the company has an up-to-date and valid permit and that the company complies with its environmental obligations. The rationale behind the model is based on effects rather than risks, and company closure (bankruptcy) as a consequence of an incident is taken as a starting point. This is because this type of company closure automatically includes the public costs that can follow from a regular business termination.

Assuming that a company complies with its up-to-date permit, in the case of company closure (bankruptcy) due to an environmental incident, environmental costs arise for disposal of stocks and waste and the remediation of soil, surface and groundwater contamination. Non-environmental costs (e.g. economic damage) are not part of the model.

Permit providers can easily fill in the model with information that companies must already provide when applying for the permit. After completing a limited number of steps, the application of the model results in an amount for the financial guarantee with which any non-recoverable environmental costs can be (largely) met in case of company closure.

Three components determine the extent of the financial security:

1. Cost for removal and processing of waste;
2. Soil and groundwater remediation; and
3. Purification and remediation of surface water.

The total size of the financial security is determined by adding up the calculated costs of the three components.

4.3.1.4 International oil spill funds: Hydrocarbon spills

There is a significant amount of information on claims under international maritime oil spill clean-up funds on the International Oil Spill Funds (IOPC) website. Research has examined correlations with factors such as hydrocarbon type and amount spilled in particular. There have also been attempts to develop formulas and models using these factors and other factors such as geographic location, shoreline type, environmental and socioeconomic features and clean-up strategy. While these should be considered with caution given the limitations of the datasets and the reallife complexities involved, they are indicative of possible approaches to developing formulas or default values.

4.4 Calculation for foreseen liabilities

For foreseen liabilities:

- The calculation should typically be based on the maximum potential liability as determined by a risk assessment.
- The calculation should allow for the scenario where a third party needs to complete the works, to provide for cases where the liability is abandoned (this is a requirement of the Extractive Waste Directive).
- The calculation should apply any legally required formulas or default amounts.

- Where the liability is going to change throughout the life of the operation, calculations should take account of the cost profile of the operation.
- For operations where the liability is unlikely to change significantly (e.g. a maximum amount of waste that is permitted to be held at a waste transfer facility), calculations should be based on that maximum amount.
- Contingency may be necessary to provide for the uncertainty in costing complex and remote events, e.g. mobilisation issues or design changes, and for inflation.
- The calculation should not include the assets of the operation (e.g. landfill void space) to offset the amount of the financial provision, to ensure that a sufficient amount will be available to the regulator in the case of insolvency or dissolution.

In some cases a contingency may be included to allow for costs associated with legal fees/penalties and delays.

Calculations may need to be performed by a third party (e.g. as per the Extractive Waste Directive) and may often be verified by a third party or regulator. The extent to which this is done depends on the regulatory requirements and the level of concern about the quality of calculations versus the increasing resource that verification demands. It is important to note that the accuracy of the estimation of maximum potential liability is dependent on the comprehensiveness of the method used and assumptions made.

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The following sections provide a summary of typical costs to be covered and resources for the calculation of costs for the main categories of unforeseen liabilities: landfill, mining (including mining waste), transfrontier shipment of waste, and other operations such as non-landfill waste activities and windfarms.

4.4.1 Landfill

Key factors to include in costing for landfills

Type of Operation	Costs
Landfill	▪ Monitoring, e.g. surface water, groundwater, air, gas, leachate, stability ▪ Maintenance of monitoring equipment ▪ Verification and reporting ▪ Site security ▪ Final capping ▪ Landscaping ▪ Surface water drainage ▪ Leachate and gas infrastructure and management, including leachate disposal ▪ Plant decontamination

4.4.1.1 Calculation of costs for landfill – resources

The online resources identified by the IMPEL project are summarised below.

Victoria, Australia: Financial assurance calculation for landfills, prescribed industrial waste management (PIW), container washing, and PIW composting Draft Guideline (2015)

Closure and aftercare costs are required to be calculated on a site-specific basis over 30 years. The document provides a formula for landfill operational phase (closure and aftercare must be calculated on a site-specific basis), industrial waste management, container washing and composting.

Ireland: Guidance on assessing and costing environmental liabilities (2014)

The guidance covers foreseen and unforeseen liabilities for industrial and waste operations. The guidance contains templates and examples and is accompanied by Guidance on assessing and costing environmental liabilities – Unit cost rates for verification and Guidance on assessing and costing environmental liabilities – frequently asked questions. The guidance brought about significant improvement in environmental liability costings totalling €815 million across 163 facilities at the end of 2016, with consequent gains in financial provision.

England and Wales: Guidance on financial provision for landfill (2014)

Landfill costing is required to be based on 60 years' aftercare for non-hazardous and hazardous landfills (unless justified otherwise) and 3 years for inert landfill. The guidance contains some information on unit rates and expected design life and is accompanied by spreadsheets. The English EPA reported having over 500 financial securities in place in England with a total value over £600 million in 2016.

Scotland: SEPA Technical Guidance Note Estimate of Amount of Financial Provision for Landfill (2016)

The guidance covers closure and aftercare of landfills. It has a useful discussion on the 'cost profile' and contains indicative costs of key items.

Northern Ireland: Financial Provision for Waste Management Activities in Northern Ireland (2016)

The guidance takes a similar approach to England and Wales for landfills and the Scotland formula approach for non-landfill waste operations.

4.4.2 Mining

Key factors to include in costing for mines and mining waste

Type of Operation	Costs
Mine	▪ Monitoring , e.g. surface water, groundwater, air, gas, leachate, stability ▪ Maintenance of monitoring equipment ▪ Verification and reporting ▪ Site security ▪ Filling of void and removal of stockpiles ▪ Reinstatement of culverted watercourses ▪ Final capping

	▪ Landscaping ▪ Surface water drainage ▪ Water management ▪ Plant decontamination
Mining waste	▪ Monitoring, e.g. surface water, groundwater, air, gas, leachate, stability ▪ Maintenance of monitoring equipment ▪ Verification and reporting ▪ Site security ▪ Final capping ▪ Landscaping ▪ Surface water drainage ▪ Plant decontamination

4.4.2.1 Calculation of costs for mining – resources

The online resources identified by the IMPEL project are summarised below.

Scotland: The Heads of Planning Scotland Position Statement on the Operation of Financial Mechanisms to Secure Decommissioning, Restoration and Aftercare of Development Sites (2015). The statement considered the 'measure and value' option to be more effective for open cast coal sites and possibly landfill sites, and for the calculation of the quantum of bonds for mineral sites directs users to the Restoration Guarantee Bonds for Opencast Coal Mines report, 2007.

Queensland, Australia: Financial assurance security deposit for an environmental authority (2016)

There is guidance and spreadsheets for calculating the amount of financial provision for mining and for petroleum/gas.

Ireland: Guidance on assessing and costing environmental liabilities (2014)

The guidance covers foreseen and unforeseen liabilities for industrial and waste operations. It contains templates and examples and is accompanied by Guidance on assessing and costing environmental liabilities – Unit cost rates for verification and Guidance on assessing and costing environmental liabilities – frequently asked questions.

EU: Guidelines on Financial Guarantees and Inspections for Mining Waste Facilities (2007)

This EU-sponsored guidance on financial provision under the Extractive Waste Directive contains sections on how to calculate the amount of financial provision including information on principles, costs to be covered and review periods in various countries.

France: Order of 9 February 2004 on the determination of the amount of financial guarantees for the rehabilitation of quarries**.** https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=LEGITEXT000021711481

The order contains formulas for determining the amount of financial guarantee.

4.4.3 Transfrontier shipment of waste

Key factors to include in costing for transfrontier shipment of waste

Type of Operation	Costs
Transfrontier shipment of waste	▪ Monitoring ▪ Maintenance of monitoring equipment ▪ Verification and reporting ▪ Site security ▪ Storage ▪ Transport ▪ Recovery or disposal

4.4.3.1 Calculation of costs for transfrontier shipment of waste - resources

The online resources identified by the IMPEL project are summarised in the link below.

EU: Method of Calculation in the Member States of the Financial Guarantee and Equivalent Insurance pursuant to Art.6 of Regulation (EC) No 1013/2006 on shipments of waste (2016)

A compilation of methods used in EU Member States was published in 2016. The calculation methods are formulas based mainly on the tonnage of waste shipped by the cost per tonne for 90 days' storage, transport and treatment. Other factors that may be incorporated include distance, number of active shipments, administration and contingency. Some rates to be used in the calculations are specified or given as guidance, minimums are also set and one State specifies an absolute amount as a starting point.

4.4.4 Other permitted operations

Key factors to include in costing for other permitted operations

Type of Operation	Costs
Other permitted operations	▪ Monitoring, e.g. surface water, groundwater, air, gas, leachate, stability ▪ Maintenance of monitoring equipment ▪ Verification and reporting ▪ Site provision ▪ Plant decontamination ▪ Waste recovery or disposal

4.4.4.1 *Calculation of costs for other permitted operations – resources*

The online resources identified by the IMPEL project are summarised below.

France: Order of 31 May 2012 on the procedures for determining and updating the amount of financial guarantees for the safeguarding of classified installations and additional guarantees in the event of the implementation of measures for the management of soil and groundwater pollution

The order contains formulas for calculating the amount of provision for a range of activities including quarries, waste storage facilities, installations classified for protection of the environment, Seveso sites and geological storage of carbon.

New Financial Guarantees in France

The presentation provides costing methodologies and formulas for the financial guarantee requirements introduced in 2012.

Scotland: Financial Provision for Non-Landfill Waste Management Activities (2016)

The document provides a formula for calculating the amounts for waste management activities based on the maximum amounts of various wastes stored.

United States: Resources for Underground storage tank owners and operators (2016)

Minimum amounts for owners and operators of underground storage tanks are specified based on the type of operator and throughput.

Victoria, Australia: Financial assurance calculation for landfills, prescribed industrial waste management (PIW), container washing, and PIW composting Draft Guideline (2015)

Closure and aftercare costs are required to be calculated on a site-specific basis over 30 years. The document provides a formula for landfill operational phase (closure and aftercare must be calculated on a site-specific basis), industrial waste management, container washing and composting.

Ireland: Guidance on assessing and costing environmental liabilities (2014)

The guidance covers foreseen and unforeseen liabilities for industrial and waste operations. The guidance contains templates and examples and is accompanied by Guidance on assessing and costing environmental liabilities – Unit cost rates for verification and Guidance on assessing and costing environmental liabilities – frequently asked questions.

Scotland: The Heads of Planning Scotland (HoPS) Position Statement on the Operation of Financial Mechanisms to Secure Decommissioning, Restoration and Aftercare of Development Sites

A decommissioning cost template for windfarms is provided.

Northern Ireland: Financial Provision for Waste Management Activities in Northern Ireland (2016)

The guidance takes a similar approach to England and Wales for landfills and the Scotland formula approach for non-landfill waste operations.

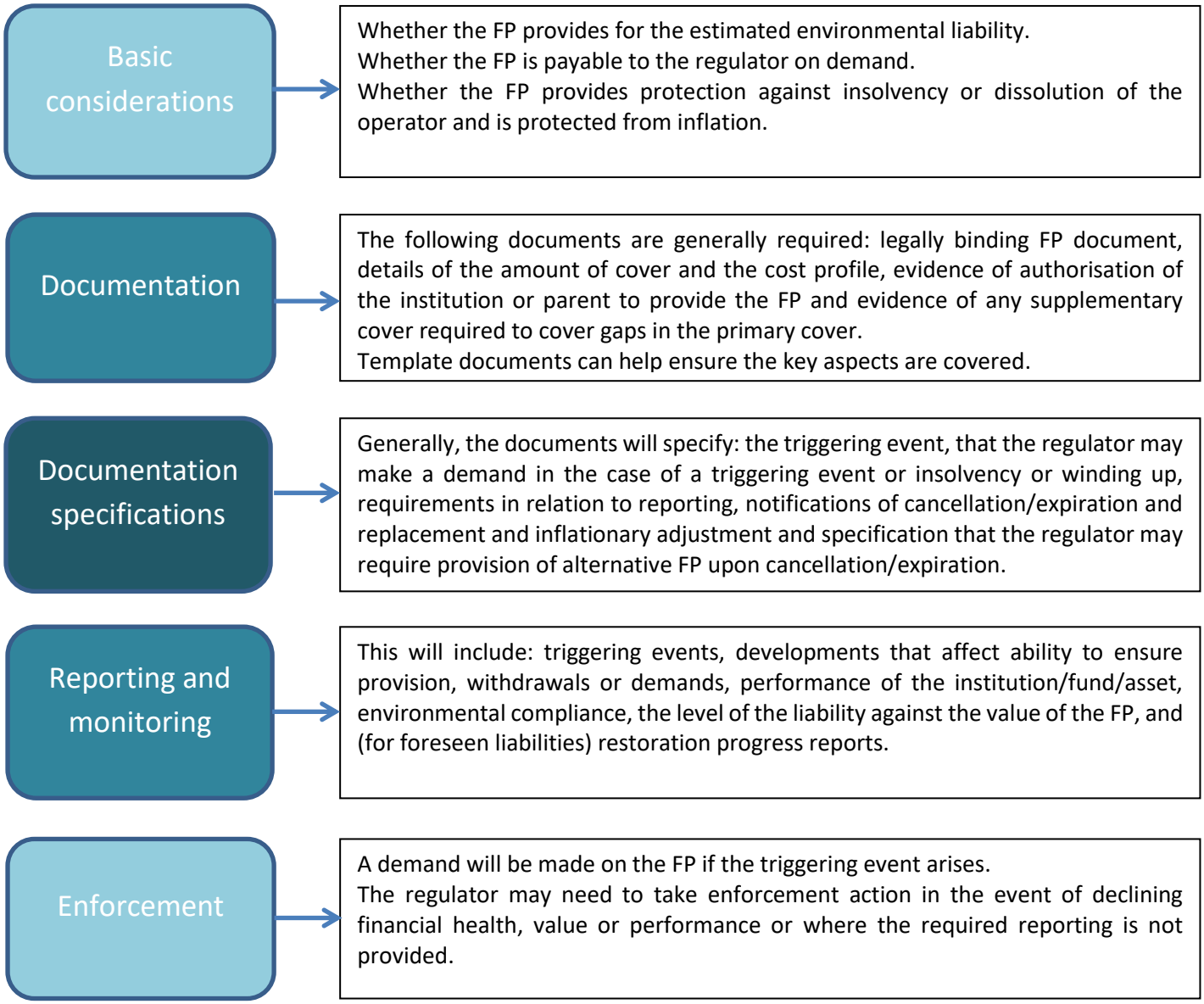
Queensland, Australia: Financial assurance security deposit for an environmental authority (2016)

There is guidance and spreadsheets for calculating the amount of financial provision for mining and for petroleum/gas.

5 Financial provisions

A wide variety of measures are used to provide evidence of financial provision for environmental liabilities. These are the focus of this chapter. Most jurisdictions allow an operator to demonstrate financial provision by a combination of the financial provisions as well as individual financial provisions. This enables the potential downsides associated with certain measures to be counteracted by the upsides of another measure. Regulators usually retain the option to approve alternative financial provisions (i.e. measures other than those considered in this practical guide) if they are satisfied that they are secure, sufficient and available when required.

The diagram below highlights key generic aspects to be considered by the regulator when considering or putting into place any financial provision. Information sheets for each financial provision are provided in this section. A table providing key checks for financial provisions is provided at the end of this section.



5.1 Environmental impairment liability insurance – INFORMATION SHEET

An insurance policy is a contract that transfers liability for the risk of the loss specified in the policy from the insured (policyholder) to the insurer on payment of a premium. It is important to be aware of the differences between insurance policies. Traditional general third party liability policies typically provide no, or limited, cover for environmental liabilities, beyond cover for bodily injuries and property damage from sudden and accidental pollution incidents. Endorsements that provide cover for remediation costs may be added but they tend to be much more limited than environmental insurance policies. This information sheet is primarily concerned with environmental insurance policies for operational risks including cover for liabilities that arise from the Environmental Liability Directive.

Insurance policies may provide cover for claims against an insured by third parties for risks such as bodily injury or property damage suffered by an insured resulting from an accident, for example, unforeseen environmental damage caused by the insured's operations. They also provide cover for actions against an insured to remediate environmental damage for which the insured is responsible. Insurance policies provide cover for chance or accidental occurrences not certainties. They cannot, therefore, be used to provide first-party cover for foreseen environmental liabilities.

Environmental impairment liability insurance policies, like any other financial provisions, have a maximum level of indemnity. They may not, therefore, provide the entire amount of cover for a disastrous pollution incident. In addition, the policy will also have limitations and exclusions from cover. The regulator may therefore retain the option to approve the policy wording or provide a pro forma.

All such policies come with an excess level which is the responsibility of the policyholder to cover. Policy premiums generally reduce if a higher excess is chosen. The regulator should be careful to ensure that the level of excess is manageable for the size of the company purchasing the policy or require payment of the excess by the insurer (for subsequent re-imbursement from the insured).

ADVANTAGES	DISADVANTAGES
✓ Does not require collateral so may be more accessible to small and medium businesses and does not tie up capital. ✓ Should not be affected by negative changes in the operator's financial strength or its dissolution provided the policy provides that it is payable in the event of the operator's insolvency or dissolution. ✓ Should incentivise the operator to reduce the risk of incurring environmental liabilities, in order to reduce premiums or avoid increases due to claims. ✓ Available from the start of the policy (unless otherwise specified).	× Must be renewed annually or at some other interval. × Cover may be invalidated by non-disclosure or misrepresentation. × Limits/sub-limits to indemnity, deductibles, conditions, exclusions, specific policy periods and triggers may restrict which environmental liabilities may be covered. × Intentionally caused harms, criminal activity and intentional violations of statutes or regulations are usually excluded from insurance policies. × Delays and legal expenses may be incurred if there is legal challenge when a claim is made against the policy.

IMPORTANT CONSIDERATIONS – ENVIRONMENTAL IMPAIRMENT LIABILITY INSURANCE

The diagram below highlights additional key aspects to be considered by the regulator when considering or putting in place environmental impairment liability insurance.

Basic considerations	The insurer must be authorised to provide the insurance in the jurisdiction. The insurer's financial strength. Ring-fencing for environmental liabilities. Policy excesses.
Documentation	In addition to the standard documentation the following may be required: insurance policy or certificate of insurance, evidence of financial strength and payment of premium.
Documentation specifications	In addition to the standard specifications the following may be required: None
Reporting and monitoring	In addition to the standard requirements the following may be required: notification of cancellation, expiration, intent to renew, renewal or non-renewal and expiry dates.
Enforcement	In addition to the standard requirements the regulator will need to make sure that the financial provision is maintained/renewed/acceptable or require a replacement provision.

An endorsement is a document attached to, and part of, an insurance contract that modifies the policy in some way, such as broadening, limiting, restricting or otherwise clarifying the scope of coverage. Modification will usually be effected by altering the policy definitions, exclusions, or conditions in the coverage form. A deductible is the amount which the insurer will deduct from the loss before paying up to the limits of the policy. It must be paid by the insured before the insurer will bear any loss.

5.2 Financial institution guarantee – INFORMATION SHEET

A financial institution guarantee is a guarantee provided by a financial institution (e.g. a bank or surety) to pay if an operator defaults on its obligations. This includes 'bank guarantees' and 'letters of credit', 'surety bonds' and 'performance bonds'. Issuance of a guarantee by a financial institution is generally supported by the payment of a premium and/or through the deposit of cash, securities or other assets for all, or a percentage of, the value of the guarantee. If the operator, known as the principal, defaults on its obligations to the regulator, the financial institution pays or performs according to the contractual arrangements instead of the operator up to the amount of the guarantee.

A financial institution guarantee is common for foreseen liabilities. While it can be used for unforeseen liabilities, usage is generally limited because of the requirement for collateral.

ADVANTAGES	DISADVANTAGES
✓ Should not be affected by negative changes in the operator's financial strength or its dissolution provided the policy provides that it is payable in the event of the operator's insolvency or dissolution. ✓ Available from the time it is issued, meaning that the risk of waiting for funds to accumulate is avoided. ✓ Creates an incentive for operators to minimise the risk of environmental damage by introducing or maintaining an environmental management plan in order to access guarantees.	× Must generally be renewed on a regular basis (usually between one and five years). There is a risk that the operator may not be able to renew if their financial circumstances have worsened. × Providers are likely to require collateral, such as shares, cash or real estate, as security, meaning that these assets are not available to the operator for ordinary commercial purposes (e.g. for working capital or used to raise debt finance from a lender). × Delays and legal expenses may be incurred if there is legal challenge when the guarantee is called upon.

IMPORTANT CONSIDERATIONS – FINANCIAL INSTITUTION GUARANTEE

Basic considerations	The provider must be authorised to provide that guarantee in the jurisdiction. The institution's financial strength.
Documentation	In addition to the standard documentation, the following are likely to be required: guarantee, evidence of financial strength of the financial institution guarantee provider.
Documentation specifications	In addition to the standard specifications, the following are likely to be required: that the regulator may make a demand in the case of non-renewal, how the guarantee can be drawn down with reference to the cost profile of the operation.
Reporting and monitoring	In addition to the standard requirements, the following are likely to be required: notification of cancellation, expiration, renewal or non-renewal and expiry dates, progress on cost profiles and restoration and expiry dates of the guarantee.
Enforcement	In addition to the standard requirements, the regulator will need to make sure that the financial guarantee is maintained/renewed/acceptable or require a replacement provision and may need to act in the case of declining performance of the institution.

5.3 Parent company guarantee – INFORMATION SHEET

A parent company guarantee is a legally binding guarantee by an operator's parent company (or another affiliate) to pay or satisfy the operator's environmental obligations if the operator fails to do so. It is often limited to a specified amount (i.e. an unlimited guarantee may not be given.)

Parent company guarantees could potentially be used to cover foreseen and unforeseen liabilities. However, they have particular risks and their usage is often restricted in practice.

ADVANTAGES	DISADVANTAGES
✓ Does not oblige the operator to set aside funds so does not tie up capital. ✓ Overrides the parent's immunity under corporate law (e.g. the separate legal personality of companies and the limited liability of their shareholders) from responsibility for the operator's environmental liabilities. ✓ Incentivises the parent to reduce the prospect of the operator incurring environmental liabilities in the first place.	The particular risk with parent company guarantees, as against financial provisions from other third parties (e.g. financial institution guarantees and insurance) or which involve securing money (e.g. cash deposits, pools), is that the guarantee could become devalued or worthless if the financial strength of the parent/group declined alongside that of the operator, the worst case being simultaneous insolvency or dissolution. Other disadvantages are: × Only available to operators with parents with the requisite financial strength. × May require complex and time-consuming financial strength tests which burden the operator, parent and regulator. × May require legal proofs and checks around the operator and parent's corporate capacity to enter into the guarantee.

IMPORTANT CONSIDERATIONS – PARENT COMPANY GUARANTEE

The diagram below highlights additional key aspects to be considered by the regulator when considering or putting in place a parent company guarantee.

Basic considerations	The parent must be authorised to provide that FP in the jurisdiction. The parent must have sufficient financial strength for the amount of the potential liability. The parent must have the corporate legal capacity to enter into the agreement. The parent must not be reliant on the financial performance of the operator.
Documentation	In addition to the standard documentation, the following may be required: guarantee, evidence of financial strength of the parent.
Documentation specifications	In addition to the standard specifications, the following may be required: that the regulator may make a demand on the parent and how the guarantee can be drawn down with reference to the cost profile of the operation.
Reporting and monitoring	In addition to the standard requirements, the following may be required: notification of cancellation, expiration, renewal or non-renewal and expiry dates, annual audited financial statements, notification if the parent is likely to no longer meet specified financial criteria, progress on cost profiles and restoration and expiry dates of the FP.
Enforcement	In addition to the standard requirements, the regulator will need to make sure that the financial provision is maintained/renewed/acceptable or require a replacement FP and may need to act in the case of declining financial health of the parent.

5.4 Cash deposit – INFORMATION SHEET

A cash deposit is money deposited by an operator with a third party (e.g. in a bank account) and legally secured so that it can only be used for the intended purposes. This includes 'escrow accounts'.

An escrow account is a sum of money deposited in a dedicated account with a third party, usually a financial institution, on account of an obligation owed by the regulated person to a regulator. The third party agrees to pay out the money according to the terms of the documentation establishing the account, usually directly to the regulator on presentation of specified documentation.

Cash deposits are generally used for foreseen liabilities such as closure, restoration and aftercare of a landfill or mine, but can also be used for other liabilities.

In certain circumstances, a regulator may consider allowing a licensee to build up the fund over an agreed period of time. While the fund is building up, the operator should put in place an appropriate alternative financial provision.

ADVANTAGES	DISADVANTAGES
✓ The regulator has immediate access on presentation of specified documentation. ✓ May be appropriate to cover longer periods of time than other financial securities. ✓ The assets will not be affected by negative changes in the operator's financial position or its insolvency or dissolution provided that the underlying instrument is drafted appropriately. ✓ Creates an incentive for operators to promptly progress closure, restoration and aftercare works to limit the amount of money required to be set aside. ✓ There is potential for the value of the fund to grow ahead of projections.	× The associated money is not available to the operator for ordinary commercial purposes (e.g. for working capital or used to raise debt finance from a lender), although it may be released as and when the liability is addressed, e.g. through the complete of closure, restoration and aftercare works. × Domestic insolvency or winding up law could treat the deposits as properly belonging to the company and so undo the benefit of segregating them from the main body of the company's assets. × If the deposit is gradually built up without additional FP to cover the gap until the full amount is deposited, there may be insufficient money in the event of unanticipated early closure. × The sufficiency of the amount of money deposited being reduced by inflation or risk to investments in it.

IMPORTANT CONSIDERATIONS – CASH DEPOSIT

Basic considerations	Supplementary cover may be required while the deposit is accumulating. A first ranking charge on the account in favour of the regulator is required to protect against insolvency or dissolution of the operator. The deposit must be protected from investment risk.
Documentation	In addition to the standard documentation, the following may be required: a charge on the account in favour of the regulator.
Documentation specifications	In addition to the standard specifications, the following may be required: how the deposit can be drawn down with reference to the cost profile of the operation.
Reporting and monitoring	In addition to the standard requirements, the following may be required: reporting and monitoring of payments in.
Enforcement	In addition to the standard requirements, the regulator will need to ensure that the scheduled payments into the deposit are being made and may need to act in the case of the declining financial health of the deposit/institution.

5.5 Mutual fund/pool – INFORMATION SHEET

A mutual fund/pool is a mechanism by which a group of operators may satisfy financial provision requirements by demonstrating their membership of it. Acceptance into the mutual fund/pool requires the members to provide evidence of a specified amount of financial provision, and/or to pay a specified amount into the fund/pool each year. Members must agree to pay up to a specified (or unspecified) amount if a member of the fund/pool fails to do so. If the amount of such payment exceeds the monies held by the fund/pool, an additional drawing may be made on the members.

A mutual fund/pool may be used as financial provision for unforeseen incidents. It is not feasible for first-party cover for foreseen liabilities because this is a responsibility that must be carried out by individual operators as part of their permit or licence commitments. However, a mutual fund/pool may, depending on the nature of the pool, be used to cover the foreseen liabilities of a member that has become insolvent. Mutual funds/pools can be viewed as contrary to the polluter pays principle.

ADVANTAGES	DISADVANTAGES
✓ The cost to operators may be relatively low and does not tie up capital. ✓ May avoid the complexity and costs associated with establishing, maintaining and monitoring financial securities on a site-specific basis. ✓ May reduce the risk of a financial provision failing in any given case for legal or other issues. ✓ Should not be affected by negative changes in the financial viability of individual members or their insolvency or dissolution as long as the amount of assets in the fund/pool is sufficient to pay a claim(s) and/or other members have sufficient funding to respond to a call for additional funding in the event of a claim. ✓ Potential to provide a source of funds for large-scale losses. ✓ Potential to provide a source of funds where a member has entered into insolvency proceedings. ✓ Depending on the structure of the pool, contributions may be segregated from the operator's assets, meaning that they are likely to be beyond the reach of its creditors should it enter into insolvency or dissolve. ✓ Protects operators themselves from the financial consequences of environmental liabilities arising by spreading costs among members. ✓ Capacity to ensure that funds will be available to cover liabilities arising in the mid to long term. ✓ Where the amount that a member is required to contribute is determined by its individual risk profile (i.e. contributions are differentiated), this provides an incentive for it to reduce the risk. ✓ Where provision of an environmental management system is a requirement of membership, this provides an incentive to members to adopt them in order to be able to gain and continue their membership and lower their contribution (if relevant).	× Cost, time and expertise needed to establish and monitor the mutual fund/pool. × May be perceived as failing adequately to implement the 'polluter-pays' principle. Membership may be strictly limited, making it unavailable to many operators. × Where contributions are not differentiated according to the risk of the individual member, members may not be as motivated to improve their safety levels. × Where the terms and conditions for payment from the fund/pool are construed overly strictly, this may make it difficult to draw upon when necessary. × May not be feasible to establish a fund/pool for diverse operations; funds/pools tend to be used mainly for specific industrial or other sectors. × The mutual fund/pool may provide insufficient cover in the event of multiple calls on the pool; for example, where the industry covered by the pool goes into decline.

IMPORTANT CONSIDERATIONS – MUTUAL FUND/POOL

Basic considerations	Careful attention will need to be paid to the structure, management and governance of the mutual fund/pool. The fund should be ring-fenced for environmental liabilities and protected from investment risk.
Documentation	In addition to the standard documentation, the following may be required: evidence of continued membership.
Documentation specifications	In addition to the standard specifications, the following may be required: specification of joining criteria and specification of the structure, governance and management of the mutual fund/pool.
Reporting and monitoring	In addition to the standard requirements, the following may be required: reporting and monitoring of payments in, maintenance of membership and breach of membership criteria.
Enforcement	In addition to the standard requirements, the regulator will need to ensure that membership of the mutual fund/pool is maintained and may need to act in the case of declining financial health of the mutual fund/pool or the industry.

5.6 Charge on asset – INFORMATION SHEET

A charge on asset may take the form of a charge on premises (i.e. real estate) or other assets owned by an operator.

A charge on premises may take the form of a first ranking mortgage/fixed charge over a specific piece of land or real estate in favour of the regulator. While the land/real estate remains in the possession of the operator, the regulator will have the legal right to enforce their security over the asset and exercise their power of sale in respect of it if the operator fails to meet its obligations to the regulator or there is any other 'event of default' under the charge. This could, for example, include operator insolvency or dissolution under domestic law.

A charge on assets may be used as financial provision for an operator's foreseen liabilities as well as liabilities arising from an unforeseen incident that causes environmental damage.

ADVANTAGES	DISADVANTAGES
✓ As a fixed charge holder in respect of the asset, the regulator will be paid in priority to the operator's other creditors if the operator is wound up following its having become insolvent. The funds secured by the charge are, therefore, legally 'secure' in the event of the operator's insolvency or dissolution. ✓ A charge has the capacity to release capital from an illiquid asset (i.e. real estate) to use as evidence of financial provision while enabling the operator to continue using the asset. ✓ Does not oblige the operator to set aside funds, so does not tie up capital. ✓ Capacity to ensure that funds will be available to cover liabilities arising in the mid to long term. ✓ It may not be affected by negative changes in the operator's financial viability. ✓ There is a potential for increase in the value of the asset.	× Where a regulator requires that the asset be unencumbered (that is, it must not have any other interests registered against it, such as a charge in favour of a lender) before it can be utilised as financial provision for known, foreseen liabilities, it is likely that the vast majority of commercial premises, particularly high-value city-centre office premises, will not be suitable for such a charge. Few such premises are likely to be 'mortgage free' in the sense that there is no earlier charge registered in favour of a lender. × The associated asset is not available to the operator for ordinary commercial purposes (e.g. to raise debt finance from a lender). × Real estate is an illiquid asset, meaning that it may take some time to sell and transfer legal ownership; therefore, delay in realising its value. This will be particularly the case for specialist assets for which the market may be small. × There is potential for a reduction in the value of the asset due to decline in the overall real estate market and/or the market for that particular asset class/category. The asset could also decline in value due to local/national economic and political conditions. × Prior charges will reduce the effectiveness of the charge.

IMPORTANT CONSIDERATIONS – CHARGE ON ASSET

Basic considerations	Supplementary cover may be required due to illiquidity of the asset. A first ranking charge on the asset in favour of the operator is required to protect against insolvency or dissolution of the operator. The asset must be protected from devaluation. The asset must be protected (i.e. insured). The asset must be free from other charges or encumbrances.
Documentation	In addition to the standard documentation, the following may be required: the charge, evidence of valuation, evidence of insurance to protect the asset.
Documentation specifications	In addition to the standard specifications, the following may be required: how the charge can be drawn down with reference to the cost profile of the operation.
Reporting and monitoring	In addition to the standard requirements, the following may be required: annual revaluation, insurance to protect the asset, the value of any other obligations secured by the asset.
Enforcement	In addition to the standard requirements, the regulator may need to act in the case of declining financial health of the deposit/institution.

5.7 Self-provision – INFORMATION SHEET

Self-provision is financial provision by the operator itself.

Self-provision is the weakest method of financial provision. This may only amount to ensuring the operator plans for environmental liabilities, represents environmental liabilities in financial statements and/or provides a written commitment. Although it may be supported by financial criteria and checks, self-provision still offers little or no protection in the event of operator insolvency or dissolution. If the regulator becomes aware of the deteriorating financial strength of the operator and requires it to deposit funds or assets to provide for environmental liabilities, then this may be challenged under domestic insolvency or winding up law as a 'preference'.

The interpretation, verification, and monitoring of the financial test is time consuming and expensive, and also requires financial expertise. It may be restricted to public bodies/local government operators where the prospect of the operator ceasing to exist is remote and the liability is a public one in any case.

Ultimately there may be little or nothing that can be done if the operator encounters financial difficulties, so the critical point in considering self-provision is its suitability and acceptability in the first instance, in particular beyond public bodies/local government operators.

ADVANTAGES	DISADVANTAGES
✓ Little or no cost to the operator and does not oblige the operator to set aside funds, so does not tie up capital. ✓ Encourages the operator to plan for environmental liabilities and represent them in financial statements	× The overriding risk is that the self-provision becomes devalued or worthless if the financial strength of the operator declines, the worst case being insolvency.

IMPORTANT CONSIDERATIONS – SELF PROVISION

The diagram below highlights additional key aspects to be considered by the regulator when considering accepting self-provision.

Basic considerations	The operator must have sufficient financial strength for the amount of the potential liability. Whether the operator is a public body or not.
Documentation	The following may be required: evidence of financial strength of the operator based on audited accounts prepared according to international accounting standards, evidence of the provision and potentially a written guarantee to maintain the provision.
Documentation specifications	The following may be required: ongoing requirement to meet specified financial criteria, financial triggers for replacement with a stronger financial provision.
Reporting and monitoring	In addition to the standard requirements, the following may be required: frequent (annual minimum) audited financial statements and reporting on the level of liability and notification if the operator is likely to no longer meet specified financial criteria.
Enforcement	The regulator will need to make sure that the financial provision is acceptable or require a replacement provision.

5.8 Key checks for financial provisions

Key things to check	Insurance	Financial Institution Guarantee	Parent Company Guarantee	Cash Deposit	Mutual Fund/Pool	Charge on Asset	Self-Provision
Basic considerations							
The provision provides for the estimated environmental liability	●	●	●	●	●	●	●
Certainty of amount to be received and immediacy of access	●	●	●	●	●	●	●
Payable on demand	●	●	●	●	●	●	
Provider is authorised to provide that provision in the jurisdiction	●	●	●				
Provider has sufficient financial strength	●	●	●				●
Supplementary cover for intentional acts or excess	●						
Supplementary cover due to illiquidity of the asset						●	
Supplementary cover while the provision is being accumulated				●			
Protection against insolvency or dissolution of the operator – first ranking charge				●		●	
Protection against insolvency or dissolution of the operator – right of regulator to call in the provision	●	●	●	●	●	●	
Parent has corporate legal capacity to enter into the agreement and is not reliant on the financial performance of the operator			●				
Ring fencing of cover for environmental liabilities	●				●		●
Protection from investment risk				●	●		●
Structure and management and governance of the provision					●		
Protection from devaluation						●	
Protection from inflation	●	●	●	●	●	●	●
Commercial appeal, valuation and free from other charges or encumbrances						●	
Protection of the asset						●	
Cover in the case of insolvency/termination	●	●	●	●	●	●	●

Key things to check	Insurance	Financial Institution Guarantee	Parent Company Guarantee	Cash Deposit	Mutual Fund/Pool	Charge on Asset	Self-Provision
Documentation							
Legally binding financial provision document	●	●	●	●	●	●	●
Details of the amount of cover and the cost profile	●	●	●	●		●	●
Evidence of the authorisation of the financial institution or parent to provide the financial provision	●	●	●	●		●	●
Evidence of membership					●		
Evidence of financial strength	●	●	●				●
Evidence of supplementary cover for gaps in primary cover	●	●	●	●	●	●	●
Evidence of valuation						●	
Evidence of insurance to protect the asset						●	
Documentation specifications							
Standard template or standard worded clauses	●	●	●	●		●	●
Specification that regulator may make a demand in the case of non-renewal		●	●				
Details of cover in the case of insolvency or dissolution	●	●	●	●	●	●	
Specification of the triggering event, including insolvency/termination	●	●	●	●	●	●	●
Specify who can make a demand and who payments are made to in the case of the triggering event.	●	●	●	●	●	●	
Ensure exclusions do not compromise access to the financial provision	●	●	●	●	●	●	
Specification of requirements in relation to cancellation, expiration and replacement.	●	●	●	●		●	●
Specification that the provision is irrevocable, non-transferable and non-assignable	●	●	●	●		●	
Specification of requirements in relation to inflationary adjustment	●	●	●	●		●	●
Specification of how the guarantee can be drawn down with reference to the cost profile of the operation		●	●	●		●	
Specification of reporting requirements	●	●	●	●	●	●	●
Specification of joining criteria					●		
Specification of the management, structure and governance of the provision					●		

Key things to check	Insurance	Financial Institution Guarantee	Parent Company Guarantee	Cash Deposit	Mutual Fund/Pool	Charge on Asset	Self-Provision
Reporting, monitoring							
Triggering events	●	●	●	●	●	●	●
Cancellation, expiration, intent to renew, renewal or non-renewal	●	●	●				
Developments that affect financial strength or ability to ensure provision	●	●	●	●	●	●	●
Annual audited financial statements			●				●
Annual inflationary adjustments	●	●	●	●		●	●
Payments in				●	●		
Progress reports on cost profile and restoration etc.		●	●	●	●	●	●
Withdrawals or demands	●	●	●	●	●	●	
Performance of institution or fund or asset value	●	●	●	●	●	●	●
Maintenance of membership					●		
Breach of membership criteria					●		
Use of the asset to secure other obligations						●	
Ongoing insurance to protect the asset						●	
Annual valuation						●	
Expiry dates	●	●	●				
Environmental compliance	●	●	●	●	●	●	●
The level of liability against the value of the financial provision	●	●	●	●	●	●	●
Enforcement							
Making a demand on the financial provision if the triggering event arises	●	●	●	●	●	●	
Ensure financial provision is maintained/renewed	●	●	●				●
Ensure membership of a mutual fund/pool is maintained					●		
Ensure financial provision is increased in line with increasing liability	●	●	●	●	●	●	●
Ensure scheduled payments into cash deposits are made				●			
Act on declining financial health of the operator or parent or declining value of the asset or negative performance of institution or fund		●	●	●	●	●	●
Act on failure to provide required reports	●	●	●	●	●	●	●

6 Monitoring and enforcement

6.1 Monitoring

Following the establishment of the specific form of financial provision, ongoing maintenance and monitoring of the financial provision during the lifetime of the operation is necessary. This may be as simple as ensuring that financial provision, such as an insurance or guarantee, is renewed or it may involve a more in-depth investigation as to whether the operator continues to satisfy the financial tests, for example, in the case of self-provision. Regulators should consider the benefits of engaging in dissemination and sharing of good practice in this area and of joined-up working with other authorities involved in the permitting, regulation and monitoring of an activity.

Practices that should be considered by regulators for checking and monitoring each of the different types of financial provision are detailed below. Before considering these, two more general points applicable to all the measures covered below may be made:

- The operator could, if they are not so already, be placed under an obligation to inform the regulator of any material change in their financial strength or petition being presented, or resolution being passed, to wind up the company. This would give the regulator advance notice of any entry of the operator, or potential entry, into insolvency or winding up proceedings.
- Regulators should have a clear, pre-prepared plan of action should the operator or their parent company no longer be in a position to deliver the financial provision that they originally presented. For instance, a plan should be in place as to the appropriate course of action should a self-insuring operator, or a parent company that provides a parent company guarantee, be no longer able to meet the financial tests.

Environmental impairment liability insurance

- Seek confirmation that the policy remains in place.
- The regulator should ensure that the operator provides evidence of payment of premiums annually.
- At least a specified period (e.g. three months) prior to expiry of the policy, require that the operator notify the regulator of their intent to replace the policy on the same terms of the existing policy.
- At least a specified period (e.g. 30 days) prior to the expiry of the policy, require that the operator provide evidence to the regulator that the policy has been so replaced.
- If the above information is not presented to the regulator's satisfaction, the operator should be required to put in place a replacement financial provision that is acceptable to the regulator immediately.

Financial institution guarantee

- The regulator may want to conduct ongoing health checks of the financial institution.
- The performance agreement associated with any guarantee should contain a clause requiring the operator to renew it prior to the expiry. Failure to comply would constitute a default and would result in the existing guarantee being drawn upon if the operator fails to agree an alternative financial provision with the regulator.
- A renewable guarantee may require a fixed sum to be paid from day one, or it may be incremental, building up or decreasing year by year as the liability on the site increases or

decreases. In either case, the sum should be subject to an annual inflationary adjustment as specified in the relevant clause in the performance agreement. The regulator should require written confirmation from the financial institution that the guarantee value has been amended. The guarantee will follow a profile agreed at the outset and will normally be documented within a schedule to the performance agreement. It will still be necessary for the regulator to review the rate of input into the site and confirm that the estimated liability is adequately covered by the value of the guarantee at that point in time.

Parent company guarantee and self-provision

- Regular ongoing monitoring of the financial strength of the operator and/or their parent company typically based on detailed, specified financial criteria. The financial criteria may include net assets and net current assets, location of assets, various financial ratios. The operator or parent could be required to continue to meet a specified credit rating which must be reported direct to the regulator at the cost of the operator.

Cash deposits

- The regulator should review the deposits regularly (at least annually) to ensure that the sums deposited accord with the expenditure profile. The sum should be subject to an annual inflationary adjustment which should be specified in the relevant clause in the performance agreement. The regulator should carry out this calculation and communicate it to the operator.
- If the operator wishes to withdraw sums for works legitimately carried out under the permit, they should be requested to present contractors' invoices as evidence. In circumstances where there is a major withdrawal, which has not been planned for, the sum taken out will impact on the financial profile of the account. At that time the overall sum will need to be reviewed.
- It is vital that account statements are issued to both parties on a regular basis. The regulator should review the statements to ensure that the value of the deposit is in line with the agreed profile. For example, for a landfill, the expenditure profile may have been calculated on a rate per tonne – in line with the anticipated input rate to the site. It will therefore be necessary for the regulator to review the waste input rate and ensure that the cash available continues to meet the potential liability at the particular point in time. The regulator will also have to adjust the rate per tonne annually in line with the inflation clause in the performance agreement.

Mutual fund/pool

- Monitor information provided on a rolling/regular basis as to the financial viability of members or delegate this task.
- Monitor membership and any financial provision evidenced by them to improve the ability to respond quickly to any negative changes or delegate this task.
- Investigate notification of any:
    - incidents or events that affect the financial viability of the fund/pool, e.g. reductions in members' credit ratings, insolvencies;
    - change in the membership of the fund/pool, the amount of funding held by it; and
    - breach by a member of the criteria for membership.

- Consider carefully whether financial provision in lieu of the fund/pool is required and, if so, what type.

Charge on asset

- The charge instrument may provide that a breach of the required 'property value : financial provision' ratio will entitle the regulator to exercise their power of sale under the charge. The operator should accordingly be required to periodically (as well as on request) provide an independent valuation of the property to the regulator to demonstrate that the 'property value : financial provision' ratio continues to be satisfied. If the ratio is breached at any time, consider exercising the power of sale under the charge.
- Monitor any requirement that the operator maintain appropriate insurance in respect of the property subject to the charge.

6.2 Enforcement

Regulators need to have systems and protocols in place to respond decisively and effectively to the following types of scenarios.

- Making a demand on the financial provision if the event arises, e.g. in the event of insolvency or dissolution of the operator leading to abandoned closure liabilities or an incident leading to environmental pollution.
- Failure to maintain financial provision, e.g. non-renewal of insurances or guarantees.
- Failure to maintain membership of a mutual fund/pool.
- Failure to increase financial provision in line with increasing liability.
- Failure to make scheduled payments into cash deposits.
- Declining financial health of operator or parent.
- Declining value in asset.

The options available to regulators will depend on the legal systems in place in that country but, as with any other matter of environmental enforcement, there should be provision for administrative or legal sanction. There will be provision within the financial provision legal documents to take action in relation to the core protection but there may also be provision therein to address matters such as non-renewal. For example, there may be provision in a financial institution guarantee to make a demand on it if is not renewed within a specific period prior to expiry. It is key that regulators consider these various scenarios in advance of any possible event, and consider their powers and the practicalities involved so to be well placed to act in the event that enforcement is required. There may be complex legal issues involved and restrictions in terms of timing; for example, insurance policies may be complex documents and there are generally stipulations around notices to the insurer and the timing of the event and notice in respect of the policy period.

7 Other approaches to provide for environmental liability

There are other ways that seek to ensure that environmental liabilities are addressed if the operator cannot pay or be found. This includes measures that seek to hold other persons liable for remedial costs and national funds.

7.1 Extended liability

There are three main categories of persons who may be found liable: parent companies, directors and officers, and a broader category of 'related persons'.

7.1.1 Parent companies

There may be instances in which a parent company (i.e. the corporate shareholder) of an operator may be held liable for environmental liabilities. Prior to discussion of these, two fundamental principles of corporate law, present in many if not most jurisdictions, must be emphasised. First, upon incorporation, each company is treated as a separate legal person to its shareholders (e.g. its parent company). This means that the shareholders cannot, in ordinary circumstances, be held liable for the company's debts and obligations. Second, shareholders (e.g. parent companies) benefit from limited liability, meaning that should the company become insolvent, they need only contribute the amount, if any, unpaid on the shares which they hold in the company. The extent to which these two principles are respected within a legal jurisdiction will depend on its legal tradition. For instance, some jurisdictions will disregard the principle of separate legal personality more readily than others.

If a parent company is to be held liable, its liability will usually arise in two circumstances. First, where, upon an interpretation of legislation, the parent is found to be the 'responsible person'. This often is termed 'direct' liability. For instance, where the responsible person is deemed to be the person who 'operates' or 'controls' the relevant activity (e.g. the EU ELD), a parent company that is found to have 'operated' or 'controlled' the activity will be the responsible person. Case law from the United States Supreme Court (*United States v Bestfoods*, 524 U.S. 51 (1998)) states that, under US law, there are circumstances under which a parent company could be deemed to 'operate' the facility of its subsidiary. But these circumstances are restrictive and have been interpreted narrowly by subsequent courts.

Secondly, the parent company may be held liable for the debts and liabilities *of its subsidiary*. This is often termed 'indirect' or 'derivative' liability. It must be noted that this form of liability is quite different to the first category where the parent is held liable for its *own* actions. Indirect (or derivative) liability could arise where the 'corporate veil' of the subsidiary was pierced or lifted. In corporate law, the phrase 'corporate veil' is a metaphorical term for the principle that once incorporated, a company is a legal person separate to its shareholders with rights and liabilities of its own. When the 'corporate veil' is 'pierced' or 'lifted', the courts will disregard the separate legal personality of the subsidiary, imposing its debts on its parent company (or its shareholders more generally). Again, the extent to which this is possible will be determined by the legal tradition of the particular jurisdiction. However, some jurisdictions specifically provide for such liability if a subsidiary becomes insolvent or bankrupt. An example is the Grenelle 2 legislation that was enacted in France in 2010. The legislation includes provisions that can require the parent of a subsidiary that faces liquidation to pay part or all of the costs of remediating environmental damage at specified facilities if the parent's negligence contributed to the subsidiary's loss of assets.

7.1.2 Directors and officers

As with parent companies, directors and officers may, in some jurisdictions, also be subject to direct or indirect (or derivative) liability for remediating environmental damage.

Perhaps the best-known case is Northstar Aerospace (Canada) Inc., which operated a helicopter and aircraft parts manufacturing facility in Cambridge, Ontario, from 1981 to 2010. Following the company's bankruptcy in 2012, the Ontario Ministry of Environment ordered 12 former directors and

officers of Northstar to carry out measures to remediate trichloroethylene and hexavalent chromium in groundwater that was migrating from the facility to a residential area. The regulator had previously required Northstar to carry out the remediation. The case was eventually settled for C$4.75 million.

There is also case law from the High Court of Ireland on both the direct (*Ronan v Clean Build Ltd*. and *Cork CC v O'Regan*) and indirect (or derivative) (*Wicklow CC v Fenton* and *Environmental Protection Agency v Neiphin Trading Ltd*) liability of directors.

There may also be opportunities to pursue directors personally under insolvency or winding-up law provisions in circumstances where they have been negligent or in breach of their duties to the company, such as the provisions in the UK in section 212 of the Insolvency Act 1996.

7.1.3 Related persons

In 2016, the Government of Queensland, Australia, amended the Environmental Protection Act 1994 (Qld) to authorise the Department of Environment and Heritage Protection to order 'related persons' to remediate environmental damage if the operator enters into formal insolvency proceedings (administration, liquidation or receivership) and thus cannot pay to remediate environmental damage for which it is responsible.

'Related persons' under the 'chain of responsibility' amendments are: a holding company (i.e. its parent company) of the operator; an associated company that owns land on which the operator is carrying, or has carried, out specified activities such as mining; or another person who is carrying, or has carried, out activities under an environmental permit that are causing, or are likely to cause, environmental damage.

7.2 General funds

There are various general environmental funds at State level which are in theory or practice available to use by States to address environmental liabilities where there is a default by an operator. These may be funded from general taxation or levies targeted on polluting practices and may also have other purposes such as funding environmental initiatives generally.

These are considered distinct from financial provisions by way of a 'mutual fund or pool', which are much more targeted instruments in terms of both their funding (by operators who have the specific obligations and liabilities) and their uses (generally only as a fall-back to address defaults by those operators).

These types of general environmental funds are not considered further here.

At EU level, the EU Solidarity Fund was established in 2002 following severe flooding in Austria, the Czech Republic, France and Germany. The focus of the fund is to enable the EU 'to respond [to a major natural disaster] in a rapid, efficient and flexible manner'. With the sole exception of damage from the *Prestige*, however, the fund has not provided, and does not provide, funding for a man-made disaster. Further, the EU Solidarity Fund does not provide funding if the damage is insurable.

The EU Commission published a report in 2013 on a Study to explore the feasibility of creating a fund to cover environmental liability and losses occurring from industrial accidents.

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https://www.business.qld.gov.au/running-business/environment/licences-permits/rehabilitation/provision-deposit

Guidelines on Financial Guarantees and Inspections for Mining Waste Facilities, 2007, Montex
http://ec.europa.eu/environment/waste/mining/pdf/EU_Final_Report_30.04.08.pdf

Heads of Planning Scotland Position Statement on the Operation of Financial Mechanisms to Secure

Decommissioning, Restoration and Aftercare of Development Sites (contains decommissioning cost template for windfarm)
https://hopscotland.files.wordpress.com/2014/08/hops-6-7-15-position-statement-on-bonds-with-appendices2.pdf

Restoration Guarantee Bonds for Opencast Coal Mines, 2007
https://www.east-ayrshire.gov.uk/Resources/PDF/C/Coal-Restoration-Guarantee-Bonds-for-Opencast-Coal-Mines.pdf

Annex 1 Examples of Usage and Guidance

European Union	
Sector	Environmental Liability Directive
Liability	Unforeseen
References	Extensive information is available on environmental insurance and other forms of financial provision in the context of studies under the Environmental Liability Directive. The European Commission in particular has conducted a number of studies which are available on its website. http://ec.europa.eu/environment/legal/liability/ This report, by Marsh, on environmental insurance is also available, and details average limits of indemnity sought by mid-sized companies from 2011 to 2015. https://www.marsh.com/content/dam/marsh/Documents/PDF/UK-en/EMEA%20Environmental%20Market%20Update.pdf
Sector	Extractive Waste Directive
Liability	Obligations under a permit including after-closure and rehabilitation
References	EU Guidelines on Financial Guarantees for Mining Waste Facilities http://ec.europa.eu/environment/waste/mining/pdf/EU_Final_Report_30.04.08.pdf
Sector	Transfrontier shipment of waste regulation
Liability	Repatriation of waste
References	A compilation of methods used in EU Member States to calculate the amount of financial provision was published in 2016. The calculation methods are formulas based mainly on the tonnage of waste shipped by the cost per tonne for 90 days' storage, transport and treatment. Other factors that may be incorporated include: distance, number of active shipments, administration and contingency. Some rates to be used in the calculations are specified or given as guidance; minimums are also set and one State specifies an absolute amount as a starting point. http://ec.europa.eu/environment/waste/shipments/pdf/Calculation%20of%20financial%20guarantee.pdf
Sector	Geological storage of carbon dioxide
Liability	Obligations under a permit
References	Guidance on financial security and financial mechanism https://ec.europa.eu/clima/sites/clima/files/lowcarbon/ccs/implementation/docs/gd4_en.pdf

Bulgaria	
Sector	Environmental Liability Directive
Liability	Unforeseen
References	Prevention and Remediation of Environmental Damage Act 2008 (PREDA) SG 43/2008
Financial provisions [terminology of country used]	– Insurance – Bank Guarantee – Mortgage – Pledge
Notes	The minimum required amount of insurance cover is Bulgarian Leva 50,000 (€ 25,025)

England	
Sector	Landfills
Liability	Closure, restoration and aftercare, and specified events
References	Guidance and spreadsheets for determining the amount Guidance on financial provision https://www.gov.uk/government/publications/financial-provision-for-landfill
Financial provisions [terminology of country used]	– Escrow account – Cash deposits with the Environment Agency – Trust-based investment portfolios – Renewable bonds – Local Authority Deed Agreement (restricted to a local authority or public body or activities by a company whose shares are wholly owned by a local authority or public body) – Parent company guarantees (restricted to 'in-house' landfills that only accept waste from the on-site producer. The parent cannot be financially reliant on the operator.)
Notes	The Environment Agency requires landfill costing to be based on 60 years' aftercare for non-hazardous and hazardous landfills (unless justified otherwise) and 3 years for inert landfill. The guidance contains some information on unit rates and expected design life. The Environment Agency reported having over 500 financial securities in place in England with a total value over £600 million in 2016.

Finland	
Sector	Waste management and waste treatment, transfrontier shipment of waste
Liability	Closure, restoration and aftercare for waste management and treatment Transportation costs for transfrontier shipment of waste
References	Jätevakuusopas − Opas jätehuollon toimijoilta vaadittavista vakuuksista (in Finnish) (Guide on a Financial Guarantee in Waste Management − Guidance for waste management operators on the required financial guarantee) Ministry of the Environment, Department of Natural Environment Date August 2012

	http://hdl.handle.net/10138/41529
Notes	The purpose of the guide is to instruct operators and regulators in the revised provisions on financial guarantee. The Waste Act stipulates that a financial guarantee to ensure proper waste management is required from manufacturers of electrical and electronic equipment used in households, from waste carriers and suppliers, and from those involved in international waste transfers. The Environmental Protection Act stipulates that a financial guarantee is required from entities engaged in waste treatment. The amended regulations more specifically limit the scope of approved forms of financial guarantee and indicate the parties allowed to provide the guarantee.
Sector	Operators who require an environmental permit from the state environmental authority or from the Finnish Safety and Chemicals Agency for processing or storing hazardous chemicals or explosive (subject to certain exemptions).
Liability	Environmental damage
References	The IMPEL Year 1 Report discussed a Finnish fund created by the Environmental Damage Insurance Act of 1998. The aim of the fund is to guarantee full compensation for environmental damage, including the costs of measures to prevent or limit the damage and to restore the environment to its previous state in cases where persons who are liable for compensation are insolvent or cannot be identified. Monies for the fund are from special mandatory premiums for operators who have an environmental permit for high-risk activities. The fund is administered by insurance companies; an Environmental Insurance Centre handles all the claims for compensation. Full compensation is provided to claimants suffering from environmental damage, as well as funding for measures taken to prevent or limit damage and measures to restore the environment to its previous state. http://www.yvk.fi/en/
Financial provisions [terminology of country used]	– Environmental insurance pool

France	
Sector	Industry and waste (with some exemptions)
Liability	Decommissioning
References	Presentation and legal links. http://www.commonforum.eu/Documents/Meetings/2013/Bratislava/2_C_Favrie_FinancialGuarantees.pdf https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000025801785&dateTexte=&categorieLien=id https://www.legifrance.gouv.fr/affichTexte.do;jsessionid=?cidTexte=JORFTEXT000026052400&dateTexte=&oldAction=rechJO&categorieLien=id

	https://www.legifrance.gouv.fr/affichTexte.do;jsessionid=?cidTexte=JORFTEXT000026269532&dateTexte=&oldAction=rechJO&categorieLien=id https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000026052372 https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=LEGITEXT000021711481
Financial provisions [terminology of country used]	– Guarantees from a bank, an insurance company or a mutual guarantee company – Deposits to a public agency – Guarantee fund managed by public agency, ADEME, for landfill sites – A private guarantee fund proposed by an activity sector and organised by a fund manager (insurance company or mutual guarantee company) – Parent company guarantee; the parent company must have another guarantee (from the types above)

Greece	
Sector	Waste management and transportation
Liability	Not known
References	Environment Protection Law 4042/2012 http://www.ypeka.gr/Default.aspx?tabid=778&sni[1155]=1568
Financial provisions [terminology of country used]	– Insurance – Bank Guarantee
Notes	

Ireland	
Sector	Waste and industrial operations
Liability	Closure, restoration and aftercare, and incidents
References	Guidance on determining the amount Guidance on financial provision Financial provision templates http://www.epa.ie/enforcement/financialprovisionforenvironmentalliabilities/
Financial provisions [terminology of country used]	– Secured fund – On-demand performance bond – Charge on property – Parent company guarantee (not accepted for inevitable closure liabilities such as landfill and mine closure, subject to financial tests) – Environmental impairment liability insurance (specific requirements apply)
Notes	The Irish EPA reported over €400 million in financial provision in place under the above system, over 50% in financial institution guarantees, in mid 2017.

Netherlands	
Sector	Service stations
Liability	Contamination
References	The Netherlands CoFiZe is a Collective Financial Provision Fund that service stations can join to fulfil the legal obligation to provide financial provision. This guarantee is intended to cover the liability arising from contamination of the soil due to the operation of a service station. The provision is focused on damage to third parties including the State. An additional levy is payable where there is pre-existing contamination. http://www.cofize.nl/page/view/aanmelden The legal basis is found in article 2.24 of the Activities Decree Environmental Management (Activiteitenbesluit milieubeheer) and in article 4.1 of the Wabo (Act on general provisions on environmental law).
Financial provisions [terminology of country used]	– Collective financial provision fund
Sector	Mining
Liability	Storage of waste
References	Mining law (Mijnbouwwet)
Financial provisions [terminology of country used]	An extraction or exploration permit may be refused if the applicant cannot demonstrate financial strength.
Sector	Earthworks
Liability	Permitted obligations
References	Earth Removal Act (Ontgrondingenwet)
Financial provisions [terminology of country used]	– Bond
Sector	In the Soil Protection Act (Wbb) is incorporated an article (39 f) dealing with financial security in case – after remediation – a partial contamination remains. This security can be appealed to if after a period of five years the cost of measures to contain the pollution is above 50% of the total costs.
Liability	–
References	–
Financial provisions [terminology of country used]	–
Notes	In addition to the above mentioned provisions a new law has been adopted: Omgevingswet (Environment and Planning Act). An underlying decree is in preparation (expected to enter into force on 1 January 2021). This would give the competent authority the power to require financial provision for SEVESO activities

	and activities falling under category 4 of Annex I of the Industrial Emissions Directive.

Northern Ireland	
Sector	Landfills
Liability	Closure, restoration and aftercare
References	Guidance on determining the amount Guidance on financial provision https://www.daera-ni.gov.uk/sites/default/files/publications/doe/waste-policy-financial-provision-waste-management-june-2016.pdf
Financial provisions [terminology of country used]	– Cash – Escrow – Bond and renewable bond – Local Authority Deed Agreement (restricted to a local authority or public body carrying on its own waste activities)
Sector	Non-landfill waste operations
Liability	Management of waste and restoration/remediation
References	Guidance on determining the amount Guidance on financial provision https://www.daera-ni.gov.uk/sites/default/files/publications/doe/waste-policy-financial-provision-waste-management-june-2016.pdf
Financial provisions [terminology of country used]	Higher risk (amount ≥£10,000) – Cash – Escrow – Bond and renewable bond – Parent company guarantee – Insurance Lower risk (<£10,000) – Credit reference check or other evidence of financial standing – Named, dedicated budget (restricted to public sector sites)

Norway	
Sector	Storage, delivery and treatment facilities of hazardous waste
Liability	Cover costs of removing and treating the maximum amount of waste that can be stored according to the permit (unforeseen liabilities)
References	The Pollution Control Act section 16 cf. 11 (Not based on EU regulations) Regulations relating to the recycling of waste, chapter 11 appendix 4
Financial provisions	The operator can choose between -Account pledges in respect of blocked cash deposits, – -On demand bank guarantees

[terminology of country used]	
Sector	Landfill, Mining Waste
Liability	Cover costs of closure and aftercare (normally 30 years)
References	The Pollution Control Act section 16 cf. 11 Regulations relating to the recycling of waste, sections 9-10 and 17-8
Financial provisions [terminology of country used]	The operator can choose between Account pledges in respect of blocked cash deposits, -On demand bank guarantees In addition, parent company guarantees can be accepted in combination with one of these two securities in the early stage of the period.

Poland	
Sector	Industrial installations
Liability	Unforeseen
References	The Act of 13 April 2007 on the prevention and remedying of environmental damage (Dz. U. z 2014 r. poz. 1789 - t.j. ze zm.) http://www.lex.pl/du-akt/-/akt/dz-u-2014-210
Financial provisions [terminology of country used]	– Deposit – Bank guarantee – Insurance policy

Scotland	
Sector	Landfills
Liability	Closure, restoration and aftercare
References	Guidance and spreadsheets for determining the amount. https://www.sepa.org.uk/media/219299/wst-g-031-financial-provision-for-non-landfill-waste-management.pdf
Sector	Quarries
Liability	Restoration
References	The Mineral Products Association Restoration Guarantee Fund provides a £1m overall guarantee to planning authorities against a restoration default up to a single claim limit of £500k. It applies to all extraction sites operated by Fund members, and a planning authority can submit a claim when the operator of a quarry is unable to meet restoration obligations that arise through a planning condition. The only terms of eligibility are that the operator concerned is unable to comply as a result of financial failure and that the planning authority should have used every enforcement power available to them to achieve compliance. The Fund has monies on deposit and any additional amounts needed to meet a successful claim are to be raised from the membership. Over the 40 years it has been in place, the Fund has never had to be called upon. http://www.mineralproducts.org/restoration_guarantee_fund.htm

Financial provisions [terminology of country used]	– Guarantee fund
Sector	Mineral extraction
Liability	Restoration
References	The IMPEL Year 1 Report *Financial Provision – Protecting the Environment and Public Purse* identified a case where guarantees to restore mineral extraction sites in Scotland were called in. This was successful in some cases but led to disputes about the terms and conditions of the guarantees in other cases, which resulted in delays before the courts held in favour of the regulators. In addition, there were inadequate amounts of funds in some guarantees. These problems can be mitigated by: – Specifying in the guarantee that the regulator may make a direct claim against it; – Ensuring that the guarantee may be accessed immediately if the triggering event occurs, clearly specifying the procedures for doing so in the guarantee; and – Ensuring that the amount of the guarantees adequately corresponds to the amount of the losses covered by it. The Heads of Planning Scotland Position Statement on the Operation of Financial Mechanisms to Secure Decommissioning, Restoration and Aftercare of Development Sites contains an example planning agreement for restoration and aftercare. https://hopscotland.files.wordpress.com/2014/08/hops-6-7-15-position-statement-on-bonds-with-appendices2.pdf
Financial provisions [terminology of country used]	– Guarantees
Sector	Non-landfill waste operations
Liability	Restoration
References	Includes a formula for calculating the amounts for waste management activities based on the maximum amounts of various wastes stored. Guidance on credit reference checks and other financial checks. https://www.sepa.org.uk/media/219299/wst-g-031-financial-provision-for-non-landfill-waste-management.pdf
Financial provisions [terminology of country used]	– Credit reference check or other evidence of financial standing

Slovenia

Sector	Landfill, Transfrontier Shipment of Waste
Liability	Operation and cessation
References	Environment Protection Act 2016 http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO1545
Financial provisions [terminology of country used]	– Insurance – Bank Guarantee
Sector	Environmental liability directive Annex III activities
Liability	Cost of preventive or remedial measures
References	As above
Financial provisions [terminology of country used]	Bank guarantee or other form of security

Spain	
Sector	Various
Liability	Unforeseen
References	The Ministerio de Agricultura y Pesca, Alimentación y Medio Ambiente has developed a computer application (MORA) for calculating potential environmental damage costs. According to the legal requirements, operators initially carry out a risk assessment to identify the operation's risk scenarios, score them based on the probability of occurrence and an environmental damage index and then select the scenario that represents 95% of the risk. The MORA model is a follow-on non-mandatory tool for calculating potential environmental damage costs. It requires information on the place where the damage would occur, the agent causing the damage (e.g. fuel, fire), the extent of natural resources affected (e.g. numbers of species, quantities of soil or water) and the reversibility of damage. It contains environmental data for Spain, selects the best remediation method (which can be adjusted) and contains unit rate costs for the remediation methods. The receptors considered are water (groundwater, rivers, sea), soil, species and habitats. Its greatest potential is as an *ex-ante* methodology although it could be used to assist with evaluations *ex-post*. Many sectors have developed electronic risk analyses for their industry that connect with the MORA application, automatically retrieving estimated restoration costs for their risk scenarios, which is very useful for risk management purposes. https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/responsabilidad-mediambiental/modelo-de-oferta-de-responsabilidad-ambiental/
Financial provisions [terminology of country used]	– Dedicated assets reserve – Bond – Insurance

Sweden	
Sector	Mining

Liability	Treatment of mining waste and after-treatment of mining facilities
References	Report on costs: DELRAPPORT AV REGERINGSUPPDRAG STRATEGI FÖR HANTERING AV GRUVAVFALL, *Utvärdering av efterbehandlad gruvverksamhet* och *Kartläggning av kostnader för hantering av gruvavfall och för efterbehandling av gruvverksamhet*, RR 2017:04, SGUs diarie-nr: 311-888/2016 och Naturvårdsverkets diarie-nr: 03195-16.
Sector	Operators with environmental permits
Liability	Environmental damage
References	A fund that was established in Sweden was discussed in the IMPEL Year 1 Report. The Swedish Environmental Damage Insurance fund, which was established under the 1986 Environmental Damage Act, provided compensation for environmental damage, personal injury and property damage in cases of pollution when the polluter could not be identified, the liable party was insolvent, or liability was time-limited. Monies for the fund came from operators with environmental permits, with the amount paid by them proportionate to the type of operations carried out by them and their size. As indicated, however, that fund was abolished in January 2010, largely because it was more restrictive in operation than anticipated when it was established. http://www.regeringen.se/contentassets/ecc43e5964704389a67658b96fd0ecea/gmo-skador-i-naturen-och-miljobalkens-forsakringar-sou-200721
Financial provisions [terminology of country used]	– Environmental damage and clean-up insurance fund

Australia (Victoria)	
Sector	Landfills, prescribed industrial waste management, bulk storage, container washing and contaminated sites
Liability	Operation, closure and aftercare
References	Guidance on determining the amount Guidance on financial provision Financial provision templates http://www.epa.vic.gov.au/~/media/Publications/1584.pdf http://www.epa.vic.gov.au/~/media/Publications/1594.pdf http://www.epa.vic.gov.au/~/media/Publications/1595.pdf
Financial provisions [terminology of country used]	– Bank guarantee – Guarantee by deed poll (certain credit rating required, not appropriate for closed landfills) – Mutual fund – Accumulating trust fund – Letter of credit – Security over land

	– Bond – Contract performance bond – Insurance – Internal provisioning of adequate funds (sites operated by public entities or Local Government)
Australia (Queensland)	
Sector	Mining and petroleum/gas
Liability	Rehabilitation and restoration
References	Guidance and spreadsheets for determining the amount https://www.business.qld.gov.au/running-business/environment/licences-permits/rehabilitation/security-deposit

Canada (Alberta)	
Sector	Oil and gas
Liability	Closure of all wells, facilities and pipelines associated with the oil and gas sector
References	Alberta has an industry backstopped levy-based system for addressing liabilities in the oil and gas sector. On a monthly basis, and at the time a transfer is applied for, an asset and liability assessment is conducted. When the assets associated with a company are deemed to be less than their liabilities, a security deposit is required to be provided to the regulator of sufficient value to make up the difference. In the event of insolvency, those security deposits, and associated infrastructure and sites that require closure work, are transferred to the Orphan Well Association to address. The Orphan Well Association is a separate corporate entity whose operating budget comes from transferred security deposits, and an annual levy of the oil and gas sector. http://www.aer.ca/rules-and-regulations/directives/directive-001 http://www.aer.ca/rules-and-regulations/directives/directive-006 http://www.aer.ca/rules-and-regulations/directives/directive-011 http://www.aer.ca/rules-and-regulations/directives/directive-024 http://www.aer.ca/rules-and-regulations/directives/directive-075 http://www.orphanwell.ca/
Financial provisions [terminology of country used]	– Letter of Credit – Cash http://www.aer.ca/rules-and-regulations/directives/directive-068

United States of America	
Sector	Hydrocarbon storage
Liability	Releases from hydrocarbon storage tanks
References	Guidance on financial provision for underground storage tanks including specified minimum amounts. https://www.epa.gov/ust/resources-ust-owners-and-operators

	The New Hampshire Petroleum Fund Program is a financial assistance programme for owners of petroleum storage facilities, and owners of public or private water supplies. The programme provides 'excess insurance' for cleaning up contamination at storage tank facilities and provides funding to clean up water supplies contaminated by gasoline products. The programme comprises four separate funds authorised by state statute. Since programme inception, $251,980,232 has been disbursed from the funds for clean-up cost reimbursement. http://www.des.nh.gov/organization/divisions/waste/orcb/fms/prfp/
Financial provisions [terminology of country used]	– Trust fund – Surety bond – Letter of credit – Financial test (companies with tangible net worth ≥$10 million and subject to other tests) – Corporate guarantee – Underground storage tank pollution liability insurance – State financial assurance fund The following are also available to local governments – Bond rating test – Financial test – State or another local government guarantee – Dedicated fund
Sector	Municipal solid waste landfills
Liability	Closure, post-closure and incidents
References	Financial assurance requirements https://archive.epa.gov/epawaste/nonhaz/municipal/web/html/famsw.html#1
Financial provisions [terminology of country used]	– Trust fund – Surety bond guaranteeing payment or performance – Letter of credit – Insurance – Corporate financial test (companies with tangible net worth ≥$10 million plus liabilities, and subject to other tests) – Local government financial test – Corporate guarantee – Local government guarantee – State-approved mechanism – State assumption of responsibility
Sector	Hazardous waste treatment, storage and disposal
Liability	Closure and accidental release
References	Financial assurance requirements https://www.epa.gov/hwpermitting/financial-assurance-requirements-hazardous-waste-treatment-storage-and-disposal
Financial provisions	– Trust fund – Surety bond

[terminology of country used]	– Letter of credit – Insurance – Financial test – Corporate guarantee

International	
Sector	Maritime hydrocarbon shipping
Liability	Hydrocarbon spill clean-up
References	There is a significant amount of experience in mutual funds/pools in maritime hydrocarbon shipping. Annual reports and other documents are available online from the international oil pollution compensation funds. There is also a significant amount of information on claims. Research has examined correlations with factors such as hydrocarbon type and amount spilled in particular. There have also been attempts to develop formulas and models using factors such as hydrocarbon type, spill amount, geographic location, shoreline type, environmental and socioeconomic features and clean-up strategy. While these should be considered with caution given the limitations of the datasets and the real-life complexities involved, they are indicative of possible approaches to developing formulas or default values. http://www.iopcfunds.org/
Financial provisions	– International oil pollution compensation funds