Decommissioning nuclear

Understanding the reporting obligations
The decommissioning of nuclear power plants is subject to intense public, media and regulatory scrutiny. The development of cost estimates for decommissioning, and the accounting for nuclear decommissioning obligations is increasingly complex, and influenced by shifting trends in technology and other underlying assumptions, as well as practices such as data analytics. Controls and governance over decommissioning projects must therefore be rigorous.

**Overview**

Around the world, owners and licensees of nuclear power plants are responsible for developing reliable and complete cost estimates of decommissioning their assets. These cost estimates not only influence the obligations reported on an entity’s balance sheet, but they also provide the basis for the development of realistic decommissioning plans, as well as funding and financial assurance requirements. In this sense, cost estimates are the baseline for transparency and accountability for nuclear decommissioning activities.

As an increasing number of plants retire early, entities are challenged to ensure that their cost estimates remain appropriate and their funding arrangements adequate. Our analysis of ninety-nine power plants noted certain factors influencing when a power plant might retire early. For example:

— We expect that poor plant economics, plants with maintenance issues and plants with expiring Power Purchase Agreements would be most likely to retire early

— We also expect that plants in regulated markets are less likely to decrease output due to the market’s ability to react to pricing changes, and believe that multi-unit plants will benefit from certain economies of scale and will be less likely to retire early

**Top of mind questions from Boards**

— Does our cost estimate for decommissioning account for shifts in technology and regulatory requirements?

— Do we have adequate governance and controls over the management of nuclear decommissioning funds?

— Why doesn’t the decommissioning obligation on our financial statements represent total decommissioning costs?

— Are we applying the right assumptions to measure the decommissioning obligation?
Trends impacting decommissioning

A 2016 OECD study, *Costs of Decommissioning Nuclear Power Plants*, summarized a number of trends influencing the costs and effectiveness of nuclear decommissioning.

1) **Effective decommissioning activities begin after all nuclear fuel has been removed** from the plant areas that will be decommissioned. This is a critical component of pre-decommissioning operations and should be factored into the decommissioning project plan.

2) **Many entities do not include the cost of managing spent nuclear fuel following removal** from the reactor (particularly interim storage of the fuel) in the cost of decommissioning. This is often treated as a separate cost, particularly the final disposal of fuel or related waste, which is a major source of costs in waste management, particularly for high-level waste. Entities need to ensure these costs are appropriately addressed in cost estimates.

3) Factors such as **the selection of immediate versus deferred decommissioning**, as well as the planned end point of decommissioning, impact the overall costs of decommissioning and the comparability of decommissioning costs site to site. Other factors influencing the cost of decommissioning activities include:

   — Decommissioning policy and strategy, i.e. the scope of work through to the end state of the site
   
   — Roles and duties of the diverse stakeholders, and the regulatory framework
   
   — Planning and preparation prior to decommissioning, and site characterization
   
   — Management of spent fuel and operational waste
   
   — Dismantling operations and related waste management
   
   — Prospects for final waste disposal, including spent fuel
   
   — Final stage of decommissioning, de-licensing, site restoration and reuse
   
   — Labour management and contractors
   
   — Risks management, uncertainties and contingencies
   
   — Funding policy and strategy
   
   — Pre-decommissioning, the planning, collecting and securing the funding; updating the cost estimates; monitoring and adapting to financial conditions and financial risk management
   
   — During decommissioning, the disbursement and long-term management of the funds, and financial and technical risk management
   
   — Management of liabilities, evaluation of the risk of adequacy of funds and contingency planning
   
   — Assumed duration of the dismantling and clean-up activities
   
   — Characterization of the physical, radiological and hazardous materials
   
   — Availability of experienced personnel with knowledge of the plant

---

Primary reactor decommissioning cost drivers

We estimate the total cost of decommissioning the current US nuclear fleet to be greater than US$150 Billion, with about two-thirds being driven by the termination of the National Research Council (NRC) operating licence.

Figure 1: Total Decommissioning Costs

Entities are also challenged to demonstrate proper governance over trust funds established to cover decommissioning costs. Timely and accurate reporting on the use of trust funds and decommissioning costs; an active and involved oversight Council and Board; and rigorous controls to validate that only eligible expenditures are funded by decommissioning trusts are just a few of the essential elements for this governance system.
Reviewing decommissioning fund implementation arrangements

It is crucial that the disbursement plan implementation arrangements are both fit-for-purpose and cost-efficient.

**Figure 2: Four key steps when undertaking a decommissioning trust fund review**

**Understand asset management costs**
- Includes asset manager fees, custody, administration, actuarial, consulting and implementation costs

**Understand governance and delivery mechanism**
- Type of decommissioning fund management vehicles
- Role of investment boards, e.g., Are they meeting the long-term objectives?
- Demonstrating effective controls over eligibility of decommissioning costs covered through the fund

**Benchmarking**
- It is important to know what average costs are for all components and how they vary with different delivery mechanisms
- Internal knowledge and Mercer’s Global Investment Manager Database can be instrumental

**Implementation**
- Contract renegotiation
- Improved (new) delivery mechanisms
- Use of third-party service providers

Source: KPMG in Canada
1) **Understand asset management costs.** Regulators require the owners of nuclear power plants to set aside funds for the future decommissioning of their facilities. Funding is either built up over the life of the nuclear power plant through amounts charged to customers which are placed in a trust, or provided through other forms of financial assurance. In either case, the anticipated decommissioning costs are the primary driver in determining the required funding. Entities are required to report to regulators on both the anticipated costs of decommissioning, and the status of decommissioning funding. A rigorous approach to decommissioning costing is essential to building up an appropriate decommissioning trust fund. Certain costs such as removal of non-radioactive structures on site; spent fuel management; and site restoration are included in decommissioning costs but excluded from the decommissioning trust, as they are not typically considered to be directly linked to decommissioning and license termination.

Entities need to consider different interpretations by various regulatory bodies on what comprises legitimate decommissioning activities. They must also regularly review their decommissioning cost estimates to ensure the appropriate cost types are included; principles like life cycle costing are appropriately applied; assumptions such as contingency rates remain reasonable; and forecasted costs are supported by data analytic techniques to validate costs with actual decommissioning experience.

2) **Understand governance and delivery mechanisms.** Entities need to ensure effective governance mechanisms are established for decommissioning trust funds, considering both good practices and regulatory requirements. Governance and delivery mechanisms should help ensure that decommissioning trust funds remain adequate for anticipated decommissioning costs; are segregated from entity assets and outside the administrative control of the entity; are appropriately used based on regulatory requirements; and that trust fund investments are consistent with investment policies and performance standards. An active, well informed investment board provides critical oversight and is a key component of the governance and delivery mechanisms.

3) **Implementation.** Entities need to ensure that internal controls and business processes for the development of decommissioning costs, and activities of the decommissioning trust fund are assessed on a regular basis. Where third party service providers are used, entities should ensure that their performance is reviewed on a regular basis by the investment board, and that appropriate evidence is provided of the effectiveness of their controls. Entities should take an evidence-based approach to demonstrating the appropriateness of decommissioning costs funded through the trust fund.

4) **Benchmarking.** Entities should be able to demonstrate how their cost estimates, and trust fund performance compare to key indicators and available data from other nuclear power plants. Investment boards are increasingly expected to provide governance over the benchmarks applied to determine the suitability of decommissioning trust fund balances. They should be able to demonstrate through the reporting received and board minutes that benchmarking information is a key component of how the trust fund is managed.
Working side by side with you

KPMG’s network of global member firms and energy sector subject matter experts can assist you with the accounting, reporting, costing, internal control and governance aspects of decommissioning projects. Whether your facility is actively undergoing decommissioning, or preparing for a future shut down, our team of partners and professionals strive to help strengthen your preparedness to meet stakeholder, external audit and regulatory demands.

Thought leadership

Foresight: Nuclear Power – Is small really beautiful?

Small modular nuclear reactors (SMRs) could play an important role in generating clean, affordable power. They promise faster construction than conventional nuclear plants at much lower cost, to provide electricity, heat and fresh water for cities and industries.

Foresight: Value-based maintenance

Our experience suggests that few operators have a complete view of the total cost of maintenance, and fewer still understand how the maintenance they are paying for contributes to overall asset health, system reliability and uptime. Value based maintenance emphasizes focusing on the “right” maintenance for reliability, and steering effort away from non-critical systems.

Empowering utilities: Creating value from physical assets

Aging energy assets are a problem in many regions in North America. On one hand, rising regulatory and public pressures are pushing to keep costs to a minimum and customer rates low, while on the other, utilities are faced with maintaining, upgrading or replacing aging assets and delivering reliable service to a growing population – how do utilities strike a balance between these competing challenges?

Emerging trends in infrastructure

Viewed against the disruption, confusion and uncertainty of the past year, it would be easy to become despondent about the future of infrastructure around the world. Yet we see great opportunity and promise emerging. Governments continue to demonstrate a strong desire and ambition to invest in infrastructure, both as a path to economic growth and as a way to hold back the rising tide of populism. New technologies and rapid innovation are creating new approaches, models and tools for infrastructure development and helping to bring down costs. A new dawn may be rising.
Contact us

Bailey Church  
Partner, Accounting Advisory Services  
KPMG in Canada  
E: bchurch@kpmg.ca