

THE CURRENT STATE OF NUCLEAR POWER PROJECT FUNDING AND EMERGING TENDENCIES

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ABSTRACT

Electrical power generation is well known for its involvement in advancements in industry, agriculture, technology, and living standards. Furthermore, a strong power industry with a variety of energy sources is critical to a country's independence. Governments have traditionally utilised domestic public cash to subsidise nuclear power projects. However, a recent trend shows that governments around the world are increasingly turning to the private sector for new financing options that include different risk and ownership structures, as well as new contractual arrangements aimed at reducing the fiscal burden associated with nuclear power projects. This paper provides an overview of the primary issues associated with nuclear power plant finance, including the high upfront capital cost, interest rate sensitivity, and protracted construction time. The analysis concludes by assessing the potential of emerging financing approaches to address some of the challenges associated with nuclear power deployment. However, there is no one-size-fits-all solution, as each project is unique and requires careful consideration of the financing model's applicability, as some of these approaches may have their own set of issues.

Keywords: Nuclear Power, Finance, Economic.

INTRODUCTION

The next ten years will be crucial for nuclear power. Nuclear power supporters believe that the shift away from carbon-producing energy sources will provide an opportunity to boost worldwide nuclear power capacity. However, the nuclear power industry is facing internal and external hurdles that may stymie such plans. In a historic move, the world acknowledged that climate change is a major issue at the United Nations Climate Change Conference, known as COP21, with all countries signing an agreement to reduce global low temperature rises by the end of the century. Many people believe that a combination of technologies, including nuclear and renewable energy, is the most effective strategy to combat climate change (Defeuilley, 2009).

Many conflicting forces are anticipated to influence future energy investments, in addition to global warming, which is ranked as one of the top risks by the Annual World Economic Forum. The most essential issues that governments examine when creating their energy policies include improving energy security, innovative finance, cost reduction, deregulation of power markets, and supply chain backlog (Mansur, 2007). The weight given to these criteria, on the other hand, may fluctuate significantly from one country to the next, depending on the economic condition and the sort of project and technology in question.

One of the most significant obstacles to nuclear power deployment is financing, which, regardless of the mechanism or source, remains a barrier due to the vast amount of money required and the lengthy tenor, which corresponds to the economic life of nuclear assets. Due to high investment costs and the despatch risk in deregulated power markets, nuclear electricity's economic attractiveness is decreasing. Alternative investment offers,

which are less controversial from a reputational standpoint and more in sync with the political and general public climate, are likewise a formidable competitor (Creti et al., 2013). Private-sector investors appear to be struggling to find "*strong reasons*" to favour nuclear power above other technologies in this scenario.

Despite these advantages, the implementation of new NPPs is fraught with difficulties. Financing a new plant's large upfront capital investment costs is a big challenge, as projects are affected by loan rates, construction and lead times, and political concerns. This problem, along with uncertain demand growth and competition from other energy production sources, means that nuclear power's future role remains uncertain, as evidenced by the wide range of installed nuclear capacity predictions for the next three decades (Dixit, 1986).

Nuclear power is a high-capital-intensive energy source, which means it is more sensitive to interest rates than other energy sources. Although the cost of building nuclear power plants varies depending on geographic location and the specific circumstances of each project, it is significantly more expensive per kilowatt than traditional energy sources such as natural gas, and is becoming increasingly less competitive against renewables. The relative economics of nuclear power have continued to drop in most OECD nations over the previous decade. From an operational standpoint, the biggest challenge is the risk of not being dispatched, particularly in the deregulated energy market. It will be critical to have government backing for new investments (Ausubel & Cramton, 2010).

Nuclear power stations are typically financed through multi-source financing, where a single package covers the full cost. The first source, the investor/owner/operator that is responsible for the plant's construction and operation, should cover a significant amount of the total investment. There are several drawbacks, such as localised thermal pollution from wastewater having an impact on marine life, and large-scale accidents having disastrous consequences. Nuclear energy, on the other hand, offers the advantages of producing low-cost energy, being reliable, emitting zero carbon dioxide, having a hopeful future, and having a high energy density.

CONCLUSION

So nuclear power plants will be crucial in the future, but if they are environmentally benign, we will get a lot of benefits. Nuclear generates no greenhouse gas emissions when in operation, and throughout the length of its life cycle, it emits about the same amount of carbon dioxide-equivalent emissions per unit of power as wind, and one-third of the emissions per unit of electricity as solar. It is critical to concentrate on future nuclear power plant developments in light of rising population, global warming, and climate change.

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