



**WHAT APPROACHES CAN BE USED IN NEW BUILDS
TO ATTRACT PRIVATE CAPITAL THAT PROVIDE
CONFIDENCE THERE WILL BE ADEQUATE ROI?**

OECD/NEA – IFNEC
Nuclear Finance Conference, 11-12 May 2016

FABIENNE PEHUET LUCET

Introduction

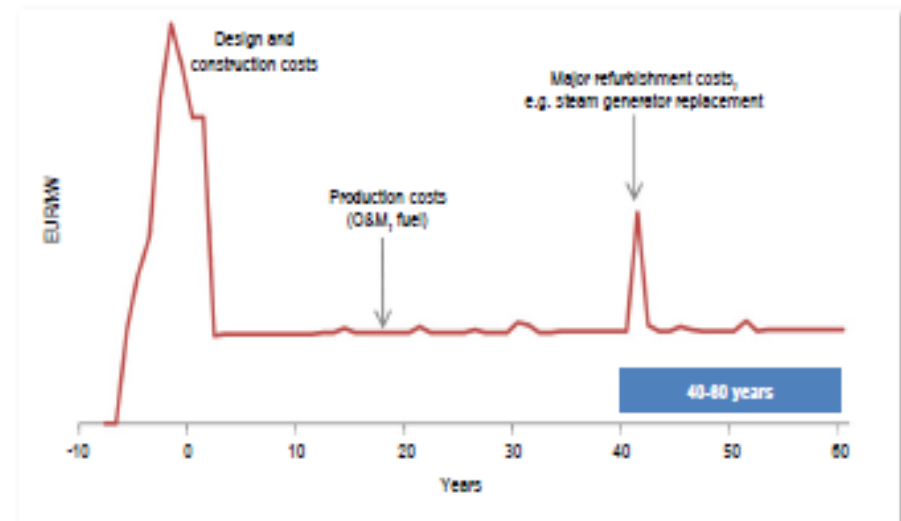
- 1. Basics of financing apply to New Nuclear projects.**
- 2. Specific features and risk profile of NPP projects require special attention to build investors confidence.**
- 3. Construction risk and revenue risk are to be monitored and are addressed in current projects.**
- 4. Various New Nuclear Power Plants investors profiles, with specific motivations and investment schemes.**

Specific Features and Risk profiles of NPP projects

Expenditure profile: two phases

- Commitment to finance: as early as bidding period
- Funds drawn during construction period
- Loans reimbursed and dividends paid during operations period

Figure 13: Expenditure profile of a nuclear power plant project



Source: Courtesy of EDF.

- 80% funds committed before commissioning
- Predictable operational costs

Specific Features and Risk Profile of NPP projects

- **Government Support and Public Acceptance**
- **Construction Risks**
 - Long lead times and size (per Kw installed) -> importance of planning control
 - Technology risk (FOAK) -> proven record of construction needed
 - Complex Regulatory environment -> preparation and compliance
- **Operations Risks**
 - Operational safety
 - Quality of dialogue with Regulatory Authorities
 - Accident
- **Revenue Risk**
 - Predictable costs require visibility on revenues

Specific Features and Risk Profile of NPP projects

- **Government Support and Public Acceptance**
- **Construction Risks**
 - Long lead times and size (per Kw installed) -> importance of planning control
 - Technology risk (FOAK) -> proven record of construction needed
 - Complex Regulatory environment -> preparation and compliance
- **Operations Risks**
 - Operational safety
 - Quality of dialogue with Regulatory Authorities
 - Accident
- **Revenue Risk**
 - Predictable costs require visibility on revenues

Mitigate Construction Risks to build confidence

- **Risk management & risk allocation improve project governance.**
 - Demanding principles and rules
 - Key role of financing institutions
- **Government incentives:**
 - Historical
 - US Energy Policy Act 2005
 - Licensing process COL, ESP, Early design certification
 - Insurance against regulatory delays
 - Tax production Credits
 - Loan guarantees program
- **Securing lending conditions, credit availability**
 - Key role of Export Credit and ECAs
 - OECD guidelines
 - Regional initiatives: EU works of ENEF, China creating in 2014 the AIIB...

Securing Future Revenues to build confidence

Liberalized electricity markets do not provide revenues predictability

and electricity prices dropped

-> Markets not favourable to building New Nuclear Power Plants

-> Find hedging systems

- **Long term purchase agreements, off-take arrangements.**
- **New tariffs schemes**

In the UK, FIT and CFDs for Hinckley Point project

Investors profile (1)

Electricity utility producers, Customers, Electricity intensive Cies

Corporations using (complex) balance sheet financing, combining:

- sophisticated risk allocation
- bank loans
- equity
- direct or indirect government guaranties
- visibility over future revenues

- **TVO to finance OL3**
- **EDF traditionally and for HPC in the UK**
- **The 4 owners investors in the Vogtle project (USA)**

Investors profile (1) TVO Investing in OL3

TVO produces electricity for its shareholders at cost.

Is 60,2% privately owned through PVO (paper & pulp industries)

- **Financing scheme: 75% debt 25% equity from shareholders , plus export credits and ECAs**

- Construction risk shifted to the vendor (turnkey contract)
- Shareholders take on the operational risk
- Revenue risk covered by LT power purchase agreements

- **Residual risks:**

Construction risks costs are covered but not avoided altogether

Opportunity risk on future market electricity prices.

Investors profile (1) EDF

Traditionally, EDF finances investments « on balance sheet ».

- Debt and equity
- Experience of long term purchase agreements in France since market liberalization: Exeltium, negotiated with 26 electricity intensive industrial companies, difficult to maintain when fundamentals of economics or competition change.
- Negotiated the much more sophisticated CFD to secure revenues from HPC in the UK.

Investors profile (1) co-owners Vogtle (USA)

4 co-owners of Plant Vogtle (Georgia USA) for extension V 3&4.

Georgia Power (45,7%) is an investor owned utility

Oglethorpe Corporation (30%) is a non-profit membership based electricity company

Mutual Electric Authority of Georgia (22,7%) groups 49 non profit municipal electric utilities and Dalton (1,06%) is a municipal electric utility.

Financing scheme:

- Each owner finances its share in a unique way
- The project benefits from US federal and local (state) incentives
- The electricity market in Georgia is regulated,
- There is no local competition between producers and retailers

Investors profile (2): project finance?

Pure project finance is not an option for financing NNP:

A specific project company (SPV) is dedicated to the implementation of a project.

Shareholders of the SPV limit their risk (liabilities) to their share in the SPV → « off balance sheet financing »

-> nuclear projects do not meet the requirements for project financing

- **« controllable and limited » construction risks**
- **« predictable and motivating » rate of return**

Investors profile (3): sharing the owner's risk

In order to allocate ultimate risks to the responsible parties, recent demand to get the key players to address directly the main underlying risks.

1- Nuclear vendor can be requested to take an equity or debt interest in the project company

- AREVA in HPC 2015, Toshiba in Nugen (60%), Sinop project.

Investors profile (4): gain competitive edge

1- Nuclear vendor taking overall responsibility of a project, with or without Government backing.

- the BOO model of Akkuyu project in Turkey:

the vendor bears financing risk, construction risk, operational risk and some electricity market risk.

→ now a commercial differentiating factor in winning tenders.

2- Investment in nuclear power projects: new power maps.

References:

Financing Nuclear Power Plant Projects: A new Paradigm?

<http://www.ifri.org/fr/publications/enotes/notes-de-lifri/financing-nuclear-power-plant-projects-new-paradigm>

Fabienne PEHUET LUCET- July 2015

Ifri Center for Energy

Nuclear New Build: Insights into Financing and Project Management

<http://www.oecd-nea.org/ndd/pubs/2015/7195-nn-build-2015.pdf>

OECD/NEA n° 7195- 2015.

