Existing and emerging financing models and multilateral nuclear projects

INPRO Dialogue Forum on Nuclear Energy Innovations: Multilateral Approaches to Sustainable Nuclear Energy Deployment – Institutional Challenges

Vienna, Austria
October 4-7, 2010

Nadira Barkatullah
Department of Nuclear Energy, Planning and Economic Studies Section
Overview

- Current Status: Nuclear
- Nuclear Power Plants (NPPs) Financing: Some Challenges
- Types of Financing
- Existing and Emerging Financing Models and Trends
- Multilateral Nuclear Projects: Financing Issues
- Concluding Comments
Current status: 1st October 2010

In operation
441 nuclear power reactors [375 GW]

- USA 104
- France 58
- Japan 54
- Russia 32
- S. Korea 21
### Current status: 1st October 2010

#### Under Construction

60 nuclear power reactors

- **China**: 23
- **Russia**: 11
- **India**: 4
- **Korea, Rep**: 5
- **Bulgaria**: 2
IAEA Projections 2010
World Nuclear Power Capacity

Outlook for Global Nuclear Power Development

Capacity (GWe)

0 200 400 600 800 1000 1200 1400 1600

High
Low
Financing: to raise funds, which is generally a combination of debt and equity.

Cost of debt: Interest paid

Cost of capital: return on capital
1) What is suitable financing mix/method to build a NPP?

How to Finance NPP

How much will NPP Cost?

What will be the cost of finance?

How long will it take to build and what will be the payback period?
IAEA: Data collected from various publications and studies to keep track of nuclear power plants investment costs, since 2008 (updated Aug 2010), all data in 2008 USD
Challenge: Financing Cost - Interest During Construction (IDC)

Note: Assuming: construction duration of 6 years
Challenge: NPP Payback Period

- Commercial banks usually look towards a payback period of 5 – 7 years!
- That is generally the construction duration of NPPs and payback period starts after 6-8 years.

IAEA
Types of Financing

- **Governments financing:**
  - Tax revenue
  - Electricity tariff subsidies

- **Industry**
  - Corporate finance or balance sheet finance
  - Project Finance (non or limited recourse): Long term finance based on the projected cash flow of the project
Old Financing Model

- Governments assume all risks and costs
- Vendors built on cost plus basis
- Utilities (Generators) borrowed on balance sheet

Who finally pays for all the costs?

Essentially 100% risk on the customer:
All costs: construction and operations passed on to the customer!
Financing Models: New trends emerging

Governments seek private sector participation (PSP)

**Corporate Finance:**

- Flamanville 3 project in France, by EDF (Areva PWR 1600MW)
- Mochovce 3 and 4 project in Slovakia, by Enel (VVER 440MW)
Financing Models: New trends emerging

Co-operative model:

- Olkiluoto 3 or Finnish Model: expanding - equity partners to diversity risk

Characteristics of hybrid financing (corporate/project finance):

- Part of equity and loan is provided by the large customers
- A long-term purchasing power agreement (PPA) with large customers ensuring future stable revenue stream from the project
- Leverage characteristics similar to project finance
4) **Project Finance trends**: More recently, some trends towards project finance are emerging, like:

- Large utilities are forming companies, adopting a multilateral approach (or JV) to venture into the nuclear market, *like ENEL/EDF (Sviluppo Nucleare Italia), Constellation Energy/EDF (Unistar Nuclear Energy), EOn and RWi (Horizon Nuclear Power)*

- For a first time a ‘build-own-operate’ (BOO) contact, where Rosatom will BOO the 2 VVER nuclear units at Akkuyu, in Turkey

- Areva and New Brunswick, EOI for merchant plant
New Financing Models

Risk transferability from public to private

Combined models widely used

Corporate Finance

Government Financing

Co-operative Models

Combined models proposed and already in use

Combined models emerging and likely to be widely used

Project Finance

Ownership transferability from public to private

Trend continues but initial government support of some form is imminent...
What do we understand by Multilateral or Regional Approach to Finance a project?

- When two or more countries join hands to form partnership to build and finance a project.
Multilateral Nuclear Projects: Financing Issues

Why Multilateral Approach?

- If a country does not have enough funds to finance a NPP or cannot build a NPP in its own country
- Wants access to electricity – security of supply
- Want to diversity the risks with other regional partners
Multilateral Nuclear Projects: Financing Issues

Country A, B and C join hands to build a NPP

So what are the main financing issues they need to address?
Multilateral Nuclear Projects: Financing Issues

What are the main financing issues?

- Where is the NPP to be built?
- Who owns the NPP? How will it be shared by the regional partners?
- Will NPP be built in a country with the highest ownership share?
- What regulatory framework will apply?
Multilateral Nuclear Projects: Financing Issues

What are the main financing issues? (Cont’d)

- Who will finance the project?
- What financing model is most appropriate?
- Government Financing or Industry finance?
- If industry finance is a hybrid model (combination of corporate model/project finance), is it feasible?
- What will be the extent of government support?
- Export Credit Agency? Other Financial institutions?
Multilateral Nuclear Projects: Financing Issues

What are the main financing issues? (Cont’d)

- What about credit rating?
- Do all countries have same credit rating? If not which country rating will apply?
- How will this impact the cost of financing?
- Which financiers will finance such a model?
Multilateral Nuclear Projects: Financing Issues

What are the main financing issues? (Cont’d)

- Rate of return for investors?
- Do the investors have a risk appetite?
- How are the major investors taxed? Cross-border tax implications? Any tax credits or exceptions or double taxation?
Multilateral Nuclear Projects: Financing Issues

Financing issues: Hypothetical case:

Country A: Utility
Credit rating AA

Country B: Utility
Credit rating BBB+

Country C: Utility
Credit rating BB

50% Equity

25% Equity

25% Equity

Subsidiary company

Local and International Financial institution (ECA, etc)

Corporate Finance Model: using utilities balance sheet

- A Robust Financial Risk Management (FRM) Strategy
- Country A to take the lead (good credit rating) and NPP to be built
- Country A regulation to apply
- The shared benefits (electricity output/revenue) based on ownership structure
- To share the costs and liability (waste)
Examples:
Europe:
- Lithuania and other regional partners Estonia, Latvia, and Poland and rest for private sector
- NPP Visaginas along Ignalina site 2 VVER
- The project completion 2018-2020
Examples:

Middle East: The Gulf Co-operation Council (GCC) countries (Behrain, Kuwait, Oman, Qatar, Saudi Arabia and UAE)
Concluding Comments

- Firm government commitment and support - imminent
- Appropriate FRM Framework/Strategy to address challenges to finance NPP
- New financing approaches/models are emerging: repackaging the existing methods and combination of project finance/co-operative model to increase the number of credible equity partners to share the financing risk
- Multilateral approach to finance nuclear projects is looking favourable for small countries
- However, the financing issues like NPP ownership, financing models/approach and tax have to be initially agreed and settled by the regional partners in a multilateral approach to avoid any delays in the project implementation
Thank you for your attention!