

New nuclear project financing

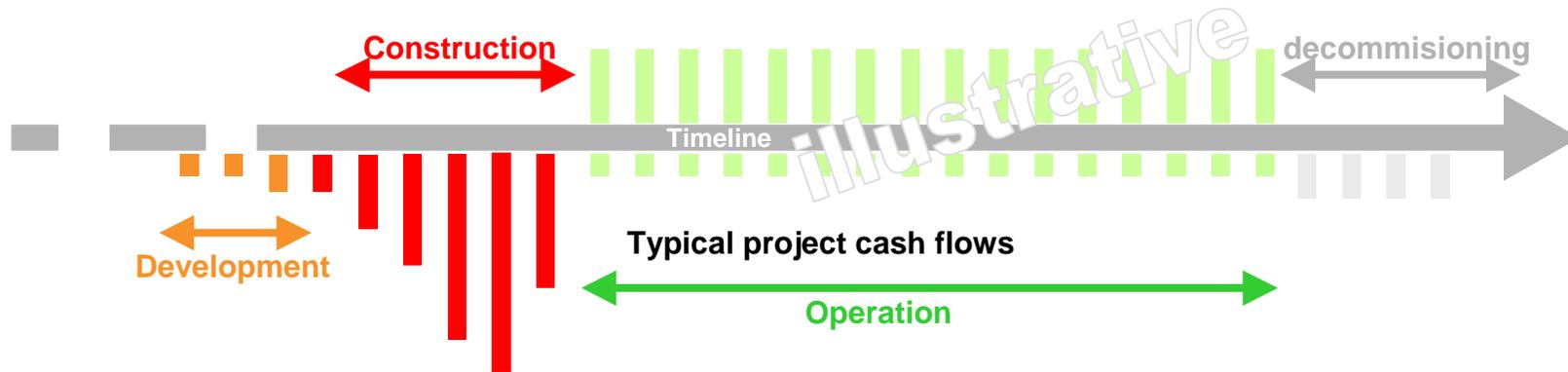
A utility viewpoint

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June the 6th, 2012



A nuclear project is a long path of hurdles with no revenue and an operational period that must go smoothly to justify the investment



- Large capital intensive infrastructure project over 10 years or so (development, investment and construction) with very **high investment and no revenue**
- Moreover, during the development period, **industrial preliminary tasks** have to be undertaken **at costs and at risks by investors** before the **Final Investment Decision**
- Project must be secured for both operational and decommissioning phases to allow for consideration

- Even at construction stage, investors **need to trust the operator's** ability to run smoothly to believe in the business plan
- The pay-back period is quite long (usually over 20 years) and measures the exposure of the project to the operational and market risks
 - Banks and debt investors value all the more **the quality and the track-record of the nuclear utility** in the post-Fukushima context...
 - ... they also **look critically on the revenue stream** and ask for a mitigation of the market risk to secure the loans they make.

Banks and debt investors have a series of requirements on project sponsors before giving access to financing

- Financial Sponsors and Lenders request a combination of securities with a strong contractual framework that includes :



- Adequate **support from local State Authorities** to secure the project regulatory framework (strong regulator)
- Full and detailed **technical** and **legal** due diligence
- Three levels of standards for **environmental and social** requirements (World bank policies, international relevant industry standards for aspects not covered by World Bank, IAEA standards)
- Good track record for managing big industrial project (both during construction and operation) with **credit worthy project sponsors** with existing assets
- Schemes that secure the revenue stream through long term Power Purchase Agreement (PPA) with **credit worthy off takers** or other similar schemes

There is a variety of financing models, out of which the project finance model has never been used in nuclear

	How does it work ?	Who bears the risk ?	Access to financing
Sovereign	The State invest directly in the project, alone or along other investors (jointly and severally)	The State fixes end-user tariffs and thus let the consumers bear all the risks	Same as State
Public utility With state support	National utility , fully or partially owned by the State, invests in the project alone or along with other investors	Risks are shared between the national utility (completion risks) and hence the State and the consumers (cost overrun) usually via tariffs	Depending on the level of state support
Corporate model with PPA / adequate regulation	Investment is made by industrial sponsors, including a national utility, granted the regulatory framework provides sufficient visibility	State bears politics and regulatory risks Industrial sponsors bear construction risks (completion & cost overruns) PPA off takers bear delay & market risks	Industrial sponsors need to be strong as banks will ask for recourse on their assets. Each sponsor brings its own share of capital during construction
Project finance	Project company is set up by industrial sponsors and it raises funds from debt investors, backed on its assets to build	Banks and debt investors and, to lesser extent, the industrial sponsors who brought some equity in the project	 Nuclear projects are too risky for banks Some countries tried to adapt the project finance scheme to suit the need of nuclear project but these projects have been postponed due to the lack of financing

Recent developments make it more difficult for nuclear projects to get financed

- Following the 2008 financial crisis, Basel III regulation will put an added constraint on capital :
 - Basel III regulation asks banks to earmark their loans by putting aside a percentage of equity **as soon as they commit to lend** money. Long term capital intensive projects will be harder to finance
- Following the 2011 earthquake and tsunami in Japan, banks are more cautious than before :
 - Extra attention will be given on safety rule and only projects with an operator with a **good track record on safety** will be considered,
 - **Gen 3 reactors** are favored on the safety side but the industrial challenge has to be mastered to convince banks and debt investors. Lenders don't like "First of a kind" projects.
- Since the financial crisis, government debt has grown and is becoming an issue
 - Sovereign model or Public Utility not applicable for some countries,
 - ECA's backing cannot be unlimited

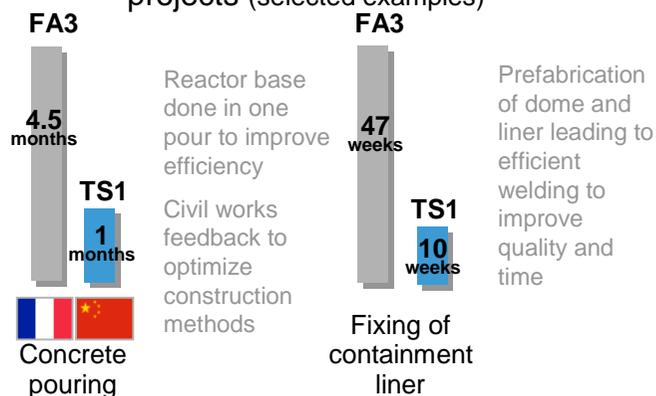
Access to capital and harnessing industrial challenge are crucial for new NPP and an essential part of the package

Sponsors should also think about financing prior to launching a tender

- Overnight cost is not all that matters, compound interests can double the need for cash
- Depending on the guarantee given (local government, ECA backing, visibility on revenue, sponsors' commitment), interest rates can vary widely with a huge impact on cost

➔ One extra point on debt rate corresponds to an increase of about **6-8 EUR/MWh** in the total cost of electricity and can jeopardize the competitiveness

The value of experience in EDF's EPR projects (selected examples)



➔ The experience from FA3 to TS1 shows that for the first 48 months of the project, 20 months of schedule can be gained by applying lessons learnt

Harnessing industrial challenge has also an impact on financing

- Any delay in construction means extra financing to be found
- Being ahead of the learning curve reassures lenders for following units
- Having an experienced nuclear utility on board is a key point in the project, either as main project sponsor or as strategic partner in newcomers' case.

Conclusion

- Based on EDF's experience with its domestic fleet and foreign projects, lenders' criteria on nuclear risk management are paramount for the financing of the project and must be taken into account from the very start of the program
- A nuclear program **spans 100 years**. Robust and long term cooperation between the local owner/operator and an experienced nuclear utility is essential
 - Strong partnership **reduces the industrial risks** to the local owner/operator and thus the financial risks of its lenders
 - Strong partnership **improves the project financing** conditions and thus the competitiveness of the project
 - Strong partnership has a positive impact on public opinion and lends **credibility to the project**