

Main challenges to nuclear power: financing

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Government Funding/Support Is Essential....

- **Many of the benefits of nuclear energy are sovereign in nature**
 - Energy security
 - Energy diversification
 - Climate change mitigation
 - Industrial development
 - Promoting higher education, highly trained workforces
 - Promoting research and development

- **Only governments can properly value these benefits**
- **Experience shows that no nuclear project will go ahead without significant host government involvement**
- **Government involvement can take different forms, including long term PPAs/sovereign guarantees and investment**



....However

Pure reliance on government funding may lead to lack of fiscal discipline/ lack of accountability/ inefficiency



Government funding and support should be seen as a bridge to private sector support with government support decreasing over time



Attracting private sector funding requires governments/ developers to begin planning and thinking as private investors would



Analyzing nuclear projects based on project financing models will help identify and mitigate the risks just like a prudent/conservative financial institution would

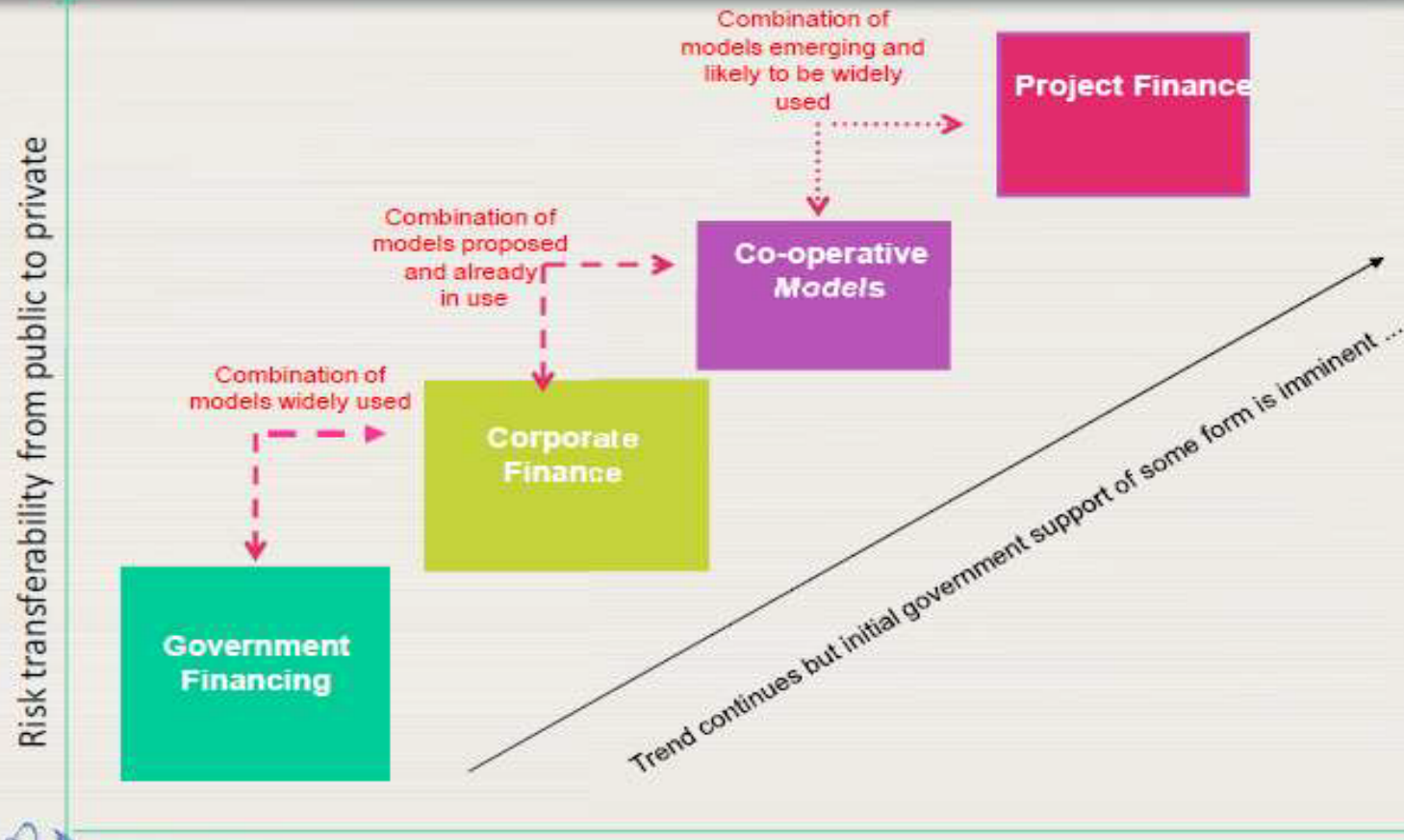


Financing Approaches Used

- Straight government procurement
- Government financing-Taishan
- Utility balance sheet/corporate finance-EDF-Flamanville
- Vendor equity
- Export Credit Agency (ECA) financing and guarantees
- Investor financing–TVO (Mankala)
- BOO with long-term PPA-Akkuyu
- Contract for Difference (CFD)-UK
- US Government Loan Guarantee program
- US Construction Work in Progress
- UK Regulated Asset Based Model
- Capital Markets-CGN



Financing trends emerging



Irrespective of approach , go back to basics

- First answer the following 5 questions:
 - Do you need a nuclear power plant?
 - Do you want a nuclear power plant?
 - Can you afford it?
 - How will you pay for it?
 - Can you manage and support it?

- Once you answer these questions then you also need to answer HOW :
 - Will you build it?
 - Will you operate it and generate the power?
 - Will you maintain it in the long term and continue generating the power?
 - Will you decommission it and clean up the site at the end of its life?

Answering these questions will allow you to develop a plan to procure/construct/finance and operate a nuclear power plant



Then you need to establish clear objectives



Long term relationship/partnership



Reasonable and achievable project schedule and budget



Comply with all regulatory obligations – work with regulator to ensure a safe project



Electricity to the grid? Local industry?

Speaking to investors early and in their own language

Industry says...
“Latest technology”

...Bank hears
FOAK risk

Industry says...
“Proven safety record”

...Bank remembers
Chernobyl, TMI, Fukushima

Industry says...
“Consortium”

...Bank thinks
Internal disputes

Industry says...
“Construction schedule”

...Bank worries about
Historical delays/cost overruns

Finally learn from industry successes and failures

Industry turning a corner

- First EPR in operation
- First AP 1000 in operation
- Westinghouse emerging from bankruptcy
- Increasing number of technology providers (from US, Russia, France, Japan, Korea, China)
- Getting closer to commercialization of SMRs



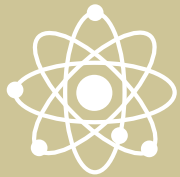
Profile recent projects that have been developed and financed without serious setbacks draw out the reasons for these successes: focus on where the private sector played a role



Profile recent projects that have been developed and financed with serious setbacks draw out the reasons for these setbacks and avoid the same mistakes



Conclusions



- Developing new nuclear power plants is a complex task
- Should be undertaken within a clear host government policy with clear mechanisms of government support
- Financing is a primary challenge – engage early
- Make use of the IAEA Guidance on Nuclear Power Infrastructure Development (Milestones in the Development of a National Infrastructure for Nuclear Power and INIR review process) which can help mitigate the financial risks



- Successful projects have occurred and are possible
 - With the significant levels of commitment by all parties
 - With the right project partner/s
 - With experienced, committed and inspired advisers
(but in a supporting role)
 - Taking full account of all lessons learned
 - Willingness to take a longer term and holistic view of “success”
 - **With the right leadership**



THANK YOU!

Source: Bloomberg and ENEC



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