

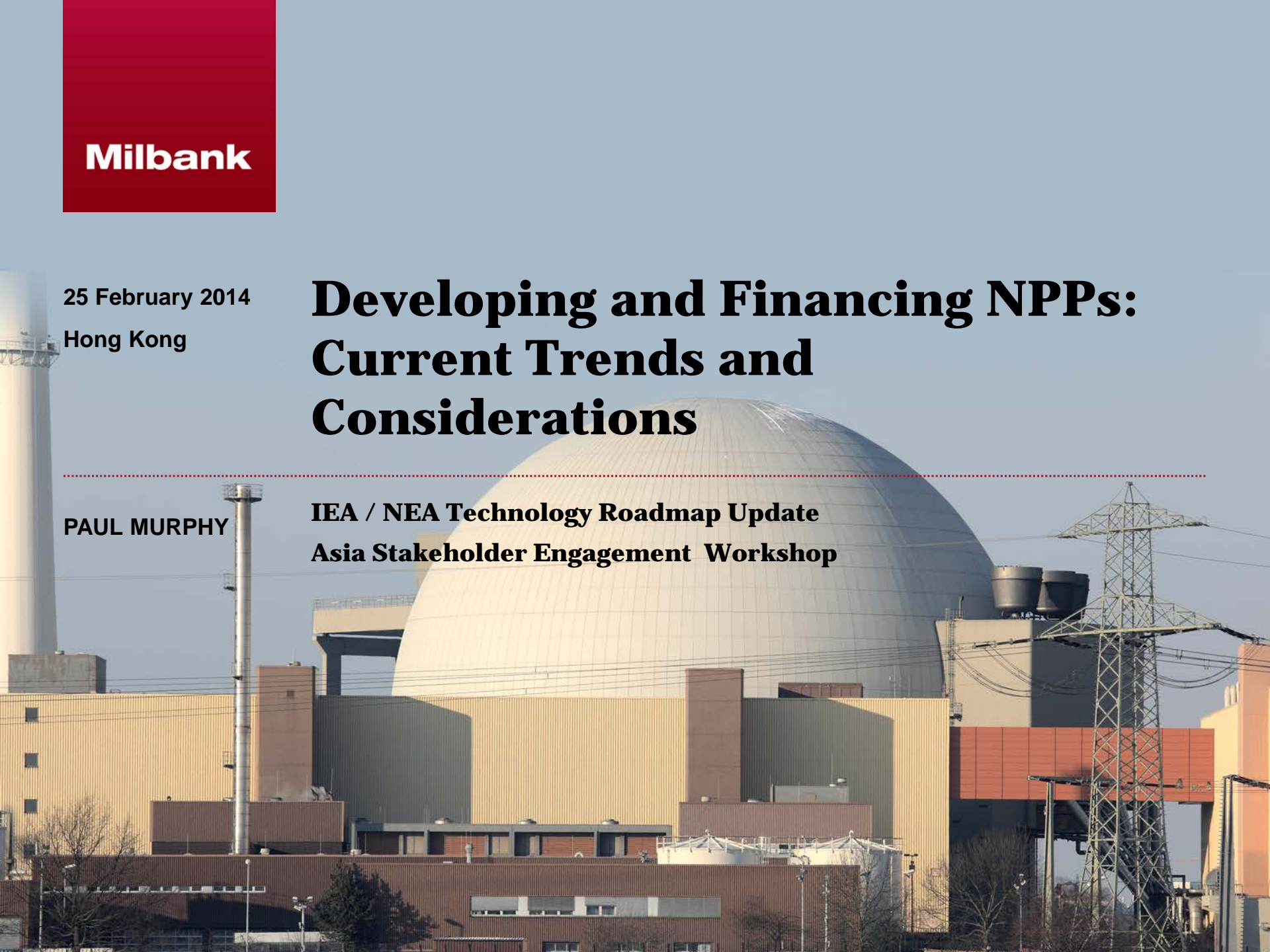
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Developing and Financing NPPs: Current Trends and Considerations

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**IEA / NEA Technology Roadmap Update
Asia Stakeholder Engagement Workshop**



Overview of Presentation

- **The Challenges for Developing and Financing NPPs**
- **Financing Trends and Considerations**
- **Existing vs. Emerging NPP Markets**
- **Putting It All Together / Concluding Thoughts**



Challenges for Developing and Financing NPPs



Financing – Current Market Conditions

- We are in a period of financial conservatism:
 - Continuing effects of the Global Financial Crisis of 2008
 - Eurozone troubles
 - Query: Have views on sovereign guarantees changed?
 - Basel III requirements
 - Fukushima places renewed focus on project risk
- Result: Money is tight
 - Combined with traditional challenges for the financing of nuclear power plants, there are limited options
 - Classic Models: Utility Balance Sheet; Government-funded/Sovereign model; Regulated Markets
 - Export Credit Agencies
 - Host Government Programs (US EPAct 2005 and CWIP financing structures; UK CfD and loan guarantees)
 - Russian approaches (India, Vietnam, Turkey, Bangladesh, Belarus, Hungary, etc.); BOO as an option
 - China for China (and maybe beyond?)
 - Oil Economies (UAE, Saudi Arabia)
 - Vendor equity models (Visaginas [?], Horizon, NuGen)
 - Foreign utility as developer (EDF in UK)
 - High end-users (TVO/OL3, Exeltium, Blue Sky)

Nuclear Financing Concerns & Types of Risk

- **Primary Concerns for Financiers**

- **Long development / construction periods**
- **High capital costs**
- **Regulatory uncertainty**
- **Reputational Risk**
 - Safety culture
 - Environmental responsibility
 - Commitment to International Regimes and Standards
- First-of-a-kind risk
- Operational Success
- Human Resources and Supply Chain
- Sustainability of government commitment
- Fuel cycle concerns

- **Key Risks in an NPP**

- **Completion**
- Political
- Country
- Regulatory / Licensing
- Technology
- Labor & Materials
- Electricity Market
- Operational
- Environmental
- Nuclear Incident
- **Reputational**

Financing a Nuclear Power Project

- Financing an NPP has historically been one of the biggest challenges for NPP development
 - NPP financing involves unique risks, large sums, and limited sources of funds
- *Note that both Export Credit Agencies and Commercial Banks have internal lending policies that specifically address Reputational Risk considerations*
- Even though it might not be a “project financed” transaction, reputational concerns will necessitate a robust reporting and covenant package, applying project finance discipline to the project review process
 - Environmental & Social Considerations
 - Equator Principles
 - IFC & OECD Environmental Guidelines
 - International Nuclear Obligations
 - Nuclear Liability (both International Treaties and Domestic Law)
 - The 3Ss of Safety / Security / Safeguards
 - Bilateral agreements
 - **Confidence in the Host Country Regulator**
 - Importance of technical due diligence on the project

Lending Decisions:

What do financial institutions really care about?

- Conclusion: **REPUTATIONAL RISK** analysis is as important to financial institutions as the commercial analysis.

1. Will I get paid back? How will I get paid back?

2. Is this a “good project”?

Both are equally important!

Existing vs. Emerging NPP Markets



So what is so different?

- **Emerging countries lack experience and predictability. Specifically:**
 - A nuclear history
 - Concern: Is the government support sustainable ?
 - Concern: Will the public accept the NPP ?
 - Will you get “Merkeled” ?
 - Experienced nationals that can staff their owner, operator, and regulator organizations
 - Concern: Where will the people come from ? (And ... how long will they stay?)
 - A regulatory track record
 - Concern: Who will take regulatory risk ?
 - Concern: Is the regulator capable (i.e., independent, competent, authoritative) ?
 - A domestic supply chain that is experienced in NPP development
 - Concern: Is localization possible ? If so, to what degree and how soon ? Are there nuclear qualified suppliers?
 - Concern: Can the foreign suppliers execute in the host country ?
- **And why does this matter so much?**
 - Contractors and vendors need predictability to commit to [aggressive (?)] cost and schedule parameters
 - Impact: Higher costs and longer schedules
 - Reality: Risk transfer will need to occur in whole or in part
 - Financing entities like to see experience and predictability
 - Why? ... because they don't want to take nuclear project risk
 - Why? ... because they don't like reputational risk
 - Result: Government guarantees will be needed to support financing structures

So what do we conclude from all this ?

- **Emerging Countries will need to consider:**
 - Bringing in outside expertise
 - Partnering with vendor countries
 - Drawing upon bilateral relationships
 - Offering greater opportunities for foreign nuclear suppliers
 - Relying on foreign nuclear suppliers to take on a greater role (e.g., Akkuyu Project in Turkey – Russian Build-Own-Operate model)
 - Transferring certain risks from foreign nuclear supplier to host country
 - What financial resources do I have available to me?
- **Financing Entities will look for:**
 - Proven technology
 - Quality of the project delivery team
 - Experience of the owner, operator, and regulatory organizations
 - International Agreements
 - **Challenge:** Because the Emerging Country is doing this for the first time, the financing entities will have to take something of a “leap of faith” in participating in the deal.
 - The project cannot be viewed through the same lens as the 105th NPP in the USA
 - Financing entities will need to be artful in crafting prospective protections in financing documentation to enable the host country to mature over the course of the NPP development and execution process **BUT** will protect the financing entities if the NPP does not follow international best practices
- **Conclusions:**
 - Existing market countries have not necessarily gotten NPP development right, but ...
 - Emerging market countries will be subjected to a heightened level of scrutiny by financing entities
 - Simply put, it is easier to finance the next NPP than the first NPP

Trending

- “Newcomer” countries
 - Lack of a track record
 - Human resource challenges
- ECA Financing
 - ... but all ECAs are not alike
 - Capacity constraints might drive multi-flagged offerings
 - Don’t forget about “Reputational Risk” issues
- Government - to - Government Model
 - The nuclear procurement is done at a government-to-government level
 - Financing can be through an intergovernmental loan
 - Currently being used by Russia in a number of locations (India, Vietnam, Bangladesh, Belarus, Nigeria, etc.)
 - Pros: Makes financing easier
 - Cons: Limits technology choice
 - Key Consideration: Strength of bilateral relationship
 - Realization: Government is a key factor in a nuclear development program
- Vendor Equity
 - Not a “Western” model
 - Foreign Investment / Ownership
 - Source of equity
 - Source of alignment (?)
 - How much capacity is there (?)
- Localization
 - En vogue, esp. with larger programs
 - Part of a national development strategy
 - Note the tradeoffs with ECA financing
 - What is feasible?
- Technology Transfer
 - En vogue, esp. with larger programs
 - Part of a national development strategy
 - Intellectual property, competition, and export control issues
 - Note: Distinguish “technology” transfer from “knowledge” transfer

Putting it all together ...



Understanding the Nuclear Global Marketplace

- ***So what can be done?***

- Financial entities aren't really ready to take uncovered nuclear project risks right now and financial market capacity is constrained
 - Nuclear projects must be structured with ECA financing or other government-supported financing techniques in mind
- At initial stages, governments will have to shoulder more of the risks
 - Getting “over the hump” is really a problem for Owners and Governments to solve (based on the long term aspect of nuclear projects)
 - Government support is critical (financial, sustained, with public support)
- Nuclear transactions are about bilateral relationships
- Importance of Reputational Issues
 - Environmental and social issues
 - Regulatory competence
 - Project life cycle considerations
 - International responsibility

Concluding Thoughts

- Ultimately, it has to be a viable project ... it must be a “good project”
 - Nuclear projects are unique
 - High visibility program of geopolitical significance
 - Sustained government support is critical
 - Classic nuclear challenges must be addressed
 - Participants need to be dependable
 - Reputational Risk factors must be considered
 - Regulatory structures need to support nuclear power generation
 - Early-stage program decisions must consider financing issues
 - Economics must work
 - If you don't have a viable structure that can be financed, you don't have a project

Thank you for your time and attention

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Paul Murphy's practice focuses on multiple aspects of the nuclear industry – from legal and policy matters, including international regulatory and treaty frameworks and issues regarding nuclear liability, to strategies for creating viable nuclear power programs and the identification and mitigation of associated risks – representing developers/owners, investors, and contractors on nuclear projects internationally. Mr. Murphy is recognized as an expert in the development and financing of nuclear power programs by the International Atomic Energy Agency (IAEA), the OECD's Nuclear Energy Agency (NEA) and the US government. Mr. Murphy currently serves on the IAEA's Technical Cooperation Program team, which assists member states in developing civilian nuclear power programs. Mr. Murphy has served as a designated expert, chairman, and author at several special meetings and for multiple working groups of the IAEA, primarily involving the development, financing, and structuring of nuclear power projects. He continues to work with the IAEA in a number of key areas, including a current revision of the IAEA's *Handbook on Nuclear Law* and as lead author for a new report to be released in the next few months, entitled, *"Alternative Contracting and Ownership Practices for Nuclear Power Plants"*.

Mr. Murphy currently serves as a two-time appointee to the US Secretary of Commerce's Civilian Nuclear Trade Advisory Committee, and he has served as chair of its Finance subcommittee. In addition, Mr. Murphy recently served as the US Government's sole representative on an NEA working group on *"Financing of Nuclear Power Plants"*, acting as chairman for the working group. Mr. Murphy also chaired the IAEA working group that issued, *"Issues to Improve the Prospects of Financing Nuclear Power Projects."* Mr. Murphy has also worked with the Nuclear Energy Institute, the US State Department, the US Mission to the OECD, and the Export-Import Bank of the United States on revisions to the OECD's Guidelines for the financing of nuclear power projects by Export Credit Agencies.

For the last five years, Mr. Murphy served as a faculty member for the *"Training Course on Nuclear Power Infrastructure Programs and Related Projects in Emerging Nuclear States"*, held on behalf of the US State Department and the IAEA at the Argonne National Laboratory and attended by representatives of over 20 foreign governments. Mr. Murphy was the lead instructor for the segments on financing and the bidding / evaluation process for nuclear power projects.

In addition to his work in the nuclear sector, Mr. Murphy's representations have included extensive work in the engineering and construction industry, where he has been heavily involved in the nuclear and fossil power sectors, both domestically and internationally. His project experience, both domestic and international, includes nuclear (new build, steam generator replacement, nuclear operating plant services), coal (both new build and environmental retrofit), and gas-fired power projects, ranging from EPC contracting structures to technical support agreements and including major equipment purchase agreements and subcontracting. Recent projects have included work in solar power projects (CSP), IGCC and coal liquefaction plants, and pipelines.

Prior to joining Milbank, he served as Senior Counsel for Bechtel Power Corporation, supporting both the Nuclear and Fossil business lines as a transactional attorney involved in bid evaluations, business development, proposal submittals, contract negotiations, procurement, and project execution.

Mr. Murphy is a graduate of Princeton University's Woodrow Wilson School for Public and International Affairs and a graduate of Harvard Law School. Mr. Murphy is also a member of the International Nuclear Law Association.

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