4TH INTERNATIONAL TECHNICAL MEETING
ON SMALL REACTORS

WILL SMR'S CHANGE THE NUCLEAR FINANCE LANDSCAPE?

AHAB ABDEL-AZIZ

GLOBAL DIRECTOR, NUCLEAR POWER GENERATION

3 November 2016
Ottawa, Canada

GOWLING WLG

SMR FINANCING

- **It will take at least two kinds of investment & financing to get SMRs to markets**

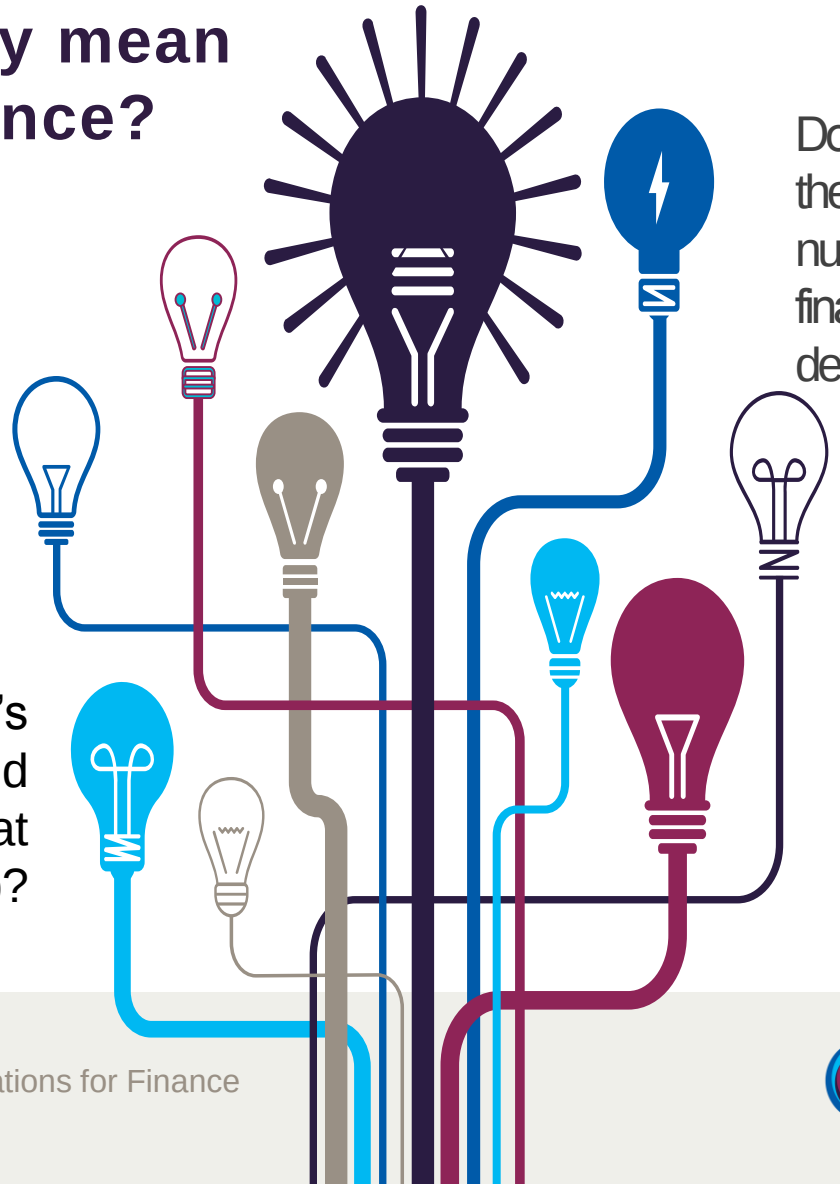
- **Product development & Commercialization**
  1. Prospective vendors are mixed between established nuclear technology developers & start-ups
  2. A good deal of money will be needed for detailed design, licensing, R&D & commercialization

- **Project specific funding**
  1. Production, construction, licensing, operating costs

- **A good deal of industry talk about private finance**
  1. Historically very challenging for nuclear

SO, SMRS ARE GREAT IDEAS, BUT...

- **What do they mean for NPP finance?**



Do SMR's remove the obstacles to nuclear power finance and → development?

What is the nuclear finance problem?

How are SMR's different and how can that help?

So What is the Problem with Nuclear Finance?

GOWLING WLG

POLITICAL GEOGRAPHY OF FINANCE IMPEDIMENTS



+ Multilateral Organizations: World Bank, IMF - AWL

Major growth economies, no problem:

- Russia, Korea, China, India, UAE –public financial backing

West, political capacity impediment:

- NA & W Europe governments largely avoiding public backing– looking to private finance

Emerging economies, economic capacity impediment:

- Tight credit + no multilateral support – looking to G-2-G & private finance

GOWLING WLG

Nuclear Project Risks Have Excluded Private Finance

- **Nuclear project risks make investors and bankers nervous**
  - Completion risk factors
  - Economic performance
- **Post TMI & Chernobyl accidents project performance track record feeds the concerns of private capital**

UNCERTAINTY

- **MIT & Congressional Budget Office both concluded:**
  1. New build nuclear power plants are not commercially viable
  2. Due to uncertainty raising risks of cost overrun, schedule delay, technological, regulatory and political risks
  3. Requires government incentives, risk absorption (and penalties to competing technology) or other support to attract finance and investment

- **Uncertainty**
  1. US Congressional Budget Office 2008:
     1. Cost uncertainty forecasted at 400% x Original Project Budgets

PROJECT PERFORMANCE

Post TMI completion grew from 5 yrs to 12 yrs

Political Support withdrawn in West

US Cost Overrun range 109% -281%; 207% Avg

50+% of projects over schedule & over budget



All 41 US reactors ordered after 1973 cancelled

ABANDONED PROJECTS



Where Nuclear Finance Comes From



Vendor Equity financing

Government & G-2-G financing

Export Credit Agency financing

Rate Base – Regulated Markets cost recovery

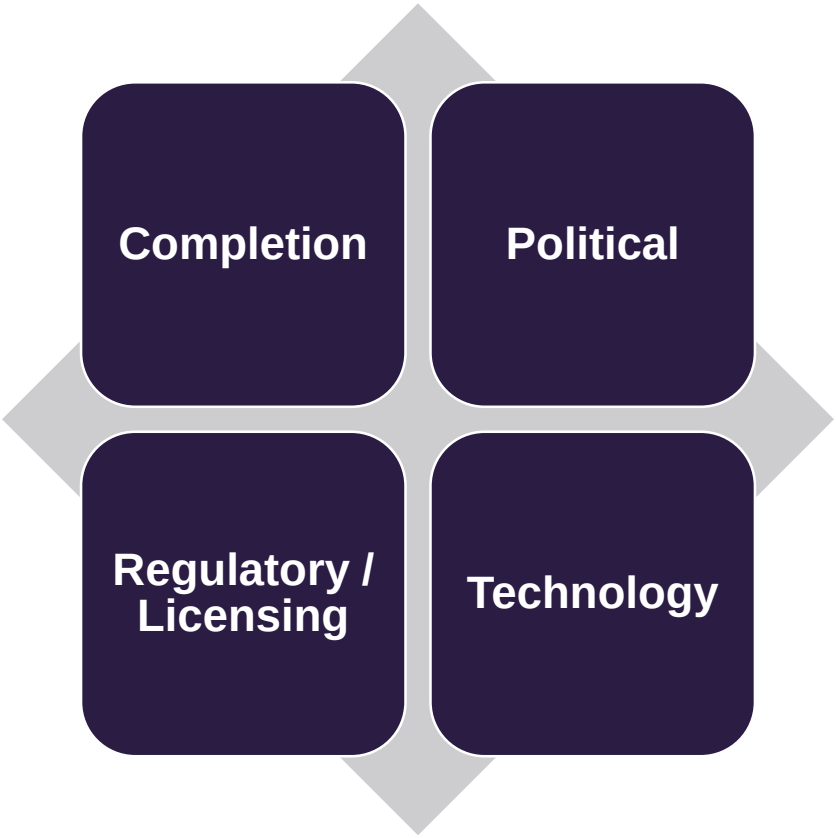
Private Finance is not a real part of the mix

GOWLING WLG

WHAT INVESTORS & BANKERS SEE

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
  - Electricity Markets
- Human Resources and Supply Chain
- **Sustainability of government commitment**
- Fuel cycle concerns



How Do SMRs FIT?

GOWLING WLG

DO SMRs PROVIDE AN ANSWER TO RISKS?

- **Key Challenges for SMRs**
  - **FOAK risk**
  - **Need for R&D + Reference Plant**
  - **No Regulatory Track Record**
  - **Lack of R&D Funding + Lack of Regulatory Fault Tolerance – Hard to Survive without One**
  - **Time to market (and funding getting to market) during product development**
  - **Investor skepticism**
- **Key Drivers for SMRs**
  - **Shorter construction periods ($)**
  - **Lower cost ($)**
  - **Standardization**
  - **Lower operating demands**
  - **Scalability ($)**
  - **Factory construction & transportability**
  - **A new story that could be more politically consumable in the West**

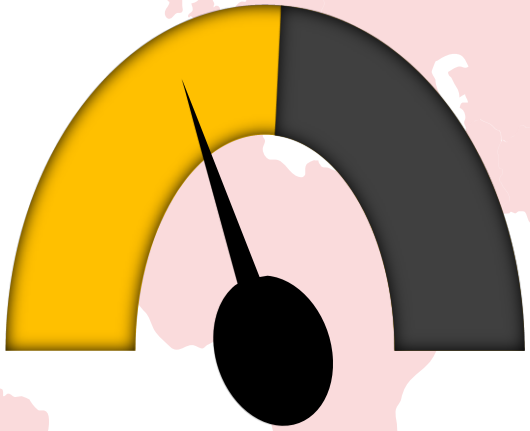
Summary of Key Prose & Cons

Technology



FOAK risk
R&D capacity
Design completeness

Regulatory



Standards?
Fault tolerance?
Transferability?
Tech licensing?

Completion



Factory construction
Construction time
Lower capital outlays
Reduced time

GOWLING WLG

REGULATORY CONSIDERATIONS

- **Early adopters have no established roadmap**
  1. Standards under development
  2. No real regulatory experience & expertise in licensing SMRs

- **What will the key licensing juncture for SMRs:**
  1. Design certification or Construction license
  2. Will licensing standardization match technology standardization?
  3. When we talk about matching regulatory intensity to the size of the hazard, what will that mean in terms of space to experiment & risk based fault tolerance

- **Recognition of country-of-origin licensing**
  1. Critical for the success of SMR deployments in small economies

SO, WILL SMRS HAVE A BETTER RUN AT FINANCE

- Maybe.
- Features can help to reduce the strains of nuclear project risk and improve the viability of political and public support
- It would be a stretch to think SMRs can displace the need for public support
- Financing challenges likely to remain but perhaps at a reduced intensity
- Much will depend on the effectiveness of the regulatory approach

HOW WILL SMRs BE SUCCESSFUL?

- **Solid economic rationale for the project**
  - Dedicated electricity source
  - Long-term PPA
  - Balance sheet financing (perhaps)
  - Sovereign guarantee (perhaps)
  - Quantifiable cost model
  - Verifiable delivery model
  - Delivery team with proven track record (perhaps not in ARs/SMRs, but in similar projects)
  - Phased development and financing
- **Public support / acceptance**
  - Safety case
  - Technological advancements
  - Rethinking the model for electricity
  - Combining ARs/SMRs and desalination

- ***Simply put: Where is the money in the deal?***
  - *Where is the money behind the deal?*
  - *How does money come from the deal?*
  - *Are there other considerations that override the first two factors?*
  - *If other considerations matter, how can the risk allocation be reconfigured in such a manner that still supports external financing?*
- ***Likely sources:***
  - *ECA financing*
  - *Government-to-Government financing*
  - *Host government support (guarantees, PPAs, financing; both program and project support)*
  - *Vendor equity*
  - *And, maybe, balance sheet deals*

QUESTIONS?

GOWLING WLG



Ahab Abdel-Aziz

Partner
Global Director Nuclear Power Generation

Ahab.abdelaziz@gowlingwlg.com

416-814-5608

Gowling WLG (Canada) LLP is a member of Gowling WLG, an international law firm which consists of independent and autonomous entities providing services around the world. Our structure is explained in more detail at gowlingwlg.com/legal

GOWLING WLG

GLOBAL REACH



Gowling WLG is an international law firm which consists of independent and autonomous entities providing services around the world. Our structure is explained in more detail at gowlingwlg.com/legal

GOWLING WLG


GOWLING WLG