ROSATOM: Financing Opportunities and Challenges

Vyacheslav Ivanov

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Global Nuclear Technology Footprint

70+ years of continues experience

Uranium production
Uranium enrichment
Fuel fabrication
Power equipment manufacturing
NPP design, engineering and construction
Electricity generation
Services and modernization

JSC Rosatom Energy International - subsidiary of State Corporation ROSATOM – integrator and project developer of ROSATOM solutions in Russian nuclear business abroad
Tested Nuclear Technology – key reference factor for financing

1. **Water-Water Power Reactor (VVER)**
   - One of the most reliable reactors in the world today
   - One of the most referenced technology

2. **Nuclear Icebreaker Fleet**
   - #1 nuclear fleet in the world
   - Assures stable functioning of Northern Sea Route

3. **Fast Reactors (Gen IV)**
   - #1 fast neutron reactor in the world
   - #1 operating fast neutron reactor in the world

4. **Small and Medium Size Reactors**
   - Variety of different designs with referent parameters

5. **Floating Nuclear Power Plant and Desalination Solution**
   - FNPP solution - manufactured on a turnkey basis, unique, eco-friendly
   - Desalination solution – variety of applications, referenced, proven safety

6. **Nuclear medicine and Radiation technologies**
   - Nuclear medicine is a niche market based on the use of radioisotopes, mature for diagnostic and emerging for therapy.
Russian nuclear technology – Water-Water Power Reactor (VVER)

- **Forefront** of nuclear technology – Generation III+ reactor
- **Hanhikivi-1 project is based on VVER-1200 design**
- **Proven and mature** solutions – ≈1400 reactor years of total operating time*
- **In Finland 2 VVER-440 units have been used safely in Loviisa for decades**
- **A high level of internal safety** gained through evolution of design
- **Most demanded capacity** suitable for various grid conditions – 1000-1200 MWe
- **60-year lifetime** (+20-year extension possible)
  - High performing source of supply – availability factor ≈ 92%
  - Meets all current Russian and international safety standards and the IAEA requirements
- **Widely referenced by utilities**

* According to WANO it is one of the most reliable reactors in the world today.

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Rosatom NPP construction perspective pipeline – more than 90 units

*Countries of BOO(T) Projects: “built own-operate (transfer)” projects where Rosatom Group owns equity vs. the rest EPC(M) project countries where it provides engineering procurement and construction (management) services.
Our Approach to Financing New NPP Generation

Financing terms and structures for new NPP are unique and driven by:

- Economic and credit metrics of host country
- Selected business model for NPP
- Bilateral relationships between host country and Russia

EPC contract + IGA financing (sovereign loans and guarantees) is cost effective and long-term solution to ensure new NPP generation built on time and budget.

BOO model might be put in place when economic terms and conditions are favorable. Such structures are multilayer, complex and more expensive and usually not fully committed at the beginning of the project (additional risk and costs on the project).

Rosatom has successful track record arranging multibillion financing for Russia design NPPs (both EPC and BOO models) new NPP generation across the world.
Contracting and risk sharing

Various models are possible:

- Customer's risk appetite and investment horizon
- Availability of financing
- Host government agreement and guarantees
- Available tax incentives

**EPC Model**
- Handover upon completion to host
- Often requires debt financing
- Relatively short term
- No equity

**BOO Model**
- Requires equity appetite
- Construction viewed as cost center
- Requires long term PPA
Representative Financing Structure: EPC plus IGA Financing
Focus on Intra-Government Debt

- **Russian Government**
- **The Russian Ministry of Finance**
- **Rosatom Family**
  - IGA on cooperation in peaceful use of nuclear energy
  - Financial IGA for financing the Project
- **Vnesheconombank (VEB) or other State bank**
  - 70% debt of total financing
- **Rosatom EPC Contractor**
  - EPC contract implementation
  - NFS contract
  - O&M contract
- **Project company**
  - Obtaining licenses and permits
  - NPP operation
  - Decommissioning and waste disposal

30% equity or sponsorship of total financing
Representative Financing Structure: BOO plus Financing
Focus on project financing and international economics

- Obtaining licenses and permits
- Project management
- Fund raising
- Contract execution
- Operation
- Management
- Decommissioning and waste disposal

Site Selection
- Construction site
- Project warranties and permits

Domestic Utility
- Power purchase agreement (PPA)

Host Country Consortium

New Investors

equity ownership decided case by case

International and Russian ECAs, Banks, Capital Markets

ROSATOM Family Companies

- EPC contract
- Operation & maintenance contract
- Fuel supply contract
Hanhikivi-1 Case. Project snapshot

- **Project**: construction of Hanhikivi 1 nuclear power plant on a greenfield site Pyhäjoki in Northern Finland, Baltic Sea
- **Mankala structure**: NPP will produce electricity which will be sold to the shareholders at cost (Finnish “Mankala model”)
- **Shareholder base**: majority shareholder is Voimaosakeyhtiö SF (“VSF”) which comprises some 47 Finnish corporates (industrials and utilities). Rosatom also became shareholder in April 2014.
- **Local support and government approval**: In 2010, the Government of Finland and the Finnish parliament granted their permit (Decision-in-Principle) to FV for the Project. The Project also benefits from strong and consistent local support
- **Vendor and technology**: Rosatom is the exclusive turn-key EPC contractor providing its AES-2006 / VVER nuclear reactor technology (1,200MW). Its Leningrad 2 is the reference plant
- **Timetable**: It is currently planned that construction works will commence in 2018, and that the commercial operation date will occur in 2024
- **Project funding**: project costs are to be funded 72.5% by debt financing and 27.5% by equity
- **Competitiveness**: Target Mankala price over 2024-2035 is expected to be highly competitive in Nord Pool.

### Key project strengths

- **Strong and balanced financing structure**
- **Proven and competitive Russian technology**
- **Established nuclear country with strong government support**
- **On-time and to-budget project delivery secured by Rosatom role**
- **Mankala structure providing optimal risk diversification among shareholders and open-ended full recourse**
- **Strong EPC contract provides protection to the project from delays and cost overruns**
Finland Sources of Funding

<table>
<thead>
<tr>
<th>Sources of Funding</th>
<th>Amount</th>
<th>Benchmark (target) terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity financing: VSF (including its shareholders), REIN</td>
<td>EUR ~ 1.7 billion</td>
<td>NA</td>
</tr>
<tr>
<td>Subordinated debt financing originated from NWF sources</td>
<td>EUR ~ 2.4 billion</td>
<td>3% ~ CIRR+100</td>
</tr>
<tr>
<td>Primary secured debt financing: various state-owned and commercial banks with ECAs coverage</td>
<td>EUR ~ 2.2 billion</td>
<td>~CIRR+200(*)</td>
</tr>
<tr>
<td>Other</td>
<td>EUR ~ 0.5 billion</td>
<td>~EURIBOR+300(*)</td>
</tr>
</tbody>
</table>

- Project’s economic success highly correlated with competitiveness of financing
- Key economic rates have been favorable
- Rouble devaluation contributed

* Benchmark (target) terms

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Graphs showing trends in CBR Rate, USD-RUR, LIBOR, EURIBOR, and CIRR EUR from 2010 to 2016.
Electricity supply-demand forecast for Finland

**Finnish real yearly prices SKM, forecast € / MWh**

Source: SKM (all except “Mankala price”), FV (“Mankala price” only)

**Domestic electricity balance (base case) TWh**

Source: SKM

**Summary Financials, mln EUR**

- Cumulative FCFF, right scale
- Revenue, left scale
- Equity, left scale
- NWF funds, left scale
- Other commercial debt, left scale
- FCFF, left scale

Source: FV ("Mankala price" only)
Hanhikivi-1. Preliminary project schedule

- June 2015 – application for construction license submitted
- January 2018 – first concrete
- January 2024 - Commercial Operations Date (COD)
NPP in Jordan. Project snapshot

- **Project**: The Project envisages the construction of 2 nuclear power plant units in the desert 72 km far from the As Samra Waste Treatment plant
- **Model**: ForJoint-Venture. The Project Company (PC) shall be established for Project implementation and will be the Owner and operator of the Plant
- **Government approval**: The Project benefits from strong and consistent political and state support
- **Vendor and technology**: Rosatom is to be the exclusive turn-key EPC contractor providing its AES-92/VVER nuclear reactor technology (1000 MW)
- **Timetable**: It is currently planned that engineering and designing works will commence in 2017, and that the commercial operation date will occur in 2025
- **EPC contract price (estimation)**: ~10+ bn US dollars

**Key project strengths**

- Sustainable cash flow and return on investment
- Proven and competitive Russian technology
- Jordan government guarantees
- Government support from both Russia and Jordan

Nuclear energy in the region

Planned

Egypt
Saudi Arabia

None

Israel
Syria
Iraq
NPP in Jordan. Preliminary contractual and shareholder structure

- **GK Rosatom**
- **JSC Rosatom Energy International**
- **Jordan Government**
- **Other investors**

Jordan
- Construction site
- Project warranties and permits
- Power purchase agreement (PPA)
- Purchase and sale of remaining power on the market

Project Company
- Obtaining licenses and permits
- Project management
- Fund raising
- Contract execution
- Decommissioning and waste disposal

EPC contract
- Operation and maintenance contract
- Fuel supply contract
- Debt financing
- Capital markets / Commercial banks

- **NEPCO**
- **Large consumers**

*In case of export opportunities*
Electricity market in Jordan

Electricity consumption forecast 2014 – 2040*

- Overall installed generating capacity in Jordan in 2012 was 3000 MW
- Expected annual electricity demand growth rate is around 6%
- Electricity demand forecast:
  - to 2014 – 3 370 MW,
  - to 2020 – 4 782 MW,
  - to 2040 – more than 14 000 MW

New electricity capacity commissioning 2014 -2030**

Cost of generation by source***

<table>
<thead>
<tr>
<th>Source</th>
<th>Current cost of generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas</td>
<td>40-60 $/MWh</td>
</tr>
<tr>
<td>Oil</td>
<td>170-190 $/MWh</td>
</tr>
<tr>
<td>Diesel</td>
<td>250-300 $/MWh</td>
</tr>
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<th>Source</th>
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<tr>
<td>Nuclear (from 2025)</td>
<td>&lt;100 $/MWh</td>
</tr>
<tr>
<td>Oil shale (from 2017)</td>
<td>90-110 $/MWh</td>
</tr>
<tr>
<td>Liquefied natural gas (from 2015)</td>
<td>100-120 $/MWh</td>
</tr>
</tbody>
</table>

Jordan imports more than 97% of energy, accounting for 20% of GDP.

Nuclear energy will help to:
- Reduce the country’s dependence on external fuel supplies
- Increase the stability of the power system
- Reduce electricity tariffs and decrease Government subsidies (more than 1.8 billion U.S. dollars per year currently)

* Worley Parsons Project Feasibility Study
** JSC Rosatom Energy International data
*** 2014 price level; Source: Jordan Atomic Energy Commission
NPP in Jordan. Preliminary project schedule

**Phase 1**: Preparation
- Oct. 2013
- GK Rosatom was elected as a preferred supplier of the first NPP in Jordan
- Signing of Project Development Agreement

**Phase 2**: NPP construction
- July 2014
- May 2016
- Dec. 2017
- Ratification of the IGA for the construction and operation of NPP by the Parliament of Jordan
- NPP construction documents package signing (PPA, EPC contract, NFS contract, SHA)

**Phase 3**: Operation and maintenance
- 2025
- 2027
- Unit 1
- Unit 2

**Phase 4**: Decommissioning
- 2085
- Decommissioning of the first unit
Strong Relationships with Capital Providers

**Overview**

- Rosatom maintains excellent relationships with all major sources of sovereign and institutional financing, and is flexible in its approach
- Russia’s sovereign funds, state-owned banks
- Own shareholder financing including bridge loan, straight debt, preferred shares, straight equity subject to satisfactory terms and conditions
- International export credit agencies
- National wealth funds, financial and industrial institutions of host countries, as well as those in the region
- Partnerships with global and local suppliers and providers

**Key sources of funds**

(1) Russian State, Ministry of Finance, Ministry of Economic Development, National Wealth Fund (NWF), Export Insurance Agency of Russia (EXIAR), State Corporation Bank for Development and Foreign Economic Affairs (VEB), Savings Bank of Russia (Sberbank), International Trade Bank (VTB), ECAs such as COFACE, EGAP, NEXI, ECGD and EKN
THANK YOU FOR YOUR ATTENTION