Financing Nuclear Power Projects

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1. Financing Options
2. Risks Allocation
3. Insurance
4. Financing Planning
5. ECA Finance
6. Case Study
7. Financing Considerations
1. Financing Options
Financing Options for Nuclear Power Projects

- Government finance

- Corporate/Balance sheet finance
  - Full-recourse
    A sponsor acts as a borrower or borrower’s guarantor. The borrower shall have credit track record satisfactory to lenders and is liable for the repayment and the lender has recourse to the sponsor. The borrowing will be reflected on the sponsor’s balance sheet.

- Project finance
  - Non-recourse / Limited-recourse
    A borrower is the SPV, an entity set up solely for the project. The borrower itself doesn’t have a credit track record, and the lender has only limited recourse to the sponsor. The lender holds the pledged project assets and relies on the cash flows generated by the project for repayment. Given the recourse and repayment features above, reasonably allocating the project risks is key for project finance.

- Hybrid/Structured finance
Existing Financing Options for Nuclear Power Plants

- **Balance sheet financing by utilities**
  - Many utilities are electricity providers with strong balance sheet. It is only possible for a limited number of utilities to fund on this basis.

- **Power user investment**
  - This is the model adopted for TVO’s reactors in Finland where the equity has largely been taken up by local energy-intensive industries and local utilities.

- **Utility joint ventures**
  - Many of the European international utilities have created Joint Ventures for the construction of a nuclear power plant to share the financial, regulatory, political and technical risks.

- **Public private partnership**
  - In this model a government runs a competition for a company to build, finance and operate a specified project. This is currently envisaged for some nuclear new build projects.

- **Project Finance**
  - Debt investors lend to a single purpose entity, whose only asset is the new power plant and whose only revenue is from future power sales. There has not been any project financing for nuclear power projects yet.
Type of Finance

- **Full recourse**
  - Sponsors are responsible for the repayment of the debt

- **Limited recourse**
  - Sponsors support is limited

- **Non recourse**
  - Sponsors are not required to deliver any support to the project
Definition of Project Finance

- A funding structure that relies on future cash flows from a specific development as the primary source of repayment, with that developments’ assets, rights and interests held as collateral security.

- The financing of a particular economic unit in which a lender is satisfied to consider the cash flows and earnings of that economic unit as the source of funds from which a loan will be repaid and to the assets of the economic unit as collateral for the loan (OECD Guideline).
Why Project Finance?

- Tax benefit
- Off-balance sheet finance
- Borrowing capacity
- Risk limitation
- Risk sharing
- Long-term finance
- Joint ventures
Typical PF Structure

- Government/Govt. Entity
- Suppliers
- Operator
- Insurers
- EPC Contractors
- Special Purpose Project Co (SPV)
- Sponsors & Equity Investors
- Lenders
- Buyers (Offtakers)
- Equity Injection
# Features of Project Finance

<table>
<thead>
<tr>
<th></th>
<th>Benefits</th>
<th>Costs</th>
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<tbody>
<tr>
<td><strong>Project Sponsors</strong></td>
<td>• Risk Transfer (Limited Recourse)</td>
<td>• Higher financing costs</td>
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<td>• Off-balance Sheet</td>
<td>• Complex contracts</td>
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<td>• Risk sharing</td>
<td>• Difficulty in negotiation</td>
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<td>• Tax break</td>
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<td><strong>Lenders</strong></td>
<td>• Higher profitability</td>
<td>• Difficulty in assessing project feasibility</td>
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<td>• Project risk reduction</td>
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<td>• Reducing information asymmetry problem</td>
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</table>
Major Project Participants

- **Sponsor:** Utilities, IPP developer
- **EPC Contractors**
- **Lenders:** Banks, Capital Market, ECAs
- **Insurance Providers**
- **Project Company (SPV)**
- **Off taker:** Electricity utilities, industrial user; sometimes state owned or controlled
- **Operator**
- **Fuel Supplier**
- **Government**
- **Other Parties**
Project Participants : PPP basis

- Government
- Sponsors
- Insurers
- Off-taker
- Lenders
- Fuel Supplier
- EPC Contractor
- O&M Provider

Special Purpose Vehicle (SPC)
Project Participants: PPP basis

- Government
  - Government Guarantee
- Off-taker
  - Power Purchase Agreement
- Fuel Supplier
- Sponsors
  - Shareholder Agreement
- EPC Contractor
- Insurers
  - Insurance
- Lenders
  - Loan Agreement
- Special Purpose Vehicle (SPC)
- EPC Contractor
- O&M Provider
  - O&M Contract
- Government Guarantee
Project Participants: Utility Basis

- Owners
- Insurers
- Lenders
- O&M Provider
- EPC Contractor
- Fuel Supplier
- EPC Contract
- O&M Contract
- Fuel Supply Agreement
- Loan Agreement
- Insurance
Project Participants: Utility Basis

- **Owner**
  - **Sponsors**
    - **Insurers**
    - **Lenders**
  - **Shareholder Agreement**
  - **Insurance**
  - **Loan Agreement**

- **Government**
  - **Government Support**

- **Fuel Supplier**
  - **Fuel Supply Agreement**

- **EPC Contractor**
  - **EPC Contract**

- **O&M Provider**
  - **O&M Contract**

- **Nuclear Power Plant**
Joint Venture Agreement (Shareholders Agreement)
- Sponsors are required to make capital investments in the project vehicle according to the terms and conditions of the shareholders agreement.

Concession Agreement (Implementation Agreement)
- Provides concession such as designing, building, financing and operating a project to provide public infrastructure.

Power Purchase Agreement
- An offtaker purchase the project’s output, i.e. electricity, based on a pre-agreed Tariff. It provides the offtaker with a secure supply of the required electricity and the project company with the ability to sell its output on a pre-agreed basis.

Fuel Supply Agreement

EPC Contract (Construction Contract, Supply Contract)

O&M Contracts

Land Lease Agreement
Contractual Framework – Finance Documents

- **Common Terms Agreement**
  - Governs common loan terms between and among the Facilities such as reps and warranties, covenants, events of default and mandatory prepayments.

- **Inter-creditor Agreement**
  - Governs rules of engagement between Finance Parties regarding security interests and other intercreditor relationship matters (i.e., voting)

- **Subordination Agreement**
  - This governs relationships between Lenders, which have a senior security interest in the assets of Borrower, and the Shareholders in the event that they advance subordinated loans to Borrower
Contractual Framework – Finance Documents

- **Security / Guarantee documents**
  - Purpose: Establish Lenders’ first ranking securing interest in Borrower’s assets, Project documents, interests of Shareholders in Borrower, subordinated loans from Sponsors and insurances

- **Hedging Agreement**
  - Provides interest rate and currency hedging (if required)

- **Facility Agreement**

- **Guarantee Agreement, Support Documents**

- **Direct Agreements**
Typical Capacity & Utilization Payment Mechanism

- Capacity payment
  - Debt service recovery
  - Return on equity (ROE)
  - Fixed O&M expenses
- Energy payment
  - Variable O&M expenses
  - Fuel cost. Etc.
Typical Capacity & Utilization Payment Mechanism

- Capacity payment
  - Debt service recovery
  - Return on equity (ROE)
  - Fixed O&M expenses

  ✓ Fixed payment designed to cover fixed costs of the project (including debt service)

  ✓ Indexation of fixed fee reflects extent of inflation and interest rate risk pass through in contract price

  ✓ Payment linked to availability of the facility to produce or provide services

  ✓ This structure typically includes penalties for failure to make capacity available and may provide financial incentives for excess capacity
Typical Capacity & Utilization Payment Mechanism

- Energy payment
  - Variable O&M expenses
  - Fuel cost. Etc.

✓ Variable payment designed to cover variable operating costs of the project

✓ Payment linked to the extent to which the electricity produced or service provided by the project is sold/used

✓ Amount typically will be based on an assumed operating efficiency with an assumed inflation indexation

✓ Project bears risk of operating inefficiencies and mismatches between inflation on its variable cost and the assumed indexation and benefits from operating efficiencies and cost savings
Contractual Arrangements of PPP

- Build-Operate-Transfer (BOT)
- Build-Own-Operate-Transfer (BOOT)
- Build-Own-Operate (BOO)
- Build-and-Transfer (BT)
- Build-Lease-Transfer (BLT)
- Build-Transfer-Operate (BTO), etc.
Build-Operate-Transfer (BOT)

BOT finds extensive application in the infrastructure projects and in public–private partnership. In the BOT framework a third party, for example the public administration, delegates to a private sector entity to design and build infrastructure and to operate and maintain these facilities for a certain period. During this period the private party has the responsibility to raise the finance for the project and is entitled to retain all revenues generated by the project and is the owner of the regarded facility. The facility will be then transferred to the public administration at the end of the concession agreement, without any remuneration of the private entity involved. Some or even all of the following different parties could be involved in any BOT project.
Contractual Arrangements of PPP

- **Build-Own-Operate-Transfer (BOOT)**
  - A BOOT structure differs from BOT in that the private entity owns the works. During the concession period the private company owns and operates the facility with the prime goal to recover the costs of investment and maintenance while trying to achieve higher margin on project. The specific characteristics of BOOT make it suitable for infrastructure projects like highways, roads mass transit, railway transport and power generation and as such they have political importance for the social welfare but are not attractive for other types of private investments. BOOT & BOT are methods which find very extensive application in countries which desire ownership transfer and operations.
Build-Own-Operate (BOO)

In a BOO project ownership of the project remains usually with the project company for example a mobile phone network. Therefore the private company gets the benefits of any residual value of the project. This framework is used when the physical life of the project coincides with the concession period. A BOO scheme involves large amounts of finance and long payback period. Some examples of BOO projects come from the water treatment plants. This facilities run by private companies process raw water, provided by the public sector entity, into filtered water, which is after returned to the public sector utility to deliver to the customers.
Contractual Arrangements of PPP

- **Build-Lease-Transfer (BLT)**
  - Under BLT, a private entity builds a complete project and leases it to the government. On this way the control over the project is transferred from the project owner to a lessee. In other words, the ownership remains with the shareholders but operation purposes are leased. After the expiry of the leasing, the ownership of the asset and the operational responsibility are transferred to the government at a previously agreed price. For foreign investors taking into account the country risk, BLT provides good conditions because the project company maintains the property rights while avoiding operational risk.
Contractual Arrangements of PPP

- Build-Operate-Transfer (BOT)
- Build-Own-Operate-Transfer (BOOT)
- Build-Own-Operate (BOO)
- Build-and-Transfer (BT)
- Build-Lease-Transfer (BLT)
- Build-Transfer-Operate (BTO), etc.
2. Risk Allocation
Risk Allocation of Conventional Power Projects

- Equity investors
- Project company
- EPC contractors
- O&M provider/Operator
- Host government / Off-taker
Risks of Nuclear Power Projects

- Waste Management Risk
- Decommissioning Risk
- FM Risk
- Environmental & Social Risk
- Legal Risk
- Market Risk
- Construction Risk
- Operating Risk
- Financial Risk
- Political Risk
- Regulatory Risk
- Credit Risk
Risk Trend

Development Phase

Construction Phase

Operation Phase

Operating Risks

Market Risks

Regulatory Risks

Risk Trend

Risk for Developers

Construction Risk

Start-UP (Debt Service starts)
Nuclear Power Plants…

When they see nuclear power plants, they see…..
Fukushima Accident
Construction Delay and Cost Overrun

TVO: We don't know when Olkiluoto 3 will be ready

A French-built nuclear reactor on Finland’s west coast was originally scheduled to begin operations in 2009 -- but there is still no clear end in sight.

Costs nearly triple

The entire project was originally to have been completed by 2009. Construction began in 2005, but a year ago TVO said it was “preparing for the possibility” that OL3 might not go online until 2016. Meanwhile the budget has ballooned from three to at least 8.5 billion euros.

“This is of course a difficult situation for them as well,” said Tuohimaa. “We both share the goal completing OL3 as soon as possible, though. TVO has a turnkey contract, so for us the price of the facility is what it is. But the time that it is off the national grid naturally has a cost.”

TVO and the Areva-Siemens consortium have been suing each other for billions of euros in lost income.

Olkiluoto 3 delayed beyond 2014

17 July 2012

A further delay in commissioning the EPR under construction at Olkiluoto has been announced by Teollisuuden Voima Oyj (TVO). It attributed the delay to the Areva-Siemens consortium, which counter claimed TVO has failed to fully commit itself to resolving outstanding issues.

In December 2011, TVO announced that it expected Olkiluoto 3 to begin operating in August 2014. It now says that, based on information provided by the Areva-Siemens consortium, the plant unit “will not be ready for regular electricity production in 2014.”

The civil construction works of Olkiluoto 3 have mainly been completed and the major components of the nuclear island - such as the reactor pressure vessel (RPV), pressurizer and steam generators - have all been installed. Welding work of the primary coolant circuit piping has also been completed. Meanwhile, installation of the internal parts of the RPV as well as equipment for the vessel’s lid continue.

TVO noted, “Planning, documentation and licensing of the reactor plant automation are not yet completed,” and complained that these “have not progressed according to the supplier’s schedules.” TVO senior vice president for corporate relations Anna Lehtiranta said, “Even though we are not pleased with the situation and the fact that there have been repeated challenges with the time scheduling, works are progressing and solutions for remaining instrumentation and control (I&C) items are fixed step-by-step.”
Construction Risk

- Failure to complete the project
- A construction delay
- A cost overrun
- Failure of the project to perform well
- Occurrence of a force majeure (FM)
- Unavailability of qualified staff, managers and reliable subcontractors
Operating Risk

- Incidents or accidents at plant
- Incidents or accidents related to waste fuel transport
- Failure to attain high capacity factor due to prolonged outages
- Environmental factors
- Fuel cycle issues (supply, waste storage)
- O&M especially quality assurance program and nuclear regulator competence
Financial Risk

- Exchange rates
- Interest rate
- Commodity prices
- Decreases prices of the product by the project
- Inflation
Political Risk

- War and civil disturbance
- Expropriation
  - Nationalization and confiscation
  - Creeping expropriation
  - Expropriation of funds
- Currency inconvertibility and transfer restriction
- Breach of contract
  - Breach or repudiation of project agreement by government
Decommissioning & Waste Management Risk

- Long term storage issue
- Uncertainties of decommissioning and waste management liabilities
- Waste treatment including the safety culture and experience in dealing with radioactive waste
Regulatory Risk

- Cost overruns/delays due to safety or design related reasons
- Cost overruns/delays due to permitting, etc.
Market Risk

- Competitive of the cost of power for off-taker
- Credit risk of off-taker
- Amount of risk passed through in power purchase agreements
Other Risks

- Credit Risk
  - Sovereign credit risk
  - Corporate credit risk
- Fuel Supply Risk
- Environmental & Social Risk
- Force Majeure Risk
## Credit Rating

<table>
<thead>
<tr>
<th>Moody's</th>
<th>S&amp;P</th>
<th>Fitch</th>
<th>rating description</th>
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<td>High grade</td>
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<td>AA</td>
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<td>AA-</td>
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<tr>
<td>A1</td>
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<td>Baa1</td>
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<tr>
<td>Ba1</td>
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<tr>
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<tr>
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<tr>
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<tr>
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<td>B3</td>
<td>B-</td>
<td>B-</td>
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<tr>
<td>Caa1</td>
<td>CCC+</td>
<td>CCC+</td>
<td>Substantial risks</td>
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<tr>
<td>Caa3</td>
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<td>CCC-</td>
<td>Default imminent with little prospect for recovery</td>
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<td>CC</td>
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3. Insurance
Insurance

- OCIP (Owner controlled Insurance Program)
- Construction Period
  - Construction All Risks (CAR)
  - Delay in Start-Up (DSU)
  - Marine Cargo
  - Marine Delay in Start-Up (Marine DSU)
- Operation Period
  - Property Damage
  - Machinery Breakdown
  - Business Interruption (BI)
Insurance – Construction Period

- **Construction All Risks (CAR)**
  This covers physical loss or damage to work, materials and equipment at the project site where appropriate cover should include mechanical and electrical breakdown. The level of coverage is normally on a replacement-cost basis, including any extra import duties and costs of erection.

- **Delay in Start-Up (DSU)**
  This compensates the project company for loss of profit or additional costs (or at least the cost of the debt interest and fixed operating costs, plus any penalties payable for late construction completion of the project), resulting from a delay in start of operations of the project caused by a loss insured under the CAR policy.

- **Marine Cargo**
  This covers physical loss or damage to equipment in the course of transportation to the project site or in storage prior to delivery.

- **Marine Delay in Start-Up (Marine DSU)**
  Marine DSU covers the same scope as DSU in relation to delays caused by loss or damage to equipment being shipped to the project.
Insurance – Operation Period

- **All Risk**
  The level of coverage is normally the replacement cost of the project or relevant equipment. This coverage may be split into property (or material damage) insurance and machinery breakdown insurance.
  - Property Damage
  - Machinery Breakdown

- **Business Interruption (BI)**
  This is the equivalent of DSU insurance, once the project is operating. Again, the scale of coverage should be sufficient to cover losses (or at least interest, penalties, and fixed operating costs) during the maximum period of interruption that could be caused by having to replace a key element of the project.
Insurance

Construction Period

- Marine Cargo
- Construction Insurance CAR/EAR

Operation Period

- DSU
- PD, MB
- Business Interruption
- Terrorism Insurance
- Employer’s Liability, Personal Safety Insurance
- Auto Liability
- Third Party Liability
4. Financing Planning
Key Financing Consideration for Planning

- Specific risks associated to nuclear
- Scarcity of precedents for private sector nuclear financing
- Lack of experience and pre-set position of financial institutions re: nuclear financing
- Large amount of the investment
- Availability of liquidity and risk appetite in debt and credit markets
Primary Concerns for Lenders

- Long development and construction period
- Capital cost
- Regulatory uncertainty
- First-of-a-kind risk
- Sustainability of government commitment
- Fuel cycle concerns
- Social and environmental acceptance
- Commitment to international regimes
- Reputational risk
Initial Consideration for Financing NPPs

- Government Support
- Construction risk
- Operating risk
- Regulatory risk
- Country risk
- Site selection
- Technology
- Time frame
Financing Planning for NPP

Example: Financing planning

- Financing Planning
- ECAs’ LOIs
- Financing Strategy
- Bank Commitment
- Loan Agreement
- Financial Close
- Draw Down
- Refinance

Phase: Pre-FS/FS, Bidding, Construction, Operating

Development
Project Development Process with Financing

- Project Identification Phase
- Project Definition Phase
- Feasibility Study
- Competition Phase (where applicable) – International Bid
- Contract Negotiation Phase
- Financial Structuring Phase
- Financing Competition / Commitment Phase
- Financing Due Diligence and Documentation Phase
- Financial Close
- Construction Phase
- Operation Phase
Financing Transaction Timeline

Initial Bankability Assessment
- Preliminary discussion with Sponsor / Borrower
- Basic project information
- Review and analyze the information to issue an LOI

Preliminary Financing Plan / Strategy
- Prepare/Review Project teaser/Preliminary Information Memorandum
- Financial model
- Select lenders’ consultant

Financing Development/Marketing
- Agree to a financing structure
- Lenders selection (RfP, receipt of proposals, etc.)
- Review a term sheet

Due Diligence
- Agree to the term sheet (final)
- Review the Information Memorandum, financial model, etc.
- Review lenders’ consultants reports
- Obtain lenders’ board approval
- Issue commitment / acceptance letter

Documentation
- Review a finance documents with the agreed term sheet.
- Agree to the finance documents

Signing and Disbursement
- Sign the finance documents
- Conditions precedent
- First drawdown
Risk Allocation and Financing Process

Risk Allocation

Risk Identification

Financial Model

Sensitivity Analysis

Risk Mitigation

Commercial Structure

Risk Matrix:
(i) Identification
(ii) Allocation
(iii) Mitigation

Commercial Contracts

Financing Documents

Project Concept

Outputs
Sources and Uses of Funds

- Uses of Funds
- Sources of Funds
Uses of Funds

- Construction (EPC) contract price
- Financing costs (interest rate and fees)
- Insurance premiums
- Development costs
- Development fees
- Project company costs
- Start-up costs
- Initial spares
- Contingency, etc.
Sources of Funds

- **Equity finance**
  - Local investor
  - Foreign investor

- **Mezzanine finance**
  - Shareholder loan, CB, etc.

- **Debt finance**
  - ECAs
  - Commercial banks
  - Local banks
  - Infrastructure funds
  - Islamic finance
  - Project bond/Capital market, etc.
Sources of Funds

- **International Financing Sources**
  - Export Credit (Export Credit Agencies)
  - Commercial bank loans
  - International bonds
  - Foreign investors equity capital
  - International Capital Market

- **Local Financing Sources**
  - Investor’s own resources
    - Equity capital
    - Utility’s internal cash flow
  - Debt capital
    - Domestic bonds
    - Local bank credit from commercial sources
    - Development bank credit
    - Islamic finance
<table>
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<tr>
<th>Instruments</th>
<th>description</th>
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<tr>
<td><strong>Ijara</strong></td>
<td>Islamic lease</td>
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<td><strong>Mudaraba</strong></td>
<td>Installment sale, Profit sharing financing</td>
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<tr>
<td><strong>Sukuk</strong></td>
<td>Islamic asset backed bond</td>
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<tr>
<td><strong>Murabahah</strong></td>
<td>Resale of goods &amp; cost plus financing</td>
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<tr>
<td><strong>Musharaka</strong></td>
<td>Equity Participation</td>
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<td><strong>Istinaa</strong></td>
<td>Commissioned Manufacture</td>
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5. ECA Finance
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<tr>
<th>Advantage</th>
<th>Item</th>
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<tr>
<td></td>
<td>• Competitive Pricing</td>
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<td>• Long Tenor</td>
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<td>• Cash Flow Matching</td>
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<td></td>
<td>• Flexibility</td>
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<td></td>
<td>• Low Capital Consumption</td>
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<tr>
<td></td>
<td>• Diversification</td>
</tr>
<tr>
<td>Disadvantage</td>
<td>• Time</td>
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</table>
ECAs provide insurance cover/guarantees to lending banks to mitigate the political and commercial risks entailed in financing transactions.

Guarantees are provided in return for a premium charge by the ECAs (i.e. an insurance premium).
Export Credit Agencies

- KEXIM (Export-Import Bank of Korea)
- K-SURE (Korea Trade Insurance Corporation)
- JBIC (Japan Bank for International Cooperation)
- NEXI (Nippon Export and Investment Insurance)
- US-EXIM (Export-Import Bank of the United States)
- OPIC (Overseas Private Investment Corporation)
- COFACE (Overseas Private Investment Corporation)
- EIBC (Export-Import Bank of China)
- (SINOSURE) China Export & Credit Insurance Corporation
The Arrangement on Guidelines for officially Supported Export Credits

- Coverage: 85% of the export contract value
- The credit premium: 100% of the credit premium can be financed
- The maximum repayment term: 18 years
- Repayment: Equal principal repayment, annuity repayment
- Interest rate: CIRR (Commercial Interest Reference Rates)
- Minimum Premium Rate (MPR)
4. CONSTRUCTION OF CIRRs

The applicable CIRRs for official financing support provided in accordance with the provisions of this Sector Understanding are constructed using the following base rates and margins:

<table>
<thead>
<tr>
<th>Repayment Term (years)</th>
<th>New nuclear power stations</th>
<th>All other contracts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Base Rate (Government bonds)</td>
<td>Margin (bps)</td>
</tr>
<tr>
<td>&lt;11</td>
<td>Relevant CIRR in accordance with Article 20 of the Arrangement</td>
<td></td>
</tr>
<tr>
<td>11 to 12</td>
<td>7 years</td>
<td>100</td>
</tr>
<tr>
<td>13</td>
<td>8 years</td>
<td>120</td>
</tr>
<tr>
<td>14</td>
<td>9 years</td>
<td>120</td>
</tr>
<tr>
<td>15</td>
<td>10 years</td>
<td>120</td>
</tr>
<tr>
<td>16</td>
<td>10 years</td>
<td>125</td>
</tr>
<tr>
<td>17</td>
<td>10 years</td>
<td>130</td>
</tr>
<tr>
<td>18</td>
<td>10 years</td>
<td>130</td>
</tr>
</tbody>
</table>
Supplier Credit – Direct Loan

- Exporter (e.g. EPC contractor)
- Buyer

ECA

Export Credit
Direct Loan

Repayment

Shipment / Service
Buyer Credit – Direct Loan

Exporter (e.g. EPC contractor) → Exporter

Cash Payment for Export Value*

ECA → Buyer

Export Credit Direct Loan → Repayment

Buyer → Repayment

Shipment / Service
Buyer Credit – Covered Loan

Exporter (e.g. EPC contractor) → Bank → ECA

Cash Payment for Export Value

Export Credit Covered Loan

Guarantee / Insurance

Shipments / Service

Repayment

Buyer
Untied Program – Direct Loan

ECA

Borrower (Overseas entity)

Korean Interest

Direct Loan

Repayment
Untied Program – Covered Loan

Bank

ECA

Borrower (Overseas entity)

Korean Interest

Covered Loan

Repayment

Guarantee / Insurance
# Overview of Korean ECAs

<table>
<thead>
<tr>
<th></th>
<th><strong>KEXIM</strong></th>
<th><strong>K-SURE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Legal Entity Name</strong></td>
<td>The Export-Import Bank of Korea (&quot;KEXIM&quot;)</td>
<td>Korea Trade Insurance Corporation (&quot;K-sure&quot;)</td>
</tr>
<tr>
<td><strong>Purpose of the ECA</strong></td>
<td>To support Korean enterprises in conducting their business overseas</td>
<td>To promote Korean enterprise’s export, overseas investment, and other overseas business activities</td>
</tr>
<tr>
<td><strong>Legal Status</strong></td>
<td>Wholly State-owned Bank</td>
<td>Wholly State-owned Corporation</td>
</tr>
</tbody>
</table>
| **Establishment (Year)** | 1976                                                                      | 1992 (Previously, a department within KEXIM)  
Formerly KEIC, renamed to K-sure in July 2010                                                |
| **Governing Authorities** | The Ministry of Strategy and Finance (MOSF)                              | The Ministry of Knowledge Economy (MKE)                                                      |
| **Products**         | Direct Loan, Guarantee                                                    | Insurance                                                                                     |
| **Sectors**          | Power, green energy, petrochemical, oil & gas, metals and mining, shipping, etc. | Power, green energy, petrochemical, oil & gas, metals and mining, shipping, etc.             |
| **Website**          | [www.koreaexim.go.kr](http://www.koreaexim.go.kr)                        | [www.ksure.or.kr](http://www.ksure.or.kr)                                                     |
## Summary of Korean ECAs Programs

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Tied</th>
<th>Untied</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>K-sure</td>
<td>KEXIM</td>
</tr>
<tr>
<td></td>
<td>K-sure</td>
<td>KEXIM</td>
</tr>
<tr>
<td>Eligible Transaction</td>
<td>Korean exporter</td>
<td>Korean equity investor, offtaker, EPC contractor and/or O&amp;M operator</td>
</tr>
<tr>
<td>Maximum Amount</td>
<td>85% of Export Contract Value + IDC + Premium</td>
<td>100% of Senior Debt</td>
</tr>
<tr>
<td>Cover</td>
<td>Up to 100% Political + Commercial Risks</td>
<td></td>
</tr>
<tr>
<td>Tenor</td>
<td>Max 18 years</td>
<td>Min: 2 years</td>
</tr>
<tr>
<td>Guided by OECD Consensus</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Overall Assessment</td>
<td>Under OECD Guidelines, Limited Application</td>
<td>Flexible, Cost Effective with Longer Tenor</td>
</tr>
</tbody>
</table>
6. Case Study
Case Study: Finland

Co-operative model: Olkiluoto 3 or Finnish Model: Expanding equity partners to diversity risk

- Debt Financing (75%)
  - Debt holders: Market rate
  - TVO
  - 6 Shareholders
  - Other power off-takers (about 60)
  - External Market

- Equity (25%)
  - Shareholders:
    - Equity injection
    - Subordinated shareholder loan
    - no dividends
  - Power use in own operation

- Characteristics of hybrid financing (corporate/project finance):
  - The project financed on the balance sheet of TVO
  - Part of equity and loan is provided by the large customers
  - A long-term PPA with large customers ensuring future stable revenue stream from the project
  - Leverage characteristics similar to project finance
  - Export credit guarantee by the Finnish and Swedish Government
Case Study: Turkey

For the first time a ‘build-own-operate’ (BOO) contact, where Rosatom will BOO the VVER nuclear units at Akkuyu, in Turkey.

- Project company legal entity incorporated in Turkey
- Founders: 5 Russian government companies affiliated with Rosatom
- Russian Party to retain majority stake during the whole lifetime of the Project (51%-100%)
- Turkish Party hasn’t intended to finance equity of the Project Company

- Federal loan guarantee
  - 80% of project cost

- Production tax credit
  - $18/MWh
  - 6,000 MW eligible
  - $125m/1000MW per year

- Risk Insurance (stand by support)
  - Delay protection from licensing or litigation

- Price-Anderson act
  - Nuclear liability insurance
7. Financing Considerations
Consideration to Financing Planning

- Local sources of funds
- Credibility of sponsor/host government
- Government support
- Independent nuclear regulatory
- Electricity market (deregulated vs regulated)
- Financing precedents
- Contractual structure
- Investment structure
- Public acceptance
- Management of spent fuel and waste and decommissioning
- Nuclear third party liability
- Timeline
Host Government Support for Financing

- Regulatory certainty
- Political and economic stability
- Clear public acceptance of nuclear power
- Financial support to the projects
Thank you

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Nuclear Project Export Promotion Dept / KEPCO
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victor@kepco.co.kr