Nuclear Energy Industry and Corporate Transparency
London, May 27 2008
It is time to change the approach towards the nuclear energy sector

Past public opinion has not been supportive for nuclear energy industry.

  e.g. sector excluded from SRI portfolios

Latest world’s energy scenario raises new attention.

Corporate transparency is a key factor to decide about investability of nuclear sector companies.
ECPI adapts its model of Nuclear Sector Screening

ECPI is active in ESG (Environmental, Social, Governance) Research

**Common Current Approach - Revenue Threshold**

The application of the sector screening can be determined by client on the basis of a threshold expressed as revenue pct weight over total.

**Enhancement in line with industry developments - ESG Rating**

ESG rating makes inclusion/exclusion more thoughtful if adapted accordingly.

The challenge is: determining the most appropriate evaluation criteria.
Eurosif Nuclear Sector Report: Methodology and Credentials

Process

- Background research on current status of the nuclear energy sector and main market developments
- Identification of the key challenges of the industry, in terms of ESG, and their potential impact on business
- Finding related examples from European players and/or initiatives

Parties involved

- ECPI - gathering information and preparing the document
- Steering committee - giving valuable inputs and suggestions based on the knowledge of the market
- Eurosif - supervising, coordinating, managing, editing

Steering committee composition: Dexia Asset Management; Fortis Investment; Groupama Asset Management; Schroders
Eurosif Nuclear Sector Report: Key Challenges

Climate Change
- The largest single sources of carbon-free and base load electricity
- Timescale of project
- Risk of draught and/or flooding

Safety
- Lowest number of accidents with fatalities throughout the supply chain (1969-1996)
- Risk of extreme events: minimum probability of accident with very severe consequences
- Monetary damage highest for nuclear (calculations are limited by incompleteness and inconsistencies\(^1\))
- New and safer Nuclear Power Plant (NPP) technology

Relative share of accidental fatalities in the stages of various energy chains

<table>
<thead>
<tr>
<th>Source</th>
<th>Coal</th>
<th>Oil</th>
<th>Natural/Gas</th>
<th>Hydropower</th>
<th>Nuclear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploration and production/processing</td>
<td>Explosions and fires in coal mines</td>
<td>Well blowouts, accidents on drilling platforms at sea</td>
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<td>Transportation</td>
<td></td>
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<td>Tanker accidents at sea</td>
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<td>Pipeline accidents</td>
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<tr>
<td>Processing/storage</td>
<td></td>
<td>Process accidents in refineries and tank farms</td>
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<tr>
<td>Regional/local division</td>
<td>Overturning and collisions of tank trucks</td>
<td></td>
<td>Pipeline accidents</td>
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<tr>
<td>Powerplant or heat production</td>
<td>Process accidents</td>
<td>Overflow or failure of storage dams</td>
<td></td>
<td>Core meltdown with large release of radioactivity</td>
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<tr>
<td>Waste treatment/disposal</td>
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\(^1\) e.g. estimates of monetary losses are not available for a major part of nonnuclear accidents; lack of documentation of cost elements covered; the nature of the reported costs may be different

Spent Fuel Waste Management

DIRECT DISPOSAL

- Plans for deep geological repositories¹
- Necessity to find large geological formations
- Nothing similar has been attempted on such a long timescale
- Uncertainty about costs²
- Low risk of proliferation

REPROCESSING-RECYCLING

- Saves uranium and reduces the volume of final waste
- Increased risk of nuclear proliferation (plutonium is separated)

OTHER CROSS TECHNOLOGY FACTORS:

- Progress in existing nuclear technologies
- An intergenerational issue
- Liberalisation of electricity markets: “who is going to pay for tomorrow’s waste management?”
- Difficulties in comparing provisions reported by companies

¹ e.g. Bure /France/ conversion of underground laboratory into repository site BUT a new law must be adopted by the Parliament for such a decision - project by 2012, decision by 2015 and final but reversible storage by 2020 or 2025; also plans in Finland, Sweden, USA
² In 1996 ANDRA estimated the cost of deep geological disposal at 14 billion euros; today this estimation varies between 16 and 58 billion euros
Eurosif Nuclear Sector Report: Key Challenges

**Social acceptance**
- The sector requires stewardship over generations
- The perception is that “It can never be safe enough”
- 50% of European citizens say they are not well enough informed
- It is important to have an open and two-way dialogue between stakeholders

**Plant Decommissioning**
- Many NPPs will end their lifetime within the next two decades (expenditure is rising\(^2\))
- The real costs are difficult to assess\(^1\)
- Timeline can take up to 100 years
- Contaminated sites cannot be released for unrestricted use
- The discount rate adopted affects the economics of a project

**Human Resources**
- Lack of nuclear technology education and limited attractiveness for top-quality students
- Finding and training new personnel becomes a major challenge
- In France by 2015, 40% of the sector’s employees are expected to retire
- Risk in terms of: knowledge transmission, future technology development and safety

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\(^1\) e.g. Magnox (UK) liability averages £1.2bn (in 1989 forecast cost was £250m)
\(^2\) about 107 NPPs are permanently shut down or undergoing decommissioning
Transparency is the key factor from the investor’s point of view

An extremely difficult industry to assess

- Nuclear safety and licensing is a country specific issue
  - Sovereign national authorities
  - Licensing procedures according to national law
  - National nuclear safety standards
  - No EU Directive (ONLY radiation protection), no EU Authority
  - IAEA standards are not mandatory

- Nuclear has become an international business
  - Small number of vendors marketing their designs worldwide
  - Multinational utilities, joint ventures, liberalized markets
  - Components manufactured all around the world

There is a need for convergence and harmonization of standards/practices:

- Safety (standardized designs): WENRA, ETSON, EUROSAFE Forum, MDEP
- Joint inspections of vendors and component manufacturers
- Streamlined national licensing procedures
- Firm commitment before licensing begins,
  e.g. UK - “White Paper” with “Statement of need”

TRANSARENCY is the first step for ESG analysis as publicly
available information varies from company to company
Transparency and Nuclear energy operators: the ESG approach

- Transparency is an effective enforcement tool to enhance safety performance
- Transparency increases the motivation of individuals and institutions to meet their responsibilities in:
  - (a) drafting rules and regulations;
  - (b) strictly verifying compliance; and
  - (c) enforcing necessary corrective actions
- Transparency provides access to relevant information to stakeholders

Some of the potential ESG issues related to operator’s transparency include:

- Periodic, accurate and complete public information concerning plant operations
- Language availability: communication should not be restricted by national boundaries
- Stakeholder engagement (e.g. conducting surveys, information centers, organization of regular community meetings)
- Info about measures and means for controlling and managing risks
- Safety assessment
- Development of international relations
Transparency of Nuclear Energy operators: Case Studies

Safety assessment:

“In 2006 a total of 119 events of significance to reactor safety (83 last year) were reported to SKI. The number is the second highest in the Company’s history. An event is classified as INES 2; two events, classified as INES 1 according to IAEA’s internationally used seven-grade scale (International Nuclear Event Scale) for the classification of nuclear power related events.”

(Forsmarks Kraftgrupp AB /Vattenfall, E.On/, 2006)

Development of international relations:

“Most important event in this respect was the WANO Peer Review carried out at the Dukovany NPP in mid-June 2007. A team experts from 11 countries took two weeks to examine a variety of safety aspects of Organisation and Administration, Operations, Maintenance, Engineering Support, Operational Experience feedback, Radiation Protection, Chemistry, and Training…..The international team of WANO suggested 12 areas for improvement, and pointed out 10 good practices which are to be recommended to other nuclear power plants worldwide.”

(CEZ, 2007)

Disclosure about funding of future decommissioning:

“EDF is technically and financially responsible for the decommissioning of its nuclear power plants.... Decommissioning is carried out under the close scrutiny of the French Nuclear Regulatory Authority. At each stage, key milestones are laid out in conjunction with the ASN. An internal authorisation process specific to EDF and audited by the ASN is implemented between each milestone..... On 21 October 2005, under a public service agreement signed with the French government, the Group committed to completing its decommissioning programme within 25 years instead of the originally planned 50 years.”

(EDF, 2008)

Stakeholders engagement:

“For about ten years, Demoskop has been conducting annual surveys among the population in the Uppland/Gävle region on behalf of Forsmarks Kraftgrupp. In the most recent survey conducted in November 2006, 81 percent of the people expressed great or very great confidence in the Forsmarks Kraftgrupp. It represents a small increase compared with the corresponding figure from last year which was 79 percent.”

(Forsmarks Kraftgrupp AB /Vattenfall, E.ON/, 2006)
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