The European Investment Bank reviews its Energy Sector Lending Policy

TVO's Response to Public consultation

TVO welcomes the opportunity to respond to European Investment Bank's (EIB) consultation launched to support the review of EIB’s energy lending policy. TVO also recognises the EIB’s important role as a provider for funding in the energy sector and is pleased to be given the opportunity to express its views on the European power sector.

European Investment bank should be a facilitator in implementing measures enabling to EU energy policy targets. Any lending policy of EIB should be technologically neutral and should not create distortions in the market by supporting one type of low carbon resources more than other types.

The lending policy of EIB should follow the CO₂ reduction targets and therefore nuclear energy - as it represents today two thirds of the low carbon electricity - should play an important role.

Nuclear power has high upfront capital cost. In this uncertain economic situation, such investments are difficult to realize. However, due to agreed CO₂ emission reduction target Europe has to invest in low carbon technologies and EIB can have important role in achieving this goal.

Nuclear energy currently generates approximately one third of the overall electricity consumed in the EU and two thirds of its low-carbon electricity. Many Member States see nuclear energy as a secure, reliable and affordable source of low-carbon electricity generation. Projects for long term operation of existing facilities and new nuclear power plants in EU countries would need investment needs up to EUR 100 billion over the period to 2030.

What role do you expect nuclear power to play in the European energy market?

The electricity demand is forecasted to grow, even if the energy demand growth would slow, because it becomes an increasingly used energy vector. The highest growth is expected to happen in electric cars. The role of low carbon power technologies are increasing in the long term in case the CO₂ emission targets are kept in the EU. This creates an opportunity to develop nuclear power plants which are producing CO₂ free electricity in a competitive way.

In the consultation paper it is already noted that nuclear energy is today providing around one third of the electricity consumed in the EU. Nuclear electricity is perceived mainly as stable and reliable base load securing electricity supply in a competitive and CO₂ free way. Nuclear power is expected
to stay as an important contributor to the power mix in many European countries up to 2050 and beyond.

The EU Commission presented in its Energy Roadmap 2050 five so called climate scenarios which explore routes towards decarbonisation of the energy system. The share of nuclear power in power generation mix varies from 3 to 19 %. The highest shares of nuclear power lead to lowest costs\(^1\). The highest figure 19% is lower than the projections by industry\(^2\). This share of 19% or less means that some 100 new power plants should be built by 2050 in order to keep this level of nuclear power in the EU.

From 27 EU members states 14 have nuclear power plants and most of them are continuing their commitment on nuclear energy - by either extending the lifetimes of the power plants or building new ones, or both. In those countries the public acceptance is also quite high. For example 61 percent of Finnish citizens agree\(^3\) that Finland has had good experiences with nuclear power, only 15 percent disagrees.

Low carbon energy future by 2050 is not possible without nuclear energy.

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<th>Nuclear energy has an important role in reducing CO2 emissions, and it is the most cost efficient alternative.</th>
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<td>The role of nuclear in energy generation is increasing as electricity consumption is growing, and therefore the nuclear share in generation should be kept at least at the level of today.</td>
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<td>The EU member states have to keep the right of choosing their own energy mix and its measures to reduce greenhouse gas emissions.</td>
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As nuclear power stations are ageing, should their life be extended (where possible) or should they be replaced with other generation sources?

In those EU member states which will continue to rely on nuclear energy for their mix, most nuclear power plants - after careful assessments both of safety and economics - will have life time extensions between 50 and 60 years. The 3\(^{rd}\) generation nuclear plants already have expected lifetime of 60 years. The extensions of operating life times will be a very efficient contributor to the low carbon economy targets agreed in the EU.

Most new nuclear power investments are utilizing the existing production site and infrastructure. Therefore building new nuclear power plants and lifetime extensions of present nuclear capacity are complementary.

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\(^1\) The average annual energy system costs 2011-2050 are 2525 bn € for Delayed CCS Scenario and 2535 bn € for Diversified supply technologies while the costs of other Decarbonisation scenarios vary between 2552-2615 bn €.

\(^2\) Eurelectric Power Choices Scenario 2010 leading to 28% of nuclear electricity in 2050

\(^3\) Finnish Energy Industries (ET)
The extension of a lifetime of a nuclear power plant should be judged case by case. Firstly, all nuclear power plants have to meet the safety requirements decided upon by national regulators. If they are met, it should be up to the power plant operator to estimate whether it is economical to extend the lifetime of a nuclear power plant.

With well planned investments in the life time extensions of the present nuclear capacity we could secure the low carbon electricity supply for years to come. And replacing retired nuclear power plant with new nuclear power plants ensures that the low carbon electricity production is at the required and agreed level.

For TVO continuous safety improvement and the principle of keeping the power plants as new, is the key for sustainable and secure and cost effective supply of electricity.

What will be the impact on electricity generation and climate action of the reconsideration of nuclear policies within EU member states, in particular after the Fukushima accident?

Those member states which have decided to phase out their nuclear power plants will have to replace this production capacity with other sources, notably by fossil fuels and by renewable energies. Phasing out in one member state will have an important impact on the security of supply also in neighbouring countries, as some part of the phased out capacity is foreseen to be replaced by imports of electricity from neighbouring countries.

If phased out nuclear power plants are replaced with fossil fuel power plants -even in the case of natural gas, but especially with coal and lignite - the CO₂ emission targets cannot be met. Also the impact on the electricity prices can be important - depending on the fuel prices.

If the replacement is largely through renewable energies, the whole energy system has to be taken into account as intermittent renewable energies need more network capacity and back-up capacity. Electricity prices for final consumers could rise in an important way.

In those countries which will continue their nuclear programmes, the energy system will be secured and agreed climate targets can be met and the price levels for consumers will stay affordable.

Nuclear power generation produces virtually no CO₂ emissions, and the entire nuclear life cycle has among the lowest emissions per kilowatt-hour (kWh) of any generating option including renewable energies. Nuclear energy makes a significant contribution in reducing CO₂ emissions from the energy sector in the EU and worldwide. The share of nuclear energy in electricity supply will substantially decrease, unless new plants are built in time and NPPs in service are operated longer (“long-term operation” (LTO)). LTO of existing plants is needed to maintain the share of nuclear power generation in the EU at the current level by 2020.

Nuclear energy is currently recognized as the least cost option for base-load centralized generation, providing electricity at stable and predictable prices and therefore it contributes to competitiveness of European industries.
Nuclear plays a substantial role in Europe across most of the published scenarios, with the nuclear deployment ranging from 117 to 424 GW in 2050, compared to the current 134 GW in the European Union (EU). For those studies with a strong climate change mitigation target, a nuclear share of roughly 30% is realised.

To gain the already agreed energy and climate policy targets, a balanced energy mix with all low carbon energy sources should be developed.

**Nuclear energy has been and will continue to be a key element in meeting EU’s energy demand, CO2 reduction targets and competitiveness objectives.**

**Level playing field and equal opportunities for different energy sources should be ensured.**

**TVO in brief**

Teollisuuden Voima Oyj (TVO) is a non-listed public company founded in 1969 to produce electricity for its shareholders at cost price. **TVO's mission is to produce electricity for the shareholders safely and economically, without carbon dioxide emissions.**

The company owns and operates two nuclear power plant units, Olkiluoto 1 and Olkiluoto 2 (OL1 and OL2) at Olkiluoto in Eurajoki. A third nuclear power plant unit (OL3) is under construction and a favourable decision in principle of a fourth unit (OL4) was given by the government in May 2010 and ratified by the parliament in July 2010.

The Olkiluoto power plant has been running for more than 30 years with high degree of reliability and safety. The capacity factors for both units have been at the top internationally for nearly the entire history of the power plant. In 2010 OL1-2 reached the capacity factor over 93% despite of the largest ever maintenance outage. OL1 and OL2 have now a net output of 880 MW after being upgraded during the modernization outages in 2010 and 2011. Together they produce slightly more than one sixth of all the electricity consumed in Finland.

TVO delivers electricity in accordance with the "Mankala principle" which means delivering the electricity produced to its shareholders at cost in proportion to their shareholdings. Each of the shareholders bears their share of the variable and fixed annual costs. This "at cost" model gives the smaller players/companies a possibility to enjoy the benefits of a large scale power production with high investment costs, but low operation costs, and in a sustainable way with practically no CO2 emissions.