The competitiveness of nuclear energy

Electricity is an essential commodity that an increasingly energy-dependent world needs more and more. Consumers have a legitimate right to expect electricity prices that are as competitive as possible. For this to be the case industry needs to benefit from competitive prices too so that their production costs can be kept as low as possible taking into account the global market. It is hardly surprising that governments and economists alike constantly analyse the economics of energy.

Comparative analysis carried out by international and independent organisations has shown that the competitiveness of nuclear energy is second to none.

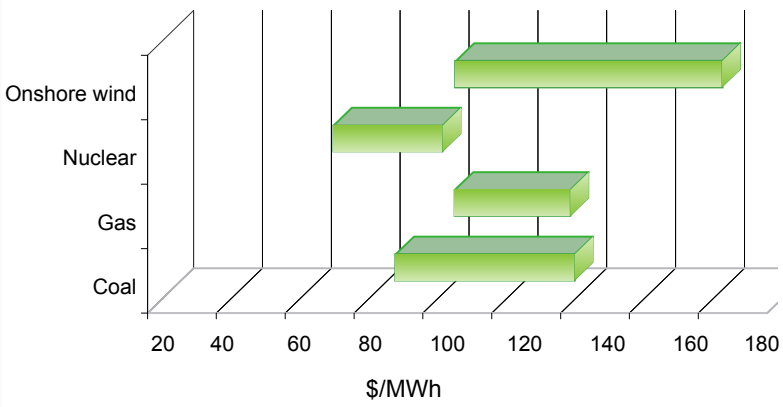
> ***In the low discount rate (at 5% discount rate), more capital intensive, low-carbon technologies like nuclear energy are the most competitive solutions. (Projected costs of generating electricity, 2010 edition, IEA, OECD/NEA).***

Including the price of carbon in cost calculations

The International Energy Agency and OECD/Nuclear Energy Agency study, *Projected costs of generating electricity*, 2010 edition, compares the generating costs of the following energy sources: nuclear, coal, gas and onshore wind (table 1). The generating cost analysis took into account the price of carbon. Thus, the results incorporate for the first time a carbon price of 30$ per tonne of CO2 (table 2).

Clearly, as nuclear is a major low-carbon energy source, its electricity generating cost is more competitive than that of fossil fuels. When carbon prices rise, nuclear remains unaffected.

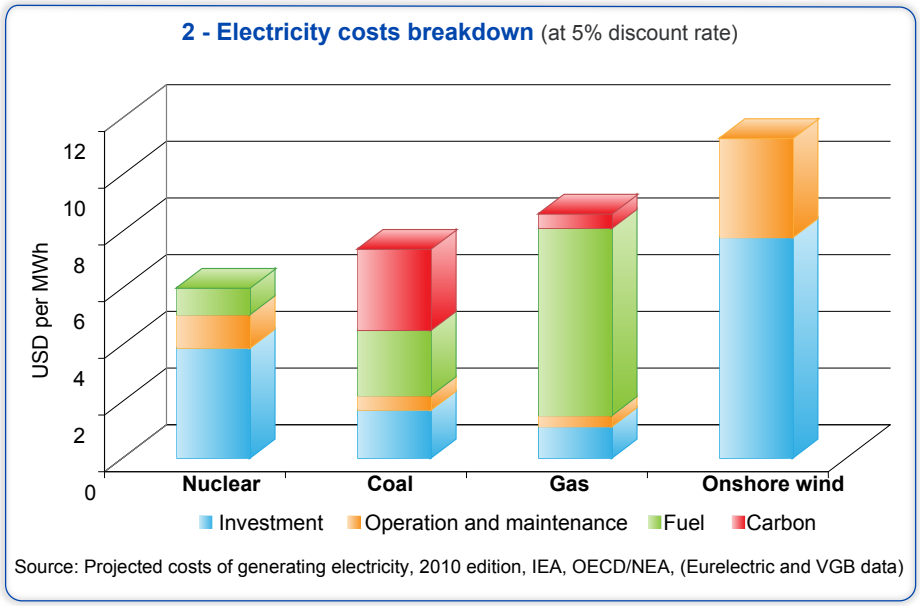
1 - Costs of electricity for nuclear coal, gas and onshore wind power plants in Europe (at 5% discount rate)



Source: *Projected costs of generating electricity*, 2010 edition, IEA, OECD/NEA




High capital costs of nuclear offset by long term operation and lower fuel costs



The study analyses generating costs (at low and high discount rate) at each major stage in the generating life-cycle, i.e initial investment and construction costs, life-time operating and maintenance costs and fuel provision costs (table 2).

Statistics show that generating electricity from nuclear energy involves a major initial capital cost for the construction of the plant, but thereafter a nuclear power station can operate at a very high capacity level for up to 60 years (compared to 30 years for gas-fired power plants, 40 years for coal-fired power plants and 25 years for wind and solar plants), allowing initial investment to be easily written off before the end of the plant's operational lifetime.

Another important factor is that for nuclear energy the cost of decommissioning (15% of construction costs) is factored into the initial capital costs calculation, which explains why they are high. Fuel provision costs are lower than those incurred by other base-load energy sources. Uranium accounts for only 5% of the overall nuclear generating costs, while the whole uranium fuel cycle (including mining, enrichment, conversion and waste management) accounts for only 15%. Furthermore, as uranium is mined in economically and politically stable countries, like Australia and Canada, the price is less likely to fluctuate as a result. Table 2 shows clearly how, for other major energy sources, the cost of fuel is a considerably higher proportion of the overall generating costs.

> ***Although nuclear power is not a panacea for all the world´s energy problems, it will continue to play an important role in the global energy mix. The OECD NEA´s high projection is for global nuclear power capacity to grow by around 66 % by 2030 (Mohamed ElBaradei, IAEA Director General, 2009).***

Next generation reactors will bring costs down further

Next generation ("Generation IV") reactors under development, which are estimated to be available between 2030 and 2050, will bring economic benefits. These include reduced construction periods, reduced capital costs, higher capacity factors, longer operating lifetimes, higher burn-up to reduce fuel costs and the production of less radioactive waste.