



# Costs of wind power is in line with coal based power

**Costs of energy and impact on climate are important factors when deciding the future energy supply of a country. In Denmark, these factors have resulted in policies that encourage renewable energy.**



Comparing the costs of different technologies to produce energy is a challenge. The cost structure differs - some technologies have large investment costs and low operational costs while others have small investment costs and large costs of operation. In addition there might be differences in the technical life time of the equipment, and the quality also affects the annual production (performance). Coal based power production has large negative environmental impacts imposing costs on the surrounding society, while renewable energy like wind and solar have negligible external costs. Each country has different infrastructure networks, which also have an impact on the costs.

When making a fair comparison of the 'true cost of energy' the following factors must be taken into consideration: the technical lifetime of the investments, the quality of the equipment and the external costs during construction and operation. The concept of Levelised Cost of Energy (LCOE) takes these factors into account and provides the production costs per unit (kWh) of the entire lifetime of an 'average plant' by including all costs. In this way, LCOE can provide important insights in the changing patterns of the costs of energy.

In a Danish context the DEA recently published a report showing that LCOE of onshore wind power with 320 DKK/MWh (329 CNY) has the lowest cost per unit over the lifetime of the wind turbine regardless of whether external costs are included or excluded. The LCOE of coal based power produced in a combined heat and power plant are in comparison 540 DKK/MWh per unit. Wood-, straw or natural gas fired CHP has higher costs. Solar power has the

highest LCOE with 903 DKK/MWh per unit.

An ongoing study looking at the average LCOE for all the 28 EU member states so far shows that the LCOE of electricity from hydropower are the lowest (150 DKK/MWh), while coal based power is around 410 DKK/MWh and onshore wind power is around 450 DKK/MWh, including external costs.

In a Chinese context, the Danish Energy Agency (DEA) and China National Renewable Energy Centre (CNREC) has already calculated the LCOE for renewable power and heat sources, however the 'true costs' of conventional power or heat has not been estimated yet. DEA and CNREC is jointly working to share knowledge about the 'true costs of energy' and the factors affecting it (external costs, the quality of the equipment and the life of the investments) with decision makers, power producers and investors in China, who may tend to have a very short horizon in their decision-making and disregard the importance external costs. CNREC and DEA is also involved in the on-going RE costing project within the International Renewable Energy Agency, IRENA.

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