Comparison of electricity production costs from fossil and renewable energy sources

The price of electricity is made up of various components. For example, the listed electricity production costs (as of the end of 2015) include amortization of investment costs of the plants, maintenance costs, and procurement costs for energy sources, such as coal. The prices are listed in eurocents and are solely production costs without subsidies.

Power plant, system	Production costs (approximate) [eurocents/kWh]*	Comments
Nuclear power, amortized, without disposal costs	2.5–5.0	From 1950 to 2010, approximately 200 billion euros in subsi- dies were provided for nuclear power. This includes direct subsidies for research, development, and construction as well as indirect subsidies such as tax incentives, govern- ment-supported monopoly prices, and guarantees.
Nuclear power, new construc- tion, without disposal costs	10.5–13.5	New nuclear power plants are unviable economically. For instance, the United Kingdom supports new construction with subsidies of 4-6 billion euros per 1 GW and guarantees an electricity price of 10.5–13.5 eurocents/kWh for 30 years. By comparison, the price on the European Energy Exchange was approximately 4 eurocents/kWh in early 2017.
Nuclear power, with dismantling and final dis- posal	50.0–100.0	Back in 2001, a study by the German Federal Environmental Agency estimated the costs at 50 eurocents/kWh, and today the costs are more likely 100 eurocents/kWh.
Coal power	4.0-8.0	The costs depend on the location (for example, directly next to lignite mine is economical). Old power plants long since amortized may be most economical. The construction of a new power plant with the latest, most efficient technology would not be profitable at 5.2 eurocents/kWh as of 2015.
Gas power	7.5–11.0	New gas-fired power plants (including combined cycle) are currently (2015) unprofitable.
Hydropower	4.5–20.0	Large, amortized run-of-river power plants are most econom- ical, new small power plants are least economical.
Wind power	4.5–14.0	Modern onshore wind turbines with a standard output of ap- proximately 3 MW and favorably windy location achieve val- ues below 5 eurocents/kWh. Large offshore plants run ap- proximately 14 eurocents/kWh (as of 2015). The price could fall below 8 eurocents/kWh by 2018 due to standardization and mass production.
Photovoltaics	7.0–14.0	The plant size, location, and extent to which optimal align- ment is possible are the decisive criteria. In Germany, 10 eurocents/kWh was already achievable in 2015 with large roof systems on single-family homes.
Biogas	12.0–54.0	The costs depend on the plant size, type of biomass used, and the required gas purity.

Sources: Fraunhofer, BMWi, DEA, arrhenius Institute for Energy and Climate Policy.