

The truth unveiled: Geothermal key in achieving an affordable energy transition but lacks adequate support

EGEC reacts to EU study on energy costs and subsidies and calls for rebalancing support across technologies

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The European Geothermal Energy Council (EGEC) welcomes the European Commission's final report "[Subsidies and costs of EU energy](#)" unveiling for the first time data on costs and subsidies across various generation technologies in the electricity sector in all EU Member States. EGEC is also pleased with the transparent debate and consultation of the relevant European trade organisations, carried out by the Commission during the preparatory work. The present document provides a brief overview of the main findings of the study, especially regarding geothermal energy.

Geothermal, a stable renewable energy source ensuring grid stability

Geothermal power technologies are key in ensuring grid stability. The study clearly shows that they have the highest capacity factor of all electricity technologies- even higher than nuclear. Geothermal power is indeed a stable and flexible technology: the study reports that geothermal plants operated, on average in the EU, 7,744 full load hours per year. It represents the highest capacity factor of 85%, against the 77% of nuclear power plants.

A highly competitive power generation technology

The report fully acknowledges geothermal as one of the most competitive electricity sources as its Levelised Cost of Electricity (LCOE) does not exceed €100/MWh (see Figure below).

The report also provides an insightful analysis of the external costs of all electricity sources. In contrast to negligible external costs for renewables in 2012, the external costs of coal, gas and nuclear were by far the highest, amounting to respectively €86, €54 and €15 million. Geothermal energy proves therefore all the more competitive. It is even estimated that the external costs of the EU's energy mix in 2012 were comparable to the total level of direct subsidies (between €150 and €310 bn), which highlights once again the magnitude of this market failure and justifies state interventions.

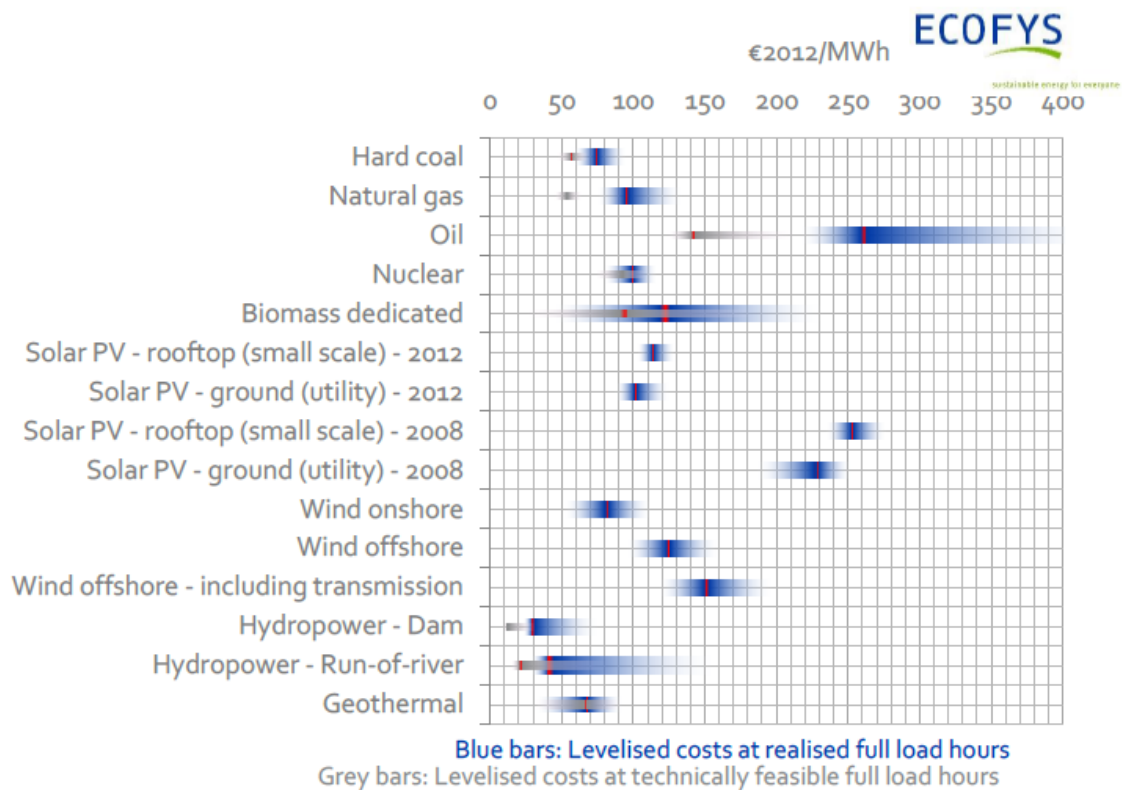


Figure S - 7: Levelised costs of energy in EU28 for electricity (in €₂₀₁₂/MWh)

Note: The red lines in the figure above represent the median value for the range

Source: Subsidies and costs of EU energy: Final report, p. X (Roman numeral)

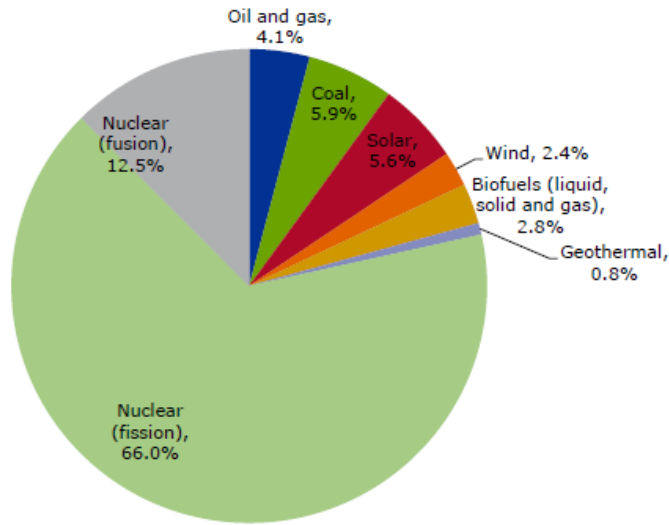
The report also includes a first attempt to compare cost of various heating technology. This is not an easy task as numerous factors contribute with their specific impact. To mention a few: type of building, size of building, climatic zone, availability of fuel types, and many more. Regrettably, the LCOH of ground source heat pumps is not reported, despite the 1.3 million units installed in Europe. This analysis will hopefully be finalised with all heating technologies in a next update of this study.

Subsidies: Enormous difference between geothermal and other technologies

The level of support dedicated to geothermal is staggeringly insignificant compared to other mature or less mature technologies. In 2012, geothermal received only €70 million, 20 of which from the European level. In comparison, solar PV received €14.7bn, coal €9.7bn, wind (onshore and offshore) €11.2bn, nuclear €6.6 bn, and natural gas € 6.5bn. This significant discrepancy is all the more regrettable that the geothermal sector is ready to deploy new innovative and low-carbon technologies.

Additionally, the study estimates the order of magnitude of historical interventions across all power generation technologies. It demonstrates that, over the past 30 years, nuclear and coal have benefited from considerable public support which “still has a direct effect today”. In terms of R&D

expenditures, between 1974 and 2007, more than two-thirds of EU and Member States' R&D expenditures were allocated to nuclear energy, and only 0.8% to geothermal (See Figure below).



Breakdown of the total EU Member State RD&D expenditure on energy supply side technologies (€₂₀₁₂ 87 billion) in 1974-2007.

Source: Subsidies and costs of EU energy: Final report, p. 29.

Total interventions, external costs and costs by power technology are illustrated below.

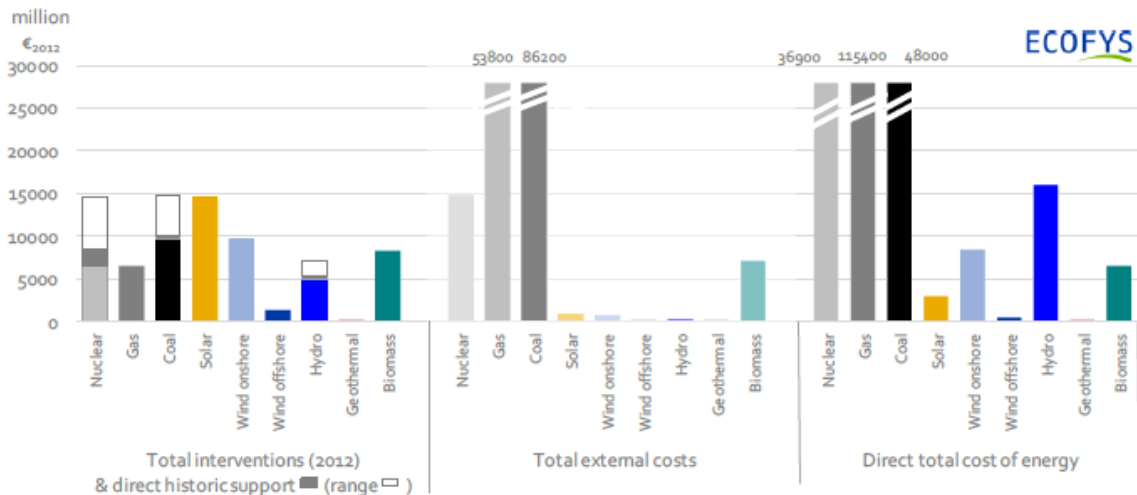


Figure 4-2: Total interventions, external costs and costs of energy split by technology 2012 (in million €2012)

Note: In this figure, total interventions exclude those not allocated to technologies i.e. infrastructure, energy demand, energy saving and free allocation of EU ETS allowances. Direct historic support is shown as ranges at the top of the interventions bar (marked by a gap in the bar). External costs have a higher level of uncertainty than the other components.

Source: Subsidies and costs of EU energy: Final report, p. 52.

Geothermal electricity has many obvious assets:

- Geothermal is a predictable, reliable and flexible source of energy, with the highest load factor of all technologies, and can balance the electrical grid. Its development is not distorting the market.
- Geothermal electricity can now be developed anywhere. In 2030 it has the potential to provide some 34 TWh of power annually in the EU thanks to economies of scale, innovative drilling concepts, and substantial cost reduction.

The report published by the European Commission demonstrates that in spite of having the best load factor and the lowest full costs of all electricity sources, geothermal received a negligible amount of public support compared to other power generation technologies.

It proves therefore crucial that exemptions for geothermal from the new stricter state aid rules should be put in place in order to ensure effective support, of which other technologies have widely benefited.