

POSSIBLE FUTURES: FINDINGS FROM THE DELPHI ENERGY FUTURE 2040

DEMAND FOR FOSSIL ENERGY SOURCES IS DROPPING SHARPLY

With the energy sector having undergone profound political and technological changes, the world in 2040 has come close to achieving a transformation of energy systems all around the globe. Energy generation from fossil energy sources, which used to be the norm, has been replaced in many countries by new, mostly decentralised systems based on renewables. The energy transition is not only limited to the power sector. The heating/cooling and transport sectors have also been transformed. The period until 2040 has seen an unprecedented development: a decoupling of the demand for fossil energy sources from total energy demand. Industrialised countries and emerging economies are using less oil, coal and natural gas despite having doubled their energy demand. For more information, please read theses 5 and 33.

"Delphi Energy Future 2040" is a strategic foresight project in the energy sector, based upon the expertise of more than 350 experts from over 40 countries and all relevant sectors. This extraordinary study offers exciting insights into a worldwide discussion that evolves around the core question "What future awaits the energy systems in Germany, Europe and the world in the year 2040 and beyond?" To access all results, please download the full report free of charge here:

<http://www.delphi-energy-future.com/results/>

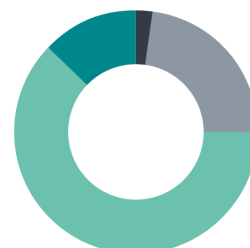
THESIS 33

By 2040 an "all electric society" will have become a reality. Electricity, especially power generated from renewable sources, will also provide mobility and heating, and will have displaced petroleum and natural gas in many industrial processes.

WILL THIS THESIS ACTUALLY TAKE PLACE?

13%
certain

62%
likely



2%
impossible

23%
unlikely

CAUSES OF THE DECLINE IN DEMAND

The driver behind these developments is a global climate regime under which individual states have agreed to binding and ambitious decarbonisation targets. This political change of course also marks a turning point for the world of finance. Institutional investors have divested their capital from fossil resources and are now funding renewable energy projects and companies – “fossil” and nuclear energy investments come at too high a risk. Especially in Europe, a politically motivated strategic diversification of the energy sector is underway, which further reinforces this development. Russian oil and natural gas have become considerably less important for the European energy sector by 2040.

More importantly, though, the economic competition between renewables and fossil energy sources has produced a clear winner by 2040: wind, solar and hydropower. Oversupply of affordable renewable energy has resulted in electricity increasingly displacing oil and natural gas in many industrial processes as well as in heating and mobility applications. A technological “tipping point” was reached when electric mobility made its breakthrough with the help of innovative storage systems. Renewables are now bringing mobility even to remote areas whose fuel supply used to be dependent on lengthy and complex fuel transportation. For more information, please read thesis 36.

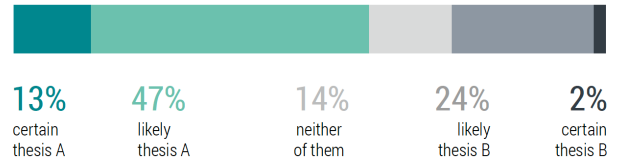
THESIS 5

A: By 2040 worldwide economic growth and increased mobility will have caused global energy demand to double compared to 2015.

Versus

B: By 2040 global efforts to improve energy efficiency will have stopped the rise in energy consumption.

WHICH OF THE TWO THESES (A, B) WILL TAKE PLACE?



THESIS 36

By 2040 thanks to new battery technologies, electric vehicles will be able to travel distances of more than 3,000km per charging cycle and will be rechargeable within a time span of no more than a few minutes by means of electrical induction. Climate protection will no longer be the primary driver and rationale behind this development and will only be of secondary importance.

WILL THIS THESIS ACTUALLY TAKE PLACE?



PRODUCING COUNTRIES ARE DESTABILISED

Even though the fall in demand has not caught fossil fuel producing countries unprepared, the speed of the transformation has surprised especially those countries whose economies still largely rely on sales of oil and natural gas. A rapid loss in important export and public revenue has plunged them into economic crises compounded by a devaluation of national currencies and soaring inflation, which give rise to unemployment, poverty and social unrest. Prolonged social and political instability is further dampening the prospects of an economic recovery. As a result, producing countries are competing fiercely for market shares in an ever-smaller global market for fossil energy sources.

The geopolitical balance is shifting: driven by a rapid expansion of renewable energy infrastructure, new raw materials have become scarce, among them silver, copper and rare earth elements. Individual states and multi-lateral cooperation initiatives that have been quick to secure resource supply agreements have an important advantage. The energy transition has delivered new opportunities for many. But for others it has brought turmoil, economic risks and dangerous uncertainties. For more information, please read theses 16 and 21.

CONTACT

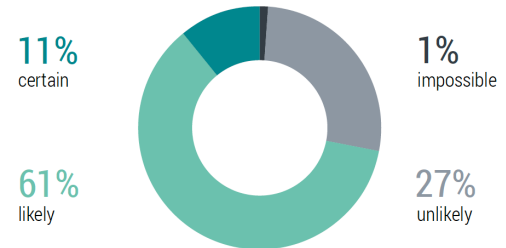
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THESES 16

By 2040 Europe will have adopted a common foreign energy policy, including joint strategic infrastructure investments and collective supply deals with third countries for the supply of resources.

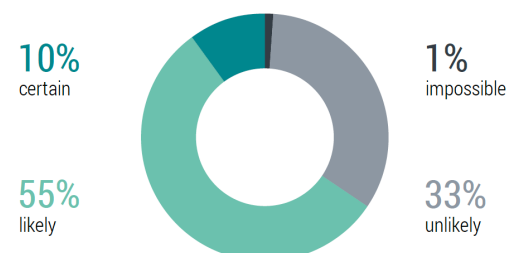
WILL THIS THESIS ACTUALLY TAKE PLACE?



THESES 21

By 2040 important resources (silver, copper, rare earth elements) will be in greater demand and will have become increasingly scarce as a result of a worldwide promotion of renewable energy sources and expansion of electricity networks. Many industrialised countries and emerging economies will be competing for strategic commodity partnerships with resource-rich countries.

WILL THIS THESIS ACTUALLY TAKE PLACE?



"Delphi Energy Future 2040" is a joint project of: