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FOR IMMEDIATE PUBLICATION

New Study: First Ever Hourly Simulation of Global Energy System Across All Sectors

100% Renewables are cheaper than current energy system

Berlin (12 April 2019) – The new study by the Energy Watch Group and LUT University is the first of its kind to outline a 1.5°C scenario with a cost-effective, cross-sectoral, technology-rich global 100% renewable energy system that does not build on negative CO₂ emission technologies. The scientific modelling study simulates a total global energy transition in the electricity, heat, transport and desalination sectors by 2050. It is based on four and a half years of research and analysis of data collection, as well as technical and financial modelling by 14 scientists. This proves that the transition to 100% renewable energy is economically competitive with the current fossil and nuclear-based system, and could reduce greenhouse gas emissions in the energy system to zero even before 2050.

“The report confirms that a transition to 100% renewables is possible across all sectors, and is no longer more expensive than the current energy system,” said Hans-Josef Fell, former Member of the German Parliament and President of the Energy Watch Group, in advance of the publication. “It shows that the whole world can make the transition to a zero emission energy system. That is why all political powers around the world can and should do much more to protect our climate than they currently envision.” Thanks to the developed model and the extensive existing database, EWG and LUT can now also develop national roadmaps for the transition to 100% renewables, tailored precisely for the individual countries’ respective context, Fell added.

“The study’s results show that all countries can and should accelerate the current Paris Climate Agreement targets,” said Dr Christian Breyer, Professor for Solar Economy at the Finnish LUT University. “A transition to 100% clean, renewable energies is highly realistic – even today, with the technologies currently available.”

Prof. Dr Claudia Kemfert, Head of the Department of Energy, Transport and the Environment at the German Institute for Economic Research (DIW), highlighted the economic viability of renewable energies: “The study is an impressive demonstration that a transition to renewable energy sources worldwide is not only feasible, but also makes economic sense.” David Wortmann, initiator of the Eco Innovation Alliance and founding member of Entrepreneurs For Future also called on policy-makers to put in place innovation-friendly frameworks and emphasised that “for us, an economically profitable energy transition has long since ceased to be a myth”. Franziska Wessel from Fridays For Future also called on policy-makers to take immediate action: “This study shows what is possible if our politicians are willing to act. We – Fridays For Future – call for a completion of the transition to 100% renewables by 2035.”

The study concludes with political recommendations for a rapid integration of renewable energy and zero greenhouse gas emission technologies. Among the most important measures suggested by the report are promoting sector coupling, private investments (which should ideally be incentivised with fixed feed-in tariffs), tax breaks and legal privileges with simultaneous discontinuation of subsidies for coal and fossil fuels. According to the report, the transition to a global energy system based on 100% renewables can be achieved before 2050 if a strong policy framework is implemented.

Some key findings of the study:

- The transition to 100% renewable energy requires comprehensive electrification in all energy sectors. The total electricity generation will be four to five times higher than electricity generation in 2015. Accordingly, electricity consumption in 2050 will account for more than 90% of the primary energy consumption. At the same time, consumption of fossil and nuclear energy resources in all sectors will cease completely.
- The global primary energy generation in the 100% renewable energy system will consist of the following mix of energy sources: solar energy (69%), wind power (18%), hydropower (3%), bioenergy (6%) and geothermal energy (2%).
- By 2050, wind and solar power will account for 96% of the total power supply of renewable energy sources. Renewable energies are produced virtually exclusively from decentralised local and regional generation.
- 100% renewables are more cost-effective: The energy costs for a fully sustainable energy system will decrease from € 54/MWh in 2015 to € 53/MWh in 2050.
- The transition in all sectors will reduce the annual greenhouse gas emissions in the energy sector continuously from roughly 30 GtCO₂-eq. in 2015 to zero by 2050.
- A 100%-renewable electricity system will employ 35 million people worldwide. The roughly 9 million jobs in the worldwide coal mining sector from 2015 will be phased out completely by 2050. They will be overcompensated by the over 15 million new jobs in the renewable energy sector.

The full study and further documents available under:

<http://energywatchgroup.org/new-study-global-energy-system-based-100-renewable-energy>

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About the Study

The simulation "Global Energy System based on 100% Renewable Energy", co-funded by the German Federal Environmental Foundation (DBU) and the Stiftung Mercator, comprises a state-of-the-art modeling, developed by LUT University and computes a cost-optimal mix of technologies based on locally available renewable energy sources. It determines the most cost-effective energy transition pathway for global energy supply on an hourly resolution for an entire reference year and structured in 145 regions. The global energy transition scenario is carried out in 5-year time periods from 2015 until 2050. The results are aggregated into nine major regions of the world: Europe, Eurasia, MENA, Sub-Saharan Africa, SAARC, Northeast Asia, Southeast Asia, North America and South America.

About Energy Watch Group

Energy Watch Group (EWG) is an independent, non-profit, non-partisan global network of scientists and parliamentarians. EWG conducts research and publishes independent studies and analyses on global energy developments. The mission of the organization is to provide energy policy with objective information. www.energywatchgroup.org

About LUT University

LUT University has pioneered as a science university combining technology and business since 1969. It has been recognised in international rankings as one of the world's top universities. Clean energy and water, a circular economy and sustainable business are pivotal questions for humankind. LUT University applies its expertise in technology and business to seek solutions to these questions. LUT University strongly promotes entrepreneurship stemming from its scientific research. An example of this is the business accelerator Green Campus Open, which supports new spin-off companies that are based on LUT's research. LUT's international science community consists of 6500 students and experts. www.lut.fi/web/en/