PRESS RELEASE

Agentur für Erneuerbare Energien

Kombikraftwerk 2 demonstrates:

Reliable Electricity Grid Operation Possible in Future with 100% Renewable Energy

Calculations by the research project reveal that the stability of the electricity grid is guaranteed in a future intelligent energy system sourced 100% from renewable energy / Live demonstration of provision of balancing power by a renewable combined power plant

Berlin/Kassel, 30 October 2013. A few years ago, the first Kombikraftwerk project showed that renewable energy can meet all of Germa**ny's** electricity needs at all times in a few decades. The results of the follow-up project Kombikraftwerk 2 now prove that grid stability can also be guaranteed in a fully renewable power supply. That could render the use of conventional fuels superfluous from roughly the middle of the century, if the system is developed accordingly from a technical and regulatory point of view.

Today, on Wednesday, the project partners of the research project Kombikraftwerk 2 presented initial results of their three years of work to the public. A live field test, combining multiple wind farms, biogas and photovoltaic plants with a total capacity of over 80 MW to a combined power plant demonstrated how a combination of renewable energy systems can already provide balancing power now, making an important contribution to the stability of the power supply. On the basis of a proprietary, geographically high-resolution future scenario, the research partners from science and the industry also demonstrated that grid stability can be guaranteed in an adapted power supply system with 100% renewable energy sources.

"If renewable energy sources are linked and controlled in combined power plants in future, they, together with storage facilities, can meet the demands at all times and ensure a stable frequency and voltage in the grid," emphasised Dr. Kurt Rohrig, Deputy Director of the Institute at the Fraunhofer IWES as the most important result of the project Kombikraftwerk 2. In the current Kombikraftwerk 2, real renewable energy systems are managed centrally from a control centre. Constant online power measurements and a precise weather forecast facilitate extremely accurate estimates of the expected output in the minutes and hours to come, which makes it possible to include sufficient reserves for balancing energy in the roadmap.

Today's field test demonstrated that under real conditions. After a preset signal was run to test the speed and precision of the feed under strict conditions, the systems had to adapt to a real draw signal at the end of the field test, and provide balancing energy in accordance with the current frequency situation in the grid. "Our test not only showed that renewable energy sources fulfil the requirements for providing balancing energy, but that they can react far faster than conventional power stations, with an adjustment time of just a few seconds," explained a delighted Kaspar Knorr, Project Manager of Kombikraftwerk 2. "To enable renewable energy sources to better fulfil their system responsibilities, they should also be permitted to participate in the balancing energy market. To achieve this, we have to adapt the framework conditions accordingly," continues Knorr.

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Further information, diagrams and photos are available at www.unendlich-viel-energie.de.
They can be used free of charge specifying "German Renewable Energy Agency" as the source.

Supplementing the field test, the scientists modelled a very high resolution 100% scenario, which was run with hourly weather data from a real reference year. That gave precise insights into the geographic effects of electricity generation and transport at every hour of the year, and allowed the required system services to be recorded. The complex calculations which can be seen as a video animation on the www.kombikraftwerk.de website show that the current high level of supply security in the German electricity grid could also be reached with renewable energy alone in a few decades. "The modern technologies provide comprehensive scope for action with an intelligent adaptation of the framework conditions for market and system integration," is Knorr's summary of the results. "The reward for designing the energy transition appropriately is a clean and stable power supply."

Background

The three-year "Kombikraftwerk 2" research project examines how a 100% renewable electricity system could function and what the demand for system services will be. At the same time, it looks into options for how renewable energy systems can provide these services required for grid stability and examines potential solutions on real systems. The consortium partners are: CUBE Engineering GmbH, Deutscher Wetterdienst (German Weather Service), ENERCON GmbH, Fraunhofer-Institut für Windenergie und Energiesystemtechnik (Fraunhofer Institute for Wind Energy and Energy System Technology, IWES), ÖKOBIT GmbH, Fachgebiet Elektrische Energieversorgung der Leibniz Universität Hannover (Electricity Supply Faculty of Leibniz University Hanover), Siemens AG, SMA Solar Technology AG, SolarWorld AG and the Agentur für Erneuerbare Energien (German Renewable Energy Agency). The project is funded by the German Ministry for Environment, and builds on the first Kombikraftwerk project started in 2007, which, among other things, demonstrated the feasibility of a power supply based solely on renewable sources.

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The German Renewable Energy Agency is borne by companies and associations in the renewable energy industry, and funded by the German Ministries for the Environment and for Agriculture. It organises the nationwide information campaign "deutschland hat unendlich viel energie" (Germany's energy is infinite). Its purpose is to provide information on the opportunities and advantages of a renewable energy supply based on renewable energy sources – from climate protection to a reliable energy supply to jobs, economic development and innovations. The German Renewable Energy Agency is independent and has no affiliations to any political party or company.