ENERGYWATCHGROUP

India, Iran and Nigeria Can Switch To 100% Renewable Electricity by 2050

New studies show that the fossil fuel dependent countries can switch to fully renewable electricity systems and achieve zero-carbon emissions till 2050.

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In India, Iran and Nigeria electricity supply fully based on renewable energy sources and storage is feasible until 2050 and is more cost-efficient than other existing energy supply options. This is the result of a series of studies by researchers of the Lappeenranta University of Technology, including authors from the respective countries.

The fully renewable electricity systems in India, Iran and Nigeria would be 60-70% cheaper than the so-called "low-carbon" energy options, including nuclear power or the fossil fuel energy combined with the CCS.

"All the three countries have abundant renewable energy sources and will be facing a rising energy demand in the coming years and decades. The transformation of the fossil fuel dependent economies can solve energy security issues and drive the economic growth", Christian Breyer, Professor for Solar Economy at the Lappeenranta University of Technology and Co-chairman of the Energy Watch Group scientific board said.

The new studies have modeled on a full hourly resolution the energy sectors electricity, desalination and industrial gas in India, Iran and Nigeria, fully based on renewable energy and storage. According to the studies, solar PV and battery storage will play a dominant role in the electricity mix, given their falling costs and given the fact that all three countries belong to the global Sun Belt. Meanwhile, the industrial gas demand can be covered entirely by a mix of biomethane and power-to-gas processes.

"The studies show that investments in new coal and nuclear power plants are no longer necessary and will lead to stranded investments. Climate protection and the avoidance of radioactive hazards are feasible and enable cost-effective energy security," President of the Energy Watch Group Hans-Josef Fell said.

In India, solar PV and storage will form the backbone of a fully renewable electricity system. In times of low radiation and the monsoon season, wind and hydropower will help to sustain the energy supply, but also solar electricity harvested in other Indian regions not affected by the monsoon and transmitted by the power grid. In Iran, wind energy will be dominant until 2030 with solar PV taking over thereafter. In Nigeria, the study shows a phase out of fossil gas can take place already by 2040, resulting in a solar PV and battery storage dominated electricity system.

According to the studies, the costs for one MWh will vary between €37-42 in India, €32-44 in Iran and €35-38 in Nigeria in the year 2050. The overall costs covering production, storage and curtailment will be cheaper than conventional energy sources. For instance, new nuclear power costs some €110 per MWh and the fossil fuel energy plus CCS option some €120 per MWh. The study on Iran shows that if energy transition takes place slower than its potential is, it would cause higher cost for the energy system in the double digit billion € order.

“It is now a matter of favourable policies and financial schemes supporting investments in renewable energy to further accelerate the already impressive exponential growth of renewables and to turn these study results into reality”, Breyer said. “And if India, Iran and Nigeria switch to 100% renewable energy then other countries in their respective regions will most likely follow them as role models”.

RESOURCES:

India

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