Danish Energy Agency

Haikou city at the Chinese island, Hainan. Foto: Colourbox

Coal free by 2030: Danish study shows how a large Chinese island could replace coal with renewables and become a Clean Energy Island as early as 2030

The Chinese Hainan Island and province could replace its entire coal-fueled energy production by 2030 by mainly investing in solar and wind power. A shift from coal to wind and solar would cost only 2 percent more annually compared to business as usual. This is the conclusion of a new study from the Danish Energy Agency.

The study is part of the Danish-Chinese Energy Partnership Program and

supports climate and energy targets set by Hainan, while introducing renewable energy sources as an essential component of the least-cost pathway.

The study shows that there is great potential for phasing out the current 38 percent coal supply for the island of Hainan. Deployment of wind and solar is the lowest cost path for achieving Hainan's ambitious clean energy targets. Wind and solar power could cover 44 percent of Hainan's electricity generation mix and phase out coal by 2030. Replacing coal with wind and solar would only have a 2 percent higher annual cost compared to the business-as-usual scenario. Such a shift would reduce the annual CO_2 emissions from the power sector from 7.0 million tons to 1.3 million tons.

Futhermore, local energy planning like this could also play an importing role supporting the 2060 net-zero emissions target announced by President Xi Jinping.

Hainan to demonstrate a clean island alternative

Hainan is located in Southern China and home to a population of more than 9 million inhabitants. The economy is growing at a rapid pace not least due to a large tourist industry, entailing an equally fast growth in energy demand.

In May 2019, the Chinese government announced a plan to make Hainan a "Clean Energy Island" (CEI). Hainan is set to demonstrate a shift from black to clean energy to inspire the future development of Chinese energy expansion. The plan focuses on the decarbonisation of the energy system in Hainan by boosting renewable energy integration, as well as banning the sale of internal combustion engine vehicles by 2030. Following the ambitions for 2030, the transition requires acceleration and considerable planning efforts to accommodate the targets set by the government.

A showcase for detailed provincial and regional studies in China

The study is a good case of provincial energy modelling, indicating how the power sector of Hainan can transition and contribute towards the CEI policy target. Towards 2030, Hainan should reduce energy exports and increase generation from renewable sources, resulting in complete removal of coal from the electricity generation mix.

Moreover, the report reveals that Hainan's Clean Energy Island policy could have a genuine impact on the broader energy system, where coordination of

policy and market design with neighbouring provinces is a must.

The Danish-Chinese energy cooperation is under the cooperation framework of National Energy Administration (NEA) and the Danish Ministry of Climate, Energy and Utilities.

The cooperation is financed by the Ministry of Foreign Affairs through the Danish climate envelope. The program initiatives are within renewable energy, scenario planning, power system flexibility, energy efficiency.

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