Danish Energy Agency

China: New study shows the benefits from improved air-quality from increased use of renewable energy in China

China National Renewable Energy Centre (CNREC) and the Danish Energy Agency (DEA) are cooperating on a 2050 scenario analysis for the Chinese energy sector, which shows the external costs associated with Chinas increase in air-pollution.

The new CNREC and DEA study is comparing the emissions from two different scenarios: the Renewable Energy Scenario (RES) with a share of 60 % of renewable energy in 2050 and the Business as Usual scenario (BUS) with a renewable energy share of approximately 20 % in 2050. The results of the study were presented at a seminar at CNREC in Beijing on 16 October 2014.

In order to enhance the impact of the scenario analysis, CNREC and DEA has in cooperation with Research Fellow Yanxu Zhang from Harvard University evaluated the benefits in terms of improving human health by increasing the share of renewable energy in the Chinese energy mix in 2050. The study is based on scenario results on a provincial level, which only provide indicative figures for the health impacts. The study is likely to underestimate the positive impacts because not all the negative impacts has been accounted for, and because of limitations in the primary data. The methodology could however be used with data from more comprehensive health studies when they become available.

The study estimates the impact of SO_2, NO_x and VOC (Volatile Organic Compounds) and their direct and indirect impacts on human health in China. The evaluation shows that the benefits from the RES compared to BUS scenario in terms of avoided deaths from exposure of particulate matters (PM2.5) and ozone (O_3) emissions are 1,750,000 persons during the period

2015-2050. About 80% of the avoided mortality is in the period after 2030, and particulate matters account for approximately 87% of the avoided mortality.

The avoided mortality corresponds to saved costs of 2.9 trillion RMB (0.5 trillion USD) from 2015 to 2050. This evaluation is based on a value of statistical life for China of 1.68 million RMB per avoided death. Additional benefits will come from avoided morbidity, especially cardio vascular and pulmonary diseases, which are estimated to additionally 10% of the costs of avoided mortality.

The economic benefits from saved CO_2 emissions are estimated to 21 USD per ton of CO2 corresponding to 8.7 trillion RMB (1.4 trillion USD) in the same period.

In total the external benefits of implementing a renewable energy scenario of 11.6 billion RMB from 2015 to 2050 or 0.3 billion per year, corresponds to about 20% of the additional costs of transforming the power system in a more sustainable direction. It is important to include the external costs, which are not reflected in the market prices, when evaluating different development pathways for the energy sector. The study is part of an on-goring effort to enable CNREC to include external costs in the scenario analsysis of the long term development of the energy sector, in order to get the full picture of China's energy sector in the future.

Read more the new study in the margin to the right.

Annex 1
Annex 2
CNREC Externatlities Report
Externalities Powerpoint show

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