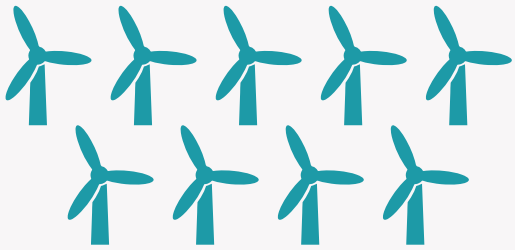
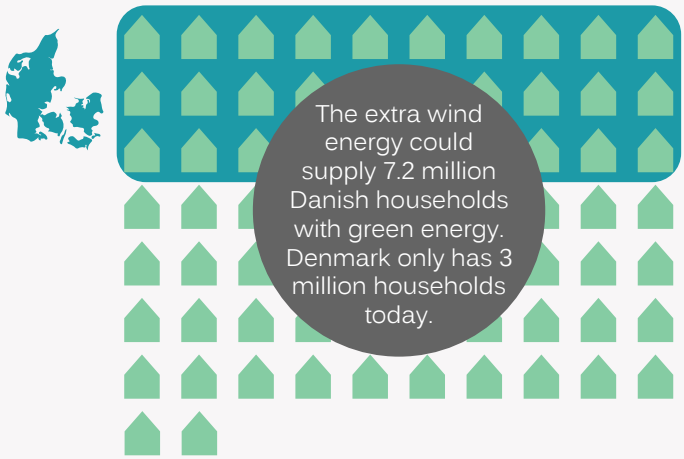
Danish Ministry of Climate, Energy and Utilities

Danish Energy Agency

DANISH-CHINESE ENERGY PARTNERSHIP DECEMBER 2019

The optimized use of wind energy in China is equivalent to Denmark increasing the offshore wind capacity fourfold.

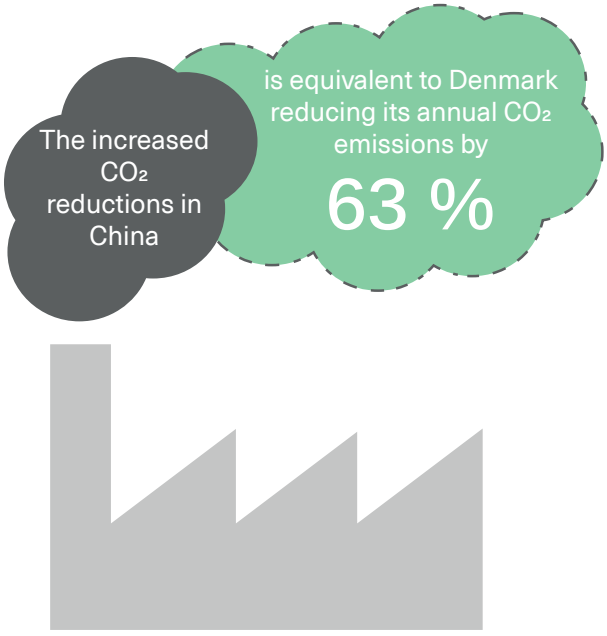




FLEXIBLE POWER PLANTS IN CHINA PROVIDE GREEN ENERGY TO MILLIONS OF HOUSEHOLDS

A cooperation between Danish and Chinese energy authorities contributes to increased power plant flexibility. This provides China with green energy equivalent to the consumption of more than 7.2 million Danish households. The reductions of production from coal power plants is equivalent to an annual reduction of 22 million tons of CO_2.

China is on the path to a green society, and this means more wind energy in the system. China is the world's biggest emitter of greenhouse gasses, and at the same time, China is the country in the world with the biggest investment level in renewable energy.



Wind energy is equally unreliable as weather forecasts. The increased level of wind energy in the system requires that Chinese power plants must be able to react fast when the wind production is going up and down. Therefore, more wind energy in the power system requires advanced planning procedures to ensure an optimal use.

This calls for a fundamental transition of conventional energy planning procedures. This transition is a challenge to many of the world's big greenhouse gas emitters, including China. In 2016, 17 percent of Chinese wind energy production in average was lost because the energy system lacked flexibility. For some Chinese regions, this loss increased to 50 percent of the total wind energy production being lost.

Today, China has come a long way in solving the challenge of flexibility in the power system. The latest data shows that the loss of energy has gone down from 17 percent in 2016 to only 7 percent in 2018.

40 years of Danish experience paves the way

Since 2006, Chinese and Danish government agencies have been working together on strengthening the wind energy development in China. Denmark is a global showcase for green transition. By sharing Danish knowhow

and experience on long-term energy policy planning, Denmark can multiply the power of the Danish green energy model.

Today wind energy powers almost half of the Danish electricity supply. Denmark has over many decades developed an optimal framework and technology that ensures that all wind energy is put into use. The Danish framework provide the right incentives for power plant producers to deliver flexible production. Furthermore, the power plant producers holds technological solutions that enables them to react fast, and turn the power production up or down when necessary to make room for the wind energy in the system.

A cooperation between the China National Energy Administration and the Danish Energy Agency has made it possible to adapt Danish knowhow on power plant flexibility successfully in the Chinese energy system. Through capacity building and knowledge sharing relevant Chinese partners have gained an insight in the unique Danish energy planning methodology.

Government cooperation paves the way for green investments

A more efficient use of wind energy also improves the business case for investors. The global market for green energy solutions is increasing remarkably. The global community will have to invest more than 13 billion US dollars over the next 11 years to reach the UN target on green transition. To push green investments it is important to provide stabile framework conditions for future energy development.

FACTS

- China and Denmark started the government-to-government collaboration on energy in 2006. The aim is to encourage reduction of CO_2 emissions in China, hereby supporting China's contribution to the Paris Agreement and sustainable development goals 7 and 13.
- 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.
- The Danish Energy Agency cooperates bilaterally with 15 countries representing more than 60 percent of the global CO_2-emissions.

In China the increased power plant flexibility gives Chinese wind producers a bigger return of investment. Together with technology development this means that onshore wind energy today is the cheapest electricity production plant when carrying out new energy investments. In this way the Chinese-Danish partnership plays an important role in strengthening the competitiveness of green technologies on the biggest market for renewable energy in the world.