



Danish Ministry
of Energy, Utilities
and Climate



Going **green** with **Denmark**

International partnerships
for energy transformation



Going **green** – faster and better – **together**

Denmark is partnering with countries to create a clean, prosperous and low-carbon energy future. Together, we are reimagining energy systems with Danish experience, expertise and innovation.

Onwards from Paris

With the 2015 Paris Agreement, the world is on a new trajectory towards sustainable development and a low-carbon economy. Delivering on the promise of Paris requires countries to urgently scale up renewable energy and to use energy more efficiently.

In Denmark, we have realised an incredible energy transformation over the last 40 years. By going from black to green, we are now on target to become independent of fossil fuels by 2050. Coal for power production will be phased out by 2030.

Since 2012, we have offered the full range of Denmark's experience, expertise and innovation to countries undergoing their own energy transformations.

Why? Because building a low-carbon economy requires global action and global collaboration. Join us and let us go green – faster and better – together.



The Paris agreement

aims to keep global temperature rise below 2° Celsius and encourages efforts to limit increases to 1.5° Celsius (both above pre-industrial levels).

Danish achievements

29%

amount Denmark reduced its adjusted greenhouse gas emissions since 1990, based on 2015 data

56%

contribution of non-hydro renewables to the electricity system in 2015 – the highest in the world

43%

amount of wind-based power used in 2017, a world record

99.996%

security of electricity supply in 2016

Setting a bold path towards sustainability

What Denmark brings to the table

Denmark offers unique policy, planning and regulatory experiences of renewable energy and energy efficiency measures, including:

1. Technical assistance in cost-effective, holistic and long-term energy planning and scenario modeling
 2. Improving framework conditions for energy efficiency measures, public tenders for renewable energy, energy price regulations, etc.
 3. Knowledge on integrating fluctuating renewable energy sources, while maintaining a stable energy system
-

Leading from Denmark

Denmark's success demonstrates that the transition to green energy is not only doable, but a pathway to greater prosperity and security.

Green energy investments have created new, high-skilled jobs, while reducing our dependence on oil and other carbon-heavy fuels.

Renewable energy has proved affordable and reliable in Denmark. Urban and rural areas alike benefit from the wind, solar and biomass energy that now safely powers our daily lives.

"Together with our partners, we are powering green energy transitions around the world. By combining long-term energy planning with short-term policy actions, we are forging cost-effective strategies for an ambitious green energy transition."



– Lars Christian Lilleholt, Danish Energy and Climate Minister

Going **green** with Denmark

With Danish experience, expertise and innovation, we partner with countries to realise energy transformations of their own.

Our collaboration rests on partnership. We bring Danish experts together with their counterparts in partner countries to meet the challenges of going green. Together, we focus on identifying solutions that are realistic, cost-effective and set countries on a bold new path towards sustainability and a low-carbon future.

Denmark's 360° approach to energy modelling, planning and policy results in solutions that holistically transform energy systems.

Based on our experience, we know how to set the optimal framework conditions for energy efficiency measures, public tenders for renewable energy, energy price regulations, and more. We know the technical experts and where to find them.

Our ability to produce scenario-based energy models – the blueprints for energy transformation – can help countries deliver on their international commitments.

Together, we identify solutions that respond to local needs and realities. Together, we champion solutions that we know work. And together, we are inspired by the incredible possibilities of a green future.



360° approach

Our energy partnerships are based on a 360° approach to energy modelling, planning and policy. Together, we

produce solutions that holistically transform energy systems. Going green – faster and better – together.





Going green **together**

Chinese-Danish Partnership

China is firmly committed to delivering on the Paris Agreement by reducing carbon emissions and air pollution. Thus, despite having significant coal resources, China has embarked on an ambitious path towards a greener and more sustainable energy sector.

IN TRANSITION

Our partnership supports the preparation of long-term energy scenarios for China. Our analysis shows that with an ambitious long-term strategy, China could reach a 60% share of renewable energy by 2050 and limit CO₂ emissions to 3,000 metric tons by 2050, compared to 10,000 metric tons today. This would represent a decisive step forward for China in fulfilling the Paris Agreement.

Making Chinese power plants more flexible to integrate more wind power in the energy system is also central to our partnership. This involves increased flexibility on coal based power stations when

the wind blows. The potential is significant. If China could have integrated all of their wind power in 2017, they would have reduced CO₂ emissions equivalent to 75% of Denmark's total annual emissions.

Mexican-Danish Partnership

Mexico was one of the first countries to submit a Paris climate pledge, setting a target to reduce emissions by 22% of baseline levels by 2030. This is significant since 80% of Mexico's electricity comes from fossil fuels. Given Mexico's considerable solar, wind and biomass potential, it is well positioned to deliver on its target. Denmark is working with Mexico on cost-effective strategies to deliver on its commitment, while exploring opportunities to raise Mexico's ambitions beyond the unconditional Paris pledge.

IN TRANSITION

With our joint models and scenarios, we have identified strategies for Mexico to reduce emissions in the power system by 30% by 2020. The



Highlights from the Chinese Partnership

The partnership has supported the publication, *China Renewable Energy Outlook 2017*, with two scenarios for a future energy system in China. The scenarios show that:



China could get 85% of its electricity from renewables



China could get 60% of its total energy from renewables.



Reimagining the future together



Development engagements in Mexico



Efficient
integration
of traditional
renewable energy
into the power
sector



Cooperation to
increase energy
efficiency



Support
Climate Change
Mitigation
Measures

partnership involves promoting evidence-based energy planning and policymaking. As a result, Mexican institutions have a greater capacity for long-term energy and climate change mitigation planning. This includes creating incentives and initiatives to increase the energy efficiency of industrial companies and buildings. Reductions have already materialised on the ground as a direct result of our partnership.

Offshore wind in China, India and the U.S.

What do China, India and the United States all have in common? Tremendous energy needs and tremendous offshore wind potential off the coastlines close to their large cities and load centres. Advancements in turbine technology and economies of scale are helping to drive down costs, making offshore wind an increasingly attractive source of energy.

As one of the world leaders in wind energy, China has set an ambitious goal of having 5 gigawatts (GW) operating offshore

wind capacity and another 10 GW under construction by 2020. India is similarly ambitious. A new 5 GW target for offshore wind has recently been announced on top of the existing onshore wind target of an additional 30 GW by 2022. In the United States, the U.S. Department of Energy is planning more than 25 offshore wind projects with a potential generating capacity of almost 24 GW.

IN TRANSITION

Denmark has become a trusted partner to unlock the potential of offshore wind in each of these countries. We support our partners to streamline regulations and create one-stop-shops to engage with relevant stakeholders from wind-farm entrepreneurs to planners. Using the Danish experience, we advise on pre-tender dialogue with industry and developers. We also offer strategic guidance on de-risking tender material and the terms and conditions for bids.



Danish Energy
Agency

"I also believe the two countries will make a greater contribution to the global energy transition and energy structure through the cooperation in the field of renewable energy."

Nur Bekri,

Vice-Chairman of the National Development and Reform Commission (NDRC) and Administrator, National Energy Administration (NEA), People's Republic of China

"The cooperation with Denmark on energy and climate focuses on areas important for Mexico and for Denmark, within renewable energy, energy efficiency and climate change mitigation. [...] With this collaboration, Mexico strengthens its path towards a future with low carbon emissions to achieve its goals in terms of clean energy and energy efficiency."

Efrain Villanueva,

Director General for Clean Energy, Secretariat of Energy, Mexico

"Denmark is one of the leading countries in reforming energy sectors and the development of new green technologies, renewable energy and energy efficiency, therefore it is important for Ukraine to take advantage of Danish experience and facilitate cooperation with Danish businesses for implementing joint projects in the energy sector. We highly appreciate the close cooperation with Danish institutions."

Ihor Nasalyk,

Minister of Energy and Coal Industry of Ukraine

Go green with Denmark

Are you ready to reimagine your country's energy future? Go green - faster and better - with Denmark. Together, we'll create a clean, prosperous and low-carbon future for the planet we all share.

**Contact us
to learn more**

Danish Energy Agency
Tel: +45 3392 6700
Website: www.ens.dk/en