



Danish Energy
Agency

The joint
Danish-Mexican
cooperation on
climate and energy



Key Data

Mexico

Population (millions):	127.5 (2016)
CO ₂ -emissions (Mega tonnes):	442.3 (2015)
CO ₂ (t/capita):	3.6 (2015)
kg CO ₂ /GDP:	0.37 (2015)
Investment in RE (billion \$US):	0.443 (2016)

Source: IEA 2017, WorldBank 2016 and Frankfurt School-UNEP Centre/BNEF 2017

NDC Goals - Mexico

Unconditional: Committing to reduce 22% of Greenhouse Gases emissions below BAU for the year 2030.

Conditional: The 22% reduction commitment expressed above could increase up to a 36% in the conditional goal.



Denmark

Population (millions):	5.7 (2016)
CO ₂ -emissions (Mega tonnes):	32 (2015)
CO ₂ (t/capita):	5,63 (2015)
kg CO ₂ /GDP:	0,09 (2015)
Investment in RE (billion \$US):	2.5 (2016)

Source: IEA 2017, WorldBank 2016 and Frankfurt School-UNEP Centre/BNEF 2017



Green government-to-government cooperation

Inclusive, sustainable growth - and development is a strategic objective of Denmark's development cooperation. Economies in transition and emerging economies are considered key players for achieving the global Sustainable Development Goals and it is important to provide support for their sustainable development, as they demand expertise, knowledge, technologies and investments to make appropriate strategic choices for their sustainable development. This is not least true with regard to development of their energy sector.

The Danish Energy Agency's global cooperation intends to assist partner countries with their transition to a low carbon pathway reaching the National Determined Contribution (NDC) targets they committed to at COP21.

The primary modality of the Danish Energy Agency is to engage in government-to-government cooperation to promote the common climate change agenda.

It strives for true peer-to-peer exchange to advance the understanding of policy options, strengthen planning - and framework conditions, and strengthen enforcement of regulation.

The overall development objective agreed to by the counterparts of the Partnership Program between Denmark and Mexico is that Mexico is in transition to decouple carbon emissions from economic growth through cost-efficient mitigation actions.

Facing the challenges

The government of Mexico envisages economic growth in the country to be decoupled from dependency of fossil fuel within a 20-year time horizon and envisages at least 50% of electricity generation from clean sources by 2050 and 50% reduction in economy-wide greenhouse gas emissions compared with the 2000-level. As an emerging economy highly dependent on fossil fuels (91% of primary energy supply in 2015)

such development is a major challenge not least because it requires considerable capital investments. Studies suggest that it would require an almost full decarbonisation of the electricity sector by 2050, along with energy efficiency improvements to reach this.

Nevertheless, Mexico – highly vulnerable to impacts of global warming - takes global leadership and was the first developing economy to submit its pledge for the Paris-agreement. In Paris, Mexico unconditionally committed to reduce economy-wide greenhouse gas emissions by 22% of baseline levels by 2030 and to potentially raise ambitions to 36% conditionally on e.g. financial support and technology transfer.

The Mexican government has established a comprehensive policy, legal and institutional framework conducive for its green transition. Notable achievements include the energy reform package initiated in 2014, the General Law on Climate Change (2012) and the Energy Transition Law (2015) and their associated strategies and special programs.

The electricity generation market has been liberalized to create competition among energy producers, enable customers to purchase power directly from generators and establish an independent power producer market. The government implemented a carbon tax and created a Clean Energy Certificates market due to which large consumers are required to acquire certificates corresponding to 30% of their electricity



demand by 2021 and 35% by 2024. Clean energy includes efficient co-generation and nuclear energy in addition to renewable energy. The government introduced long-term clean energy auctions, starting in 2016 with two auctions, corresponding to

purchase of 5% of Mexico's annual energy consumption and followed by a third auction in 2017 with record low prices for wind and solar.

As Mexico is advancing in their clean energy policy goals through renewables, efficient integration of variable renewable energy sources like wind and solar becomes increasingly a challenge and requires investments in infrastructure for power transmission and/or of storage technologies. This is recognized by CENACE, the independent operator of the transmission system and responsible for balancing supply and demand.

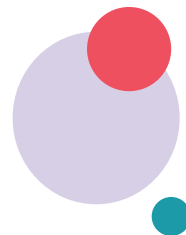
Energy efficiency is a critical mitigation option too as also recognized in the Energy Transition Strategy that sets forth the goal of annual decrease of 1.9% in final energy demand for the period 2016-2030. The industrial sector is the third largest greenhouse gas emitter (after transport and electricity) and has at the same time high, but generally unexploited abatement potentials.

The same applies for buildings. The rate of new building construction is high, with many new floor meters being added every year with costly missed energy saving opportunities. Federal mandatory standards (NOMs) reducing the need for cooling through appropriate design of the building envelope is already in place, but they are generally not incorporated in the building codes at local government levels, and hence they are not enforced.

Mexico and Denmark cooperate on climate change mitigation, renewable energy and energy efficiency

The partnership stands on the shoulders of a long-standing collaboration between the two countries on climate and energy. The present partnership consists of three distinct development engagements, which comes together in common steering and management framework pursuing synergies and cross-fertilization between the development engagements. One of its strengths recognized by the Mexican side to the collaboration is its ability to bring the energy and climate change sectors to the same table for analysis of pathways to - and advancing in understanding of policy options to achieve long-term energy related climate change goals.

The present 3-year program is running until mid-2020 and is funded with DKK 34 million from the Danish Climate Envelope



Joint effort to accelerate green development

Efficient integration of additional renewable energy into the power sector

The aim of the engagement between the Mexican Ministry of Energy (SENER) and the Danish Energy Agency is that additional renewable energy is integrated efficiently in the power sector in line with the clean energy goals in the Energy Transition law.

The Danish Energy Agency has introduced to SENER an optimization model (Balmorel-Mexico power system model), which further have be linked to the integrated energy model SIMISE developed by UNAM (National Autonomous University of Mexico) on behalf of SENER. Both institutions has received training in the usage and updating of the models. Scenarios developed from the model are published in the Mexican Renewable Energy Outlook and the Mexican Electricity Sector Outlook – two policy dialogue tools for recurrent annual publication by SENER.

SENER is striving for establishment of a sustainable energy modeling platform enhancing collaboration between institutions engaged with energy sector planning and users of energy data including SENER, CONUEE, CENACE and INECC. The Danish Energy Agency initially assists in this through developing the concept for this platform and jointly with SENER conduct initial consultation with stakeholders and financiers.

CENACE works with their Danish equivalent (Energinet) in a peer-exchange modality in assessment and resolution of integration challenges and transmission grid planning stemming from large shares of variable renewable energy in the power system.

Moreover, ways to deploy biomass for energy purposes in a sustainable manner are jointly exploited by SENER and the Danish Energy Agency. Focus is on biogas where Denmark has distinctive competencies to offer while enrolling a variety of Mexican experts and stakeholders.



Increasing efficiency in the use of energy

The engagement with SENER and CONUEE (the National Commission for Efficient Energy Use) has the goal to help reaching the national target on energy efficiency in energy usage. Focus is on strengthening energy efficiency regulatory and implementation aspects, particular in buildings and industries.

CONUEE and the Danish Energy Agency jointly work on-the-ground with local administrations to spur them to amend building codes to incorporate two relevant energy efficiency standards and to strengthen enforcement in relation to granting of construction permits and occupancy permits. Additionally, compliance auditors, developers, architects, engineers and contractors are enrolled in the program.

With regard to energy efficiency options in industry, CONUEE has recently been mandated to work with industry by means of voluntary agreement scheme. There is currently little capacity to develop and manage a voluntary agreement scheme at CONUEE whereas the Danish Energy Agency has a long-standing experience in this area to share in peer exchange with CONUEE.

Finally, the program helps assists CONUEE in areas of energy efficiency modeling and systems for data acquisition.

Support climate change mitigation measures

The engagement with the Mexican Ministry of Environment and Natural Resources (SEMARNAT) aims to bolster analysis of green transition pathways and to continue advancing the understanding of energy related mitigation policy options for Mexico's NDC-targets including informed by the insights modeling analysis provide.

The partnership provides technical assistance support to SEMARNAT for the intended review and update of the national climate change strategy and will – subject to priorities of the new federal administration – provide input for further NDC implementation planning.

Additionally, the Danish Energy Agency works with INECC, the National Institute on Ecology and Climate Change on costing of NDC measures and on enhancing quality of data used for governmental projections and basis for policy input for the ongoing national policy development on climate change mitigation. Also, the partnership intends to support outreach to engage the sub-national level in the climate change abatement agenda.

The Danish Energy Agency's Centre for Global Cooperation supports emerging economies to combine sustainable future energy supplies with economic growth. The initiative is based on four decades of Danish experience with renewable energy and energy efficiency, transforming the energy sectors to deploy increasingly more low-carbon technologies.

Learn more on our website:

www.ens.dk/en/our-responsibilities/global-cooperation

For further information, please contact:

Marianne Ramlau

mram@ens.dk

Phone: +45 33 92 75 16



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