Appendix Under2 MOU Sonora

Profile of Sonora

The state of Sonora is the second largest in area within Mexico with 179,355 sq km (9.1% of the total)[1], and it is populated by 2.85 million people (2.4% of the national population)[2]. The population growth rate of 1.6% annual is close to the national average (1.4%). The gross state product in 2015 was 537.5 billion pesos, equal to 3.24% of the national GDP.[3] In recent years the state economy has seen an increase in industrial activity, from 42% of state GDP in 2010 to 46% in 2016.

GHG emissions in Sonora reached 23.1 MtCO2e in 2010[4] representing 3.5% of the national GHG emissions. Of the state emissions, the power sector is the main contributor (7.58 MtCO2e, 33%) followed by transportation (6.46 MtCO2e, 28%), agriculture & livestock (3.70 MtCO2e, 16%) and industrial processes (2.23 MtCO2e, 10%).

Sonora has great solar irradiation all year; the potential for electricity generation from solar energy is estimated around 540 GWh/y. However, current installed capacity only reaches 3 MW in SPV and 14 MW in a solar thermal plant. Three hydro plants (El Novillo, 135 MW, Mocúzari, 10 MW, and Oviachic, 19 MW), and a couple of wind power farms (totalling 2 MW) complete the current renewable portfolio. Almost 97% of the total electricity generated in Sonora in 2017, around 17,279 GWh, comes from fossil fuel combustion.

Sonora has certain peculiarities that categorize it as vulnerable to climate change. Its diversity of ecosystems, which characterizes most of the state territory as an arid region, the economic activities highly dependent of the border dynamics and the indigenous communities that inhabit the region, this one considering the facing of climate crises such as constant droughts.

The state of Sonora was the first state in Mexico to have a State Law on climate change, aligned to the statutes established in the Paris Agreement, which came into effect on November 27, 2017 and a State Risk Atlas that contemplates 7 municipalities of Sonora as highly vulnerable to climate change. In the constant pursuit of satisfying the needs that resulted as consequence of climate change effects, Sonora state government can sum as achievements, the strength partnership with ONG's and the involvement of the community in different adaptation policies that the state had

[1] Panorama sociodemográfico de México. 2015.
http://www3.inegi.org.mx/sistemas/biblioteca/ficha.aspx?upc=702825078065
[2] INEGI: Principales Resultados de la Encuesta Intercensal 2015
[http://internet.contenidos.inegi.org.mx/contenidos/Productos/prod_serv/contenidos/espanol/bvinegi/productos/nueva_estruc/702825078966.pdf]
[3] BIE, INEGI [http://www.inegi.org.mx/sistemas/bie/]
[4] Chacón et al. Emisiones de gases de efecto invernadero en Sonora y proyecciones de casos de referencia 1990-2020, BECC-COCEF, 2010

lead. In addition, Sonora is the only state in Mexico that counts with a Green Growth Strategy supported by the Global Green Growth Institute.

Mitigation

Sonora is well known for its mitigation potential, and the state is currently implementing efforts to reduce or prevent emission of greenhouse gases. The efforts underway around the state include using new technologies, renewable energies, energy efficiency, changing management practices, consumer behavior, city planning and improvements such as bicycling paths and walkways. The Intergovernmental Panel on Climate Change (IPCC) suggested these activities, and Sonora has adopted them as a leader.

Goals

Sonora's goals on mitigation are settle from the Nationally Determined Contribution (NDC) in order to support Mexico's commitment, so that the state commitment is the reduction of 25% GHG and short-lived climate pollutants emissions for the year of 2030. The commitment as well implies a net emissions peak starting from 2026 decoupling GHG emissions from economic growth, considering the nation goal of reducing 40% by 2030.

For the power sector, we are aiming to generate 35% of clean energy by 2024, and 43% to 2030, considering the inclusion of renewable energy, geothermal energy, natural gas and CO2 capture.

By joining the Under 2 Coalition, Sonora will be adopting its goals of reducing emissions 80-95% by 2050, or limiting to 2 tons per capita.

Tools

The State of Sonora is committed to making use of the most relevant tools in planning its climate actions in the context of the Paris Agreement. Our aim is to achieve economy-wide emissions reductions across the State in an ambitious timetable while stimulating economic development. For this, we need to understand opportunities and trade-offs, within Sonora and in light of our interactions with other States, the Federal Government, and the national utility.

The Green Growth Strategy of Sonora, which began in 2016 and includes 4 main objectives: 1) Decarbonization and energy independence, 2) Innovative and inclusive economy, 3) Responsible use of materials and natural resources and 4) Quality of life resilient to climate change and 33 lines of action(see Annex 1). In addition, the main part of the ECV implementation is based on governance; transcending form a policy implemented by government to the involvement of the community in general, to a level where the community appropriates of the strategy considers it as a common effort.

We are particularly interested in significantly expanding our solar generation capacity and integrating into our energy system, electrifying urban transport options (public and private), and achieving synergies between these two; reducing emissions from industrial operations while

modernizing our power grid, and ensure our cattle-rearing and farming activities follow low-emissions practices. We will do this by means of sectorial planning with the best tools available.

The "*Implementing NDCs and Long-Term Strategies at a Subnational Level in Mexico*" project, currently underway in partnership with The Pathways 2050 Platform and WRI Mexico, is providing an initial overview of these planning challenges, and providing preliminary analytical insights into the Power / Transport nexus by means of a Stock Modelling approach on the EnergyPATHWAYS platform.

Capacity

The "I*mplementing NDCs and Long-Term Strategies at a Subnational Level in Mexico*" project will also lay out a range of actions over a short, medium, and long time-frame, required to achieve a level of decarbonization consistent with the Paris Agreement goals. It will also associate owners for each of the actions, and propose a system of monitoring and follow-up which is to be determined by stakeholders through a workshop dynamic.

Although the analysis carried out in the project will be preliminary, it is expected that it will inform an indicative calculator tool which analysts within the State government or academia can use to explore a range of policy scenarios.

The project will also generate recommendations for further capacity building within the State.

Adaptation

Throughout much of the Mexican territory, there is relatively little technical literature on potential impacts of climate change on a local scale. Although generic adaptation planning could suggest relative "no regrets" measures, applied research is required in order to generate local knowledge and leverage existing adaptation toolkits to rapidly generate relevant policy recommendations.

Goals

Reduce at least by 50% the number of municipalities in the category of "most Vulnerable" in the PECC 2014 and avoid any other Municipality falling into this Category.

Guarantee food security and water access in light of growing climate threats through integral watershed management, biodiversity and land conservation.

Ensure capacity building and participation of the society, local communities, indigenous peoples, women, men, youth, civil organizations and private sector in national and subnational climate change planning.

Reduce the population´s vulnerability and increase its adaptive capacity through early warning systems, risk management, as well as hydrometeorological monitoring, at every level of government.

Strengthen the adaptive capacity of the population through transparent and inclusive Mechanisms of social participation, designed with a gender and human rights approach.

Reduce vulnerability of the population through territorial planning tools and risk management such as the state Vulnerability Atlas and the state Risk Atlas.

Invert the proportion of financing currently provided to hydrometeorological disasters attention by increasing the ones invested for disasters prevention.

Prevent illnesses that are exacerbated by climate change through an early warning system with epidemiologic information.

Relocate irregular human settlements in zones prone to disasters through land use regulations.

Annex 1

VISION	OBJECTIVE	THEME	ACTION LINES	CC MEASURE
The State of Sonora is a national leader in economic growth based on a model of green growth, which potentiates human development, quality of life and social inclusion, while increasing the productivity of natural resources, environmental protection and resilience to climate change.	1.DESCABONIZATION AND ENERGY SELF-SUFFICIENCY	RENEWABLE ENERGIES	Encourage large scale renewable energy generation projects	Mitigation
			Promote the implementation of distributed generation systems	Mitigation
			Promote the implementation of decentralized systems for *off-grid* power generation	Mitigation
		ENERGY EFFICIENCY	Improve % energy performance of buildings and public facilities	Mitigation
			Adopt new standards and codes for energy efficiency at State and municipal levels	Adaptation
			Improve the energy performance in buildings, housing and equipment	Mitigation
		SUSTAINABLE MOBILITY	Reducing dependence on private cars	Mitigation
			Promote modal shift through alternatives of mobility (public transport, non-motorized transport, etc.).	Mitigation
			Improve the technology and the efficiency of means of transport	Mitigation
	2 INNOVATIVE AND INCLUSIVE ECONOMY	NEW ENGINES OF GROWTH	Select key sectors (*hubs*) for the development of green technologies, products and services	Adaptation
			Facilitate the creation of new companies (*startups*), strengthening University-industry linkages	Adaptation
			Strengthen R&D capacity, prioritizing practical applications and linking with the industry	Adaptation
			Fostering abilities of innovation on green growth subjects (ex. diffusion in schools, etc.)	Adaptation
		EFFICIENCY WITH INCLUSION	Develop innovative climate financing mechanisms (Green Fund; PPPs; carbon markets; green bonds)	Adaptation
			Encourage women's engagement in work life through reduction of gender and wage gaps	Adaptation
			Create one-stop window to simplify or reduce bureaucratic and administrative procedures	Adaptation
			Implement green local supply programs at the public administration of the State	Adaptation
			Reduce consumption intensity of materials through circular economy models	Adaptation
	3 RESPONSIBLE USE OF MATERIALS AND RESOURCES	SOLID WASTE	Expand and improve the service and infrastructure for collection, transport and final disposal of MSW	Adaptation
			Utilize solid waste through recovery and recycling systems	Adaptation
			Promote the generation of energy from waste *(Waste-To-Energy)*	Mitigation
			Ensure the operation through sustainable financial management schemes	Mitigation
		WATER MANAGEMENT	Increase the global efficiency from water operating organisms	Adaptation
			Increase the wastewater treatment and promote its reuse	Adaptation
			Improve the efficiency in the agricultural and urban use	Adaptation
		BIODIVERSITY AND CONSERVATION	Consolidate successful management schemes of natural protected areas (NPA) and biodiversity	Adaptation
			Promote sustainable activities with ecosystem vision and added value	Adaptation
			Apply standards & best practices to reduce impacts of activities (agriculture, livestock, mining and fishing)	Adaptation
			Control urban expansion through TOD polices	Adaptation

	4 RESILIENT QUALITY OF LIFE	URBAN DEVELOPMENT	Promote green infrastructure projects to increase urban resilience	Adaptation
			Improve air quality in cities	Mitigation
		RURAL DEVELOPMENT	Promote green infrastructure projects to increase rural resilience	Adaptation
			Implement off-grid sustainable solutions & eco-technologies (bio-digesters, solar heaters, etc.).	Mitigation