EMISIONES NETAS CERO | DESDE SOCIEDAD CIVIL

icm
INICIATIVA CLIMÁTICA DE MÉXICO

Net Zero Emissions Pathway for Mexico 2060, from Civil Society

EMISIONES NETAS CERO | DESDE SOCIEDAD CIVIL

Introduction and context

Adrián Fernández Bremauntz
Executive Director, ICM

About Us

- **Iniciativa Climática de México (ICM)** is a non-profit civil society organisation, created to promote the implementation of policies, programmes, and mitigation projects to confront the climate emergency and to promote low-carbon socially inclusive development.

- ICM is a re-granter, as well as a generator and disseminator of technical, scientific and policy-relevant information to support decisión-making.

- ICM offers pro-bono technical advice to federal and state government institutions, civil society organisations, public and private universities, and youth groups interested in helping to solve the climate change problem

Climate Emergency and insufficient efforts

- World Meteorological Organisation: September 2023 was the hottest month on record
- IPCC-Sixth Report: Global temperature has risen to nearly 1.2ºC.
- UNFCC Global Balance: We are not in line to limit the temperature increase to 1.5ºC. as mandated by the Paris Agreement.
- Emissions Gap Report 2023: We are heading towards 2.5ºC (after COP27 pledges)

What are net zero emissions?

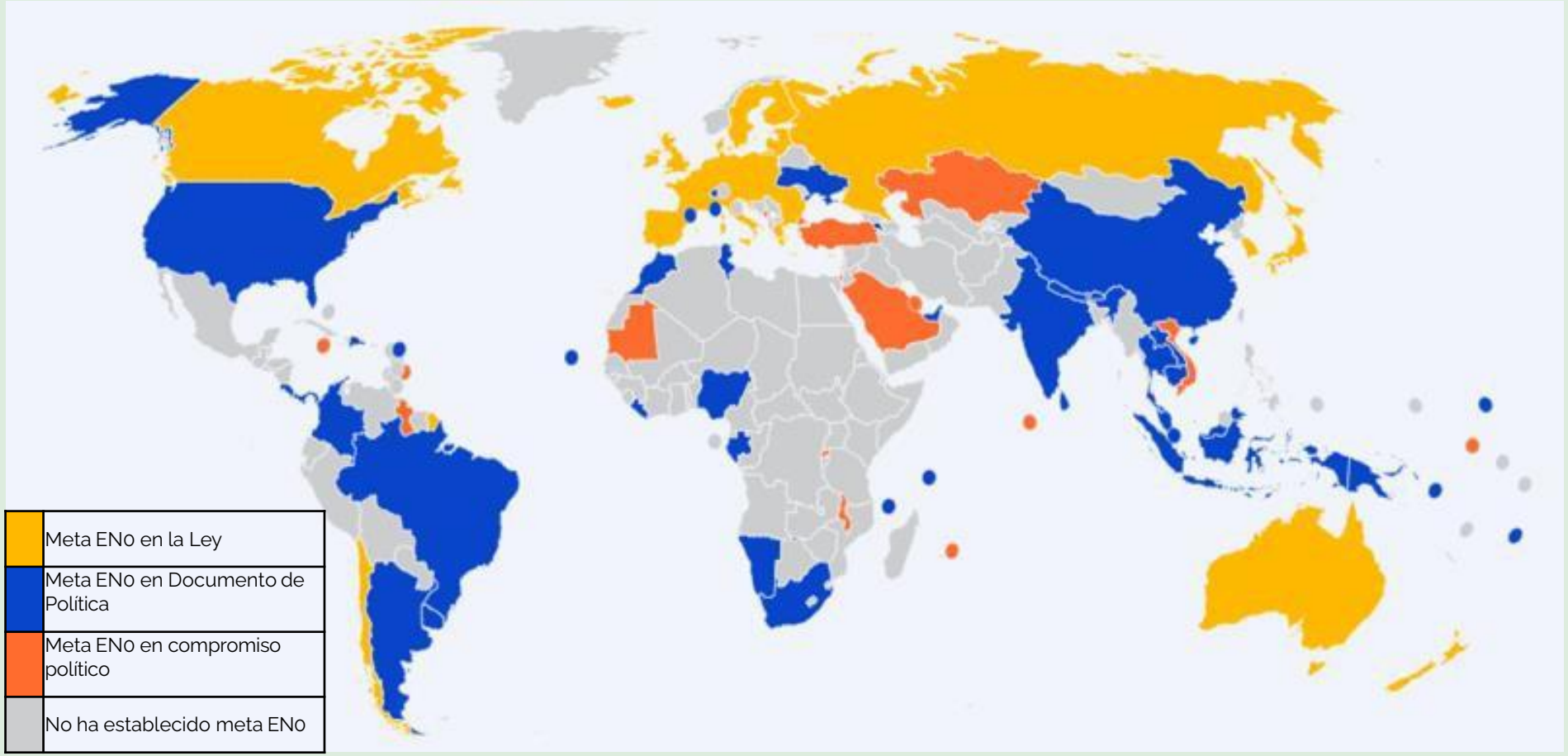
Maximum reduction of GHG emissions to reach a level as close to zero as possible.

Residual emissions are absorbed by nature-based or technological carbon capture

Net Zero Emissions Pathway should be considered as a logical continuation of the 2030 NDCs pathway

EMISIONES NETAS CERO | DESDE SOCIEDAD CIVIL

Net zero emissions worldwide



93 countries with goals and various policy instruments. Among others:

- China (2060)
- Russia (2060)
- India (2070)
- United States (2050)
- European Union (2050)
- **Mexico – ICM estimate (2060)**

Fuente: Climate Watch (2022) Net-Zero Tracker. Disponible en: t.ly/c6QK (Acceso: 13 de diciembre de 2022.

Net Zero Emissions Pathway for Mexico 2060, from Civil Society (NZEP-CS)

The NZEP-CS shows a decarbonisation path to reach net-zero emissions in the shortest possible time, the year 2060

Proposes an ambitious but feasible scenario from a technical and financial point of view if the right policies are adopted

EMISIONES NETAS CERO | DESDE SOCIEDAD CIVIL

Objectives

Objectives:

- to provide a technical tool for the development of climate policies at the national and subnational level;

- to increase mitigation ambition and identify needs for effective implementation;

- to provide continuity to the strategies proposed in the NDC from civil society.

Aimed at: decision makers, governments, academics, and society in general.

Towards net zero emissions

- No new electricity generation plants based on fossil fuels should be installed from **2027**.
- More **than 50% of electricity generation nationwide should come mainly from renewable energies (solar and wind) from 2030 onwards.**
- **Solar** energy must increase from 6 GW to **27 GW by 2030 and 63 GW by 2060.**
- **Wind** energy must increase from 7 GW to **18 GW by 2030 and 82 GW by 2060.**

Pathway towards net zero emissions

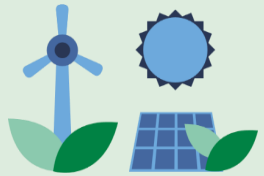
- **Compliance by 2030 with the objectives established in the NDC-CS is a precondition for reaching net zero emissions by 2060.**
- However, the current delay in implementing the proposed NDC actions could easily compromise the fulfilment of the goal for the year 2030.
- The next administration must make substantial changes in climate and energy policies from day one.
- Electricity is decarbonized by having 88% of the generation matrix with clean and renewable energy. This makes possible to meet the increase in demand from other sectors due to electrification measures without compromising the stability of the grid.

Sectorial pathways for Mexico's Net Zero Emissions from civil society

Luisa Sierra Brozon
ICM Energy Programme Director

Methodology

Electricity



Disaggregation of the electricity sector – optimization of electrical dispatch

Oil and Gas

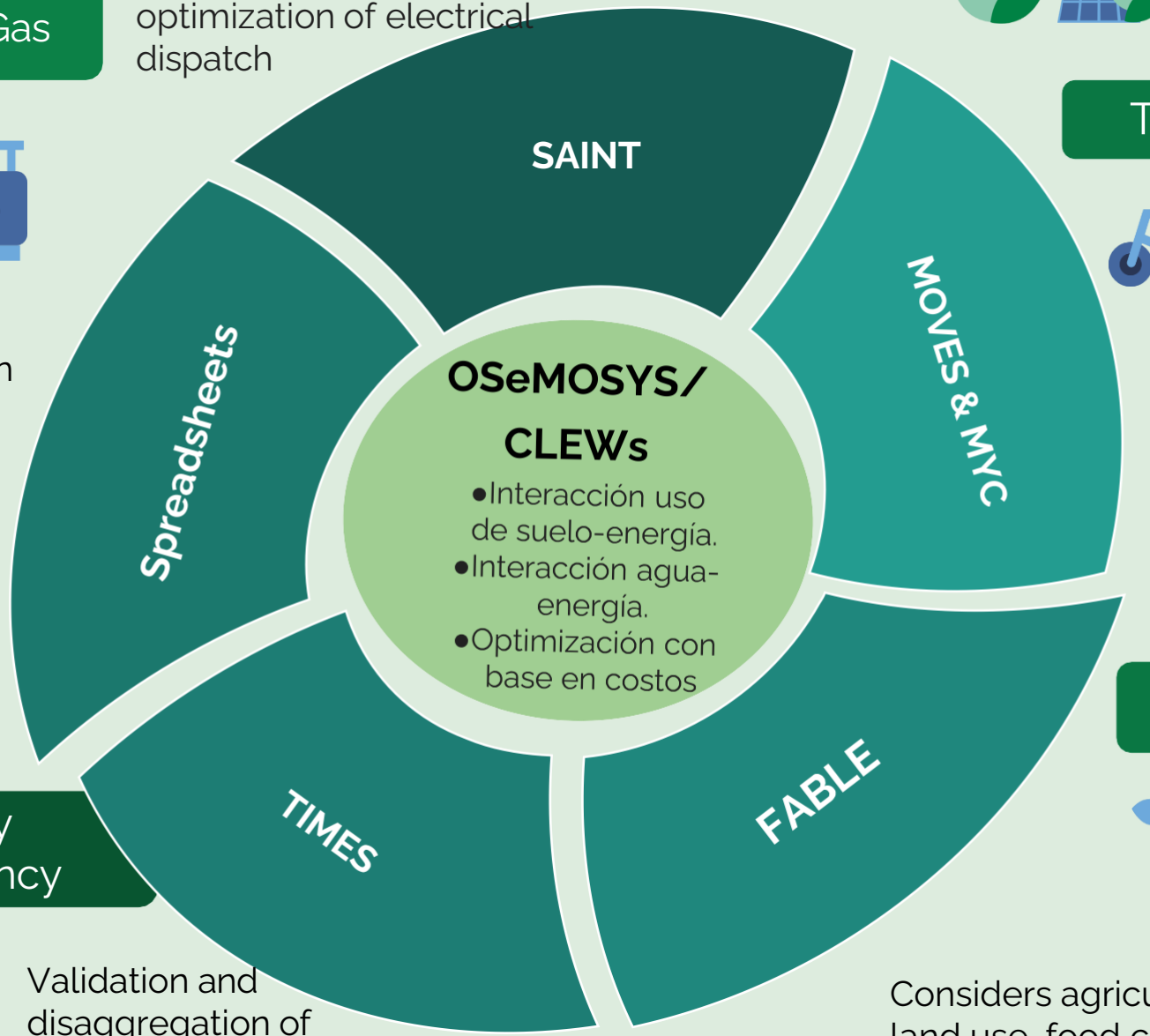
Scenario estimation

Industry

Transport

Modeling of the transport sector (avoid-change-improve)

Waste



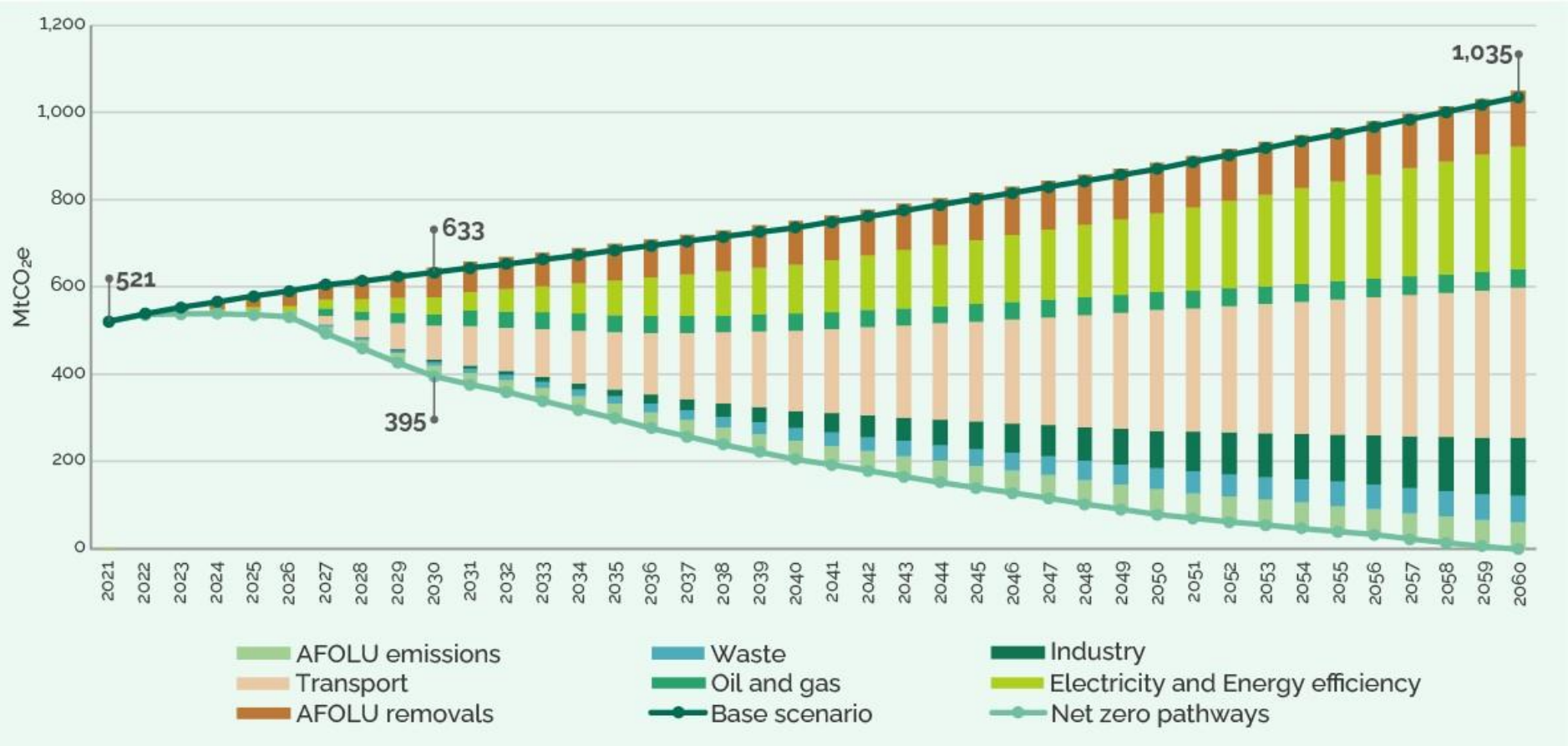
AFOLU

Considers agricultural activities, land use, food consumption, and GHG absorption.

Energy efficiency

Validation and disaggregation of the R-C-A-P sector

NZE Scenario: sectorial reduction



AFOLU emissions
61 MtCO2e (6%)
AFOLU absorbs
-128 MtCO2e (12%)

Waste
61 MtCO2e (6%)

139 measures plus absorptions with a total reduction of 1,035 MtCO2e

Electricity
279 MtCO2e (27%)

Oil and gas
24 MtCO2e (2%)

Transport
344 MtCO2e (33%)

Industry
134 MtCO2e (13%)

Energy efficiency
6 MtCO2e (~1%)

Power

26 measures
4 direct
22 indirect

Reduction potential: 279 MtCO2e (86% with respect to its baseline)

Main results

- It is required **to increase electricity generation from clean (non fossil) sources from 30 GW in 2021 to 240 GW by 2060** (reduction of 283 MtCO2e). The **accelerated deployment of renewable energies is essential**:
  - **Wind: 82 GW** accumulated by 2060 (onshore – reduction of 51 MtCO2e, offshore – reduction of 18 MtCO2e).
  - **Solar FV: 63 GW** accumulated by 2060 (reduction of 48 MtCO2e).

- **Promotion of distributed generation** to reach **43 GW** by 2060 (reduction of 39 MtCO2e) through programmes like "**Ejido Solar**" (reduction of 12 MtCO2e) and "**Hogar Solar**" (reduction of 22 MtCO2e)

- It is essential to stop installing new fossil fuels plants after 2027 and achieve **a fair and progressive exit from all coal-based thermal plants by 2030 and fuel oil plants before 2035.**

- The addition of at least **28 GW of storage capacity with lithium-Ion batteries** is required both at the transmission level and at the distribution level, so having **adequate regulation** is a priority requirement.

- The conversion of **gas-fired combined cycle plants (17 GW) to green hydrogen (reduction of 73 MtCO2e**)

- **The expansion and strengthening of the capacity of the national transmission grid between 2024 and 2030 by 28,135 km (4,019 km annually) is an essential enabling condition.**

Transport

17 measures

Reduction potential 344 MtCO2e (90% with respect to its baseline)

Main results

- To **promote non-motorised mobility** (reduction of 43.8 MtCO2e) together with the expansion of mass public transport (reduction of 14.5MtCO2e) as well as improvements in the design and planning of cities (reduction of 28.4MtCO2e). These measures could reduce petrol and diesel consumption 97% and 87%, respectively by 2060.
- It is essential to **update regulatory instruments** (fuel economy and emission standards NOM-163, NOM-044, NOM 016) to improve efficiency and reduce emissions in light and heavy vehicles (reduction of 61 MtCO2e).
- Promotion of technological change. **By 2060, electric and fuel cell vehicles should represent 92%** of the national fleet, (reduction of 57 MtCO2e). To achieve this, adequate policies and regulation are required.
- To generate **policies to improve efficiency in the transportation of goods** throughout the logistics chain, from eco-driving programmes, modal change from road to rail, and last mile schemes (reduction of 76 MtCO2e).
- **Aviation and maritime sectors** should incorporate lower carbon fuels and green ammonia in cargo ships respectively. Incorporation of , direct the sector to the incorporation of innovative technologies (19 MtCO2e).

Agricultural, commercial and residential sectors

22 measures

Reduction potential 6 MtCO2e (21% with respect to its baseline)

Main Results

- It is essential to reduce electricity demand through energy efficiency measures. The implementation of 22 measures analysed in four subsectors represents a decrease of 7.8% (53 TWh) of electricity demand by 2060.
- To trigger the penetration of more efficient technologies in all sectors, it is necessary to update regulations and financial and non-financial incentives that translate into the strengthening of capacities, for instance:

    - **Agricultural**: promotion of replacement programmes for water pumping and irrigation equipment (14 MtCO2e), as well as the complete replacement of diesel with ammonia are key for this sector (2.2 MtCO2e).
    - **Public**: programmes are proposed to replace lighting and pumping equipment in public services such as lighting, buildings and drinking water (reduction of 2.5 MtCO2e).
    - **Commercial and services** sectors: replacement of cooling equipment (refrigerators and air conditioning) is a cost-effective measure for this sector (reduction of 14 MtCO2e), as well as the incorporation of efficient lighting systems (reduction of 7 MtCO2e) and installation of water heaters (reduction of 0.4 MtCO2e).
    - **Residential**: appliance replacement and cooling programmes are key to reduce final consumption in this sector (reduction of 37 MtCO2). This must be accompanied by the implementation of efficiency standards such as the thermal envelope (NOM 020, NOM 008). In addition, it is proposed to promote the use of more efficient wood stoves and solar heaters (2 MtCO2e).

Oil and Gas

12 measures

Reduction potential 24 MtCO2e (36% with respect with its baseline)

Main results

- **Compliance with regulations to reduce methane emissions** throughout the production chain, as well as taking advantage of associated natural gas in land and marine facilities, and reducing and eventually **eliminating gas venting and flaring** in production are the most cost-effective measures, so their implementation must be immediate (reduction of 4 MtCO2e).
- Establish collaboration mechanisms between PEMEX and private industry to make **investments in cogeneration** for energy efficiency (reduction of 5 MtCO2e). The gas complex at Cactus and 4 refineries (Minatitlán, Tula, Cadereyta, and Salina Cruz) were considered.
- The decarbonisation of the other sectors of the economy, through electrification, energy efficiency measures and behavioral change, contribute to the **reduction of fuel demand** and therefore to the reduction of emissions in this sector.

Industry

39 measures

Reduction potential 134 MtCO2e (56% with respect to its baseline)

Main results

- The cement, mining, and iron and steel sectors are responsible for **33% of the total emissions reductions in the sector** (reduction of 44 MtCO2e).
- **Energy efficiency and distributed generation** in small, medium and large industries contribute to reduce 18 MtCO2e. The large scale **replacement of refrigeration equipment** with a reduction of 22 MtCO2e. To achieve this, it is necessary to launch financial instruments for technology transfer and exchange of experiences.
- **Recycling of materials** (glass, iron and steel) promotes the circular economy. Strengthening and promoting the implementation of regulations regarding the disposal and use of waste as well as the publication of the National Circular Economy Strategy are key actions to achieve this.
- **Green Hydrogen** for thermal uses in industry starting in 2027 will play an important role in the decarbonisation of this sector, which is why it is necessary to have a national green hydrogen strategy (reduction of 36 MtCO2e).

Waste

10 measures

Reduction potential 60 MtCO2e (84% with respect to its baseline)

Main results

- It is necessary to **take advantage of biogas in landfills**, so the updating and application of current regulations (NOM-083-SEMARNAT-2003) are urgent tasks.
- To launch programmes to encourage a **change in consumer behaviour** regarding the products they purchase, particularly food, to achieve adequate management of solid waste (reduction of 43 MtCO2e).
- Additionally, it is necessary to generate a **regulatory framework** to manage activities related to the operation of wastewater treatment plants (reduction of 17 MtCO2e).
- Publication of the **National Circular Economy Strategy** as soon as possible and incorporate its principles into urban operations to make better use of resources and minimize waste.
- Mixed **financing schemes** between the public and private sectors, supported by multilateral banks and the financial sector, can accelerate the implementation of these measures.

AFOLU

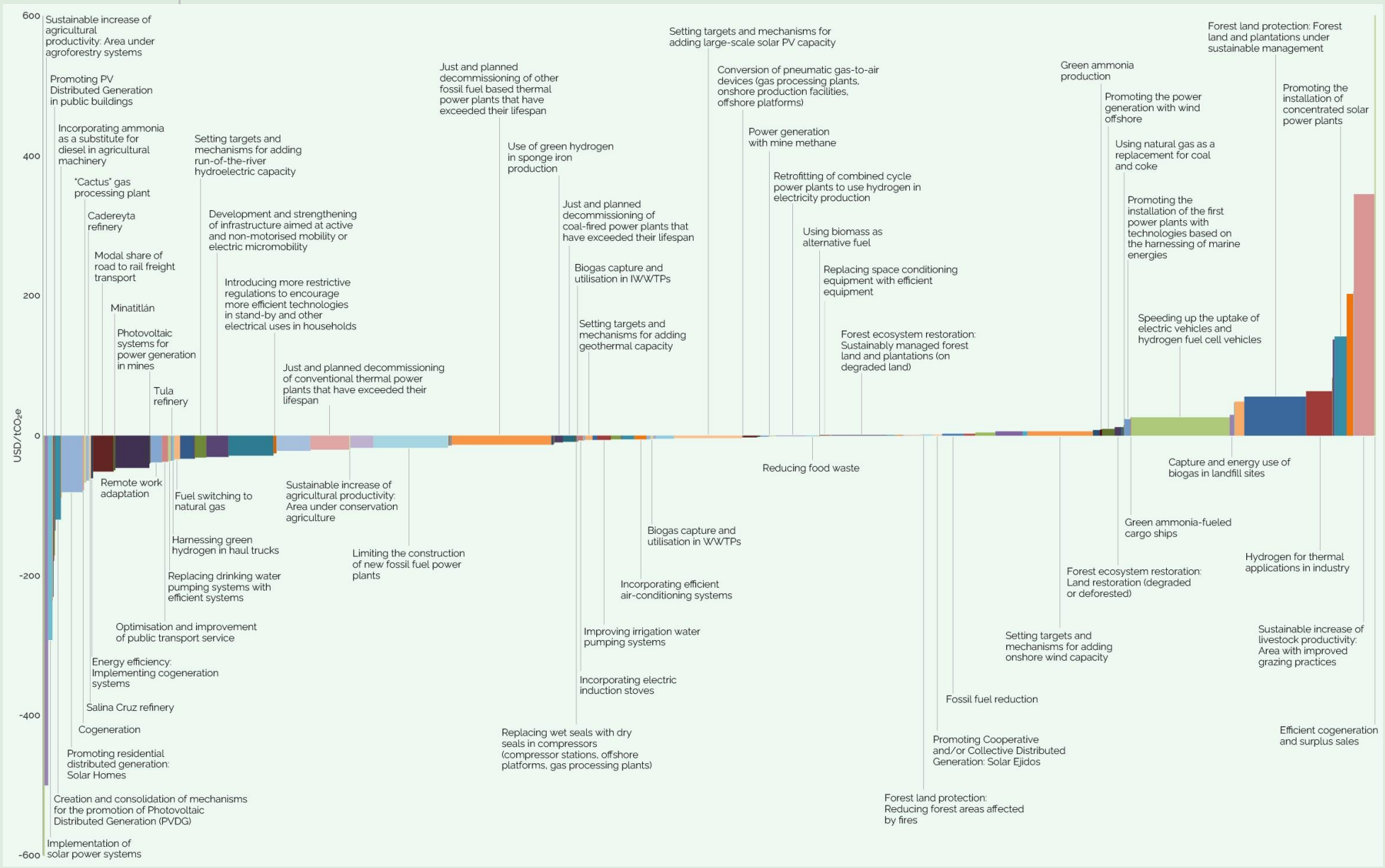
13 measures

Reduction potential
AFOLU emissions 61 MtCO2e (6%)
AFOLU absorbs -128 MtCO2e (12%)
with respect to its baseline

Main results

- The AFOLU sector plays a key role, both in annual sequestration and long-term storage of carbon.
- The **conservation of 65.7 million hectares of wooded forest** ecosystems and nearly 70 million other forest ecosystems is essential to ensure ecological connectivity, guaranteeing the survival and diversity of species (absorption of 361 MtCO2e by 2060).
- **Stop illegal land use changes** (deforestation) on forest lands (reduction of 17 MtCO2e).
- **Increased agricultural and livestock productivity**, through conservation agriculture systems, agroforestry and silvopastoral practices and reduction of synthetic fertilizers (reduction of 52 MtCO2e).
- **A change in the composition of the diet** (reducing or substituting products with a high carbon footprint) represents an opportunity to reduce emissions due to the change in demand for food and provision of goods and services from forest systems (reduction of 9 MtCO2).

Abatement cost curve analysis



57% of the 139 mitigation measures proposed are cost-effective.

In the long term, the scenario yields even more benefits,

The average cost of abatement of all measures of: -**0.338 USD/tCO2e mitigated.**

EMISIONES NETAS CERO | DESDE SOCIEDAD CIVIL

Enabling conditions and cross-cutting elements

Jorge Villarreal Padilla
Climate Policy Director, ICM

Climate Justice and Gender Perspective

- Opportunity: development model that generates **prosperity and promotes social inclusion**
- Considers the principles of **climate justice and a gender perspective**.
- Includes and promotes meaningful participation **of vulnerable groups in** the design, decision-making, and implementation of policies and mitigation measures.

Example: “ejido solar”, “solar home”, fair phase out of coal and phase out of fuel oil and gas fired thermoelectric plants that have exceeded their useful life.

Transparency

- In line with **Article 13 of the Paris Agreement**
- **Dialogue and deliberation** with civil society organisations, youth groups, academia, and the private sector
- **It makes all information available to society**, regarding the data used, the assumptions considered, the methodologies used for its modelling, as well as the results.

Financing

- **Investment required by 2030: 288 billion USD.**
- Investment required by 2060: 6.2 trillion USD.
- Estimated benefits by 2060: 11 trillion USD. That is, 1.8 times greater than the Investment.

The **development of innovative international, national, and subnational climate financing mechanisms** is required:

- The Finance Ministry published the Sustainable Financing Mobilisation Strategy (September 2023) and the Sustainable Taxonomy (March 2023), which includes mitigation and adaptation to climate change as priority axes.
- The International Financial Reporting Standards Foundation published the International Financial Reporting Standard on Sustainability (June 2023).
- Discuss climate financing goals in COP-UNFCCC and parallel initiatives (Bridgetown Initiative, GFANZ, etc.).

An opportunity for Mexico

- Define, as a society, clear objectives maximizing social benefits, equity and long-term economic development.
- Develop strategies to **decouple economic growth** from the consumption of energy and raw materials to reduce environmental impact, without compromising human and social development.
- **Cultural and behavioral changes**, such as:
  - Replacing car use with active modes of transport.
  - Adopting a sustainable, nutritious and culturally appropriate diet.
  - Avoiding food waste.
- **Identify co-benefits** associated with mitigation measures such as air quality and health, biodiversity conservation.
- Pay special attention to measures that contribute to both **mitigation and adaptation** simultaneously
- Enhance alignment of mitigation goals with Sustainable Development Goals.

Next steps

- **Urgent implementation of the mitigation measures contained in the National Determined Contribution from Civil Society,** which represents an essential step to guide the country towards net zero emissions.

- **Preparation and immediate publication of a long-term Strategy for low-emissions development, which leads Mexico to achieve net emissions by 2060** and that includes concrete and measurable objectives, as well as transparent governance and monitoring mechanisms.

Net Zero Emissions Pathway for Mexico 2060, from Civil Society

Available at:
https://www.iniciativaclimatica.org/emisionesnetascero/

EMISIONES NETAS CERO | DESDE SOCIEDAD CIVIL