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A proposal from civil society to increase ambition through a climate justice approach

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Collaboration
Analuz Presbítero García
Ángel Moreno Benitez
Carlos Correa Larios
Dahely Junueth Castelán Mendoza
Dulce Maria Guevara López
Gabriela Alarcón Esteva
Héctor Magallón Larson
Lilián Sánchez Flores
Lishey Lavariega Aguilar
Mariana Díaz Ávila
María Fernanda García Naranjo Ortega
María Teresa Salinas Azaola
Mónica Alcalá Torresdey
Rafael Enrique Fonseca Chávez
Pamela Ligregni Aguilera

Institutional coordination
Adrián Fernández Bremauntz
Luisa Sierra Brozon
Jorge Villarreal Padilla
Marisol Rivera Planter
Erika Ortiz Sánchez
Ana Sofía Tamborrel Signoret
Mariana Díaz Ávila

Technical coordination
Marco Aurelio Jano Ito
Carmen Alejandra Neri Villeda
Erika Ortiz Sánchez

Photo and icon credits
Graphic design
Ángel Moreno Benitez, ICM
Sakbe Comunicación para el Cambio Social
Zimat Consultores

Editing
Cerca Diseño

Translation
Alejandro Blázquez García
Andrea Zafra Ortega
Dennis Gastelum Rivera
Ilse Ávalos Vargas
Irving Ubaldo Tzec Quiñones
José Morales Rodríguez
José David Peñaloza Pérez
Marco Aurelio Jano Ito
Ricardo Cruz Salinas
Rodrigo Palacios Saldaña
Carbon Trust
Aldo Muller
Brenda Delgado
Iván Islas
Jorge Gutiérrez
Mari Karla Medina
Sebastián del Cueto
Zaira Rentería
FABLE- México

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Foreword

Upon signing the Paris Agreement in 2015, the nations involved delivered their Nationally Determined Contributions (NDCs). The most important aspect of these contributions relates to goals for the reduction of greenhouse gas emissions that each country promised to achieve by 2030. The NDCs also include adaptation efforts and, increasingly, actions to ensure that the climate transition can be done with justice and equity. The Paris Agreement establishes that nations are obligated to present updates to their NDCs five years after signing the Agreement, and that these must abide by the principle of progression. This means that the mitigation goals must be greater each time and show greater ambition.

Mexico set as an unconditional goal in its NDC that by the year 2030 at the latest it would reduce its emissions 22% compared with the estimation of the inertial scenario, where no mitigation efforts are made and no new public policies are implemented for reducing emissions (BAU). It also featured a goal of over 36% reduction in its emissions conditional to receiving technology transfer and financial supports from developed countries. Moreover, it promised to reduce black carbon (soot) emissions by 51% versus the BAU scenario. These goals, which were considered reasonably ambitious for that year, are now far from what is needed for a trajectory that avoids a temperature increase of more than 1.5 degrees Celsius.

At the end of 2020, our country presented before the Paris Agreement a revised version of its NDC, describing the measures needed to carry out greater efforts in adaptation and to consider in greater depth aspects of gender and attention to indigenous and other vulnerable groups. Unfortunately, however, mitigation goals remained unchanged from the 2015 version, thus failing to abide by the principle of progression. This situation perplexed the international community, since Mexico had built a positive reputation in the international climate change arena between 1995 and 2010 as a leader among emerging countries in the elaboration of emission inventories and national communications, as well as for having rescued the climate negotiations process when hosting the COP16 in Cancún in late 2010

and contributed to the creation of the Green Climate Fund, the main instrument for international funding.

In 2021, a non-governmental organization filed an amparo proceeding against the updated NDC that Mexico submitted in 2020, precisely because it did not comply with the principle of progression. A judge granted the corresponding suspension against the NDC on the grounds that the arguments raised by the organization were well founded. Resolving the judicial process constitutes an additional reason, not an impediment, to urge SEMARNAT and the Mexican government to submit a more ambitious NDC during COP27.

On October 29, 2022, SEMARNAT issued a press release confirming that Mexico would submit new mitigation targets for 2030 at COP27, consisting of 30% emission reductions as an unconditional commitment and up to 40% conditioned on receiving international support. A few days ago, on November 7, SEMARNAT presented before the Mexican public and media the most relevant aspects of the new NDC that it will formally submit to the Paris Agreement, probably during COP27.

The Climate Initiative of Mexico welcomes this decision by the Mexican government since it, together with other civil society groups, insisted on the need and urgency of this action. It is important that the official communication of the new NDC is accompanied by the detailed baseline and calculation report for each measure to comply with the requirements that the Paris Agreement establishes within its climate transparency framework. This will provide insight into the robustness of the estimates and will also facilitate the monitoring of the improvements in emission reductions.

Once the new NDC with more ambitious mitigation targets is delivered, the government and civil society groups must focus on effectively advancing the implementation of the actions that make up the decarbonization pathways for each relevant sector.

There is a profound sense of urgency. According to ICM estimates, Mexico will be among the 10 largest emitters in the world as of the middle of this decade. At the time of publishing this report, our country is the only G20 member that has not set a date to reach net zero emissions. The more developed nations such as the United

States, Canada, and those within the European Union have committed to reaching this target by 2050 at the latest. Large countries with emerging economies have already issued their commitments. For example, China has committed to reaching zero emissions by 2060, and India by 2070.

In this context, this document offers a proposal for Civil Society Engagement in the NDC process (NDC-CS). It presents an alternative as to how Mexico's NDC can be updated with greater mitigation ambition. This was developed by applying, with full awareness, the principle of common but differentiated responsibilities of the countries, and their efforts must correspond to their respective capacities, as established in the Paris Agreement itself. Based on our socio-economic circumstances and institutional and financial capabilities, **Mexico can do more.**

The main objective of the NDC with Civil Society Engagement is to support the government in its tasks and to inform Mexican society about the opportunities that exist to reduce our emissions. It shows a series of measures and public policies that would allow our country to comply with the outstanding commitments to the international community. In addition, these measures have the potential to generate green jobs and welfare, making them compatible and not contrary to the economic and social development aspirations of our country.

This document categorically demonstrates that, in terms of climate change mitigation, we can do more than what has been done in the last 10 years. As new targets to be achieved by 2030, this NDC-CS proposes a 30% reduction in greenhouse gas emissions as an unconditional commitment and up to a 47% reduction conditioned on receiving adequate financial support from developed countries.

The multidisciplinary analyses supporting this proposal are technically robust. They include the most cost-effective mitigation measures across all sectors under a climate justice approach. This NDC-CS includes some divergent proposals with respect to certain policies implemented in recent years by the federal government, particularly in the energy sector. It suggests moving forward expeditiously with the just energy transition, which requires a rapid increase in the share of renewable energies in our energy matrix and the accelerated phase-out of fossil fuels such

as coal and fuel oil, while also guaranteeing conditions of justice, equity and well-being for the populations involved in and affected by the transition.

On the other hand, this analysis does not include among the priority mitigation measures several of the actions announced in recent months as emblematic by the federal government, given that the scale of their contribution to the country's emissions reduction could be marginal and, at times, also controversial. Such is the case of the Sembrando Vida (Sowing Life) program and blue-carbon-related measures. In these and other cases, it is essential to make the methodological details of the estimates transparent and to have robust and verifiable baselines that allow adequate follow-up to verify the positive change in avoiding emissions and/or capturing a greater volume of carbon.

In this document, Climate Initiative of Mexico also applies the best practices and highest technical and climate transparency standards, so that decision both the decision makers and citizens in general can easily consult and understand the technical information of the proposed measures. The biggest challenge for our country is to not delay any longer and begin implementing or accelerating the mitigation measure. Otherwise, there will not be enough time for the emissions reduction pathway or slope to reach the mitigation target proposed here by 2030.

Fighting climate change is not only an environmental measure. The decarbonization pathway proposed here will allow our economic growth to be more sustainable and just. A study published in 2022 by the National Institute of Ecology and Climate Change concludes that the implementation of mitigation measures would allow Mexico to comfortably achieve its goals under the Paris Agreement, and would result in a positive economic balance: the monetary benefits of their implementation would be greater than the investment amounts necessary to carry them out.

The range of measures set out in this NDC has a reasonable degree of overlap with those set out in the report made by the National Institute of Ecology and Climate Change. Mexico must develop detailed portfolios of projects to be implemented in the short and medium term, and identify those for which it will request international support in the form of non-repayable grants or concessional loans that, when invested, will result in higher profits. The NDC with Civil Society Engagement must

be considered as a sustainable and low carbon development plan that will allow for the arrival of new low or zero carbon emission technologies to generate and use energy more efficiently, and achieve a more inclusive social development in line with the efforts made to address the climate emergency.

Adrián Fernández Bremauntz
Executive Director
Climate Initiative of Mexico

2 Acronyms

AAGR	Average Annual Growth Rate
AFOLU	Agriculture, Forestry and Other Land Use
ANAAE	National Association of State Environmental Authorities
BAU	Business As Usual
CCFV	Green Finance Advisory Board
CH_4	Methane
COP	Conference of the Parties
COP26	Glasgow Climate Pact
CO_2	Carbon Dioxide
CO_2e	CO_2 Equivalent
DGPAD	General Direction of Climate Action Policies
DOF	Official Journal of the Federation
GEF	Global Environmental Fund
GHG	Greenhouse Gas

GHG&C	Greenhouse Gas and Compounds
HFCs	Hydrofluorocarbons
ICM	Climate Initiative of Mexico
ICTU	The Information necessary to facilitate Clarity, Transparency and Understanding
INECC	National Institute of Ecology and Climate Change
INEGI	National Institute of Statistics and Geography
IPCC	Intergovernmental Panel on Climate Change
LGCC	General Law on Climate Change
$MtCO_2e$	One million tons of CO_2 equivalent
NDC	Nationally Determined Contribution
NDC-SC	Civil Society Engagement in the Nationally Determined Contribution process
N_2O	Nitrous Oxide
PA	Paris Agreement
PFC	Perfluorocarbons
SDG	Sustainable Development Goals

SF_6	Sulfur Hexafluoride
SEMARNAT	Ministry of Environment and Natural Resources
SINAAC	National System on Climate Change
TCO_2e	Tons of CO_2 equivalent
UNFCCC	United Nations Framework Convention on Climate Change

3 Introduction

3 Introduction

3.1 Objective of the document, legal and reference framework

In this document, ICM presents its proposed content for a NDC for Mexico (hereinafter referred to as NDC-CS). The objective of the proposal is to provide technical inputs, from civil society, to update and increase the ambition of the NDC submitted by the country in 2020 as part of the efforts to comply with Article 2 of the PA (UNFCCC, 2016) regarding long-term goals, as well as with Article 4, for compliance through the NDCs and in response to decision 1/CP.21 (UNFCCC, 2015) in paragraphs 23 to 25 of the UNFCCC concerning the implementation of the Agreement.

The NDC-CS particularly addresses the urgent call of the COP 26 through decision -/CP.26 (Glasgow Climate Pact) in its paragraphs 4, 15-19, 53, 55, 62, 64, and 68, as well as the Talanoa Dialogue (UNFCCC, 2014) to increase climate-related ambition. It is framed within the mandate of Article 7 of the Escazú Agreement (DOF, 24 April, 2021), which allows for the participation of civil society in this matter. The proposed contents directly address the fulfillment of SDG 13 (UNDP, 2017) and, indirectly, Goals 6, 7, 8, 9, 10, 11, and 15, which reflect the co-benefits associated with climate action.

Additionally, the document provides information for the fulfillment of Article 4 of the Constitution on the right to a healthy environment and Articles 2 - Section VIII, 7 - Section III, 31, 32, and 63 of the LGCC (2022)[1] on mitigation of greenhouse gases and compounds (GHG&C) to meet the long-term objectives of the PA. Furthermore, the NDC-SC adheres to and advances towards the achievement of the principles

1. "Progressivity, the goals for the fulfillment of this Law should be progressive and gradual over time, taking into account the principle of common but differentiated responsibilities and respective capacities, in the light of different national circumstances, and in the context of sustainable development and efforts to eradicate poverty; likewise, consideration should be given to the need to receive support from developed countries in order to achieve the effective implementation of the measures required for its fulfillment; without representing a step backward with regard to previous goals, considering the best available scientific information and technological advances, all in the context of sustainable development.".

of the national climate change policy, established in Article 26 (LGCC, 2022). In particular, it provides the elements for the increase of climate ambition, complying with the principle of progressivity established in Article 26, Section XIII of the Law (LGCC, 2022). It also provides information for the fulfillment of Article 2 of the Energy Transition Law (DOF, 24 December 2015), which mandates emission reductions in the energy sector. From the current international policy and legal framework in Mexico, the NDC-CS takes advantage of the fact that there is no obstacle for Mexico to submit an updated NDC with a more far-reaching mitigation commitment.

The NDC-CS also considers as a reference framework the sense of urgency of the recent studies that are part of the IPCC Sixth Assessment Report: Climate Change 2022 (IPCC, 2022), including the reports of Working Groups I, II, and III. Similarly, the NDC-CS uses the most current transparency guidelines agreed upon in the context of Article 13 of the PA and the Katowice Rulebook (UNFCCC, 2015), and is based on the document Technical Inputs of the Proposal for a Nationally Determined Contribution from Civil Society. This analysis, which is annexed to the present NDC-CS, is technically robust and was prepared by ICM; its main results are detailed in this document. Following the spirit of inclusion of paragraph 11 of the preamble[2] to the PA, the human rights framework, the concept of climate justice, and the gender perspective are taken up in the elaboration of the technical proposals to reduce GHG&C emissions.

3.2 Scope and approach of the document

The NDC-CS provides updated and complementary information from the mitigation measures described in the NDC revised in 2020 (SEMARNAT, 2020), from the document Estimation of costs and benefits associated with the implementation of mitigation actions to meet the emission reduction targets pledged in the Paris Agreement drafted by INECC in 2018, published in August 2022, and from several other sectoral instruments described at length in the document Technical Inputs of the Proposal for a Nationally Determined Contribution from Civil Society, and

2. Which acknowledges "that climate change is a common concern of humankind and that, when taking action to address it, Parties should respect, promote and consider their respective obligations on human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women, and intergenerational equity".

it includes the "Decalogue of actions against climate change", presented by the President of the Republic in June 2022.

The technical proposals to broaden the scope of Mexico's climate action focus exclusively on the GHG&C mitigation component, as part of the global efforts to comply with Article 2.1 of the PA, particularly as it relates to "holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change (UNFCCC, 2015)."

In this sense, the NDC-CS proposes that the Government of Mexico extend the commitments made in 2015 and 2020 before the UNFCCC, as well as its interest in working collaboratively with the international community to hold the global temperature increase below 2°C and make additional efforts to achieve 1.5°C, by establishing commitments on climate change adaptation and GHG&C mitigation at the same level of importance.

The mitigation component of Mexico's updated NDC should consider unconditional commitments that shall be implemented with the resources currently available to the country and conditional commitments that shall require the increased support of financial, technical, technological, and capacity-building instruments that accelerate the execution of mitigation actions within the national territory. As an unconditional commitment, the country must reduce GHG emissions by 30% by 2030 against the BAU scenario. As a conditional commitment, GHG emissions must be reduced by up to 47% by 2030 against the BAU scenario. The baseline is also detailed in the document.

In the NDC-CS, the proposed conditional and unconditional commitments are supported by a portfolio of detailed mitigation actions for each of the GHG-emitting sectors, whose mitigation potential and costs were carefully analyzed. For each sector, it also includes measures necessary to enable the implementation of actions that have a direct emission reduction impact. This analysis is extensively described in the document Technical Inputs of the Proposal for a Nationally Determined Contribution from Civil Society, which includes an analysis of the status of each

GHG-emitting sector, the estimate of the baseline, the breakdown of actions with a marginal abatement cost analysis, and an aggregated portfolio of investments. Further on, this NDC-CS includes a condensed list of priority mitigation actions that support the reduction commitment, with a cost-benefit and a technological maturity that allow its implementation.

The NDC-CS assumes that Mexico, not being an Annex I country of the UNFCCC, will have to expand this NDC "in pursuit of the objective of the Convention and being guided by its principles, including the principle of equity and common but differentiated responsibilities and respective capabilities, in the light of different national circumstances", as stated in the preamble of the Agreement. It underscores the importance of providing multilateral support in the implementation of this expanded NDC proposal, as foreseen in the PA to meet the objectives and facilitate its implementation. In addition, the climate finance component is also included in this NDC-CS, considering that financial resources are essential for meeting the established goals. This involves generating, attracting, channeling, distributing, and managing funding immediately and on a large scale for effective implementation, especially for the conditional commitment and associated actions.

The NDC-CS incorporates a vision of climate justice, just transition, and gender as cross-cutting themes in mitigation measures and enablers. In other words, the proposed measures seek to place the most vulnerable people and communities at the center of climate actions, as well as to acknowledge, identify, and address the injustices and inequalities derived from climate change impacts and mitigation actions (climate justice). The NDC-CS maintains that the actions undertaken in the face of the impacts of the process of changing from a fossil fuel-based to a decarbonized economy and society shall contemplate an equitable distribution of costs and benefits, the acknowledgment of past and future impacts, as well as the construction of spaces for participation, dialogue, and deliberation (just transition). Finally, the NDC-CS seeks to strengthen the participation of women and the empowerment of vulnerable populations from an intersectionality approach, where climate action and policy can reduce inequalities by gender, age, and ethnocultural affiliation, among others.

The vision for a just climate and energy transformation proposed in this NDC-CS coincides with the three priority areas of the National Development Plan 2019-2024: 1) Policy and Government (Justice) - to guarantee employment, health, and welfare; 2) Social Policy (Welfare) - to guarantee the effective exercise of economic, social, cultural, and environmental rights with emphasis on reducing the inequality and vulnerability conditions of populations and territories, promoting sustainable development, and the right to a safe environment with ecosystem sustainability; and 3) Economy (Development) - to create secure, permanent and well-paid employment, promote development in vulnerable areas of the country, and support rural communities. Therefore, the NDC-CS proposal adds to the efforts of the federal administration and subnational governments to fight poverty and inequality and to promote the welfare of the Mexican population.

In this sense, ICM also recognizes the importance and centrality of actions to "increase the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production" (UNFCCC, 2015), as stated in Article 2.1 of the Agreement.

For this purpose, ICM considers that the NDC updated on the subject of adaptation by the Mexican government in 2020 has sound content, and therefore, ICM subscribes to what was presented and proposes some additional considerations.

3.3 Additional considerations

The information presented here is public and it is intended to provide the public sector with concrete proposals, based on science and within the framework of climate justice, especially the federal government, which has the task of defining climate policy, in this case through the NDC. It is also a proposal for the general public, civil and social organizations in Mexico, the diversity of the emerging and vigorous youth movements, academic institutions, and the private sector on how to move forward with the decarbonization of Mexico in order to comply with the PA progressively.

ICM would like to thank and acknowledge the technical, professional, and committed effort of the entire team involved in the preparation of this document, the dozens of

colleagues from civil society organizations, youth collectives, as well as academia and the private sector for their valuable input in the preparation workshops that were essential to identify the actions that led to the proposed mitigation actions presented in this document.

As a member of civil society, ICM is pleased to present this technical offer for greater climate ambition. ICM hopes that this NDC-CS will be one of several proposals that come from non-governmental organizations and generate a more favorable environment for their adoption, without claiming, of course, that this proposal shall speak for the non-governmental sector. This effort is especially dedicated to the vigorous and diverse youth climate movement, in whom ICM places its hope that the proposed content resonates, with a sincere desire that this proposal is nurtured, discussed, improved, and enhanced.

4

Adaptation Follow-Up

4 Adaptation Follow-Up

The NDC-CS focuses exclusively on GHG mitigation measures. However, it acknowledges the importance of adaptation in addressing the potential impacts of climate change. It acknowledges the existing imbalance that favors the mitigation agenda over the adaptation agenda in terms of available funds and technical resources, an imbalance that cannot be postponed and needs to be addressed.

Reducing vulnerabilities and increasing resilience in a country like Mexico is a priority. 68% of the population in Mexico is in conditions of high and very high vulnerability (INECC, 2016). This is more than 85 million people. Approximately 59% of the municipalities present very high and high vulnerability to climate change, which is expected to be exacerbated in the future. Mexico is ranked 95th out of 181 countries most vulnerable to climate change (ND-GAIN, 2020). Its location between two oceans, and its latitude and topography, make it particularly exposed to different hydrometeorological phenomena. In 2020, SEMARNAT, in collaboration with the INECC, as part of the efforts to comply with the objectives of the PA, updated the NDC 2015 in the component of Adaptation to Climate Change, reflecting its commitment to address the condition of vulnerability and protect its biological and cultural diversity and wealth (SEMARNAT, 2020). The NDC 2020 presented an increase in ambition concerning the NDC 2015 to:

- Increase the thematic scope in the main components (i.e., deserts, islands -population and species-, cities -comfort, heat islands-, fisheries, fires).
- Convert unconditional targets into cross-cutting issues for all NDC actions.
- Identify new means of implementation.
- Increase the number of actions from 21 in the NDC 2015 to 27 in the NDC 2020 in five thematic axes

The NDC-CS recognizes and supports the contribution that these 27 adaptation actions represent towards the fulfillment of the national commitments that Mexico has signed and towards the construction of a National Adaptation Policy

(México ante el Cambio Climático, 2021), foreseen in the LGCC (2022), aimed at moving towards a low-carbon economy, reducing vulnerability, and increasing the adaptation and resilience of the population, ecosystems and productive systems to the effects of climate change. In addition, the relevance and usefulness is acknowledged of Mexico having presented in 2022 its First Communication on the Adaptation of Mexico(INECC, 2022) covering the period from 2018 to 2021.

In order to continue strengthening and increasing adaptation actions, Mexico should consider allocating resources and significant efforts towards the fundamental issues that reduce vulnerability and increase resilience, especially for the most vulnerable groups, such as: zero rates of change of native vegetation cover; disaster risk management and adaptation; productive systems and food, water, and health security; water management with a watershed approach; and conservation, restoration and sustainable use of natural resources, biodiversity and environmental services.

In this sense, Mexico needs to advance in the implementation of actions aimed at reducing vulnerability and increasing adaptation, guaranteeing that the human and financial resources allocated to this end are increased and executed under the approaches of a just, inclusive and gender-focused social transition, generating positive impacts that contribute to the fulfillment of mitigation goals.

The NDC-CS also suggests identifying participatory mechanisms that efficiently gather the various proposals from the territory, especially from youth movements, in order to strengthen adaptation measures and their effective implementation. These participatory processes should include affirmative actions to ensure equitable participation and the strengthening of the sector's capacities, especially in areas with greater vulnerability to the impacts of climate change.

Maintaining an integrated approach between the adaptation and mitigation components in several of the measures (i.e., nature-based solutions, ecosystem-based adaptation, electricity measures, waste, and food security, among others) will be a priority to achieve resilient societies, ecosystems, infrastructure, and productive systems that are less vulnerable and have greater and better adaptive capacities.

5

Mitigation commitment

5 Mitigation commitment

According to the calculations conducted for this report, Mexico can make a more ambitious commitment to bring the country's efforts closer to meeting the long-term goals of the PA. As an unconditional commitment, and implemented with resources available to the country, 30% of GHG emissions can be reduced by 2030 in relation to the business-as-usual (BAU) scenario, a value that matches the commitment recently announced by SEMARNAT as part of Mexico's new 2022 NDC (SEMARNAT, 2022). Similarly, we could reduce GHG emissions by up to 47% by 2030 in relation to the BAU scenario as a commitment conditioned on receiving international financial support. This target is higher than the 40% conditional emissions reduction also announced by SEMARNAT.

The estimated investment required for the implementation of the unconditional commitment amounts to USD 105.64 billion by 2030, and USD 255.997 billion for the implementation of the conditional commitment. The non-conditioned commitment requires the support of financial, technical, technological, and ability-strengthening instruments, which may accelerate the execution of mitigation actions in the national territory. The technical proposal of NDC-SC did not perform a new calculation regarding black carbon and, therefore, does not propose a different black carbon goal. We suggest recovering and updating the NDC 2015 and 2020 for this compound.

For each of the analyzed sectors, a baseline by 2030 was estimated, considering different hypotheses that are detailed in the Technical Inputs of the Proposal for a Nationally Determined Contribution from civil society. The total GHG emissions estimated for 2022 correspond to 757.4 $MtCO_2e$. We expect these emissions to increase at a yearly average rate of 1.5%, thus reaching 872.8 $MtCO_2e$ in 2030. It is important to point out that the baseline represents the total GHG emissions without including the removals by sinks. Considering these removals, the net emissions for 2022 are estimated to be 505.6 $MtCO_2e$ and 625.5 $MtCO_2e$ by 2030.

The Technical Annex, describes in-depth: the baseline, the national context in the sectors, the methodology used for the definition of these scenarios, the transversal hypotheses, and the marginal costs curve. For each sector, it includes the context and its historical behavior, the specific baseline, the mitigation measures, and their detailed description in each scenario. The sectoral analysis considers the climate justice framework, just transition, and gender perspective.

5.1 Unconditional scenario

The unconditional scenario involves a level of emission reduction 8% above the level defined in the NDC 2015 and 2020, establishing a 30% reduction by 2030 in relation to the baseline (265.1 $MtCO_2e$ per year). This scenario, which has a larger mitigation scope than the current NDC, can be implemented with the resources currently available to the country, as well as based on technology with a high degree of maturity and commercial penetration. Furthermore, the scenario must possess a regulatory framework and enabling policies for its implementation.

This scenario is composed of 80 GHG mitigation measures. Table 1 presents the reduction of emissions in an aggregated manner, expressed in $MtCO_2e$ and in percentage above the baseline, for each emitting sector. Moreover, it contains the comparison with the NDC 2015 to identify the level of progression in each sector.

Table 1. Mitigation by sector for the unconditional scenario compared to the 2015 NDC

Sector	NDC 2015			NDC-SC		
	Baseline 2030 ($MtCO_2e$)	Mitigation ($MtCO_2e$)	Mitigation (%)	Baseline 2030 ($MtCO_2e$)	Mitigation ($MtCO_2e$)	Mitigation (%)
Electricity and energy efficiency	266	63	25.2	198.4	77.2	38.9
Industry	165	8	4.8	155.9	15	9.6
Oil and gas	137	19	13.9	45.4	22.8	50.3
Transportation	266	48	18.0	248.9	82.1	33
Residues	49	14	28.6	67.9	26.6	39.1
Agriculture, Livestock and Other Land Use	93	7	8.0	156.1	41.4	26.5
LULUCF (absorptions)	32	56		-247.3	-275.2	

Source: Own elaboration.

Note: Percentages refer to the reduction of GHG emissions with respect to the baseline for each sector.

Main measures of emission reduction

In the electricity sector, the measure with the greatest mitigation potential is the establishment of actions and incentives to significantly increase solar and wind energy generation capacity. This endeavor could reduce nearly 30 million tons of CO_2e within the current decade. This is consistent with what many other countries in the world have stated.

In the case of large-scale solar photovoltaic energy, 26.9 GW could be reached by 2030 (a reduction of 17.2 $MtCO_2e$ by 2030). Wind power generation capacity could reach 17.5 GW, which would mean a reduction of almost 12 $MtCO_2e$ by 2030.

Simultaneously, it is necessary to limit the installation of new natural gas-fired power plants (reduction of 14.9 $MtCO_2e$), as well as to phase out all thermoelectric plants that operate with fuel oil and coal (reductions of 9.1 $MtCO_2e$ and 1.9 $MtCO_2e$, respectively). Therefore, it is essential for mitigation in the energy sector to completely eliminate the use of coal and fuel oil by 2030 and to halt the increase in natural gas usage as soon as possible.

In addition, the implementation of the large-scale Solar Home program is important, being able to grow to 231 MW by 2030, reducing up to almost 0.2 $MtCO_2e$. This translates into a direct benefit to 97,448 households, as well as the possible reduction of technical losses and the democratization of energy. This program proposes a progressive scaling up of the number of solar roofs to meet the needs of 25 million households. Furthermore, the development of 40 solar ejido (communal land) projects, with a total capacity of almost 20 MW, could reduce 0.02 $MtCO_2e$ in 2030 and directly benefit communities with a governance model where ejido holders' participation and ownership are at the center.

The expansion and strengthening of the power grid are a key enabling condition for the implementation of these measures. Investment in the National Transmission Network (RNT), as well as the expansion and modernization of the General Distribution Networks (RGD) could reduce technical losses and mitigate 0.7 $MtCO_2e$ and 1.0 $MtCO_2e$ by 2030, respectively. Undoubtedly, energy storage is another of the elements needed to decarbonize the sector, and it has been estimated that it could reach a capacity of approximately 500 MW for large-scale projects and 18 MW for distributed generation systems by 2030.

In relation to energy efficiency, efficient lighting in homes (reduction of 1.8 $MtCO_2e$) and in the commercial and service sectors (reduction of 0.3 $MtCO_2e$) should be increased; additionally, the use of liquefied petroleum (LP) gas should be replaced with solar heaters (reduction of 3.0 $MtCO_2e$). Regarding the replacement of current street lighting luminaires with LED luminaires, it is possible to reduce up to 0.7 $MtCO_2e$ per year by 2030. This could replace 8.5% of the country's street lighting luminaires.

In the transportation sector, the energy efficiency norm for light vehicles (NOM 163) in terms that have been proposed by civil society groups repeatedly. If so, the emissions reduction potential would be 19.5 $MtCO_2e$. This is the measure with the highest mitigation potential of the entire scenario. This NOM would generate, in the short term, the accelerated exit of 6 and 8-cylinder SUVs from the market, and a notable increase in the sale of hybrid vehicles. Finally, there is the electrification of the vehicle fleet (with a potential reduction of 11.8 $MtCO_2e$).

In the oil and gas sector, decreasing the venting and flaring of natural gas (reduction potential of 11.9 $MtCO_2e$ per year in 2030) has a large mitigation potential, and so do the implementation of the cogeneration projects in Mexican Petroleum (PEMEX) (reduction potential of 5.3 $MtCO_2e$) and the reduction of fugitive methane emissions (reduction potential of 4.5 $MtCO_2e$).

In the industrial sector, the main mitigation measure is increasing the participation of alternative fuels in the cement sector (reduction potential of 3.3 $MtCO_2e$). In general, the industrial sector involves a significant number of energy efficiency measures with a relatively minor potential. However, their implementation is necessary to achieve the proposed reductions in this sector.

Using biogas in both wastewater treatment plants and landfills is a measure that can reduce up to 9.8 $MtCO_2e$ yearly by 2030 in the waste sector. Additionally, it is necessary to decrease the GHG emissions through plastic recycling (2.6 $MtCO_2e$) and thermal decomposition (4.2 $MtCO_2e$).

Finally, the restoration of forest ecosystems (18.8 $MtCO_2e$), as well as the protection of forest lands (22.0 $MtCO_2e$), present the greatest mitigation potential for agriculture, sylviculture, and other land uses.

Green hydrogen has been considered as a viable mitigation alternative for several sectors of the economy, such as the oil and gas, mining, steel and transportation sectors, to mention a few examples. However, given its current development and costs, it was only considered for the conditional scenario.

The Technical Annex also includes the enabling conditions required for the implementation of the described mitigation measures. As the former measures are

not exhaustive, developing an NDC-SC implementation route will be required in the immediate future.

The proposed measures are complementary and based on the actions presented by the federal government in the document *Estimation of costs and benefits associated with the implementation of mitigation actions for the fulfillment of the emission reduction objectives committed to the Paris Agreement.* However, as noted, the NDC-SC includes several necessary proposals that run counter to the priorities of the current federal government.

For the energy sector, all measures are considered, differentiated in ambition scope. For example: the replacement of fuel oil with natural gas, the increase in the capacity of renewable energy, and the decrease of losses in medium and low voltage networks.

Table of mitigation measures

A summary table of mitigation actions and measures by emission sector is presented below. Details regarding mitigation potential, scope, assumptions, emission factors and other information are described in the Technical Annex.

Table 2 List of mitigation measures by sector. Unconditional Scenario

Electricity and energy efficiency							
1. Improve water-pumping systems for irrigation	**2.** Incorporation of efficient lighting systems in the commercial and service sector	**3.** Incorporation of efficient lighting systems in housing	**4.** Refrigerator replacement	**5.** Laundry equipment replacement	**6.** Air conditioning system replacement	**7.** Domestic water pumping equipment replacement	**8.** Replacement of existing street lighting luminaires with LED luminaires
9. Improve efficiency of drinking water pumping system technologies	**10.** Creation and strengthening of mechanisms for the promotion of distributed generation (DG)	**11.** "Ejido Solar"	**12.** Solar Households	**13.** Establishment of goals and mechanisms for the addition of large-scale geothermal capacity	**14.** Establishment of goals and mechanisms for the addition of large-scale hydroelectric capacity	**15.** Establishment of goals and mechanisms for the addition of large-scale solar photovoltaic capacity	**16.** Establishment of goals and mechanisms for the addition of large-scale wind power capacity
17. Limit the installation of new fossil fuel-based power plants	**18.** Fair and planned removal of thermal power plants that have exceeded their useful life	**19.** Launch of programs for the reduction of non-technical losses in the General Distribution Grids (GDG) and energy poverty through DG	**20.** Investment in the National Transmission Network (RNT) for the reduction of losses during transmission	**21.** Investment in expansion and modernization of the GDG to reduce technical losses	**22.** Incorporation of solar water heaters (SWH) in housing		

Oil and gas							
23. Reduction of gas flaring and venting	**24.** Methane leak detection and repair	**25.** Vapor recovery units	**26.** Change of wet seals for dry seals in compressors	**27.** Conversion of pneumatic devices from natural gas to air	**28.** Caldron efficiency (economizers and excess air control)	**29.** Air preheating in distillation, reforming and hydrodesulfuriza-tion furnaces	**30.** Thermal integration in crude oil distillation units, low cost
31. Increased burner efficiency	**32.** Carbon Capture and Storage with Enhanced Oil Recovery	**33.** Cogeneration	**34.** Reduction of deep and ultra-deep waters production of hydrocarbons	**35.** Use of green hydrogen during refining	**36.** Power recovery of regeneration gases in FCC	**37.** Mitigation of incrustations in heat exchangers of crude oil distillation units	**38.** Replacement of damaged steam traps
39. Cooling tower modernization	**40.** Thermal integration of atmospheric and vacuum distillation units (combined plants)	**41.** Thermal efficiency in boilers of natural gas processing centers					
Agriculture, Forestry and Other Land Use							
42. Sustainable increase in agricultural productivity	**43.** Sustainable increase in livestock productivity	**44.** Forest protection	**45.** Forest ecosystem restoration				

Waste							
46. Biogas collection, combustion, and utilization in landfills	**47.** Anaerobic digestion plants	**48.** Biogas collection and utilization in municipal WWTPs	**49.** Increased coverage for municipal wastewater treatment	**50.** Increased coverage for industrial wastewater treatment	**51.** Thermal treatment		
Transportation							
52. Partial adaptation of online activities	**53.** Optimization of public transportation routes in metropolitan areas	**54.** Logistic improvements for freight transportation	**55.** Last mile optimization	**56.** Shared mobility promotion	**57.** Modal split of road to rail freight transport	**58.** Modernization of public transportation in metropolitan areas	**59.** Scrapping and renewal program for road freight transportation
60. Technical-economic training (Eco-driving) for freight transportation	**61.** Update of energy efficiency standard for new light-duty vehicles	**62.** Last mile adoption of cargo bikes	**63.** Electric vehicles	**64.** Energy efficiency improvement and pollution reduction in diesel-powered vehicles	**65.** Rail transportation efficiency	**66.** Infrastructure development and consolidation for active and non-motorized mobility	**67.** Urban planning programs with redensification and non-motorized modes of transportation
Industry							
68. Increase the share of alternative fuels in thermal consumption of the cement sector	**69.** Efficient cogeneration in the lime sector	**70.** Efficient cogeneration and sale of surpluses in sugar mills	**71.** Implementation of cogeneration systems in the chemical industry	**72.** Iron and steel: steel molding and direct forming	**73.** Iron and steel: energy efficiency measures and process improvement (electric arc furnace)	**74.** Glass: recuperative furnaces (air preheating)	**75.** Glass: recycled glass and batch preheating

76. Pulp and paper: press extension for drying (shoe press)	**77.** Pulp and paper: Condebelt drying	**78.** Increase the participation of alternative fuels in the thermal consumption of the cement sector	**79.** Pulp and paper: cogeneration	**80.** Pulp and paper: increased secondary fiber recovery	**81.** SMEs: installation of photo-voltaic panel systems	**82.** SMEs: installation of cogeneration systems	**83.** Automotive: energy efficiency - optimizing furnace efficiency by eliminating energy losses and implementing heat recovery systems and control equipment
84. Cement: substitution of cement clinker with other cementious materials	**85.** Mining: utilization of methane gas from underground mines for electricity generation	**86.** Mining: green hydrogen use in haul trucks	**87.** Mining: photo-voltaic systems for power generation in mines	**88.** Chemical: energy efficiency in electrical and thermal systems.			

Source: Own elaboration.

5.2 Conditional scenario

The conditional scenario commits to an emission reduction level of 11% additional to the one defined in the NDC 2015 and 2020, establishing the commitment at 47% reduction relative to the baseline (415.9 $MtCO_2e$ per year) by 2030. Emission reduction is achieved through the implementation of all measures from the unconditional scenario, with an extended reach in some cases, as well as additional measures. This scenario includes interventions based on pilot-tested technology (TRL 7) and the existence of financing, resources and technical assistance given the national context.

The conditional scenario commits to an emission reduction level of 11% additional to the one defined in the NDC 2015 and 2020, establishing the commitment at 47% reduction relative to the baseline (415.9 $MtCO_2e$ per year) by 2030. Emission reduction is achieved through the implementation of all measures from the unconditional scenario, with an extended reach in some cases, as well as additional measures. This scenario includes interventions based on pilot-tested technology (TRL 7) and the existence of financing, resources and technical assistance given the national context.

This scenario includes the 80 measures of the unconditional scenario, with higher ambition, plus 8 additional measures. Table 3 shows emission reduction for each emitting sector, both in $MtCO_2e$ and in percentage relative to the baseline for each sector, as well as the comparison against the NDC 2015.

Table 3. Percentage of mitigation for the conditional scenario compared to the NDC 2015

Sector	NDC 2015			NDC-SC		
	Baseline 2030 ($MtCO_2e$)	Mitigation ($MtCO_2e$)	Mitigation (%)	Baseline 2030 ($MtCO_2e$)	Mitigation ($MtCO_2e$)	Mitigation (%)
Electricity and energy efficiency	266	63	25.2	198.4	101.8	51.3
Industry	165	8	4.8	155.9	28.6	18.3
Oil and gas	137	19	13.9	45.4	40	88.1
Transportation	266	48	18.0	248.9	104.3	44.7
Residues	49	14	28.6	67.9	111.4	66.7
Agriculture, Livestock and Other Land Use	93	7	8.0	156.1	88.8	56.9
LULUCF (absorptions)	32	-14		-247.3	-314.3	

Source: Own elaboration.

Note: Percentages refer to the reduction of GHG emissions with respect to the baseline for each sector.

In this scenario, the electricity and energy efficiency sector considers the measures from the unconditional scenario with an increased participation. The increase in emission reduction measures for this sector amounts to 31.8% when compared to the unconditional scenario. The increase in ambition compared to the unconditional scenario for the transport, waste, and agriculture, forestry and other land use sectors amounts to 44%, 70.3%, and 114.6%, respectively. As for the industry sector, the increase was 90%, and it includes two additional green hydrogen projects in 2030, additional for the mining sector. Lastly, for the oil and gas sector there was a 75.0% increase when compared to the unconditional scenario. This sector also considers the use of green hydrogen; in this case, in the middle distillates hydrodesulfurization processes for a PEMEX refinery (Salamanca). As mentioned above, green hydrogen was considered for this scenario due to the great international interest in the technology and the accelerated technological advancement that has taken place in recent years. The systems considered correspond to comparable systems that will be in operation internationally by 2030.

5.3 Cost Analysis

The implementation of the measures that will allow the reductions described above requires financial resources, which in the unconditioned scenario amount to 105.640 billion dollars by 2030, with an annual investment of 13.205 billion dollars; and in the conditioned scenario, to 255.997 billion dollars by 2030, with an annual investment of 32 billion dollars.

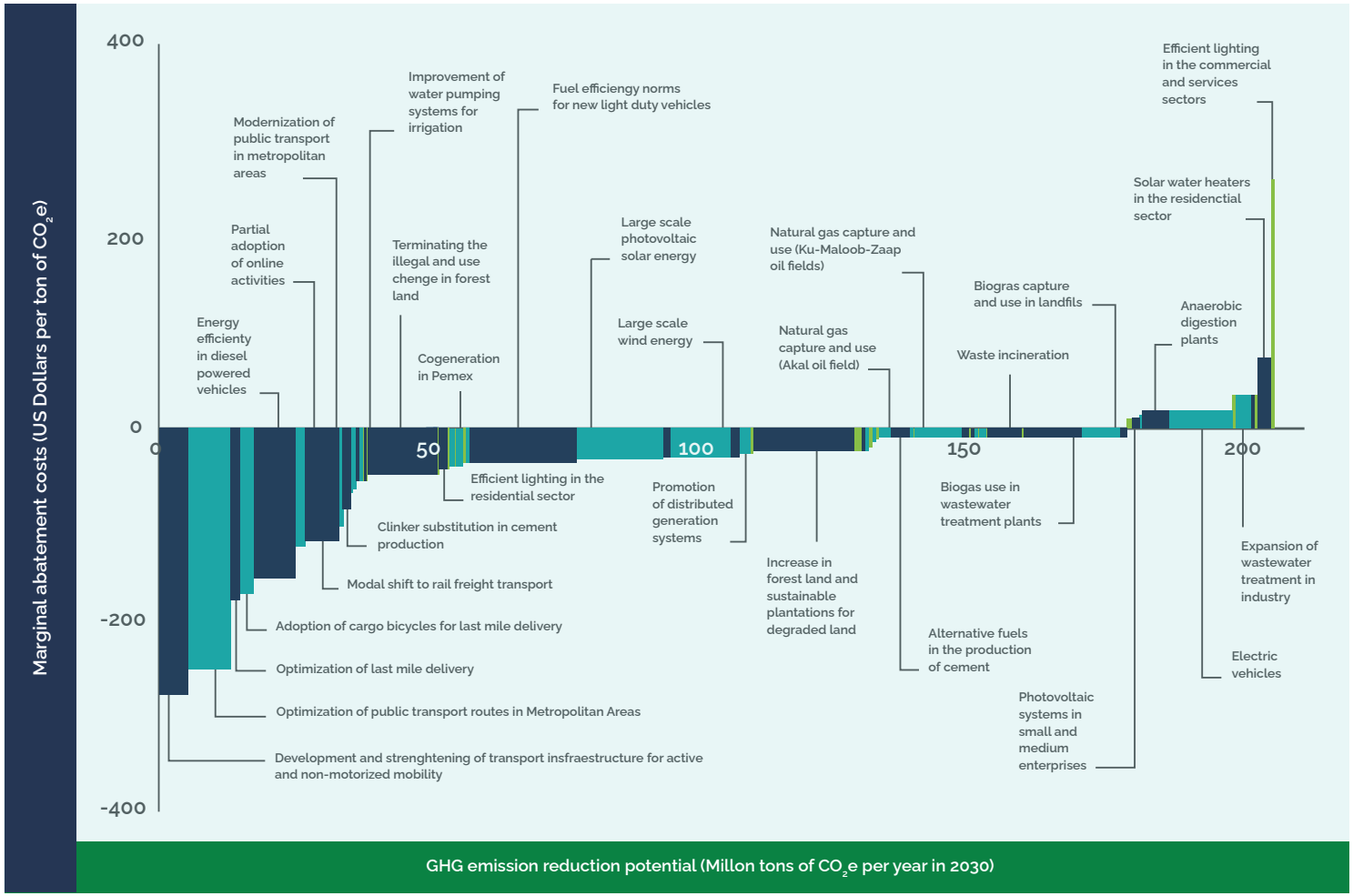
The analysis of the abatement cost curve for the conditional scenario is presented below. From this analysis, the actions with the lowest cost and highest mitigation potential are identified, and these are the priority actions to move towards meeting the mitigation targets.

It is important to note that, due to a lack of consistent information, it was not possible to estimate the marginal abatement costs of all measures, however, the most important measures are included. Of the measures reviewed, 83% are measures that are cost-effective, i.e. have a negative marginal cost. The measure with the lowest marginal cost (-272.4 USD/tCO_2e) concerns the development and strengthening of infrastructure for active and non-motorized mobility. Likewise, the

measure with the highest marginal cost (257.8 USD/tCO_2e) concerns efficient lighting in the commercial sector and services in the electricity and energy efficiency sector.

The detailed description of the cost results of the measures, as well as assumptions and calculations for each measure, are presented in their respective sectoral chapters in the Technical Annex.

Figure 1. Marginal abatement cost curve for the unconditional scenario



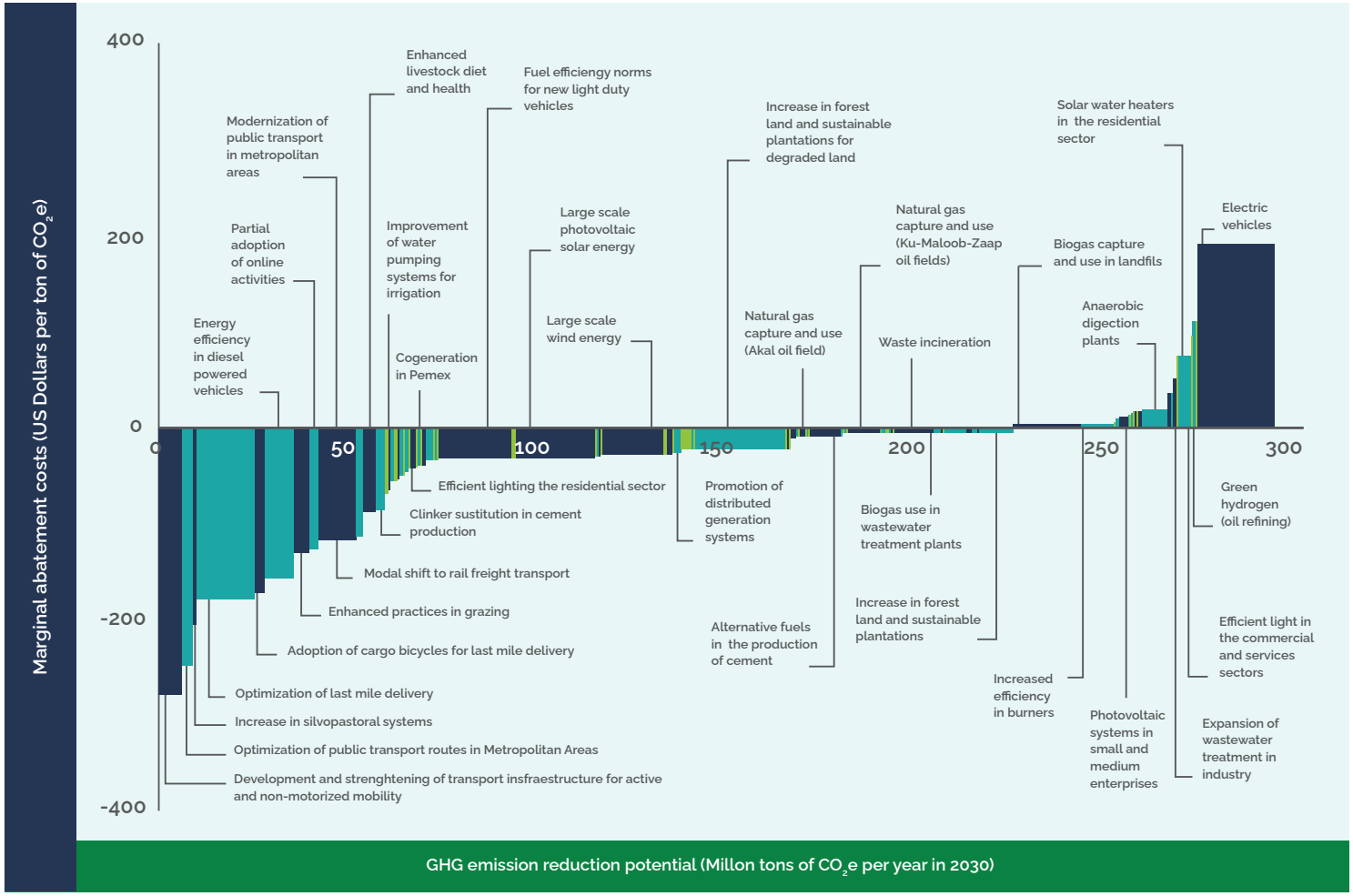
Source: Own elaboration.

In the case of the conditional scenario, the ambition needed to decarbonise the Mexican economy is increased and, therefore, a larger amount of resources is required to carry out the proposed mitigation. In addition, measures whose implementation cost remains high, such as green hydrogen, are incorporated. As mentioned above, the effort required amounts to USD 255.997 billion by 2030, with an annual investment of USD 32 billion.

Of the proposed measures, and based on the available information, 77% are cost-effective measures, i.e. they have a negative marginal cost. The measure with the lowest marginal cost (-272.4 USD/tCO_2e) concerns the development and strengthening of infrastructure for active and non-motorized mobility. Likewise, the measure with the highest marginal cost (189.9 USD/tCO_2e) concerns electric vehicles.

The marginal abatement cost curve for all sectors analysed in the conditional scenario is presented below. The assumptions and calculations for each of the measures are presented in their respective sectoral chapters in Technical Annex.

Figure 2. Marginal abatement cost curve for the conditional scenario



Source: Own elaboration.

6

Just transition, climate justice and gender as framework for climate action

6 Just transition, climate justice and genderas framework for climate action

6.1 Acknowledgement of inequalities within the climate action field

The NDC-SC acknowledges the historic injustices and structural inequalities within the climate action field and suggests designing public policies as well as starting climate actions from a justice framework. The inequalities are presented in different ways, such as in the emissions levels, the access to information and financing or in the lack of infrastructure and adaptive measures.[3] Vulnerability towards climate crisis affects people unequally and worsens in regions where high poverty and marginalization rates exist. The consequences caused by the growth in the average global temperature will especially concern women, the elderly, and girls (IPCC, 2019).

The climate action that is exhibited through the NDCs is an opportunity for reducing inequalities, lowering the growth model's negative effect, and fixing both the damages caused by the climate change's direct impact and the indirect one due to projects that have not developed the unrestricted respect to the human rights structure. Climate action is also an opportunity to trigger social and economic benefits that contribute to the population's well-being like safe and high-quality employments, improvements in air quality, energy security, etc. The NDC-SC proposed measures' design and implementation is a window for leveraging the above-mentioned opportunities. The NDC implementation pathway should contain an approach and tools that ensure this use.

3. For example, the poorest 10% of Mexico's population emits only 2.7% of total CO2e emissions (2 tons per capita), while the richest 10% produce 10 times that amount. The most relevant gap is observed when analyzing Mexico's richest 1%, who emit 44 times what the poorest emit. (World Inequality Report, 2022) (Chancel, L., Piketty, T., Saez, E., Zucman, G. et al, 2022). In the transportation sector, the higher income decile is responsible for 40% of the emissions (Vera et al., 2021).

6.2 A just transition, climate justice, and gender as a framework for a more far-reaching NDC

The NDC-SC considers mitigation actions framed by climate justice and just transition. The former implies placing the most vulnerable people and communities at the center of climate decisions and actions, as well as equitably identifying, recognizing, and addressing inequalities arising from climate change impacts, promoting positive impacts, and reducing negative ones (Sultana, 2021). As a complement, just transition is understood as the equitable distribution of costs and benefits, the recognition of past and future impacts, as well as the construction of spaces for participation, dialogue, and deliberation around the transformation of an economy based on fossil fuels towards a decarbonized one.

The NDC-SC incorporates the gender perspective in mitigation measures, which seeks to strengthen the participation of women and the empowerment of vulnerable populations from an intersectional approach. It also recognizes and identifies discrimination, unequal access to productive resources, and the exercising of rights that women suffer in our country, which places them as a population vulnerable to climate change. Consequently, the proposed mitigation measures are also aimed at reducing gender inequalities, which place racialized populations, women, and indigenous communities, among others, in a context of greater vulnerability to the effects of climate change.

In Mexico, these discussions should be translated into concrete actions such as the design and implementation of a just transition away from coal and other fossil fuels in the generation of electricity, where environmental and social damage to local populations impacted by mining and coal burning is repaired, spaces for participation in decision-making are created, and the construction of economic alternatives is encouraged. Such alternatives should build climate resilience and ensure quality, low-risk jobs for affected people.

Mexico has the opportunity to implement climate change mitigation actions that, at the same time, ensure sustainable, just, and equitable development for the population. The components of justice for each sector are described in the Technical Annex.

7

Information to Facilitate Clarity, Transparency, and Understanding

7 Information to Facilitate Clarity, Transparency, and Understanding

The NDC-SC adheres to the transparency criteria and guidelines of the UNFCCC and recognizes that the instruments on the subject generate the necessary confidence to know, deliberate, and adjust the mitigation measures, an essential condition for an NDC to be appropriate as an instrument of public purpose at the service of the country. In this context, the NDC-SC presents its content through the ICTU.

7.1 Reference Framework

In accordance with the provisions of Articles 4 and 13 of the PA on communication and transparency regarding the NDC, the Parties shall provide the information necessary for Clarity, Transparency, and Understanding (Article 4, paragraph 3) of the commitments. In this regard, Parties should promote environmental integrity, transparency, accuracy, completeness, comparability, and consistency and ensure that double counting (Article 4, paragraph 13) is avoided for anthropogenic emissions and removals for their NDCs.

A transparency framework should also be established, following Article 13, that contributes to a clear understanding of climate change action, including clarity, monitoring, and progress toward achieving the NDCs, as well as information on their emissions inventories and that which is necessary to track progress in their NDC implementation and compliance. Therefore, we emphasize the commitment to update the NDC-SC in scope, not only in its mitigation and adaptation components but also by presenting the information that composes it in a way that ensures transparency, clarity, and monitoring of the goals set.

7.2 ICTU Table

ICTU Table is presented in accordance with the information requirements included in Annex 1 of resolution 4/CMA.1, corresponding to Article 4.8 of the PA.

ICTU Element (Decision 4/CMA.1)		Source
1. Reference point information		
(a) reference year(s), base year(s), reference period(s) and other starting point(s);	The baseline was constructed based on different assumptions and reflects the possible evolution of emissions in each of the sectors.	
(b) Quantifiable information on the reference indicators, their values in the reference year(s), base year(s), reference period(s) and other starting point(s) and, if applicable, in the target year; (if 1 (c) is met, then it's not applicable)	For each of the sectors analyzed, a 2030 baseline was estimated considering different assumptions presented in each of the sectoral chapters. Total estimated GHG emissions for 2022 correspond to 757.4 $MtCO_2e$. These emissions are expected to grow at an average annual rate of 1.6%, reaching 872.8 $MtCO_2e$ in 2030. The sector with the highest growth in emissions during that period is the transportation sector, with an Average Annual Growth Rate (AAGR) of 2.5%. The AFOLU sector, on the other hand, shows the lowest growth with 0.2 percent. In the case of the oil and gas sector, its AAGR was estimated at 0.2%. In recent years, emissions from this sector have decreased significantly due to reduced hydrocarbon production and operational problems throughout the sector's supply chain.	Review section 5 Mitigation Commitments. Table 1. Mitigation by sector for the unconditional scenario.

ICTU Element (Decision 4/CMA.1)		Source
(c) For the strategies, plans and actions referred to in Article 4, paragraph 6 of the PA, or policies and measures as components of the nationally determined contributions where paragraph 1 (b) above is not applicable, Member Countries shall provide additional relevant information; (If 1 (b) is met, this is not applicable, unless a country has also established policies and measures).	A total of 88 mitigation measures were analyzed for all sectors, some of which include specific actions. The measures presented in this work were analyzed individually, estimating their mitigation potential, as well as their marginal abatement costs (over their lifespan), for those measures for which sufficient information was available, using the methodology presented by the INECC (2021). Eventually, the packages of measures for the unconditional and conditional mitigation scenarios were defined. The technical details of the considered measures are described in the different sectoral chapters of the Technical Annex.	Review section 5 "Mitigation Commitments" For more detailed information by sector, see document Technical Annex.
(d) Target related to the reference indicator, expressed numerically, e.g., in percentage or amount of deduction;	An unconditional commitment is to reduce GHG emissions by 30% by 2030 with respect to the BAU scenario. The measures can reduce up to 265.1 $MtCO_2e$. A conditional commitment is to reduce GHG emissions by up to 47% by 2030 with respect to the BAU scenario.	Review section 5 Mitigation Commitment
(e) Reports on the data sources used to quantify the reference points;	The main sources of information include the National Inventory of Greenhouse Gases and Compounds 2019, as well as official sources according to each sector. The review of mitigation measures and their costs considered previous studies for Mexico, including Johnson et al. (2009);, Houdashelt, Helme and Klein (2009);, CMM-McKinsey (2008);, IMCO (2011),); MGMInnova (2012),); INECC-Mckinsey (2013),); CMM (2017; 2018),); ICM-CarbonTrust (2020);, INECC (2018g; 2018h) and INECC (2021).	For additional information on data sources see the Technical Annex.

ICTU Element (Decision 4/CMA.1)		Source
(f) Reports on the circumstances in which the Member Country may update the values of the reference indicators.	The ICM proposal, coinciding with the 2015 NDCs, offers two emission mitigation scenarios: one whose mitigation is not conditioned and will be implemented with the resources currently available to the country and those that are conditioned, which require increased support of financial, technical, technological and ability building instruments to accelerate the implementation of mitigation actions in the national territory. A conditional commitment is to reduce GHG emissions by up to 47% by 2030 with respect to the BAU scenario. The conditional commitments are backed by a portfolio of detailed mitigation actions for each of the GHG emitting sectors, whose mitigation potential and costs were carefully analyzed.	Review Technical Annex.
2. Time frame and implementation period		
(a) Establishes the time frame and/or implementation period, including start and closing dates, consistent with any other relevant decisions adopted by the Conference of Member Countries in a meeting of the Member Countries in the PA (CMA);	The established commitments have a target date of 2030. The implementation period will be from 2022 to 2030.	Review Technical Annex.
(b) Whether it is a single-year or multi-year objective, if applicable.	Target to 2030.	

ICTU Element (Decision 4/CMA.1)		Source
3. Scope and coverage		
(a) Target general description;	Mexico's target consists of an unconditional component of 30% reduction in relation to the baseline scenario and a conditional component of 47% reduction below the baseline scenario.	
(b) Sectors, gases, categories and scopes covered by the nationally determined contribution, including, as appropriate, that it is consistent with the Intergovernmental Panel on Climate Change (IPCC) guidelines;	Sectors: • Electricity and Energy Efficiency • Oil and gas • Agriculture, Forestry and Other Land Use (AFOLU) • Waste • Transportation • Industry Gases: Carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCS) and sulfur hexafluoride (SF6). The global warming potentials (GWP) for each of the considered GHGs are those reported for a 100-year period by Working Group I in the IPCC Sixth Assessment Report in 2021. In the case of CH4, the value was considered to be 29.8, while for N2O it was considered to be 273. In addition, factors of emission were used by default for CH4 and NO2 presenting IPCC (2006; 2019).	

ICTU Element (Decision 4/CMA.1)		Source
(c) How the member country has taken into consideration paragraphs 31 (c) and (d) of decision 1/CP21;	The sector's absorptions were estimated at -251.9 million tons of CO2e in 2022. According to the Inventory, since 2000, absorptions remained practically even over 25 years, with a decrease (-2.25%) between 2000 and 2019 (SEMARNAT-INECC, 2022). The current mitigation potential of the AFOLU sector at national level is around 20% of annual emissions, but if mitigation efforts directed towards this sector increase, it could grow up to 25% (Pye and Bataille, 2016).	Review Technical Annex, AFOLU Sector.
(d) Collateral benefits of the mitigation from Parties' adaptation measures and/ or economic diversification plans, including a description of specific projects, measures and initiatives from Member Countries' adaptation measures and/or economic diversification plans.	Mexico's NDC 2020, in the climate change adaptation component, includes 27 lines of action, 18 of which are consistent with GHG mitigation benefits. Among the most relevant measures are: achieving, by 2030, a zero net deforestation rate; implementing actions in 50% of the municipalities identified as vulnerable; protection of strategic infrastructure; integrated management of water resources; conservation and restoration of marine ecosystems; soil restoration; restoration and conservation of blue carbon ecosystems and coral reefs; implementing actions to strengthen the management and conservation of forests and jungles.	
4. Planning process		
(a) Information on the planning processes undertaken by the Member Country to prepare its nationally determined contribution and, if available, on the Member Country's implementation plans, including, as appropriate:		

ICTU Element (Decision 4/CMA.1)		Source
(i) National institutional agreements, public participation and commitment with local communities and indigenous population with gender considerations.	Under the regulatory framework for climate change governed by the General Law on Climate Change, aligned with the commitments acquired after the adoption of the PA, Mexico has the National Climate Change System, that frames the national institutional agreements and establishes the institutions, mechanisms and processes for planning, coordinating, implementing and evaluating the national climate change policy. The preparation and planning process of this document was based on inputs from different stakeholders, where dialogues with the participation of civil society organizations, youth collectives and representatives of the academic and private sectors were conducted. In the participatory process with Mexican youth, a total of 11 working groups were held involving a total of 286 young people between the ages of 12 and 29 from different parts of the country, so that the voices of young people and their impact on the fulfillment of Mexico's NDCs could be heard. This NDC-SC incorporates the gender perspective in mitigation measures, which seeks to strengthen the participation of women and the empowerment of vulnerable populations from an intersectional approach. It also recognizes and identifies the discrimination, the unequal access to productive resources and the exercise of rights suffered by women in our country, which places them as a population vulnerable to climate change. As a consequence, the proposed mitigation measures are also aimed at reducing gender inequalities, which place racialized groups, women, indigenous communities, among others, in a context of greater vulnerability to the effects of climate change.	For details, see Section 3.1 "Objective of the document, legal and reference framework". Review section 2. Review section 6.

ICTU Element (Decision 4/CMA.1)		Source
(ii) Contextual matters including, among others, as applicable: a. Inclusion of relevant national circumstances such as geography, climate, economy, sustainable development and poverty eradication. b. Report of best practices and experiences in relation to the development of the nationally determined contribution; Best practices and experience are shared. c. Information is provided on other hopes and situational priorities that were recognized when joining the PA.	a) Contextual information on national circumstances is presented in the following sections: section 3. Introduction; section 4. Adaptation follow-up includes relevant data on geography, climate, and country and population vulnerability; section 6. Just transition, climate justice and gender as a framework for climate action includes aspects of poverty eradication and sustainable development. b) In order for this NDC-SC to be developed through best practices, a brief diagnosis was carried out based on Participatory Workshops with civil society organizations and academia to identify windows of opportunity to improve technical and communication aspects of the NDC 2020. c) Based on the results of the independent evaluation, "Mexico NDC Transparency Analysis" (México ndc Transparency Check) (CTI, 2020), lessons learned are taken up to strengthen and improve the given information, with clarity, transparency and understanding. d) Section 6 sets out Mexico's climate justice and just climate transitions priorities.	

ICTU Element (Decision 4/CMA.1)		Source
(b) Information applicable to Member Countries, which includes regional economic integration organizations and Member States that have reached an agreement to act jointly under paragraph 2 of Article 4 of the PA, including the Parties that agreed to act jointly and the terms of the agreement, in accordance with paragraphs 16 to 18 of Article 4 of the PA;	N/A	
(c) The way in which the preparation of the Member Country's nationally determined contribution has been based on the results of the overall emissions assessment, in accordance with paragraph 9 of Article 4 of the AA;	At the time of the preparation of this NDC-SC, there has not yet been a calculation of the global assessment, however Mexico is committed to respond adequately through a fair contribution to the needs of reducing the emission gap towards the global goal.	

ICTU Element (Decision 4/CMA.1)		Source
(d) Each Member Country with a nationally determined contribution under Article 4 of the PA consisting of adaptation measures and/or economic diversification plans that result in collateral mitigation benefits, in accordance with paragraph 7 of Article 4 of the PA, shall submit information on:	For details, see section 4 Adaptation Follow-Up.	
(i) How the economic and social consequences of the response measures have been taken into consideration when developing the nationally determined contribution.	Mexico is ranked 95th out of 181 countries vulnerable to climate change (ND-GAIN. 2020).. 68% (INECC, 2016) of a total population of 126,014,024 people (INEGI,2020) are in conditions of high and very high vulnerability. Therefore, Mexico should consider allocating resources and great efforts towards essential issues that reduce vulnerability and increase resilience, especially for the most vulnerable groups: - Zero rate of change of native vegetation cover. - Disaster risk management and adaptation - Production systems and food, water and health security - Water management with a river basin approach - Conservation, restoration and sustainable use of natural resources, biodiversity and environmental services.	Review Section 4.

ICTU Element (Decision 4/CMA.1)		Source
(ii) Specific projects, measures and activities to be implemented to contribute to the collateral mitigation benefits, including information on adaptation plans that also produce collateral mitigation benefits, which may include, but are not limited to, key sectors such as energy, aquifers and coastal resources, human settlements and urban planning, agriculture and forests; and economic diversification actions which may include, but are not limited to, sectors such as manufacturing and industry, energy and mining, transport and communications, construction, tourism, real estate, agriculture and fishing.	ICM recognizes and supports the contribution of adaptation projects, measures and activities established in the NDC 2020, towards the fulfillment of the national commitments that Mexico has subscribed to and towards the construction of a National Adaptation Policy (México ante el Cambio Climático, 2021), foreseen in the LGCC (2022), aimed at moving towards a low-carbon economy, reducing vulnerability and increasing the adaptation and resilience of the population, ecosystems and productive systems in the face of the negative effects of climate change. The integrated approach between the adaptation and mitigation components in several of the NDC 2020 measures (i.e., nature-based solutions, ecosystem-based adaptation, electricity, waste and food security measures, among others) will be a priority to achieve resilient societies, ecosystems, infrastructure and productive systems, less vulnerable and with greater and better adaptive capacities.	Review Section 4.

ICTU Element (Decision 4/CMA.1)		Source
5. Assumptions and methodological approaches (including those for estimating and accounting for anthropogenic GHG emissions and, where appropriate, absorptions		
(a) Assumptions and methodological approaches used for the justification of anthropogenic greenhouse gas emissions and absorptions corresponding to the nationally determined contribution of the Member Country, in accordance with paragraph 31 of decision 1/CP21 and the guidance for the justification adopted by the PA Member Countries (CMA);	Mexico accounts for emissions in the National Inventory of Greenhouse Gases and Compounds, which is calculated based on IPCC 2006 and its Refinement 2019 methodologies. Detailed methodological aspects are available in the Technical Annex.	Review Section 5 and Techinical Annex.
(b) Assumptions and methodological approaches used to explain the implementation of policies and measures or strategies in nationally determined contribution;	The measures presented in this work were analyzed individually, estimating their mitigation potential, as well as their marginal abatement costs (over their lifespan), with the methodology used by the INECC (2021). Detailed methodological aspects are available in the Technical Annex.	Review Techinical Annex

ICTU Element (Decision 4/CMA.1)		Source
(c) If appropriate, information on how the Member Country will take into account existing methods and guidance under the Convention to account for anthropogenic emissions and absorptions, in accordance with Article 4.14 of the PA, as appropriate;	The mitigation estimation of the measures and scenarios detailed in the "Technical Annex" follow the transparency framework of Article 13 of the AAppPdA, which underlines the importance of including clarity and monitoring of progress towards the targets of the Nationally Determined Contributions. The estimation of emission reductions was done at a measurement level towards an overall annual target in 2030 and annual interim estimates between 2022 and 2030.	
(d) IPCC methodologies and metrics used to calculate anthropogenic greenhouse gas emissions and absorptions.	The 2006 IPCC Guidelines and 2019 Refinement are used to estimate GHG emissions and absorptions.	Review Section 5 and Techinical Annex.
(e) Sector, category or activity-specific assumptions, methodologies and approaches consistent with the relevant IPCC guidance, including, as appropriate:		
(i) Approach to address subsequent emissions and absorptions from natural disturbances on cultivated land;	For accounting purposes, emissions and removals from natural disturbances on cultivated land will be excluded from the total.	
(ii) Approach used to account for emissions and absorptions from lumber products;	The national inventory update applies IPCC guidelines with the use of harvested wood product variables to estimate annual changes in carbon stocks, each of which is estimated using a flow data method with lifetime analysis. In this exercise, with the official public information available, it was not possible to estimate the variables.	

ICTU Element (Decision 4/CMA.1)		Source
(iii) Approach used to address the effects of forest age category;	N/A Mexico does not use this approach.	
(f) Other assumptions and methodological approaches used to understand the nationally determined contribution and, if applicable, to estimate corresponding emissions and absorptions, among others:		
(i) The way in which the reference indicators are developed, the baseline(s) and/or reference level(s) among them, if applicable, the specific reference levels by sector, category or activity, including, for example, key parameters, suppositions, definitions, methodologies, data sources and models used;	For each of the sectors analyzed, a baseline for 2030 was estimated considering different assumptions presented in each of the sectoral annexes. Total GHG emissions estimated for 2022 correspond to 757.4 million tons of CO2e ($MtCO_2e$). These emissions are expected to grow at an average annual rate of 1.6%, reaching 872.8 $MtCO_2e$ in 2030.	Review section 5.

ICTU Element (Decision 4/CMA.1)		Source
(ii) For Parties with nationally determined contributions containing non-greenhouse gas components, information on assumptions and methodological approaches used for these components, as appropriate;	N/A	
(iii) For climate forcings included in the nationally determined contributions that are not covered by the IPCC guidelines, there is information on how these are calculated.	N/A	
(iv) More detailed technical information, if required.	N/A	
(g) Intention to employ voluntary cooperation in accordance with Article 6 of the PA, if applicable.	N/A	

ICTU Element (Decision 4/CMA.1)		Source
6. Fairness and ambition considerations		
(a) How fair and ambitious does the member State consider its nationally determined contribution to be, in the light of its national circumstances?	The mitigation measures are considered fair and ambitious in light of national circumstances. Considering that 68% of Mexico's population and 59% of its municipalities are in high and very high climate change vulnerability conditions, the cost of climate inaction and the absence of a vision of justice would have a significant impact and contribute to the growth of inequalities. Likewise, the mitigation measures presented in this NDC-CS are more ambitious than the NDC submitted in 2015, complying with the principle of progressiveness established in Article 26, Section XIII of the General Law on Climate Change.	
(b) Fairness considerations, including reflecting on equity;	For this NDC-CS, climate justice means positioning the most vulnerable people and communities at the center of climate actions, as well as equitable identification, acknowledgment, and attention to inequalities arising from climate change impacts, promoting positive impacts, and reducing negative ones (Sultana, 2021). Just transition is understood as the equitable distribution of costs and benefits, the acknowledgment of past and future impacts, as well as the construction of spaces for participation, dialogue, and deliberation. Likewise, this NDC-CS incorporates the gender perspective in mitigation measures, seeking to strengthen the participation of women and the empowerment of vulnerable populations from an intersectionality approach.	Review section 6.

ICTU Element (Decision 4/CMA.1)		Source
(c) Has the member State has addressed paragraph 3 of Article 4 of the PA? (i) Progression (ii) Ambition (iii) Common but differentiated responsibilities and respective capabilities, in the light of different national circumstances (CBDRRC-ILONDC)	The present contribution increased the ambition with respect to the first contribution submitted to the UNFCCC in 2015. The NDC-SC assumes that Mexico, not being an Annex I country to the UNFCCC, should expand this NDC "in pursuit of the objective of the Convention and being guided by its principles, including the principle of equity and common but differentiated responsibilities and respective capabilities, in the light of different national circumstances."	
(d) Has the member State addressed paragraph 4 of Article 4 of the PA?	Mexico, as a developing country, is committed to progressively increasing its national contribution in order to reduce, according to its national capabilities, 30% of its emissions by 2030.	
(e) Has the member State addressed paragraph 6 of Article 4 of the PA?	Not applicable.	
7. Contribution towards the global temperature objectives of the PA and the UNFCCC		
(a) Does the nationally determined contribution contribute towards achieving the objective of the Convention as set out in Article 2?	The NDC-CS is aligned with the Convention's objective of stabilizing greenhouse gas concentrations in the atmosphere at a level that prevents dangerous anthropogenic interferences on the climate system. This level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened, and to allow economic development to continue in a sustainable manner.	

ICTU Element (Decision 4/CMA.1)		Source
(b) Does the nationally determined contribution contribute towards achieving the objective of the Convention as set out in Article 2, paragraph 1(a) and Article 4, paragraph 1 of the PA?	The technical proposals submitted to broaden the scope of climate action in Mexico focus exclusively on the GHG&C mitigation component, as part of the global efforts to comply with Article 2.1 of the PA, particularly in relation to "holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change ".	Review section 3.

8

Climate finance

8 Climate finance

Financial resources are essential for meeting the goals established in the NDC-SC. To cover the cost of implementing each measure that supports the mitigation goals, it is necessary to generate, attract, channel, distribute and manage financing from various sources, immediately, on a large scale, incrementally and sustainably over time. The financial needs for the implementation of the measures are determined by the characteristics of the measures and the scope of the scenario in which they are framed. Therefore, the unconditional scenario will require different financing in terms of scale and characteristics than the conditional scenario..

In this context, the INECC (INECC-ADE 2021) estimates 104 billion dollars (2018 prices) as the necessary financing amount to implement the NDC 2015 with 35 measures and mitigation potential of 237 $MtCO_2e$. According to the survey, investing in coverage of measures has in turn quantified benefits of 157 billion dollars, which derives in a cost-effective economical implementation. Nevertheless, this financing is still far from the necessary amount to achieve a 383 $MtCO_2e$ mitigation in 2030, the optimal one to place Mexico in an emissions trajectory within the range that does not exceed 1.5°C over preindustrial levels.

This NDC-SC estimates that, for the implementation of the measures considered in the unconditioned scenario, which has a mitigation potential of 265.1 $MtCO_2e$, an investment of USD 105.640 billion is required by 2030 (at 2021 prices). Despite this, the annual benefits quantified for the measures amount to USD 19.610 billion per year.

In order to mobilize this flow of funds and cover the costs associated to the mitigation of both scenarios, a long-term national transversal strategy is necessary based on the priority actions within the highest GHG emissions sectors. This strategy requires an in-depth diagnosis of the country's financial capacities and needs, a detailed analysis of the public accounts and a review of the pertinent adjustments to the flow of income and expenditures so that they are compatible with the needs of both scenarios. It also requires a diverse and plural deliberative process so that,

in the implementation of mitigation actions, a route is designed to elaborate and implement this strategy.

The following are a sample of the instruments that have been identified as part of this financing strategy, the scope and implementation of which will vary for each scenario, in order to achieve the established goals and culminate in a long-term strategy that leads to an orderly transition:

- Creating a green taxonomy that enables clear labeling of economic activities and public projects aligned with the national and international climate goals. This should be followed by a robust monitoring, reporting and verification mechanism. The taxonomy allows to determine and quantify the impact of financing different instruments in the climate action, such as the thematic bonuses expansion (green, sustainable or linked to sustainability). In August 2022, bonds accounted for 464.0005 billion pesos, 30% of which correspond to federal government sovereign bonds. (CCFV, 2022). The aforementioned, as well as the excess demand and subscription to these assets represent the potential market growth, however, without a taxonomy that determines the impact of the labeled activities and the lack of reporting, monitoring and verification mechanisms, it is impossible to determine neither the financing impact nor the adequate allocation of resources to activities that meet their labels. A robust taxonomy would allow to channel and harness the growing resource flow towards the actions identified in the NDC-SC in public and private sector projects.

- Creation of an investment portfolio of national projects that takes into consideration the mitigation potential within priority sectors, the financial viability for its implementation and the consistency with short-, medium- and long-term goals, in that order.

- Establishing a clear governance to comply with climate goals. There are different financing sources in Mexico that bolster compliance to climate goals, but each source has its limitations. There is a need to define a coordinating entity with a global vision of the main financing sources that is able to: identify and match additional sources of capital, channel financing to the highest impact projects or to key actions that enable conditions towards decarbonization of the economy, avoid duplication of initiatives, coordinate subnational entities as

well as channel access to funding for local actions and promote the replication of financing mechanisms and successful projects. The GEF structure can serve as a model for the above along the lines of creating a financing mechanism in which a board develops policies and programs to be financed, operational guidelines and criteria; with a secretariat as a central coordinator, agencies as implementers and a technical and scientific board that reports on actions and priority policies in order to reach the NDC-SC objectives.

- Implementing a collaboration and integration mechanism with the private sector that considers:

  - Clear commitments, goals and timings to achieve the decarbonization of the economy.

  - Strengthen the emissions National Registry to integrate and make the Scope 1, 2 and 3 emissions compulsory for organizations within all the economic sectors. Mandatory regulation regarding online climate outreach with global standards.

  - Enable conditions from the public through standardized tools that allow a just and orderly transition such as: development and analysis of climate scenarios, national carbon pricing, tax incentives, national taxonomy, monitoring mechanisms, homogeneous reporting and verification, best practices informing documents and success stories.

  - Entrepreneurial challenge funds, channeled blended finance, accelerator platforms, among others.

- The private sector can potentially provide a significant portion of the required financial resources for climate action in the short, medium and long term. In order to achieve alignment with the net zero emissions scenario in 2050, UN Race to Zero and Glasgow Financial Alliance for Net Zero (GFANZ) estimate that 70% of the necessary financing in the next 10 years can come from private investors and more than 50% of it, specifically from corporations (UNFCCC, 2021). This is why it is essential to coordinate and create alliances with the private sector that strengthen decarbonization actions.

- Integrating the transition costs as a transverse axis in the planning of the federal expenditure budget separately from Appendix 16. This, from a specific resource allocation for emission mitigation actions with the highest potential that meet sectoral strategies and maintain consistency between climate goals and resource allocations. The budget allocated to Anexo 16 must be assigned to specific projects with a quantifiable impact that meets sectoral strategies and drives toward NDC-SC compliance.

- The expansion of the scope of the Special Tax on Production and Services (IEPS) to cover gas as a source of energy generation with high GHG emissions, as well as increasing the carbon tax considered therein.

- Diversifying the fund raising projects that promote decarbonization and render an additional income labeled to NDC compliance. For example, labeling income obtained from carbon tax included in IEPS (special tax on production and services) or other fiscal mechanisms to direct said income towards actions and programs in order to comply with the NDC-SC goals.

- Reduction of public expenditure intended to subsidize fossil fuel consumption or to invest in infrastructure that fosters dependency on fossil energy sources for power generation and transportation.

9

Next steps to an effective implementation

9 Next steps to an effective implementation

Acknowledgment of the climate crisis, which was clearly manifested in the COP26 urgent call for action forces governments to implement immediate, substantial, and ambitious actions, through well-defined routes based on a rigorous methodology. ICM will create an implementation roadmap through which the 88 NDC-CS proposed measures will be enforced in a participating and cost-effective way, while focusing on climate justice, and with a gender perspective.

In the face of current climate challenges, countries must pursue efforts to develop implementation strategies that are based on future prospecting, and the scenario work (Strategic Foresight Vervoot et al., 2015), which are methodologies that allow to incorporate specific and complex environmental variables, and to imagine and anticipate the transformative change that is necessary to achieve both the ambitious emissions reduction, and climate resilience.

ICM will elaborate a participating implementation roadmap which contains the knowledge, experience, requirements, and ideas from all sections of the civil society, through the creation and analysis of future explorative scenarios that will allow current climate policies to be strengthened. That implementation roadmap will also include suggested measurements for the emissions reduction —built on scientific basis—, the means for said implementation, and the portfolio of detailed mitigation actions for each GHG emissions sector.

In methodological terms, the implementation roadmap of the NDC-CS will based on a strategic prospective, an anticipative governance and on future studies (possible, plausible, probable, and preferable futures). It will make the difference between the distinct phases (qualitative and quantitative), and the structurally weak elements of the intended route. The purpose of this methodological framework is to include the different social sectors and vulnerable groups in a way that is aligned with Mexico's

political reality, allowing to anticipate the forces of change, and providing the entire process with elements of reflection, analysis and foresight.

ICM fully recognizes the importance of stablishing cooperative and collaborative communication with the federal government, specifically with the SEMARNAT in its role of environmental leader. This communication will act an effective mechanism to identify priorities, define strategies, and articulate actions in the territorial, local, social, and economic spheres.

The implementation roadmap of the NDC-CS will encourage the execution of all the necessary and viable actions to move forward in a just transition that will lower gender inequalities in all connected sectors (health, work, gender, climate justice), and will incorporate measurement and impact evaluation mechanisms, conferring the traceability needed in the decision-making processes.

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