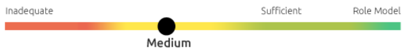
CLIMATE ACTION TRACKER

Mexico

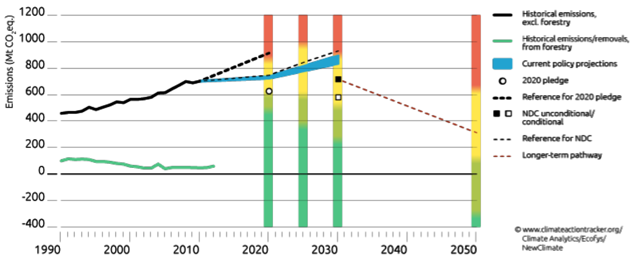
History: 2017 2016 2015 2014 2013 2011

Page last updated: 2nd November 2016

Rating



Basic view + Pledges



Note: Hover over the coloured bars for a pop-up with the fair emissions range per effort sharing category. More information here.

Assessment

We rate Mexico "medium". Mexico has pledged to reduce its GHG emissions by 22% below baseline in 2030, equivalent to an increase of emissions by 56% above 1990 levels. The NDC also includes targets on black carbon and targets that are conditional on elements of international cooperation and support. Mexico's targets are not consistent with limiting warming to below 2°C, let alone with the Paris Agreement's stronger 1.5°C limit. However, there are a number of recent policy developments which are first steps in the right direction to start bringing emissions in line with these targets.

After COP21 in Paris, Mexico introduced a major new policy on clean energy—its Energy Transition Law, which includes a clean energy target: 25% of electricity generation by 2018, 30% by 2021, and 35% by 2024. Until now, the impact of Mexico's target has been poorly understood and not quantified. Our new analysis reveals that the way in which this law is implemented will be crucial for Mexico's emissions pathway.

Critically, Mexico includes co-generation in its definition of clean energy. This is likely to be natural gas, which is a fossil fuel, and still emits CO$_2$. National projections suggest that the cogeneration plants' share of the electricity mix could be as high as 9% by 2030—up from 0% in 2014. If this goes ahead rather than using entirely zero emission sources, emissions would be 58 MtC0$_2$e—or 6% higher—in 2030, and could reduce the share of renewables in the 2024 clean energy target to 29%.

Together with the renewable energy support policies that have recently been put in place, opting for zero emission sources instead of co-generation would be an important step in the right direction, but needs to be followed up by further policies for Mexico to reach its INDC target.

On 21 September 2016, Mexico ratified the Paris Agreement and its Intended Nationally Determined Contribution (INDC) became its Nationally Determined Contribution (NDC) , covering targets for both, emissions of greenhouse gases (GHGs) and black carbon. At the same time Mexico is currently undergoing a process that further details what the NDC means at the sectoral level. Within its NDC, Mexico proposes to unconditionally reduce its emissions of greenhouse gases (GHGs) and black carbon (BC) combined by 25% below business as usual (BAU) in 2030. Mexico's BAU is a scenario of emissions projections based on economic growth in the absence of climate change policies, from 2013.

Mexico also proposed a 40% reduction by 2030 conditional on certain requirements for the global agreement and international support. Within these targets, Mexico aims at reducing GHGs by 22% below BAU unconditionally, and 36% conditionally by 2030.

Based on these targets, we rate Mexico "medium": not yet consistent with limiting warming below 2°C, let alone with the Paris Agreement's stronger 1.5°C limit, unless other countries make much deeper reductions and comparably greater effort.

Mexico's progress in policy planning and institution building over recent years has been remarkable, including the April 2012 adoption of the General Law on Climate Change (LGCC in Spanish), one of the world's first climate laws—and the first in a developing country. Under this law, Mexico aims to reduce its emissions by 50% from 2000 levels by 2050. The NDC proposal is consistent with this objective.

Further positive elements of Mexico's NDC include the specification that it includes economy-wide emissions reduction goals and the specification of an unconditional and a conditional reduction. The NDC is based around a comprehensive accounting of all sources and gases, including land use change and forestry. A significant issue is the baseline (BAU) emissions projections, which are rather uncertain, and Mexico could consider setting its targets with respect to a fixed base year

The NDC targets include black carbon, whose reductions have substantial co-benefits for human health. However, the effects on climate are close to zero. At best, they are partly additional compared to measures that reduce emissions of the greenhouse gases covered under the Kyoto Protocol.

While land use activities are included in Mexico's NDC goal, they do not make up a significant component of emissions in 2030.

Mexico should consider putting forward a 2025 goal to be consistent with the call by many countries for a five-year cycle of commitments.

In 2010, under the Copenhagen Accord, Mexico pledged to reduce GHG emissions by 30% below BAU for 2020, conditional on international support. Currently implemented policies are projected to result in emissions levels above its 2020 and 2030 targets indicating that Mexico needs to take more action to meet its goals.

Pledges and targets

Paris Agreement targets

Copenhagen pledge	
2020 target	30% below BAU by 2020 incl. LULUCF [36% above 1990 by 2020 excl. LULUCF]
Conditions	Financial and technology support
Paris Agreement target	
Ratified	Yes
Unconditional target for 2030	22% GHG, 51% black carbon, total 25% below baselines provided in NDC document by 2030 [56% above 1990 by 2030 excl. LULUCF]
Conditional target for 2030	36% GHG, 70% black carbon, total 40% below baselines provided in NDC document by 2030 [26% above 1990 by 2030 excl. LULUCF]
Coverage	Economy-wide, including LULUCF
Emission peak target	2025/2026
Long term goal(s)	
Long-term goal(s)	50% below 2000 by 2050 [31% below 1990 by 2050 excl. LULUCF]

On 21 September 2016, Mexico ratified the Paris Agreement and its Intended Nationally Determined Contribution (INDC) became its Nationally Determined Contribution (NDC). It aims to unconditionally reduce GHG emissions in 2030 by 22% below its BAU baseline.

Under a number of conditions (a global agreement addressing international carbon pricing, carbon border adjustments, technical cooperation, access to low cost financial resources and technology transfer), Mexico would increase the greenhouse gas reductions target to 36%.

The submission also includes reductions of black carbon (BC) (51%/70% reduction below BAU of 124 MtCO$_2$e of BC in 2030 unconditionally/conditionally). While the health and environmental benefits of such reductions would be immediate and clear, the effects on global warming are likely to be close to zero, not additional and extremely uncertain, as opposed to the effects of reductions in greenhouse gas emissions.

GHG and black-carbon reductions together would reflect reductions of 25%/40% in total, according to the NDC document, but we note that the actual reduction would be closer to the impact of GHG reductions alone of -22/36%.

Mexico includes numbers for the baseline in its submission, both for greenhouse gases, for black carbon and the total. Based on this baseline, the absolute values of the unconditional/conditional target for greenhouse gas reductions would be 716 MtCO$_2$e/ 580 MtCO$_2$e excl. LULUCF (759 MtCO$_2$e/ 623 MtCO$_2$e incl. LULUCF) in 2030. The reported baseline is higher than what we estimate as the current trend with implemented policies. The resulting target for 2030 is lower than the current emissions trend—its fulfilment therefore requires additional policies.

Along with the 2030 target, Mexico mentions in its NDC "a net emissions peak starting from 2026," which we interpret as starting a decline of emissions in 2026—which means peaking emissions in 2025. The level of this peak is unclear. Neither does Mexico clarify how the (conditional) 2020 pledge relates to its post-2020 contribution.

2020 pledge and long-term goal

The 2020 pledge would require a much earlier peaking, as its emissions level is already below today's level. We therefore assume that the unconditional post-2020 contribution is independent of the 2020 target. The conditional target would be roughly in line with a linear development between today, 2020 and 2050. Given this situation it appears that Mexico needs to clarify the status of its 2020 pledge. The long-term, 2050 target is explicitly mentioned in the INDC document and remains, as in earlier communications.

In its submission under the Copenhagen Accord, Mexico "aims at reducing its GHG emissions up to 30% with respect to the business-as-usual (BAU) scenario by 2020, subject to the provision of adequate financial and technological support from developed countries as part of a global agreement." Former President Felipe Calderón announced this target during the Copenhagen Conference of the Parties to the United Framework Convention on Climate Change (COP) in 2009.

Mexico has a detailed national climate change mitigation plan until 2018, which includes 28 mitigation measures and their effects on emissions. These measures are defined in the "Programa Especial de Cambio Climático 2014–2018" (PECC) (Special Programme on Climate Change). This programme is the follow-up of the first PECC, which ran from 2008–2012. The first PECC was an initial unconditional step in national implementation; the second PECC confirms this step. The plan is accompanied by an overall strategy to reduce emissions by 50% by 2050 compared to 2000 levels, which assumes moderate reductions in the early years and more ambitious reductions later.

With the General Law on Climate Change from 2012 and the National Climate Change Strategy published in June 2013, Mexico has confirmed these targets and made them binding at the national level, subject to international support. The National Climate Change Strategy includes a BAU scenario, which replaces the BAU scenario in the first PECC, to which the pledge previously referred.

The projected emissions level of the new scenario is higher than the previous scenario, so the emissions levels resulting from the pledge were corrected to 672 MtCO$_2$e including LULUCF in 2020 (626 MtCO$_2$e excluding LULUCF), up from 618 MtCO$_2$e (including LULUCF) under the previous projection. The second PECC originally included an additional BAU with 2020 emissions levels different from the previous two. However, the Government withdrew this scenario, due to its inconsistency with the climate strategy.

Black Carbon and the NDC

Mexico's NDC targets include a target to reduce black carbon emissions, which has substantial co-benefits for human health. From the climate perspective, however, there is no established scientific method to compare the climate benefits of black-carbon reductions to those of CO$_2$ and other greenhouse gases. In its most recent Fifth Assessment Report (AR5), the IPCC has not provided calculations of Global Warming Potential for black carbon comparable to those provided for greenhouse gases, merely noting the inherent difficulties in doing so and limiting itself to just displaying estimates from the pre-AR5 literature.

While the NDC does specify a metric to compare with CO$_2$ (GWP of 900), this is based on a single literature source (pre-dating IPCC AR5), which itself notes the very large uncertainties (around 100%). Even more importantly, the authors of this paper emphasise that this estimate does not take into account the current *cooling* effects of other air pollutants emitted by the same sources. Emissions of these would also be reduced by measures to reduce black carbon, so the net effect of reductions in emissions of black carbon and co-emitted species together would be smaller, or, depending on the emission source, even be negative.

Finally, reductions in black carbon are generally not additional to reductions in CO$_2$ emissions, because large fractions of black-carbon emissions stem from the same emission sources as CO$_2$. Emission reduction policies therefore reduce CO$_2$ and black carbon simultaneously, and this is already included in calculations of the emissions reductions in greenhouse gases required to hold warming below 2°C globally, like the "emissions gap" and "fair share" reductions (see next section on Fair Share).

Fair share

We rate Mexico's mitigation targets "medium." This rating indicates that Mexico's (conditional) climate plans are at the least ambitious end of what would be a fair contribution. They are not consistent with limiting warming below 2°C, let alone with the Paris Agreement's stronger 1.5°C limit, unless other countries make much deeper reductions and comparably greater effort. If Mexico were to lift the conditions of the more ambitious end of its 2030 reductions, we would rate it "sufficient." We will assess in 2017 whether this target would then be in line with the Paris Agreement's stronger 1.5°C limit.

For Mexico, the individual effort sharing categories spread over large ranges of emissions allowances, and there are no effort sharing categories that stand out and require specifically stringent or lenient reductions for Mexico. This reflects the fact that Mexico's per capita emissions and wealth are close to the global average.

Current policy projections

According to our assessment, Mexico's current policies will lead to emissions of between 724 and 736 MtCO$_2$e excl. LULUCF in 2020. In 2030, the emissions level is projected to be between 835 and 893 MtCO$_2$e in 2030, excl. LULUCF.

Historically, Mexico's emissions have been increasing since 1990. GHG emissions have increasingly shifted away from agriculture and LULUCF towards energy-related emissions. While in 1990 agricultural and LULUCF emissions represented almost 35% of Mexico's GHG emissions, by 2010 their share had declined to 19%. Over the same time period, energy-related emissions increased substantially—by more than 50%.

The basis for climate policy in Mexico is its 'General Law on Climate Change', which translates the overarching targets into strategies and plans, and provides the institutional framework for implementation. The law does not include concrete political instruments, rendering it impossible to quantify the direct effects of the law.

The National Strategy on Climate Change (NSCC), published in June 2013, implements one of the requirements of the General Law. The NSCC is designed towards a long-term strategic development, but only provides very general guidance. How this will be translated into concrete action remains to be seen.

The 2nd Special Programme on Climate Change (PECC 2014–2018), published in 2014, includes the most relevant mitigation measures to 2018. The programme summarises 23 quantified mitigation-relevant measures that lead to a reduction in emissions by 83.2 MtCO$_2$e in 2018 compared to the baseline presented in the same document.

The Energy transition law (Camara de diputados del H. congreso de la union, 2015) published in December 2015 includes clean energy targets for Mexico for the year 2018 (25% of generation), 2021 (30%) and 2024 (35%). Clean Energy according to Mexican law includes renewable energy sources, nuclear power, CCS as well as efficient co-generation (Secretaria de Energia, 2014a).

The inclusion of the latter technology is particularly noteworthy as co-generation plants are mostly gas based and thus emit CO$_2$. While this technology currently does not play a role in Mexico, the latest Energy Outlook published by the Mexican government (SENER, 2015) suggests that the share of co-generation might grow to 9% of total generation in 2030: a substantial share of the electricity matrix. This implies that the share of zero emission power plants might be lower than what the Clean Energy Target indicates. For instance, for 2024 the projections foresee a share of 6% of co-generation in the electricity matrix, potentially lowering the share of zero emission power generation under the 2024 clean energy target to 29%.

Mexico intends to use a combination of clean energy certificates (Secretaria de Energia, 2014b) and a recently introduced tender scheme to help reach its clean energy target. The clean energy certificate scheme will include targets for companies above a certain size and the tender scheme aims to supply low cost renewable energy. However, both instruments are too young to judge whether they will be effective in achieving their stated aims. Preliminary results are promising, showing that especially the tender might be effective in increasing the share of renewables, especially solar and wind, as a large number of projects were awarded in the first round (PV Magazine, 2016). However, similar processes in other countries have shown that the award in a tender process does not necessarily lead to the implementation of projects and, moving forward, it remains unclear whether these tenders will be sufficient to reach the target.

In 2014 Mexico implemented a carbon tax that is set at approximately at US$3.5/t$CO_2$e differentiated by fuel type (SEMARNAT, 2014). This tax is expected to generate an annual revenue of about US$1 billion.. However, its impact on GHG emission reduction is unclear and, given its low rate, a substantial emission reduction is unlikely.

Assumptions

Pledge for 2020

With the 5th National Communication Mexico has, for the first time, provided a GHG inventory for all years between 1990 and 2010 (SEMARNAT, 2012). This is use for historical data. The reference level projections were taken from the technical annex to Mexico's National Climate Change Strategy from 2013 (Government of Mexico, 2013). Since the reference level emissions are only reported including LULUCF, and no separate LULUCF data is reported in the strategy, we deducted LULUCF emissions using an extrapolation of the historical LULUCF trend as reported in the 5th National Communication.

NDC Post-2020 contribution

To calculate the absolute emissions level resulting from the NDC, we use the baseline provided in the NDC document. The document specifically states that the values are based on Global Warming Potentials from the 5th Assessment Report of the IPCC. The Climate Action Tracker uses the values from the Second Assessment Report as a common reference. We were not able to convert the emission levels, as the distribution of gases in the given baseline levels are unknown. In line with the 2020 pledge we deduct the LULUCF emissions using a trend extrapolation from the historical data reported in the 5th National Communication.

The approach taken in relation to Black Carbon is described in a separate section below.

Current policy projections

We show the BAU as reported in the National Climate Change Strategy from 2013 (Government of Mexico, 2013). The range for the current policy scenario is based on calculations around the PECC and the Clean Energy Target.

We assume that all measures under the PECC are implemented until 2018. In addition, we include two scenarios for the implementation of the clean energy target. A first scenario assumes that the clean energy target will be reached according to the fuel mix provided in the energy forecast by SENER (SENER, 2015). This includes the use of efficient co-generation for reaching the target, which is likely to include natural gas, which still emits C02. In a second scenario, we assumed that the Clean Energy Target would solely be achieved by the use of renewable energy sources. The latter can be justified, as efficient co-generation is currently not part of the electricity matrix in Mexico and it remains questionable whether it will actually be implemented.

We use the PECC scenarios as a starting point. The PECC provides both a baseline and reduction below the baseline scenario, which can be used to derive the PECC policy scenario. As the PECC explicitly links to the 2012 energy forecast (SENER, 2012) we calculate the emission reductions by comparing this forecast with the latest 2015 version (SENER, 2015). The emission reductions calculated this way stem from two sources: a lower projected energy demand and an increase in clean energy sources in the newer energy forecast compared to the old one. Since the PECC scenario only includes data until 2020, we scale the data to the NC5 scenario, which includes data until 2030.

For data beyond 2020, we assume for the lower end of the range (the second scenario) that the same percentage-wise reductions below BAU will be achieved in 2030 as in 2020. This underlies the assumption that both the PECC and the Clean Energy target will be successfully continued at their current level of ambition. For the upper end of the range (the first scenario) we assume that the clean energy target will be reached for 2030 using natural gas based co-generation (see above) but that the PECC will not be continued further.

For LULUCF we first calculate the emission reductions achieved through the PECC based on the PECC baseline scenarios. We then apply the resulting % wise reduction to an extension of the LULUCF trend based on the National Communication for the year 2020 as well as 2030.

Black Carbon

We estimate that the net effect of black carbon emission reductions additional to those resulting as a co-benefit from reductions in CO_2 to be negligible. There is no established scientific method to compare the climate benefits of black-carbon reductions to those of CO_2 and other greenhouse gases. The IPCC has not provided such estimates even in its most recent Fifth Assessment Report. Although the NDC does specify a metric to compare with CO_2 (GWP of 900), this value is unsuitable to use in this policy context and the single literature source (Bond et al. 2013) to which the NDC refers to states:

- "… the summed climate forcing of all species for a source category emitting in a particular region (or season) may have a different magnitude than the global average, or even a different sign."
- "The 100-year global-warming-potential (GWP) value for black carbon is 900 (120 to 1800 range) with all forcing mechanisms included. The large range derives from the uncertainties in the climate forcing for black carbon effects."
- "Co-emission effects … are not captured by BC metrics presented here…"
- "These and other differences raise questions about the appropriateness of using a single metric to compare black carbon and greenhouse gases."

The paper to which the NDC refers to (Bond et al. 2013) estimates that the combined global warming effect of black carbon and its co-emitted species is slightly negative and notes that the "reduction of aerosol concentrations by mitigating BC-rich source categories would be accompanied by small to no changes in short-term climate forcing."

Note: this is not generally the case for certain other air pollutants (e.g. reductions in sulphate aerosols would lead to warming), so that while measures to reduce black carbon do not generally help to combat climate change, these are highly welcomed as a climate-neutral measure to improve local air quality, thereby reducing health impacts.

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