Greenhouse gas mitigation scenarios for major emitters

Analysis of current climate policies and mitigation commitments: 2023 update

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Summary

Parties to the Paris Agreement communicate Nationally Determined Contributions (NDCs), which are pledges that contain their commitment to reduce global emissions. Most countries have updated their original NDCs and adopted additional policies since the Paris Agreement came into force. However, global ambition and implements gaps exist between these national actions and the collective mitigation goals of the Paris Agreement.

The 2023 update report presents an overview of projected greenhouse gas (GHG) emissions up to 2030 based on existing climate and energy policies and compares them with the emissions implied by countries' NDCs. We continually track countries' progress towards their NDCs to improve accountability within the Paris Agreement framework.

Greenhouse gas emission levels based on currently adopted policies

Although official inventories are necessary to confirm historical emissions, our projections indicate that GHG emissions in the 25 countries as a group roughly plateaued or slightly increased over the past year between 2021 and 2022 (Section 2.1).

Full implementation of existing policies and actions results in 2030 emissions below 2019. Current policies result in 2030 emissions between -6% and +8% compared to 2019 levels (Table 1) – still falling short of the Paris Agreement's aligned 43% reduction (Section 2.1).

Table 1: Comparison of key metrics between 2022 and 2023 update reports. Data refers to aggregated emissions and count for the 25 countries analysed.

Comparison metric	2022 report	2023 report
2025 aggregated emissions	36.8 – 39.9 $GtCO_2e$	37.9 – 40.8 $GtCO_2e$
2030 aggregated emissions	36.1 – 41.6 $GtCO_2e$	36.2 – 41.7 $GtCO_2e$
Increase between 2015 and 2030	-4% – +11%	-4% – +10%
Increase between 2019 and 2030	-5% – +9%	-6% – +8%
Countries with 2030 emissions above 2015	16	15
Countries with 2030 emissions above 2019	17	16
Countries on track to meet the latest NDC target	11	13

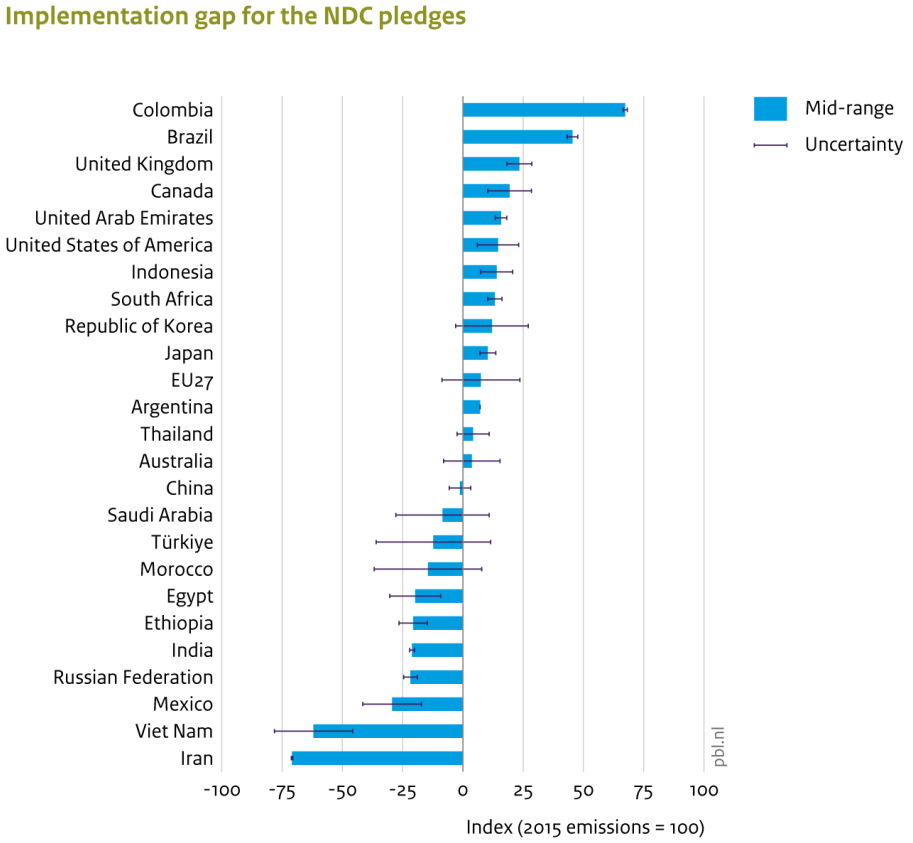
Aggregated key metrics remain relative stable since last year, but we quantify significant movements in individual countries (Chapter 3), for example:

- ↓ **United States**: progress in the implementation of the Inflation Reduction Act substantially reduces projected emissions compared to our 2022 update report (Section 3.24).
- ↓ **European Union**: continuous implementation of Fit for 55 policy and REpowerEU results in lower emissions in 2030 and could halve emissions between 2015 and 2030 (Section 3.9).
- ↑ **United Kingdom**: emissions projections are higher than we estimated in 2022 due to insufficient policy implementation. Emissions remain substantially below 2015, though some of the UK's latest U-turn climate policies are not yet quantified (Section 3.23).
- ↑ **Indonesia**: emissions are now higher than previously estimated due to an increase in the use of coal between 2021 and 2022 and a sizeable pipeline of coal-fired power plants for industry's own production (Section 3.11).

Progress towards NDC targets

All NDC updates since our last update report represent an improvement on previous versions through higher emissions reduction commitments (Section 2.2).

Six countries have submitted new NDCs since our 2022 update: Thailand, Viet Nam, Mexico, Türkiye, Egypt, the United Arab Emirates. Brazil has announced, but not yet submitted, a new NDC in 2023 (Section 2.2).



Source: PBL FAIR/TIMER model; NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 1: 2030 implementation gap between current policies and NDC targets in the 25 countries analysed. Countries with a negative implementation gap are on track to meet their NDC targets. The sectoral emissions coverage of scenarios for each country is aligned with the scope of the NDC. Source: produced by authors.

Eleven countries are clearly on track to meet their current NDCs targets and two additional countries are likely on track to meet their targets (Figure 1).

The countries on track to meet their targets are China, Egypt, Ethiopia, India, Iran, Mexico, Morocco, Russia, Saudi Arabia, Türkiye and Viet Nam.

Australia and the European Union (EU) are now likely on track to meet their targets. More specifically, the EU is projected to meet its NDC target based on the implementation of policies adopted at the EU level. Australia is projected to meet its target based on the implementation of national-level policies combined with more ambitious state-level policies.

The remaining twelve countries have an implementation gap (Figure 1); they need to adopt additional policies and follow up on the implementation of already adopted policies to meet their targets. The magnitude of the implementation gap indicates the level of additional effort necessary to meet the NDCs.

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This report builds on analyses conducted under the Climate Action Tracker project, led by NewClimate Institute and Climate Analytics, and the Horizon 2020 ENGAGE and ELEVATE projects (grant no. 821471 and 101056873). NewClimate Institute projections are largely based on its analyses for the Climate Action Tracker project jointly carried out with Climate Analytics, while those by PBL are based on scenario development for the ENGAGE and ELEVATE projects.

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1 Introduction

1.1 Background

Parties to the Paris Agreement communicate Nationally Determined Contributions (NDCs), which are pledges containing the individual contributions of Parties to the challenge of reducing global emissions and keeping end-of-century warming below 1.5°C (UNCCC, 2015).

Most countries have updated their NDCs and adopted additional policies since the Paris Agreement came into force. Collectively, the latest submitted NDC targets present an improvement in comparison to the original ones but remain globally insufficient to curb global emissions (den Elzen et al., 2022). Policies adopted to date reduced the implementation gap by 15% in the G20 since 2015 (Nascimento et al., 2022). Despite these improvements, a global implementation gap exists between countries' target and policies and the collective mitigation goals of the Paris Agreement (Nascimento et al., 2023). It is, therefore, crucial to continually track countries' progress towards their NDCs and inform policymakers with up-to-date knowledge to ensure effective implementation of the ratcheting mechanism of the Paris Agreement.

Our report presents an assessment of progress of 25 countries toward the achievement of their 2030 mitigation targets. More specifically, it provides an overview of projected greenhouse gas (GHG) emissions up to 2030, considering existing climate and energy policies, and compares them with the emission reductions implied by countries' NDCs. This supports evaluating whether countries are on track to meet their targets and assess change over time.

A country that is likely to meet its NDC does not necessarily undertake a more stringent action on mitigation than a country that is not on track (den Elzen et al., 2019). Targets differ in their ambition levels across the countries. A country off track to meet its NDC target may have set itself a very ambitious target or a country on track to meet its NDC target may have set a relatively unambitious target. This study does not assess the level of ambition and fairness of the NDC targets. NDCs are also nationally determined and heterogeneous by nature, so a fair comparison of progress across countries is not always straightforward since countries often have different policy-making approaches. Some countries use their pledges or targets to drive more ambitious policies, while others use them merely to formalise the expected effect of existing measures. Comparing countries policies to their self-determined NDC targets bypasses difficult questions regarding the target's ambition while simultaneously providing evidence of progress towards them.

The 25 countries analysed here are: Argentina, Australia, Brazil, Canada, China, Colombia, Egypt, Ethiopia, the European Union (EU27), India, Indonesia, Iran, Japan, Mexico, Morocco, Republic of Korea, the Russian Federation, South Africa, Saudi Arabia, Thailand, Türkiye, the United Arab Emirates, the United Kingdom, the United States of America (USA) and Viet Nam. These 25 countries cover all the G20 countries (three individual EU member states are covered as part of EU27).

In this report, the current policies scenario assumes that no additional mitigation action is taken beyond the currently adopted climate policies. Whenever possible, current policy trajectories reflect all relevant adopted policies, which are defined here as legislative decisions, executive orders, or their equivalent. This excludes publicly announced plans or strategies, but policy instruments to implement such plans or strategies do qualify. This definition of current policies scenario is consistent with that applied in Roelfsema et al. (Roelfsema et al., 2022) and Kuramochi et al. (2021).

The ongoing Russian Federation's war of aggression against Ukraine has significant implications for emissions in the short and medium term, as well as for a country's capacity to implement current mitigation policies. Economic measures to address Russian gas dependency in the European Union are expected to substantially reduce emissions in both economies (Liu et al., 2023). The transition away

from natural gas to renewable energy is projected to reduce global CO_2 emissions by 1% to 5% in 2030 (IEA, 2022). However, the long-term effect of the invasion with regards to ongoing energy policy reforms is not fully quantified.

Although, we do not explicitly include the impact of the Russian invasion of Ukraine in terms of higher-induced energy prices and sanctions, we do include the impact of some policies related to the war (for example, those resulting in a reduction in gas imports from Russia in the EU). In some economies, where the economic effects of the war have already been quantified, we also consider updated economic and energy forecasts (IEA, 2022).

We use the term 'NDC' throughout the report, since only Iran from the 25 countries assessed in this report has not ratified the Paris Agreement. We use the term 'country' to refer to both the EU and the remaining 24 economies.

1.2 Overview of methods

NewClimate Institute, PBL Netherlands Environmental Assessment Agency (PBL) and the International Institute for Applied Systems Analysis (IIASA) estimated the effect of current policies on future GHG emissions. The main methods used in this report are consistent with previous updates (more details about the modelling approach in the methodological Annex). In this year's update, we include policies adopted up until July 2023 and NDCs submissions through September 2023.

The calculations by NewClimate Institute are largely informed the Climate Action Tracker project (Climate Action Tracker, 2022; Nascimento & Höhne, 2023). The calculations use existing scenarios from national and international studies, such as IEA's World Energy Outlook 2022 and APEC Energy Demand and Supply Outlook (APERC, 2022), and own calculations of the effect of individual policies in different subsectors (Kuramochi et al., 2021). NewClimate emission estimates include the effect of COVID-19 pandemic and in several cases, historical emission datasets already include the dip and rebound in emissions induced by the short-term reduction in activity during economic lockdowns. In cases where historical emissions do not cover this period, NewClimate estimates assume that emission intensity over gross domestic product (GDP) remains the same as it would under current policies excluding the effect of COVID-19 and that the reduction in emissions is induced by a slowdown in GDP growth.

PBL estimates the effect of individual policies in different subsectors using the IMAGE integrated assessment modelling framework (Stehfest et al., 2014), including a global climate policy model (FAIR), a detailed energy-system model (TIMER), and a land-use model (IMAGE land). The starting point for the calculations of the impact of climate policies is the latest SSP2 (no additional climate policy) baseline as implemented in the IMAGE model (van Vuuren et al., 2021). Current climate and energy policies in G20 countries, as identified in ELEVATE (2022), were added to that baseline (Roelfsema et al., 2020, 2022). The implementation of policies in IMAGE is facilitated by a modelling protocol that translates climate policies into model inputs (Dafnomilis et al., 2023). The protocol is maintained and updated regularly via the contribution of modelling teams and national policy experts and disseminated to global and national modelling teams for use under several H2020 projects. For countries that are part of a larger IMAGE region (Australia, Republic of Korea and Russian Federation), emission projections were downscaled using the country's share of regional emissions in 2021 as a constant scaling factor. PBL emission projections account for two distinct mechanisms to account for the effect of COVID-19: GDP growth reduction and short-term impact on activity levels in specific sectors (Dafnomilis et al., 2022).

Both NewClimate Institute and PBL scenario calculations were supplemented with those on land-use and agricultural policies using IIASA's global land-use model GLOBIOM (Havlík et al., 2014) and global forest model G4M (Gusti & Kindermann, 2011) and PBL's global land-use model IMAGE-land (Doelman et al., 2020). For PBL, IMAGE's land use, land-use change and forestry (LULUCF) CO_2 projections (only

for Canada, China, India and Indonesia) and IIASA's LULUCF CO_2 projections (all 25 countries) were added to the IMAGE GHG emissions projections excluding LULUCF CO_2. Although only emission projections excluding LULUCF CO_2 were used, the IMAGE framework was applied fully, including the IMAGE land model, to ensure consistency of results (e.g., feedback between bioenergy demand and land use). Similar to IMAGE, GLOBIOM and G4M also use the SSP2 baseline (no additional climate policy) as a starting point for the projections(Fricko et al., 2017). However, bioenergy demand is based on the World Energy Outlook 2022 published by IEA (IEA, 2022). The effect of individual policies is calculated by GLOBIOM and G4M using a country specific carbon price, which is set at a level to ensure that the policies are successfully implemented by the target date (Kuramochi et al., 2021). IIASA projections also account for the effect of COVID-19. They are based on the same GDP reductions used by PBL. LULUCF non-CO_2 emissions were taken from the IMAGE model for the PBL projections.

2 Key findings

2.1 Greenhouse gas emissions projections

Current policy projections show limited climate change mitigation progress in the past year

Global carbon dioxide emissions remain at an all-time high in 2022 (IEA, 2023). It is too early to confirm the level of historical greenhouse gas (GHG) emissions for the countries analysed as they are yet to communicate official inventories. However, our projections indicate that GHG emissions roughly plateaued or slightly increased over the past year between 2021 and 2022. Aggregated emissions of the 25 countries reached 38.8 – 39.7 $GtCO_2e$ in 2022 compared to 38.9 – 39.1 $GtCO_2e$ in 2021. In both years emissions are above 2019 levels — before the drop in emissions caused by COVID-19 pandemic.

The implementation and expansion of adopted climate policies is fundamental to ensure a peak in the group of 25 countries emissions in the coming years. We project that by 2025 aggregated emissions will reach 37.9 – 40.8 $GtCO_2e$ (Table 2). This indicates that aggregated emissions could be 2% below 2019 levels, which reached 38.5–38.6 $GtCO_2e$, if countries implement policies in line with the lower end of our projections. This requires that all analysed countries fully implement adopted policies to their most ambitious level.

We project that emissions under current policies in the group will reach 36.2 – 41.7 $GtCO_2e$ by 2030, which corresponds to a change between -6% and +8% compared to 2019 levels (Table 2). The 25 countries analysed cover approximately 80% of global emissions (Gütschow & Pflüger, 2023; Tubiello et al., 2021). Therefore, emission projections in this group provide a good, albeit incomplete, indication of progress towards global goals. Our findings show that countries remain far off track to meet the collective goals of the Paris Agreement, which require emissions to be 43% below 2019 levels by 2030 (IPCC, 2023).

Table 2: Comparison of key metrics between 2022 and 2023 update reports. Data refers to aggregated emissions and count for the 25 countries analysed.

Comparison metric	2022 report	2023 report
2025 aggregated emissions	36.8 – 39.9 $GtCO_2e$	37.9 – 40.8 $GtCO_2e$
2030 aggregated emissions	36.1 – 41.6 $GtCO_2e$	36.2 – 41.7 $GtCO_2e$
Increase between 2015 and 2030	-4% – +11%	-4% – +10%
Increase between 2019 and 2030	-5% – +9%	-6% – +8%
Countries with 2030 emissions above 2015	16	15
Countries with 2030 emissions above 2019	17	16
Countries on track to meet the latest NDC target	11	13

Although most of the key metrics remain similar to our 2022 update report, substantial differences exist among countries (Figure 2). Emission projections in some major emitters are significantly lower compared to our 2022 update report. The European Union and the United States have both progressed in the implementation of major policy packages that lead to considerable emission reductions by 2030. However, this improvement was offset by an increase of emissions of many other countries, such as the United Kingdom and the Russian Federation. Lack of implementation progress led to revised assumptions about many countries' emissions projections.

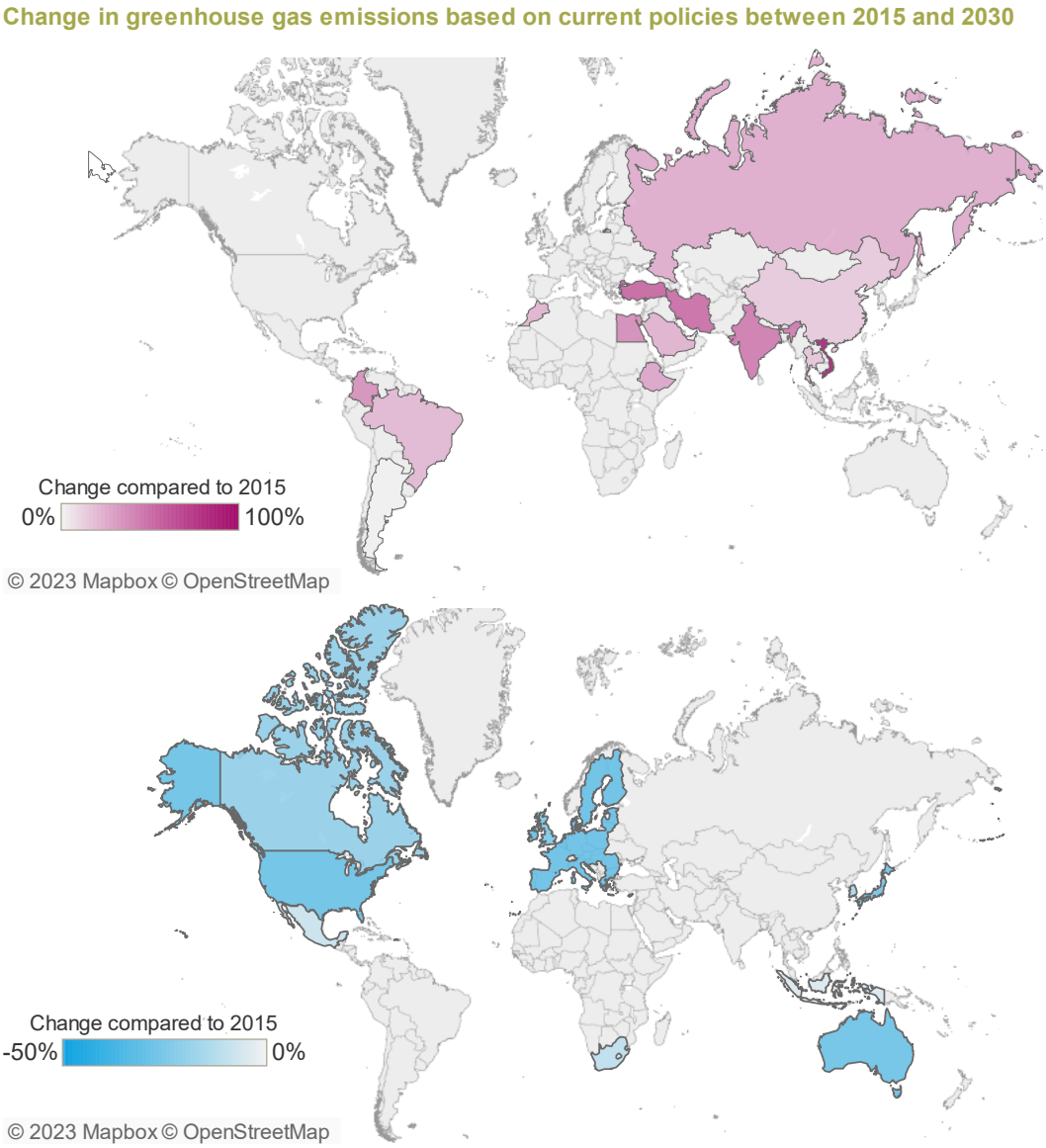


Figure 2: 2030 emissions under current policies compared to 2015 levels (based on the average of models). Although emissions are projected to decrease in some countries (lower map), the projected increase in emissions is more substantial (upper map). The sectoral emissions coverage of scenarios for each country is aligned with the scope of the NDC. Source: produced by authors.

Some countries expanded climate policy adoption or advanced in the implementation of already existing policies:

- **United States**: progress in the implementation of the Inflation Reduction Act substantially reduces projected emissions compared to our 2022 update report (Section 3.24).
- **European Union**: continuous implementation of Fit for 55 policy and REpowerEU results in lower emissions in 2030 and could halve emissions between 2015 and 2030 (Section 3.9).
- **Canada**: continuous implementation of policies to address methane and F-gases is now expected to reduce Canada's emissions by over 20% compared to 2015 levels (Section 3.4).
- **Republic of Korea**: the Korean ETS drives a large share of the expected emissions reductions by 2030. We estimate emissions at roughly 15% below 2015 levels by 2030 (Section 3.16).

However, some countries moved on the opposite direction:

- **United Kingdom**: emissions projections are higher than we estimated in 2022 due to insufficient policy implementation. Although emissions remain substantially below 2015, some of the UK's latest U-turn climate policies are not yet quantified (Section 3.23).
- **Indonesia**: emissions are now higher than previously estimated due to an increase in the use of coal between 2021 and 2022 and a sizeable pipeline of coal-fired power plants for industry's own production (Section 3.11).
- **Russian Federation**: This year's current policy projections are higher than those from 2022, partially due to changes in the assumptions about the Russian Federation reaching its 2024 renewable energy target and maintaining flaring limits (Section 3.17).

Emissions based on current policies are projected to remain at or above 2015 levels in fifteen of the 25 countries analysed, ranging from stabilising in Argentina and the United Arab Emirates to a doubling between 2015 and 2030 in Viet Nam (Figure 2 – upper). In India, Iran and Türkiye emissions are projected to increase by more than 50% between 2015 and 2013. These countries are followed by Bazil, Colombia, Ethiopia, Morocco, the Russian Federation, and Saudi Arabia, all with emissions increase between 20% and 40% between 2015 and 2030.

In the remaining ten countries, 2030 emissions are project to decrease below 2015 levels (Figure 2 – lower). In Australia, Japan, the European Union and the United States, emissions under current policies are projected to fall by a third in this period. In Indonesia, we project a modest decrease of 5% in the same period. Canada and the United Kingdom have 2030 emissions between 20% and 30% below 2015 levels.

All countries with projected emissions substantially below 2015 levels are Annex-I countries with multiple climate policies in place. Australia, Canada, the European Union, Japan, the United Kingdom and the United States are projected to have emission reductions by more than 20% in 2030 compared to 2015 values.

2.2 Progress towards NDC targets

NDC updates since our 2022 update report

During COP 26 in Glasgow, countries were invited to submit improved targets since updated NDCs remained insufficient to meet the collective goals of the Paris Agreement (den Elzen et al., 2022; Glasgow Climate Pact. FCCC/PA/CMA/2021/L.16, 2021). Some countries updates were considered in our 2022 update report. Australia, Brazil, Egypt, India, Indonesia, the United Arab Emirates and the United Kingdom all submitted new NDCs before our cut-off date in 2022. Brazil's 2022 update still resulted in emissions above its original NDC.

Since our 2022 update report, additional countries updated their targets: Thailand, the United Arab Emirates, Türkiye, Egypt, Viet Nam and Mexico. Brazil has announced a more ambitious NDC update in 2023. We present and discuss all targets in detail in Chapter 3 but summarise updates here. This report considers NDC targets submitted or announced up to September 2023 and policies up until July 2023 (more details in the separate Methodological Annex).

In November 2022, **Thailand** submitted a stronger NDC, increasing its 2030 unconditional target from 20% to 30% below business-as-usual scenario (BAU), and its conditional target from 25% to 40% below BAU all excluding LULUCF.

In November 2022, **Viet Nam** updated its NDC where it has unconditionally committed to reduce emissions by 15.8% below BAU by 2030, up from 9% from its previous NDC target. Viet Nam intends to reduce GHG emissions by 43.5% below BAU, conditional on international support, up from 27% from its previous NDC target.

In November 2022, **Mexico** updated its NDC to include a target to reduce emissions by 30% below BAU, and a 5% further reduction conditional on international finance. This improves on the 2020 update, which kept the same percentage reduction as the 2015 NDC.

In April 2023, **Türkiye** submitted its first updated NDC target. The 2023 NDC communicates an unconditional target of reducing economy-wide emissions by 41% below a BAU scenario in 2030. In its 2023 NDC, Türkiye also mentions its intention to peak emissions at the latest by 2038. Türkiye's updated NDC target is also stronger than its previous target of reducing emissions by 20% below BAU by 2030.

In June 2023, **Egypt** submitted an updated NDC that improved on the one submitted in 2022. The 2023 NDC is fully conditional on international support and includes the same emissions reduction targets for the transport and oil and gas sectors as its 2022 NDC but includes an updated target (from 33% to 37% below BAU) for the electricity sector.

In July 2023, the **United Arab Emirates** submitted an updated NDC, which sets the economy-wide and unconditional goal of reducing GHG emissions to 182 $MtCO_2e$ (incl. LULUCF) by 2030. The 2023 NDC moves from a reduction below BAU to an absolute target, that results in emissions 14% lower compared to the 2022 target.

In September 2023, **Brazil** announced an NDC update which improves on the target submitted in 2022 but only leads to emissions at the same level of the original 2016 NDC. Brazil NDC announcement was communicated in the UN general assembly meeting in New York in September and is expected to be officially communicated to the UNFCCC before the end of the year. In the announcement, Brazil indicates that it intends to increase the percentage target of the NDC from 50% to 53% below 2005 levels by 2030.

Out of the 25 countries analysed, thirteen are likely on track to meet their current NDCs

Most countries are advancing in the implementation of their NDC targets. In some cases, countries are projected to miss their targets. These countries still need to expand climate policies to reduce their projected emissions in line with a pathway compatible with its own targets. In other cases, countries policies and actions are already sufficient to meet their NDCs. These countries are well-positioned to increase the ambition of their targets.

Several of the 25 countries analysed updated their NDCs between 2020 and 2023. A country that was off-track to meet their original NDC target will be further off-track once it has set itself a more ambitious target, though full implementation of current and improved policies are expected to close this implementation gap over time. However, almost one-quarter of the countries analysed here submitted more ambitious NDCs without adopting sufficient policies to meet their original targets (Nascimento et al., 2023). Sequencing ambition raising and sufficient policy adoption remains fundamental for the ambition raising mechanism of the Paris Agreement to work.

The concept of the implementation gap has become more prevalent in current scientific literature in recent years (Fransen et al., 2023; Roelfsema et al., 2020). The implementation gap is often characterised as the difference between the NDC targets and the actions countries implement to meet them.

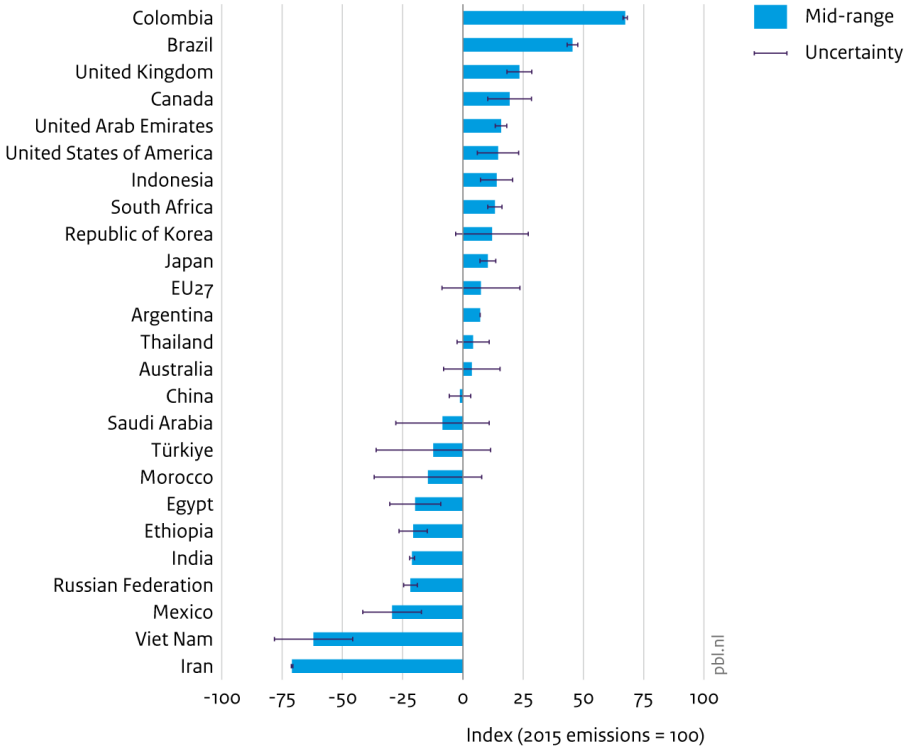
In our report, we calculate the implementation gap as the difference between our NDC and current policies scenario in 2030 (Figure 3). The existence of a positive implementation gap indicates that a country needs to adopt additional policies and actions to meet their NDC. A negative implementation gap highlights a country is projected to meet its NDC target without adopting additional policies — while still carrying out the implementation of its current policies.

We use the implementation gap to determine if a country in on track to meet its NDC. In general, this calculation is based on the middle of the range of countries' current policy and NDC projections.

However, in a few countries, the uncertainty ranges may result in a country being partially on track to meet its NDC. When a country has a substantial share of the current policy range below the NDC target we consider that the country is likely to meet its NDC.

Thirteen countries are likely on track to meet their current NDC targets. Eleven countries are clearly on track based on the middle of our projection's range (Figure 3). This number remains unchanged compared to our 2022 update report. Two additional countries are likely on track to meet their NDC targets based on the lower end of our projections: Australia and the European Union. In both countries, the uncertainty in our projections is caused by the implementation of policies at different governance levels and a substantial share of the current policy emissions range is below the NDC target. More specifically, the EU27 is projected to meet its NDC target based on the implementation of policies adopted at the EU level. Australia is also projected to meet its target based on the implementation of national-level policies combined with more ambitious state-level policies.

Implementation gap for the NDC pledges



Source: PBL FAIR/TIMER model; NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 3: 2030 implementation gap between current policies and NDC targets in the 25 countries analysed. Countries with a negative implementation gap are on track to meet their NDC targets. The lower end of the emission projections range is also substantially below the NDC target for Australia and the European Union. The sectoral emissions coverage of scenarios for each country is aligned with the scope of the NDC. Source: produced by authors.

China, Saudi Arabia, Türkiye and Morocco are currently on track to meet their targets but could miss them if emissions grow as projected in the upper end of our policy scenarios.

Viet Nam and Iran are well on track to meet their NDC targets. Their negative implementation gap is over 60% of the countries' 2015 emissions. This suggests that these countries are well positioned to submit more ambitious targets. Several of the countries which are on track to meet their targets have

submitted updated NDCs that still result in 2030 emissions significantly higher than their current policies, which indicates that these countries can meet their targets without the adoption of any additional policies. The updated NDC targets that are considerably above the current policy scenario in 2030 belong to Mexico (25%), Türkiye (30%), Viet Nam (24%) and Ethiopia (40%).

The remaining twelve countries have an implementation gap; they need to adopt additional policies as well as follow up on the implementation of policies already in force to meet their targets. The magnitude of this implementation gap indicates the level of additional policies and actions that is necessary to meet the NDC targets.

In Brazil and Colombia, the implementation gap corresponds to over 40% of 2015 emissions. In both countries, the land use sector is responsible for a large share of emissions and uncertainty regarding future projections. Swift adoption and enforcement of policies in the land use sector will advance closing the implementation gap in these countries.

Thailand and the Republic of Korea have an implementation gap based on the middle of the range of our scenarios. However, these two countries could meet their targets if they implement policies in line with the lower end of our estimates.

Iran has yet to ratify the Paris Agreement and submit an NDC. In this report, we track progress to its intended NDC, which Iran is on well on track to meet.

2.3 Comparison of key indicators across scenarios

Emissions per capita also vary substantially among scenarios and countries (Figure 2). We compare emissions under current policies to emissions associated with countries' unconditional NDC targets, except for Egypt, which only has a conditional target. In our analyses of emissions per capita and per GDP indicators, the indicator range per country is driven by uncertainty in current policy emissions trajectories up to 2030 (Chapter 3). Both the minimum and maximum of the emissions ranges are based on the same population and economic growth forecasts.

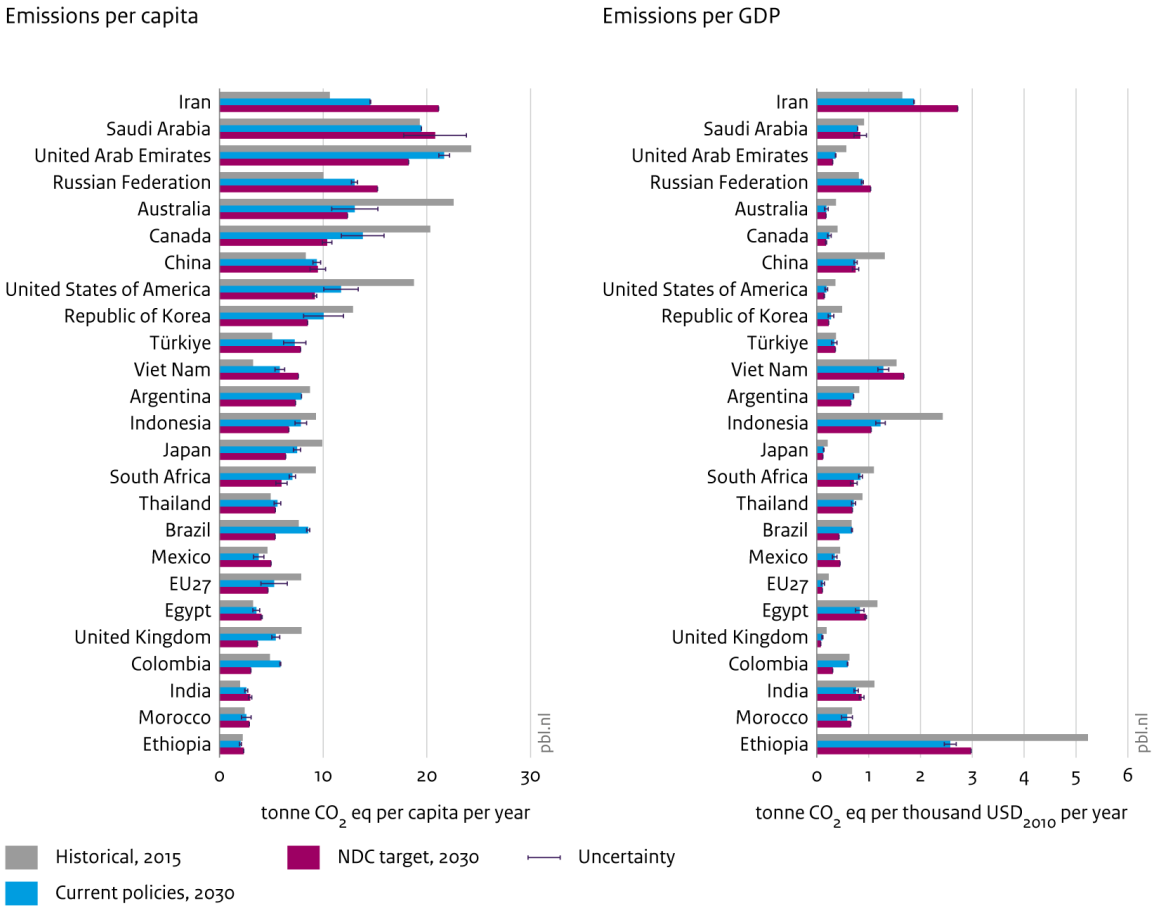
Of the 25 NDC targets analysed, the average per capita emissions in 2030 (calculated as the average of the per capita value for each country) is expected to reach 8.3 tCO_2e per capita (range: 2.9 to 21.1 tCO_2e). Current policies result in higher values for per capita emissions on average at 8.7 tCO_2e (range: 2.6 to 21.7 tCO_2e). This represents an increase compared to historical 2015 values – 7.9 tCO_2e per capita (range: 1.1 to 23.6 tCO_2e). However, both NDC and current policies scenarios show substantial range in 2030 emissions per capita.

Although Viet Nam updated their NDC in 2022, emissions per capita associated with its NDC target are five times higher than emissions in 2015. In China, India, Iran and Türkiye NDC targets imply a threefold increase in emissions per capita between 2015 and 2030. The NDC of many other countries (Australia, Brazil, Canada, Colombia, Japan, United States, the United Kingdom) results in emissions per capita approximately halving in the same period. However, several of these countries depart from a much higher per capita level. Australia, Canada and the United States have the highest emissions per capita among the countries analysed.

The variation in emissions intensity of the economy, which is calculated as the total GHG emissions per unit of gross domestic product (GDP), across scenarios is also relevant in many countries (Figure 2). In both NDC and current policy scenarios, we project that emissions intensity of the economy will almost halve in many countries: Australia, Canada, the European Union, Japan, the United States and the United Kingdom. In several additional cases, NDC targets imply emissions intensity will be substantially lower than historical levels, such as in Brazil, Colombia, the Republic of Korea and South Africa. Although in others NDC targets imply an extensive increase compared to historical levels, as is the case for Iran, Viet Nam, Saudi Arabia and Türkiye. The average emissions per GDP under the NDC scenario

is expected to be approximately 0.7 tCO_2e per thousand USD_{2010} (range: 0.1 to 3.0). Under current policies, this value is 0.7 tCO_2e (range: 0.1 to 3.5 tCO_2e).

Impact of current policies on greenhouse gas emissions in major emitting countries



Source: PBL FAIR/TIMER model; NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 4: Greenhouse gas emissions intensity per capita and per GDP in 2030 under current policies (adopted up until July 2023), NDC scenarios and historical 2015 levels. The NDC target figures refer to unconditional target, except for Egypt. Both Australia and the European Union are likely on track to meet their NDC targets and the uncertainty is mostly driven by differences in implementation of policies at different governance levels. The sectoral emissions coverage of the scenarios for each country is aligned with the scope of the NDC. Figure sorted by NDC per capita values. Source: produced by authors.

3 Emission projections per country

This chapter summarises the resulting GHG emission projections per country. In our report, we express GHG emission values in terms of global warming potentials of the IPCC Forth Assessment Report (IPCC, 2007).

The sectoral coverage for GHG emission indicators presented in the factsheets is consistent with the NDC targets, unless stated otherwise. In other words, when the NDC target excludes LULUCF, we also exclude LULUCF from our historical data and current policy projections. The term ‘land use’ used in the figures refers to LULUCF emissions and removals.

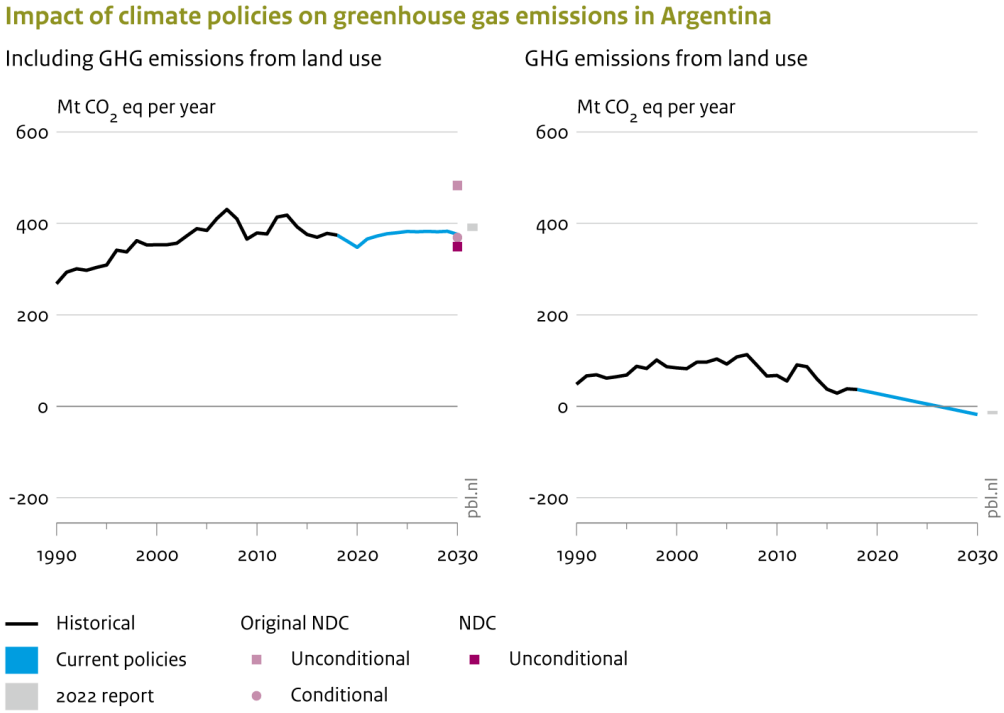
For the calculation of per capita emissions, we use population projections (median variant) from the UN population statistics (United Nations, 2022). For the calculation of emissions per GDP, we used the International Monetary Fund World Economic Outlook (IMF, 2023).

The supplementary methodological document provides explanations on historical emissions data sources and the harmonisation of emissions projections to the historical data (Annex A2), quantification of NDC emissions levels (Annex A3), general description of calculation methods used by NewClimate Institute, PBL and IIASA to quantify emissions projections under current policies (Annexes A4 to A6) and a list of the main policies quantified in the projections (Annex A7).

3.1 Argentina

Pledge	Key target	Submission date
NDC	Economy-wide target to limit GHG to 349 $MtCO_2e$ by 2030	02/11/2021
Net zero	GHG neutral by 2050	06/11/2022

Argentina is **set to miss its current NDC target with existing policies**. Emissions in energy and industry sectors remain on a strong upwards trend but are counterbalanced by an increase in land use emission sinks. Our current policies scenario this year is slightly lower than our 2022 projections, mainly due to the inclusion of Argentina's latest climate strategy, as well as a small increase in the net sink expected in 2030.



Source: NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 5: Impact of climate policies on greenhouse gas emissions in Argentina. Emissions trajectories are based exclusively on NewClimate and IIASA projections. The grey bar gives the range of our 2022 projections.

Targets

In 2021, Argentina submitted an updated NDC that includes an absolute, economy-wide and unconditional goal of limiting GHG emissions to 349 $MtCO_2e$ (incl. LULUCF) by 2030 2% – lower than its 2020 NDC target (Government of Argentina, 2021).

In 2020, the government announced a long-term strategy (LTS) aiming for greenhouse gas neutrality by 2050. Argentina's target covers all emissions and sectors of the economy but does not provide details on the expected contribution per sector nor the land use removals (Government of Argentina, 2022a).

Recent developments

In December 2022 Argentina set out its latest climate mitigation and adaptation strategy, which includes several details on climate mitigation measures, but does not introduce any new sectoral or economy-

wide GHG reduction targets (Government of Argentina, 2022b). Argentina has started operation of a new pipeline connecting the Vaca Muerta shale gas fields with the national network and plans to ramp up production to become a net exporter in the coming years (Diamante, 2023). Argentina's latest climate strategy mentions policies to support the uptake of solar PV. EVs and hybrid light-duty vehicles are slowly taking off in the Argentinian market, with sales reaching over 7,500 units in 2022, 33% up from 2021 (Della Vecchia, 2023), but the successful transition to electric transportation will depend on public financing of capital intensive infrastructure, at a time of severe constraints on public finances.

The effective implementation and emissions impact of these policies remains unclear in a context of over 100% annual inflation in 2022-2023.

Table 3: 2015 historical and 2030 projections of key GHG indicators for Argentina.

Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional target
GHG emissions - incl. LULUCF (MtCO2e)	380	380	350
	+6% vs 2000	+0% vs 2015	-7% vs 2015
GHG emissions per capita (tCO_2e/cap)	8.7	7.9	7.3
	-9% vs 2000	-9% vs 2015	-16% vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	0.82	0.71	0.66
	-26% vs 2000	-13% vs 2015	-19% vs 2015

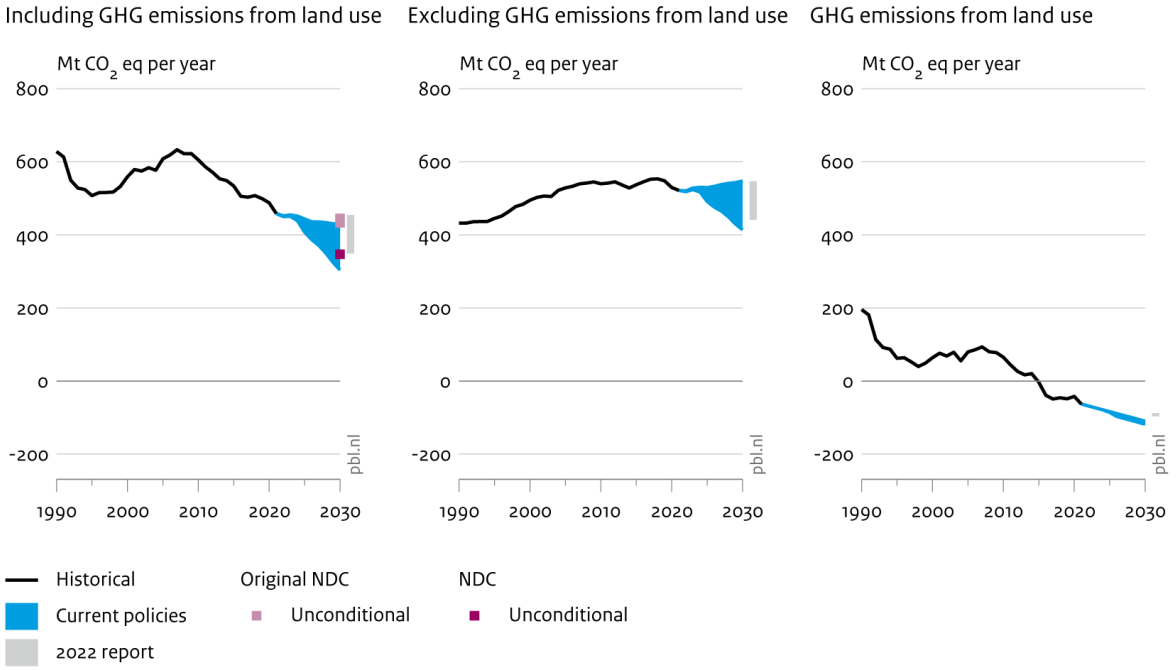
3.2 Australia

Pledge	Key target	Submission date
NDC	Economy-wide target to reduce GHG by 43% below 2005 levels by 2030	16/06/2022
Net zero	Net zero GHG by 2050	29/10/2021

Australia is **projected to meet its NDC target with existing policies** based on the lower end of the current policy range, which results in a lower emissions level than projected in our 2022 update report. This is driven by an increase in the uptake of renewable energy for power generation and the reform of the Safeguard Mechanism.

The uncertainty range in our projections is partially due to the differences between national (upper end) and more ambitious state-level policies (lower end), which represents the implementation of policies and measures adopted by the different territories. Australia projects that the LULUCF sector will remain relatively stable up to 2030, while we project a continuation of the historical trend and a steady increase in the land use sink, mainly due to increasing carbon sequestration in newly afforested land.

Impact of climate policies on greenhouse gas emissions in Australia



Source: PBL IMAGE model; NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 6: Impact of climate policies on greenhouse gas emissions in Australia (upper end: PBL IMAGE model, lower end: NewClimate Institute calculations). LULUCF projections exclude removals from non-anthropogenic natural disturbances in line with Australia's 2021 GHG Inventory Submission. The grey bar gives the range of our 2022 projections.

Targets

Australia submitted its updated NDC in June 2022 (Australian Government, 2022). The unconditional target sets a 43% GHG reduction below 2005 levels by 2030 and reiterates Australia's goal to achieve

net zero GHG emissions by 2050. The government enshrined these targets into law in September 2022 (*Climate Change Bill 2022*, 2022).

Australia's Long Term Emissions Reduction Plan outlines the country's net zero emissions pathway for 2050, including the previously published Technology Investment Roadmap Paper and the Low Emissions Technology Statements (Australian Government, 2021; DISER, 2020; Government of Australia, 2021).

Recent developments

Under the Community Solar Banks program, Australia's government is co-investing AUD 100 million to deploy shared solar across the country as a support measure for households who cannot afford to install their own system (Government of Australia, 2023b). Additionally, under the AUD 200 million Community Batteries for Household Solar program, grants will be delivered for the installation of 400 batteries across the country, providing shared storage for up to 100,000 households (Government of Australia, 2023a). The reformed Safeguard Mechanism, in force since July 2023, outlines a more ambitious emissions reduction effort, with baseline emission limits reduced by an average rate of 4.9% each year to 2030, planning to deliver over 200 $MtCO_2e$ of abatement by the end of the decade. However, questions remain on whether the supply of Australian Carbon Credit Units (ACCUs) will cover demand over the next seven years and beyond – especially for hard-to-abate sectors that will rely on Safeguard Mechanism Credits (SMCs) and ACCUs for compliance (Government of Australia, 2023c). The Safeguard Mechanism Reform factors the expansion of fossil gas and coal projects.

Table 4: 2015 historical data and 2030 projections of key GHG indicators for Australia.

Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional target
GHG emissions - incl. LULUCF (MtCO2e)	530	300 to 430	350
	-4% vs 2000	-43% to -20% vs 2015	-35% vs 2015
GHG emissions per capita (tCO_2e/cap)	22.6	10.8 to 15.3	12.4
	-24% vs 2000	-52% to -32% vs 2015	-45% vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	0.37	0.2 to 0.22	0.18
	-39% vs 2000	-59% to -42% vs 2015	-53% vs 2015

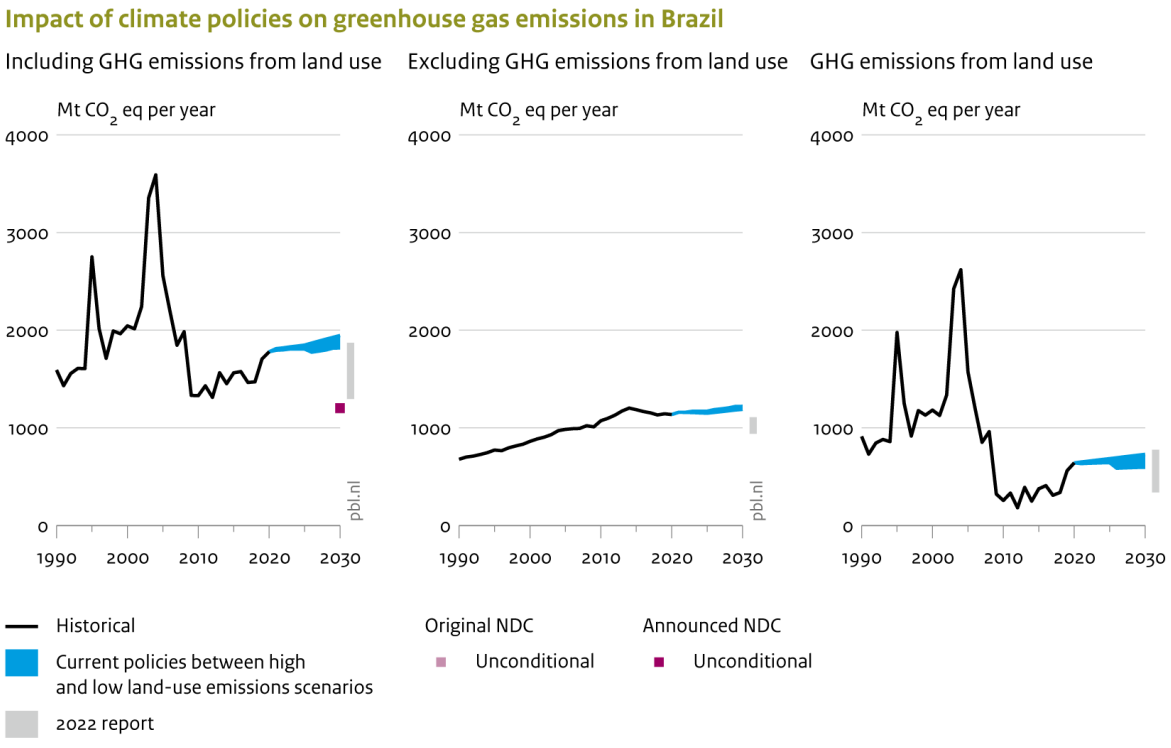
3.3 Brazil

Pledge	Key targets	Submission date
NDC	Economy-wide target to limit GHG to 1.32 $GtCO_2e$ by 2025 and 1.20 $GtCO_2e$ by 2030	27/10/2023[1]
Net zero	Climate neutral by 2050 (gas coverage not specified)	07/04/2022

Brazil announced a new, more ambitious NDC target during the Climate Ambition Summit in September 2023. This announcement was officially submitted in October 2023. This 2023 NDC returns to the ambition level of the original NDC, submitted in 2016 (more details in the target section below).

The country is **set to miss its latest 2030 NDC target** with existing policies. Emissions in all sectors plateau or slightly increase up to 2030. Current policies in the land-use sector are insufficient to meet deforestation-related targets and curb emissions in the sector. Meeting the current NDC target will highly depend on the enforcement of land-use related policies in the coming years.

Emissions projections are higher compared to our 2022 update report due to an increase in historical land-use emissions. Brazil had no substantial policy adoption or rollbacks since our last report.



Source: PBL IMAGE model; NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 7: Impact of climate policies on greenhouse gas emissions in Brazil (upper end: PBL IMAGE model, lower end: NewClimate Institute calculations). The grey bar gives the range of our 2022 projections.

[1] Brazil officially submitted its new NDC to the UNFCCC after our cut-off date for NDC targets. However, our analysis includes the new emission target as it remains unchanged since the announcement in the UN Climate Ambition Summit.

Targets

In the UN Climate Ambition summit in 2023, Brazil announced new NDC targets that result in emissions at the same absolute levels compared to the original 2016 target. This 2023 adjustment of the NDC was officially submitted to the UNFCCC in October 2023 (Government of Brazil, 2023).

The 2023 NDC communicates absolute emission limits for the 2025 and 2030 emission targets. The new targets are consistent with emission reductions of 48.4% below 2005 by 2025 and 53.1% below 2005 by 2030. This improves on the 2022 NDC, which contains emission reductions targets of 37% below 2005 by 2025 and 50% below 2005 by 2030. Brazil uses the inventory communicated in its 4th Biennial Update Report as a reference. However, it remains unclear whether an update in the inventory will also affect the emission limits of the new NDC.

The 2023 NDC contains a target to end illegal deforestation in the Amazon using similar language to the 2022 NDC. However, the target was moved from 2028 to 2030. The 2022 NDC also includes a tentative climate neutrality target (Government of Brazil, 2022). In the 2023 NDC, Brazil reiterated its commitments to its climate neutrality target, but its scope and implementation plan remain unspecified.

Recent developments

Since January 2023, Luiz Inácio Lula da Silva is again the Brazilian president. The administration of this predecessor led to a consistent increase in deforestation, dismantling of environmental protection agencies and weakening of important environment protection mechanisms (Hochstetler, 2021; Silva Junior et al., 2021). Alternatively, Lula aims to improve cross-national cooperation and reinstate his commitment to use climate change mitigation as a development strategy (Freua, 2022). The current administration has taken many steps to rebuild institutions and policies rolled-back in the past four years. In the first 100 days of government, for example, the administration has reactivated the Amazon Fund, reestablished the Plan to Prevent and Control deforestation in the Amazon (PPCDAM), and restructured the ministry of environment, which is now the Ministry of Environment and Climate Change (Política por Inteiro, 2023a).

However, the country maintains plans to increase production of oil and gas until 2030. The state-owned Petrobras requested permits to drill oil and gas exploration close to the Amazon River mouth (Júnior, 2023). This project is the centre of multiple discussions and remains subject to substantial environmental concerns. Additionally, the current administration did not implement substantial new policies to reduce emissions from energy and industry sectors.

Table 5: 2015 historical data and 2030 projections of key GHG indicators for Brazil.

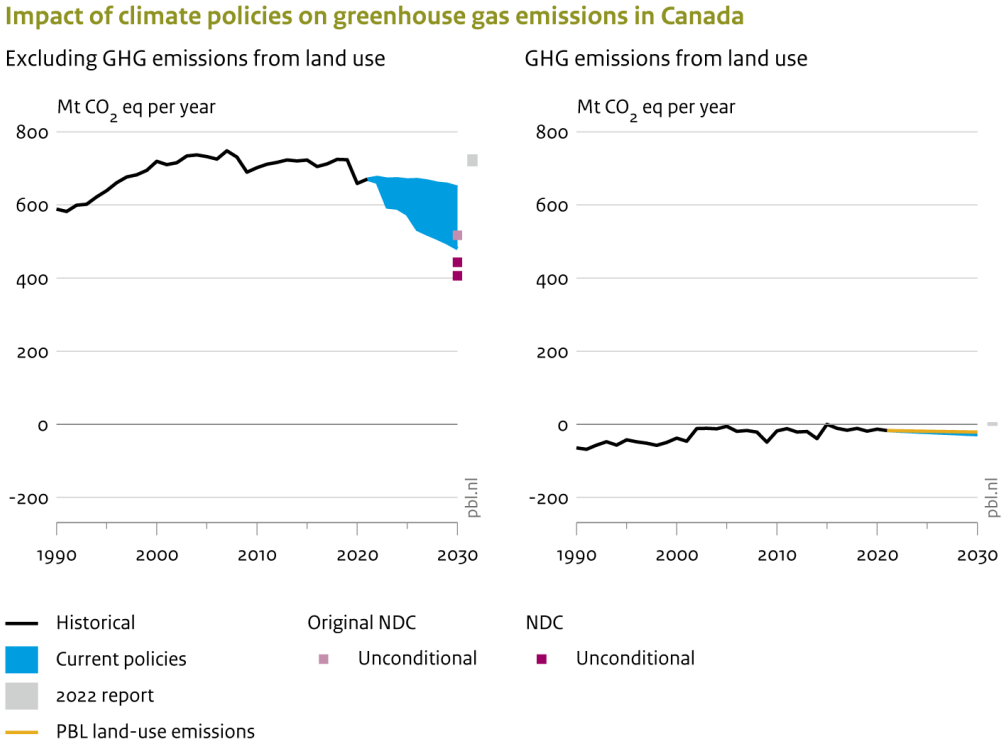
Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional target
GHG emissions - incl. LULUCF (MtCO2e)	1,560	1880 to 1950	1,200
	-24% vs 2000	+20% to +24% vs 2015	-23% vs 2015
GHG emissions per capita (tCO_2e/cap)	7.7	8.4 to 8.7	5.4
	-35% vs 2000	+10% to +14% vs 2015	-30% vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	0.67	0.7 to 0.69	0.43
	-49% vs 2000	-0% to +3% vs 2015	-36% vs 2015

3.4 Canada

Pledge	Key target	Submission date
NDC	Economy-wide target to reduce GHG by 40-45% below 2005 levels by 2030	12/07/2021
Net zero	Net zero GHG by 2050	31/10/2022

Canada is **set to miss its NDC targets** with existing policies. The Emission Reduction Plans (ERPs) published in March 2022 (Government of Canada, 2022a) suggest measures that would reduce emissions to the upper end of the NDC range, but those measures are in part not yet implemented in legislation.

Our current projections are lower than 2022, mostly due to increased LULUCF sink projections, and additional policy implementation, such as hydrofluorocarbons (HFC) reduction measures, updated methane reduction targets from the oil and gas sectors and 100% share of electric vehicles in newly purchased passenger cars by 2040.



Source: PBL IMAGE model; NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 8: Impact of climate policies on greenhouse gas emissions in Canada (upper end: NewClimate Institute calculations, lower end: PBL IMAGE model). The NDC unconditional target for 2030 accounts for credits/debits generated by the LULUCF sector. Land use emissions based on both IIASA and PBL projections. The grey bar gives the range of our 2022 projections.

Targets

In its 2021 NDC update, Canada committed to reducing its GHG emissions by 40-45% below 2005 levels by 2030. Under its domestic climate legislation, Canada is expected to submit a new NDC including a 2035 emissions reduction target within 2024 (Government of Canada, 2021). In the quantification of the NDC, we assume that Canada uses a net-net accounting approach for the land use sector (Annex A3). However, the NDC target accounts for credits generated by the LULUCF sector.

In 2022, Canada submitted an updated long-term strategy (LTS) including a net zero GHG emissions by 2050 target (Government of Canada, 2022b). This target had been enshrined into law before the LTS submission. The target is supported by the first of a series of ERPs. Canada has set out a series of scenarios exploring paths towards net zero, most of which envision a large role for LULUCF sinks and/or technological CDR, which might be needed to cover up to 300 $MtCO_2e$ of Canada's 2050 emissions.

Recent developments

The ERPs outline how the government sets and proposes to achieve its climate targets – through cutting oil and gas sector emissions by about 45% by 2030, accelerating clean technology innovation and deployment (especially Carbon Capture, Usage and Storage), investing in clean electricity, and supporting the switch to zero-emission on-road vehicles.

In their 2023 budget announcement, the Government published their Made-in-Canada Plan, that supports clean economy investments in the form of tax credits, low-cost strategic financing, and targeted investments and programming (Government of Canada, 2023). Between 2023 and 2028, the plan foresees almost CAD 28 billion to fund clean electricity, manufacturing, hydrogen support, Carbon Capture, Usage and Storage projects, and technology research and development.

Cannada also issued a new Methane Strategy, 'Faster and Further: Canada's Methane Strategy', which commits to reducing total methane emissions by 35% below 2020 by 2030, and reducing methane emissions from oil and gas production by at least 75% by 2030 from 2012 levels, by setting new requirements for the sector (Government of Canada, 2022c). These requirements build on previous regulations, which were designed to reduce the sector's methane emissions by 40 to 45% from 2012 levels by 2025.

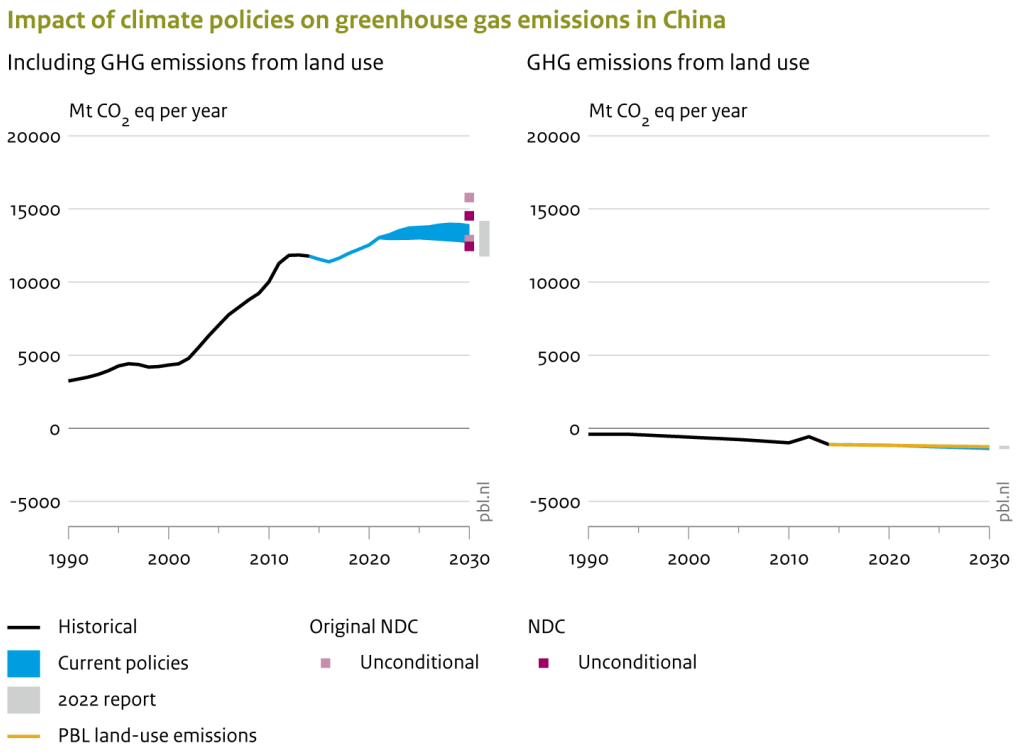
Table 6: 2015 historical data and 2030 projections of key GHG indicators for Canada.

Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional target
GHG emissions - excl. LULUCF (MtCO2e)	720	480 to 650	440 to 410
	+0% vs 2000	-33% to -10% vs 2015	-39% to -44% vs 2015
GHG emissions per capita (tCO_2e/cap)	20.3	11.8 to 15.9	9.9 to 10.8
	-14% vs 2000	-42% to -22% vs 2015	-51% to -47% vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	0.40	0.2 to 0.28	0.2 to 0.17
	-27% vs 2000	-49% to -31% vs 2015	-53% to -57% vs 2015

3.5 China

Pledge	Key targets	Submission date
NDC	Economy-wide target to peak CO_2 before 2030. China's NDC also includes targets to lower carbon intensity by over 65% in 2030 from 2005 levels, reduce the share of non-fossil fuels in primary energy consumption to around 25% in 2030, increase forest stock volume by around 6 billion cubic metres in 2030 from the 2005 level, and increase the installed capacity of wind and solar power to over 1,200 GW by 2030	28/10/2021
Net zero	Carbon neutral before 2060 (CO2 only)	28/10/2021

China's is **on track to meet its NDC** with existing policies, despite uncertainty. The lower end of our emission projections indicates that the country could peak its emissions before 2025 but the upper end still projects emissions increasing until 2029, although at a slower rate compared to historical growth, and then plateauing by 2030.



Source: PBL IMAGE model; NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 9: Impact of climate policies on greenhouse gas emissions in China (upper end: PBL IMAGE model, lower end: NewClimate Institute calculations). Land use emissions based on both IIASA and PBL projections. The grey bar gives the range of our 2022 projections.

The lower end of our current projections is higher than those from our 2022 updated report, mostly due to an expected increase in energy demand which might prolong fossil power dependence. The NDC target range calculation is based on a range of assumptions about socio-economic and energy developments in China. These assumptions are consistent for the projections for PBL and NewClimate and indicate that, under equivalent socio-economic assumptions, China is likely to meet its NDC target.

Targets

In October 2021, China submitted its carbon neutrality before 2060 target and updated NDC targets, improving on its non-fossil share (around 25% in 2030, up from 20%) and carbon intensity targets (over 65% in 2030 from the 2005 level, up from the previous by 60–65%), while adding a new renewable energy target (1,200 GW of wind and solar by 2030) (Government of China, 2021b, 2021a).

While these targets seem to cover all sectors of the economy, they leave out key GHGs such as CH_4 and N_2O. China does not specify how each sector will contribute to the achievement of its carbon neutrality target, but its plans imply a large role for carbon removals through LULUCF, as China targets an 80% share of non-fossil energy by 2060 (Climate Action Tracker, 2023).

Recent developments

China's domestic climate policy is steered by its overarching *Working Guidance for Carbon Dioxide Peaking and Carbon Neutrality* (before 2060) and *Action Plan For Carbon Dioxide Peaking Before 2030*, which are implemented through the 14th Five Year Plans (FYP) (2021-2025) (NDRC, 2021, 2022; People's Government of Fujian Province, 2021).

In July 2023 China's government announced a transition from the dual-energy controls (limiting energy consumption) on the economy to dual-carbon controls, continuing on its pledge to 'strictly control' coal consumption with peak consumption by 2025 and ramp up renewables at high rates (SCIO of China, 2023). China achieved a 2025 target of 50% installed capacity from non-energy sources at the end of 2022, with the domestic power industry earlier projecting another 180 GW installed over 2023 (CEC, 2023; Xinhuanet, 2023). China's scheduled renewable project pipeline means it could reach its 2030 target of 1,200 GW wind and solar installed a half-decade early (Mei et al., 2023). However, China's policymakers have also continued to prioritise the expansion of its coal-fired power plant fleet in the name of energy security, leading to overcapacity issues. Domestic production and consumption of all fossil fuels have increased in 2023 as the country rebounds from its COVID-19 lockdown (NEA, 2023).

Table 7: 2015 historical data and 2030 projections of key GHG indicators for China.

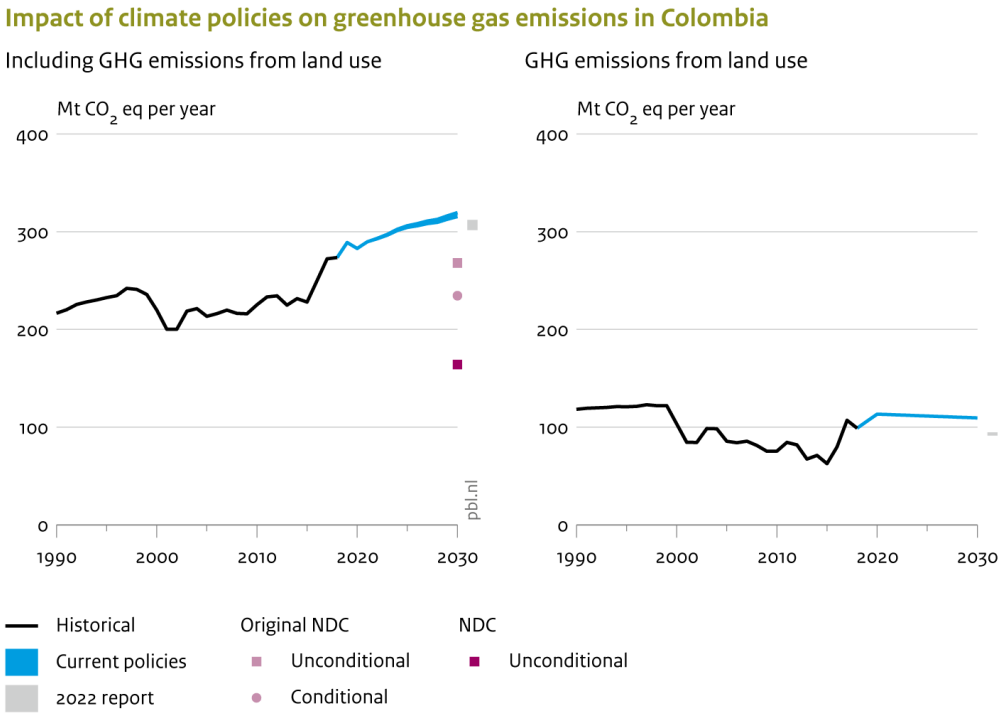
Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional target
GHG emissions - incl. LULUCF (MtCO2e)	11,560	12,780 to 13,850	12,400 to 14,500
	+167% vs 2000	+10% to +20% vs 2015	+25% to +7% vs 2015
GHG emissions per capita (tCO_2e/cap)	8.3	9.0 to 9.8	8.8 to 10.2
	+142% vs 2000	+8% to +17% vs 2015	+5% to +23% vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	1.31	0.7 to 0.78	0.8 to 0.69
	-39% vs 2000	-45% to -41% vs 2015	-38% to -47% vs 2015

3.6 Colombia

Pledge	Key targets	Submission date
NDC	Economy-wide target to limit GHG to 169.4 MtCO2e in 2030 and to peak emissions by 2027	30/12/2020
Net zero	Carbon neutral by 2050	21/11/2021

Colombia will **likely miss its NDC targets** with the currently adopted policies. Emissions projections are slightly higher in comparison to our previous projections mostly due an increase in historical land use emissions from grassland and forestland.

Developments in the land use sector have a substantial effect on Colombia's emission projections as the sector currently accounts for almost one-third of the country's emissions (Gütschow & Pflüger, 2023; Tubiello et al., 2021). A sharp increase in historical land use emissions between 2015 and 2018 results in an increase in 2030 projections compared to previous studies (Kuramochi et al., 2021). As a result of these efforts, we now project a reduction of deforestation rates from 2020 onwards which would reduce land use emissions over time.



Source: NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 10: Impact of climate policies on greenhouse gas emissions in Colombia. Emissions trajectories are based exclusively on NewClimate and IIASA projections. The grey bar gives the range of our 2022 projections.

Targets

Colombia submitted its updated NDC in December 2020, which is more ambitious than the previous one. The updated NDC sets an absolute emissions limit of 169 $MtCO_2e$, equivalent to a 51% reduction of emissions by 2030 compared to the BAU scenario (Government of Colombia, 2020). The target mentions the intention to peak emissions between 2027-2030 and to achieve a national deforestation rate of 50,000 hectares per year by 2030, with a complementary target using article 6.2 and other international mechanisms to achieve zero deforestation in natural forests by 2030.

In 2021, Colombia submitted an LTS including a net zero GHG emissions target, which was subsequently enshrined in domestic law. The target covers all sectors and GHG emissions. Colombia expects 90% of its emissions to be reduced through mitigation measures across all sectors, and the remaining 10% to be removed through LULUCF sinks or technological carbon dioxide removal (Ministerio de Ambiente y Desarrollo Sostenible Colombia, 2021).

Recent developments

Colombia's President Gustavo Petro, who was sworn into office in August 2022, has made climate change and the energy transition a top priority for his administration. Some measures proposed include increasing the uptake of non-conventional renewable energy in the electricity system, suspend new oil and gas exploration, suspend pilot projects for exploration and production of unconventional fossil deposits using hydraulic fracturing (fracking) techniques, and put climate efforts at the centre of negotiations and trade with other countries. It is still unclear how these objectives will be reflected in policies and action (Acosta et al., 2022).

Colombia progressed on the implementation of its deforestation targets. Deforestation peaked in 2017 at around 220,000 hectares per year and has since then been reduced to approximately 170,000 hectares per year by 2021, and 124,000 hectares per year by 2022 (Ministerio del Ambiente y Desarrollo Sostenible, 2022). There has been a significant reduction in deforestation in the Amazonia region as a result of government and community efforts to protect forests and combat illegal activities that contribute to deforestation. However, it remains to be seen whether Colombia will be able to sustain this development in the coming years.

In September 2023, Colombia joined the Powering Past Coal Alliance (PPCA), committing to halting the development of new unabated coal power plants and phasing out existing plants to keep the goal of limiting global temperature rise to 1.5°C within reach. Colombia is the world's sixth-largest coal exporter, becoming the largest exporter of coal to join the PPCA (Powering Past Coal Alliance, 2023).

In August 2023 in the Amazon summit, Gustavo Petro called for an end to the exploration of fossil fuels in the Amazon, but other presidents in the region and other oil producers did not agree (Osborn, 2023).

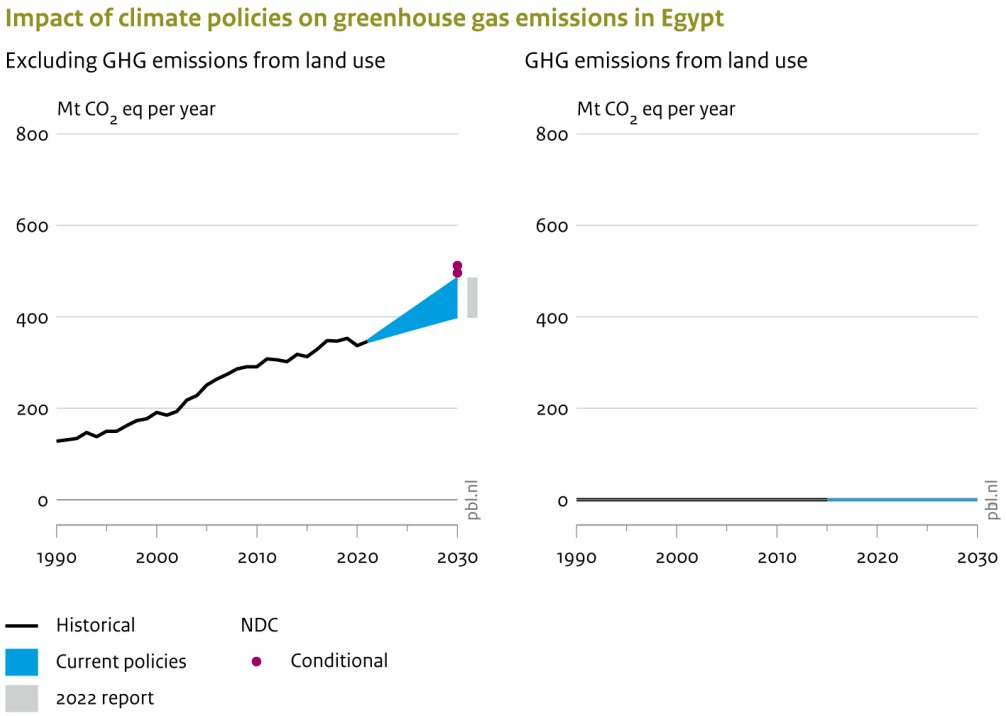
Table 8: 2015 historical data and 2030 projections of key GHG indicators for Colombia.

Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional target
GHG emissions - incl. LULUCF (MtCO2e)	230	320 to 320	160
	+4% vs 2000	+38% to +40% vs 2015	-28% vs 2015
GHG emissions per capita (tCO_2e/cap)	4.9	5.8 to 5.9	3.0
	-14% vs 2000	+20% to +22% vs 2015	-38% vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	0.63	0.59 to 0.60	0.31
	-44% vs 2000	-6% to -5% vs 2015	-51% vs 2015

3.7 Egypt

Pledge	Key targets	Submission date
NDC	Sectoral emissions reduction targets compared to a business as usual (BAU) scenario in 2030: Electricity (-37%), Transport (-7%) and Oil & gas (-65%).	26/06/2023
Net zero	No target	

Egypt is **well on track to meet its NDC target**. Emissions under current policies are projected to steadily increase towards 2030. Egypt's updated NDC maintains the targets set in the previous NDC, except for a stronger power sector target. These targets are still fully conditional on international support, do not cover all sectors and result in emissions above our estimates under currently adopted policies.



Source: NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 11: Impact of climate policies on greenhouse gas emissions in Egypt. Emissions trajectories are based exclusively on NewClimate and IIASA projections. The grey bar gives the range of our 2022 projections.

Targets

In June 2023, Egypt submitted an update to its NDC that includes its previous emissions reduction targets for the transport and oil and gas sectors, as well as an updated target (from 33% to 37% below BAU) for the electricity sector. The NDC also includes non-quantified measures for the industry, tourism, buildings and waste sectors. BAU for electricity generation, transmission and distribution: 215 MtCO2e in 2030. BAU for oil and gas upstream: 3 MtCO2e in 2030. BAU for transport: 124 MtCO2e in 2030 (Government of Egypt, 2022, 2023).

Recent developments

The Integrated Sustainable Energy Strategy to 2035 (ISES 2035), issued in 2015, remains the energy sector's core policy. The strategy maintains the target set in the 2008 National Renewable Energy Strategy of reaching 20% of the electricity generation mix from renewables (IEA, 2008) but postpones

the deadline to 2022 and adds the target of 42% by 2035 (IRENA, 2018). This target was confirmed again in the updated NDC, which also sets an interim objective of reaching 40% of renewable energy by 2030 (Government of Egypt, 2022). In 2020, electricity generation from renewable energy stood at 12% (IRENA, 2022b).

Egypt's government plans to further develop its vast fossil gas resources to maximise domestic production, consumption, and exports. First, it aims to increase the use of fossil gas in various sectors, including transport. In 2020, President al-Sisi announced a plan to convert 450,000 cars to run on compressed natural gas (CNG) by 2023 — which would bring the total number of cars running on CNG to one million (Government of Egypt, 2021). The government also unveiled plans to increase gas exports to carter to higher demand, particularly from Europe, and position Egypt as a regional energy hub (Bloomberg, 2023).

Egypt aims to become a hub for hydrogen production. At COP27, the government released an outline of its Low-carbon Hydrogen strategy, which set the objective to capture 5% of the global hydrogen market by 2040 (Reuters, 2022).

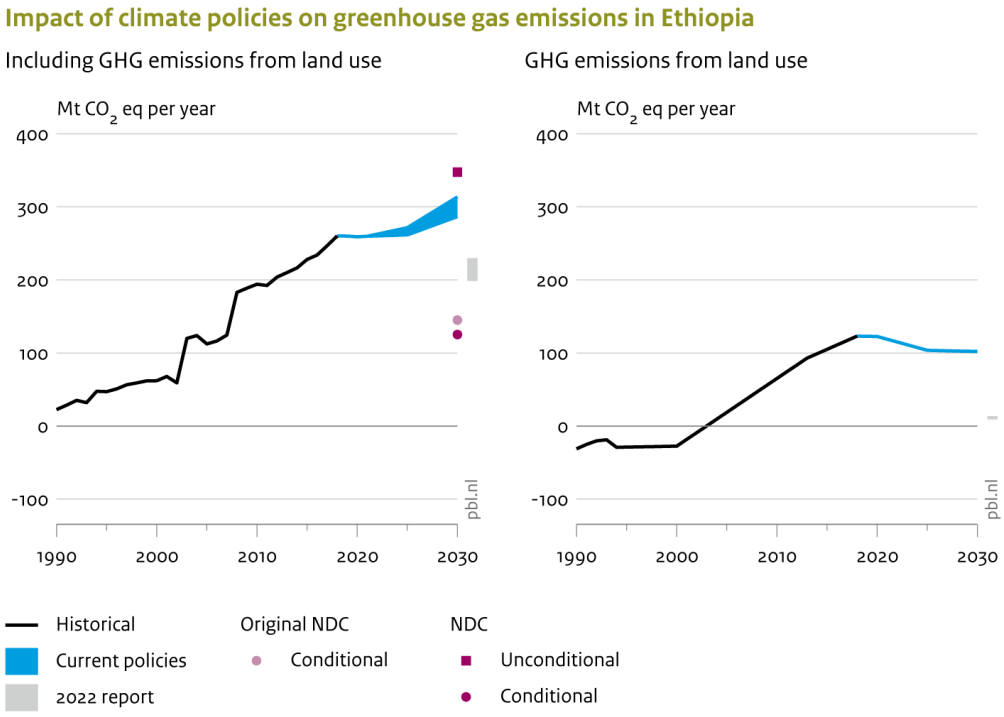
Table 9: 2015 historical data and 2030 projections of key GHG indicators for Egypt.

Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC conditional target
GHG emissions - excl. LULUCF (MtCO2e)	310	400 to 480	500 to 510
	+64% vs 2000	+28% to +54% vs 2015	+58% to +64% vs 2015
GHG emissions per capita (tCO_2e/cap)	3.2	3.2 to 3.9	4.0 to 4.1
	+20% vs 2000	-0% to +20% vs 2015	+23% to +27% vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	1.17	0.75 to 0.91	0.93 to 0.96
	-15% vs 2000	-36% to -22% vs 2015	-18% to -20% vs 2015

3.8 Ethiopia

Pledge	Key targets	Submission date
NDC	Economy-wide unconditional target to reduce GHG by 14% below BAU by 2030 and conditional target to reduce GHG by 68.8% below BAU by 2030	23/07/2021
Net zero	No target (intention to become carbon-neutral announced)	10/06/2015

Ethiopia will **miss its NDC conditional target, but it will meet its unconditional NDC target** with existing policies. Our current policy projections this year are significantly higher than in 2022. This is mostly due to changes in officially reported LULUCF and agriculture historical emissions, including an improvement and recalculation of emissions factors for certain sources as well as the identification of errors and inconsistencies in previous communications. These changes substantially affect our historical estimates and therefore the harmonisation of our current policy projections (Annex A2).



Source: NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 12: Impact of climate policies on greenhouse gas emissions in Ethiopia. Emissions trajectories are based exclusively on NewClimate and IIASA projections. The grey bar gives the range of our 2022 projections.

Targets

In 2021, Ethiopia submitted an NDC that includes an unconditional target to reduce emissions by 14% below BAU, and a conditional target of reducing emissions by 68% below BAU. This NDC includes an unconditional target for the first time. Its NDC BAU scenario has been revised upwards, expecting a higher share of LULUCF emissions under BAU than in the previous NDC. Ethiopia also expects to achieve the majority of its NDC targets through reductions in land use emissions (Government of Ethiopia, 2021).

In 2015, Ethiopia announced its intention to become carbon-neutral, but has so far not officially set a target, nor submitted an LTS (Government of Ethiopia, 2016). However, the country is working with the

Global Green Growth Institute to develop a long-term strategy including a net zero scenario that could support a future long-term emissions reduction target (Global Green Growth Institute, 2022).

Recent developments

A peace agreement in November 2022 ended the Ethiopian civil war, allowing full humanitarian access to the Tigray region (Global Conflict Tracker, 2023). In the context of pacification efforts, the Ethiopian government has not set out any new climate policies in this period. One of the country's major climate policies, the 'Climate Resilient Green Economy' (CRGE), first published in 2011 outlining Ethiopia's mitigation efforts, remains under revision as of September 2023. In 2020, Ethiopia released its Ten Years Development Plan: A Pathway to Prosperity (2021-2030) (Government of Ethiopia, 2020), which includes targets to increase Ethiopia's greenhouse gas emissions reduction capacity but does not specify what the commitment entails, and whether and how this plan links to specific climate policies.

A second phase of the Growth and Transformation Plan (GTP II) for 2016 to 2020 aimed for the full implementation of the CRGE by 2025 (NPC, 2016). The Grand Ethiopian Renaissance Dam (5 GW) and the Koysha dam (2 GW) remain under construction, with the former being filled and expected to commence operations in 2023 (Al Jazeera, 2023; Gomaa, 2022; Groenendaal, 2020). Since 2019, Ethiopia has implemented large-scale annual tree planning initiatives as part of its Green Legacy initiative (Government of Ethiopia, 2022). The initiative has led to around 25 billion tree seedlings being planted between 2019 and 2022, and the government has announced it plans to continue with the project, and aims to plant 6.5 billion seedlings in 2023 (Ethiopian Monitor, 2023).

Table 10: 2015 historical data and 2030 projections of key GHG indicators for Ethiopia.

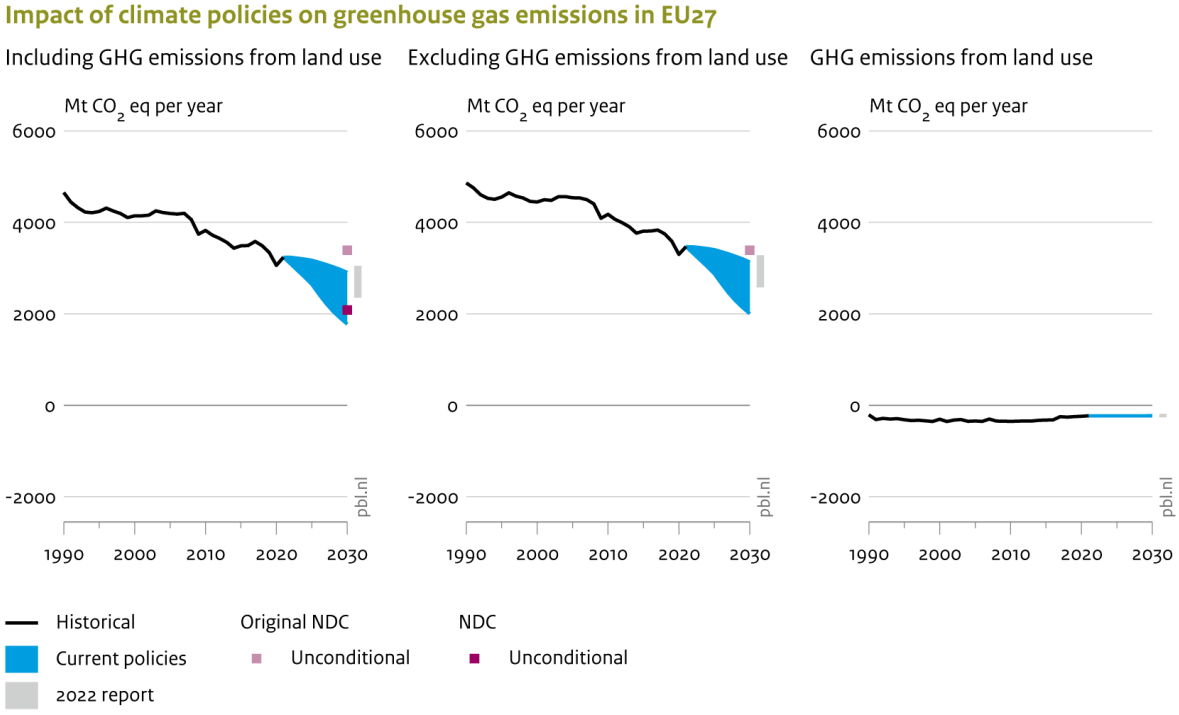
Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional [conditional] target
GHG emissions - incl. LULUCF (MtCO2e)	230	290 to 310	350 [130]
	+268% vs 2000	+26% to +38% vs 2015	+52% [-45%] vs 2015
GHG emissions per capita (tCO_2e/cap)	2.3	1.9 to 2.1	2.4 [0.8]
	+140% vs 2000	-14% to -6% vs 2015	+4% [-62%] vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	5.23	2.5 to 2.69	2.98
	-8% vs 2000	-53% to -49% vs 2015	-43% [-79%] vs 2015

3.9 European Union (EU27)

Pledge	Key target	Submission date
NDC	Economy-wide target to reduce GHG by 55% below 1990 levels by 2030	17/12/2020
Net zero	Net zero GHG by 2050 at the latest	06/03/2020

The EU27 is **projected to meet its NDC target** based on the implementation of policies adopted at the EU level. The full implementation of the Fit for 55 legislative proposal and the REPowerEU Plan puts the EU on track to achieve or even slightly overachieve its updated NDC target, and account for a substantial decrease in 2030 emissions under current policies compared to our 2022 projections.

The EU's economy-wide emissions reached 4,650 $MtCO_2e$ in 1990. Its NDC targets a reduction of at least 55% below 1990 by 2030, which translates to emissions of 2,080 $MtCO_2e$ in 2030. Under EU-level policies, emissions are expected to reach 1,780 $MtCO_2e$ in 2030 — 62% below 1990 levels. Under current Member State-level policies, emissions are expected to reach 2,900 $MtCO_2e$ in 2030 — 38% below 1990 levels.



Source: PBL IMAGE model; NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 13: Impact of climate policies on greenhouse gas emissions in the EU (upper end: NewClimate Institute calculations based on the compilation of national projections prepared by the European Environment Agency (EEA), lower end: NewClimate Institute calculations and PBL IMAGE model projections based on the implementation of policies and measures adopted at the EU level). The grey bar gives the range of our 2022 projections.

Targets

In 2020, the EU submitted a stronger 2030 NDC target – from at least 40% to at least 55% emissions reductions below 1990 – and has set a legal objective to become climate neutral by 2050 under the 2021 European Climate Law (Regulation (EU) 2021/1119). The current NDC target includes emissions and sinks from the LULUCF sector and does not include the UK (European Commission, 2020).

The EU's 2050 climate neutrality target includes all sectors of the economy and all GHGs. The official submission does not specify the share of emissions to be removed through LULUCF sinks or other carbon dioxide removal options. However, the accompanying analysis presents two scenarios for achieving its target, where the assumptions around LULUCF and technological CDR are presented transparently. The European Climate Law addresses the necessary steps meet the 2050 target, which among others, includes a process for setting a 2040 climate target within six months of the first global stocktake under the Paris Agreement, taking into account the projected indicative EU greenhouse-gas budget between 2030 and 2050 (*Regulation (EU) 2021/1119 ('European Climate Law')*, 2021).

Recent developments

The Fit for 55 package set a wide range of legislative proposals to achieve the 2030 emissions reduction target (European Commission, 2021a). It includes the update of the current Emissions Trading System (ETS) to cover additional sectors and achieve a higher level of emissions reductions (62% compared to the previous target of 43%), updates to the Effort Sharing Regulation, improvements in the renewables and energy efficiency targets, CO_2 standards for passenger cars and vans and a carbon border adjustment mechanism, that will ensure that carbon-intensive imports are subject to a carbon price equivalent to that of products from within the EU (European Commission, 2021b). In January 2024, the existing ETS will be extended to cover CO_2 emissions from all large ships entering European Union ports, regardless of the flag they fly. Coverage of non-CO_2 emissions will be implemented as of 2026 (European Comission, 2023b). In 2023, the EU created a second ETS to cover fuel combustion in buildings, road transport and additional sectors (mainly small industry not covered by the existing ETS. The ETS 2 is planned to launch in 2027 (European Comission, 2023a).

As of October 2023, twelve out of thirteen of the 'Fit for 55' individual proposals have been adopted and are in force, and negotiations are ongoing for the Energy Taxation Directive (European Commission, 2023). The REPowerEU plan proposes further increases in the renewable targets (from the current 40% to 45% in the overall energy mix by 2030), increase in the energy efficiency targets (from 9% to 13% below the 2020 reference scenario set out in the Energy Efficiency directive by 2030), among several other measures to diversify its energy supply and reduce overall demand (European Commission, 2022c). The European Council formally adopted the REPowerEU plan in the Recovery and Resilience Facility in February 2023 (The Council of the European Union, 2023).

Table 11: 2015 historical data and 2030 projections of key GHG indicators for the EU.

Indicator	2015 (change rate vs 2000 and 1990)	2030 projections (change rate vs 2015 and 1990)	
		Current policies scenario[2]	NDC unconditional target
GHG emissions - Excl. LULUCF (MtCO2e)	3,490	1780 to 2900	2,080
	-16% vs 2000	-49% to -17% vs 2015	-40% vs 2015
	-25% vs 1990	-62% to -38% vs 1990	-55% vs 1990
GHG emissions per capita (tCO_2e/cap)	7.9	4.0 to 6.5	4.7
	-19% vs 2000	-49% to -17% vs 2015	-41% vs 2015
	-29% vs 1990	-64% to -41% vs 1990	-58% vs 1990
GHG emissions per GDP (tCO_2e/thousand USD)	0.23	0.09 to 0.15	0.11
	-32% vs 2000	-60% to -35% vs 2015	-53% vs 2015
	-51% vs 1990	-80% to -68% vs 1990	-77% vs 1990

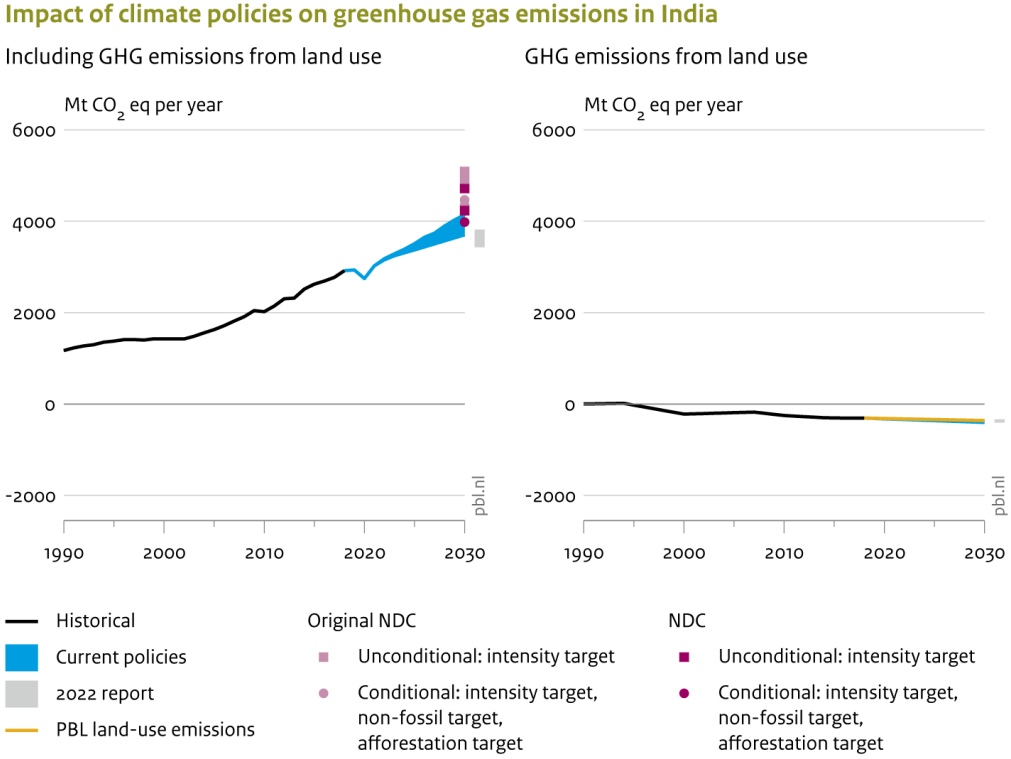
[2] Although some EU-level policies are not yet translated into national law, their rollout is mandatory. The range indicates that further action is necessary in EU member states to ensure the implementation of EU-level policies within the period analysed in our projections.

3.10 India

Pledge	Key targets	Submission date
NDC	Economy-wide target to reduce GHG intensity by 45% below 2005 levels by 2030, increase share of non-fossil fuel in primary electricity production to 50% (conditional) and create additional (cumulative) carbon sink of 2.5–3 $GtCO_2e$ by 2030.	26/08/2022
Net zero	Net zero by 2070 (gas coverage not specified)	26/08/2022

India **will likely overachieve its unconditional NDC targets** with existing policies and might meet its conditional targets if it implements policies in line with the lower range of our current policy projections.

In any case, emissions under current policies are expected to increase roughly in line with the last 10-year trend. Our current policies scenario projections this year is higher than our 2022 projections due to changes in the expected LULUCF sink in 2030, as well as slightly higher historical emissions, and changes in our methodological approach in the implementation of certain policies (such as the PAT scheme in the industry sector).



Source: PBL IMAGE model; NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 14: Impact of climate policies on greenhouse gas emissions in India (upper end: PBL IMAGE model, lower end: NewClimate Institute calculations). Land use emissions based on both IIASA and PBL projections. The grey bar gives the range of our 2022 projections.

Targets

India's NDC submitted in August 2022, aims to decrease GHG emissions intensity by 45% below 2005 levels and increase the share of non-fossil energy capacity in the power sector to 50%, both by 2030 (Government of India, 2022c). Other targets related to land use sinks and non-quantifiable targets related to adaptation and mobilisation of finance remain unchanged compared to the original NDC.

In COP 26 in 2021, India announced its net zero by 2070 target, which was confirmed in its 2022 LTS submission. India has not clarified which gases are covered in its LTS, or to what extent the target is expected to be achieved through LULUCF sinks (Government of India, 2022b).

Recent developments

The Energy Conservation Amendment Act is in force since January 2023, and introduced a carbon credit trading scheme, obligations to use non-fossil sources of energy, energy conservation code for buildings and standards for vehicles and vessels (Government of India, 2022f, 2022a).

India has several policies to support the use of renewables for energy supply. The Long-Term growth trajectory of Renewable Purchase Obligations (RPOs) has been updated, prescribing a total of 43% share of renewables in the electricity supply of distribution companies by 2030 – 7% from wind, 3% from hydropower, and the rest from other renewables (Government of India, 2022e). The National Electricity Plan (NEP) renewable capacity targets for 2022 have not materialized, but the respective policies are still in place. At the same time, the new National Electricity Plan for the period of 2022-32 projects total non-fossil based capacity additions of around 500 GW by 2030, and almost 600 GW by 2032 (Government of India, 2023). Finally, the Ministry of Power issued a revised policy increasing the obligation to use biomass pellets in thermal power plants through co-firing to 7% (Government of India, 2022d).

In the transport sector, India has a target in place to increase the share of electric vehicles in new sales to 30% by 2030. This target is supported through the Faster Adoption and Manufacturing of Electric Vehicles in India (FAME) scheme (Ministry of Road Transport and Highways, 2018). Passenger vehicles fuel intensity limits have, at the same time, decreased, starting in 2022, to 113 gCO_2/km, compared to 130 gCO_2/km in the previous years (Roychowdhury & Chattopadhyaya, 2021).

Table 12: 2015 historical data and 2030 projections of key GHG indicators for India.

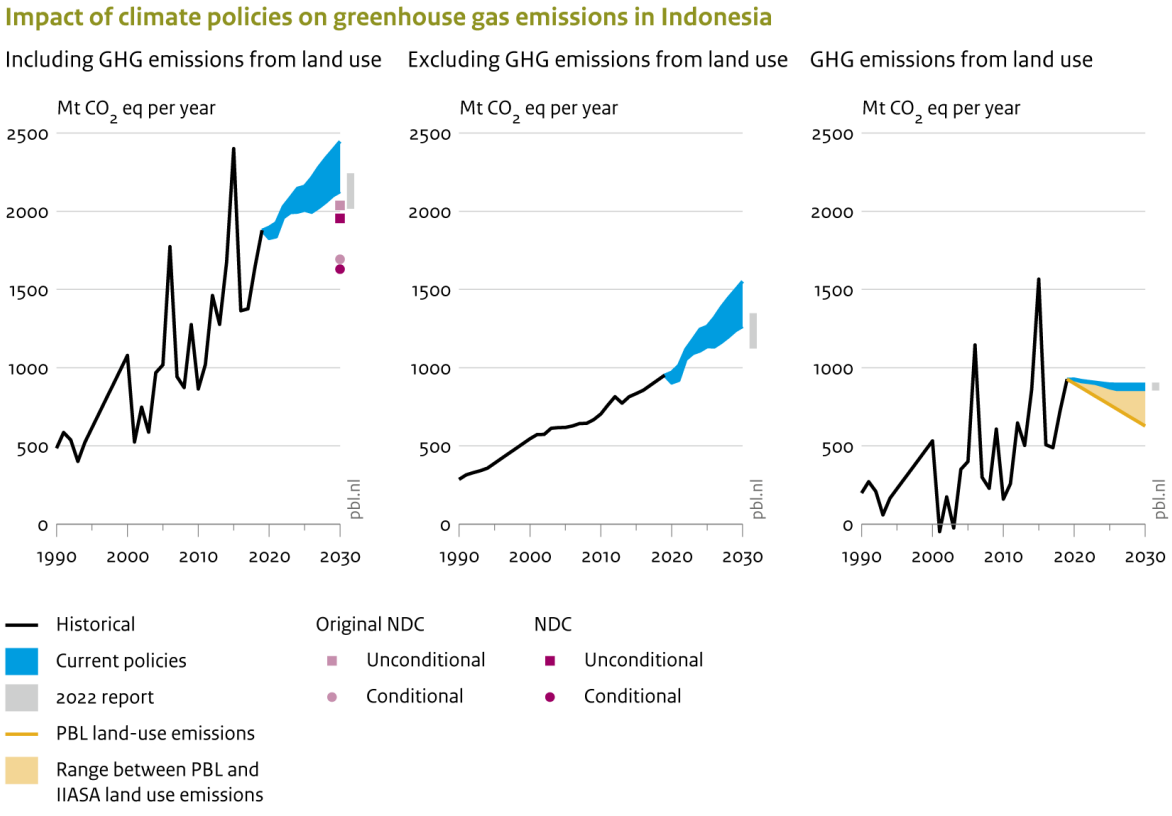
Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional [conditional] target
GHG emissions - incl. LULUCF (MtCO2e)	2,620	3,700 to 4,140	4,720 to 4,230 [3,980 to 4,210]
	+84% vs 2000	+41% to +58% vs 2015	+80% to +61% [+52% to +61%] vs 2015
GHG emissions per capita (tCO_2e/cap)	2.0	2.5 to 2.7	2.8 to 3.1 [2.6 to 2.8]
	+47% vs 2000	+23% to +38% vs 2015	+41% to +57% [+32% to +40%] vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	1.11	0.72 to 0.80	0.82 to 0.91 [0.77 to 0.81]
	-36% vs 2000	-35% to -28% vs 2015	-26% to -18% [-30% to -26%] vs 2015

3.11 Indonesia

Pledge	Key targets	Submission date
NDC	Economy-wide unconditional target to reduce GHG by 32% below BAU by 2030 and conditional target to reduce GHG by 43% below BAU by 2030	23/09/2022
Net zero	Net-zero by 2060 (gas coverage not specified)	22/07/2021

Indonesia is **set to miss its NDC targets** with existing policies. Current policy projections remain on an upwards trend and achieve a higher emissions level than our 2022 projections, mostly due to increased coal use in 2021 and 2022 and the inclusion of captive power plants in the country's coal fleet pipeline. The first factor led to significantly higher historical emissions, while the second factor explains the increase in the upper limit of current policy projections.

Emissions related to land-use play a significant role in Indonesia's emission projections, especially after a peak in land-use emissions in 2022, amounting to 42-44% of its total emissions. The uncertainty range in our projections is partially due to the differences between models is carbon sequestration in newly afforested land. The upper end of the projections represents a slow carbon uptake land afforested due to the Forest Law Enforcement National Strategy (FLENS) and the lower end represents a more ambition carbon uptake from the targeted 5 million hectares of afforestation by 2030.



Source: PBL IMAGE model; NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 15: Impact of climate policies on greenhouse gas emissions in Indonesia (upper end: NewClimate Institute calculations, lower end: PBL IMAGE model). Land use emissions based on both IIASA and PBL projections. Land use emission projections do not account for the impact and annual fluctuations of natural disturbances and peat fires. The grey bar gives the range of our 2022 projections.

Targets

Indonesia submitted its current NDC in 2022 (Government of Indonesia, 2022). The NDC sets out a slightly higher unconditional target of 31.89% GHG emissions reduction by 2030 below BAU, compared to the previous 29% reduction below BAU (43.2% GHG emissions reduction below BAU, compared to the previous 41% for the conditional target).

In 2021, Indonesia submitted an LTS including a net zero emissions by 2060 target. While Indonesia is currently exploring net-zero pathways, it's LTS lacks detailed information so far (Government of Indonesia, 2021). The land use sector accounts for a large share of current emissions and of emissions reductions in Indonesia's mitigation scenarios, meaning that other sectors plan substantially less reductions.

Recent developments

Indonesia, together with the International Partners Group (IPG), announced a Just Energy Transition Partnership (JETP) during the G20 Summit held in November 2022. The JETP's Joint Statement presents a commitment from the IPG to mobilise an initial USD 20 billion from public and private finance over the next three to five years. The partnership targets a peak in the country's power sector emissions of no more than 290 $MtCO_2$ by 2030 and net-zero emissions in the sector by 2050, while also reaching a minimum of 34% renewable share of electricity generation by 2030 (SIPET, 2023). The Comprehensive Investment and Policy Plan for the implementation of the JETP is expected between November and December 2023.

Indonesia's emissions trading system (ETS) is in the early phases of its development but recorded 42.5 $MtCO_2e$ of transactions at 2 USD/tCO_2e in its 2022 voluntary pilot phase (Tampubolon et al., 2022). In August 2023, the Government of Indonesia issued Law No. 4 on the Development and Strengthening of the Financial Sector on the setting up of a carbon exchange, aiming to launch onshore carbon trading (meaning that the exchange operator must be an Indonesian based entity) by the end of this year, as a follow up to the previously established carbon trading policy and Indonesia's Carbon Law (Ashurst, 2023; Reuters, 2023). Indonesia's national electricity supply plan (RUPTL 2021-2030) projects renewables to account for 52% of the planned capacity between 2021-2030, supported by several regulatory improvements. However, coal and gas are expected to remain important sources of electricity in 2030 and beyond. This implies a massive compensation from the forestry sector acting as carbon sink. In the transport sector, Indonesia has set a biodiesel blending mandate of 35% starting in 2023, aims to develop its mass public transport systems and to expand its domestic electric vehicles industry.

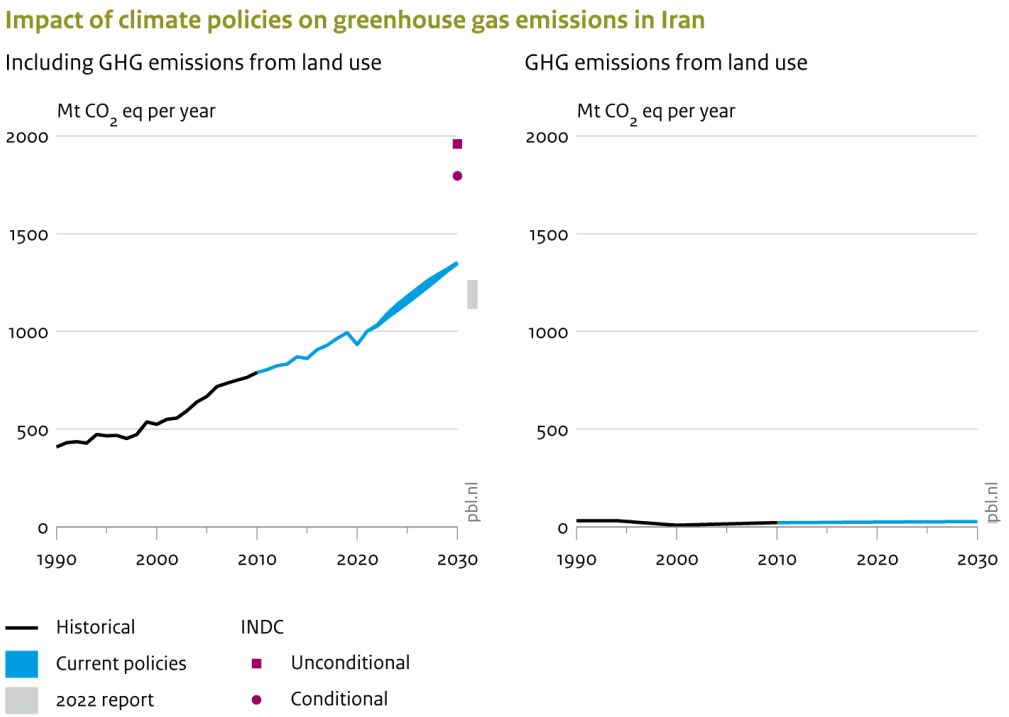
Table 13: 2015 historical data and 2030 projections of key GHG indicators for Indonesia.

Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional [conditional] target
GHG emissions - incl. LULUCF (MtCO2e)	2,400	2,130 to 2,450	1,950 [1,630]
	+123% vs 2000	-11% to +2% vs 2015	-19% [-32%] vs 2015
GHG emissions per capita (tCO_2e/cap)	9.3	7.3 to 8.4	6.7 [5.6]
	+84% vs 2000	-22% to -10% vs 2015	-28% [-40%] vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	2.43	1.1 to 1.32	1.05 [0.88]
	-1% vs 2000	-53% to -46% vs 2015	-57% [-64%] vs 2015

3.12 Iran

Pledge	Key targets	Submission date
NDC	INDC target (not ratified): Economy-wide unconditional target to reduce GHG by 4% and conditional target to reduce GHG by 12% below BAU both by 2030.	21/11/2015
Net zero	No target	

Iran will **likely substantially overachieve its unconditional and conditional targets** with existing policies. Emissions projections this year are higher when compared to estimates developed in 2022 and remain in a clear upwards trend towards 2030. This increase is mostly driven by revision in economic forecasts and most up to data historical data, which shows a higher-than-expected increase in emissions in recent years.



Source: NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 16: Impact of climate policies on greenhouse gas emissions in Iran. Emissions trajectories are based exclusively on NewClimate and IIASA projections. The grey bar gives the range of our 2022 projections.

Targets

Iran is the largest emitter that has not ratified the Paris Agreement. The current Intended Nationally Determined Contributions (INDC) states that Iran's climate targets and mitigation efforts are conditional on the absence of international economic sanctions (Department of Environment of Iran, 2015), which were reimposed in 2018, when the US withdrew from the Iran nuclear deal.

Recent developments

Investments in mitigation measures – renewable energy deployment in particular– have significantly slowed down in the past couple of years, as the government has been prioritising Iran's economic recovery. This is best exemplified by the bill of Seventh Five-Year Development Plan (2023-2027), a strategic document which serves as a guiding framework for annual budgets and policy developments

(The Islamic Republic of Iran, 2023). Unlike the previous edition, the new plan, announced in May 2023, is exclusively focused on addressing Iran's pressing economic challenges and does not include any mitigation measures or renewable energy targets. The government decided to leave out the section on environmental policy, sending a clear signal about its priorities.

Current levels of installed renewable energy capacity remain low, with only 0.8 GW of installed total renewable energy capacity from wind and solar in 2021 (IRENA, 2022a). Nuclear energy continues to play a small role in the Iran's electricity mix, with just 0.9 GW of installed capacity (World Nuclear Association, 2023). There is however another 1.1 GW reactor currently under construction, with operation planned to start in 2024.

Table 14: 2015 historical data and 2030 projections of key GHG indicators for Iran.

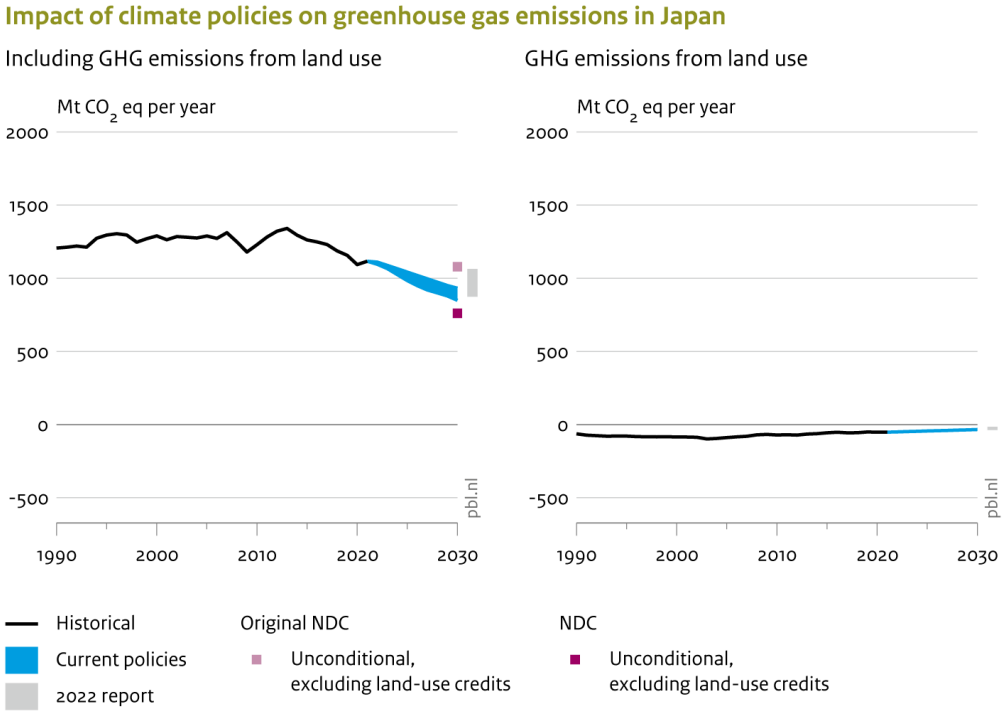
Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional [conditional] target
GHG emissions - incl. LULUCF (MtCO2e)	860	1350 to 1350	1,960 [1,800]
	+64% vs 2000	+56% to +57% vs 2015	+128% [+109%] vs 2015
GHG emissions per capita (tCO_2e/cap)	10.7	14.5 to 14.6	21.1 [19.4]
	+32% vs 2000	+36% to +37% vs 2015	+99% [+82%] vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	1.65	1.9 to 1.88	2.72 [2.50]
	+0% vs 2000	+13% to +14% vs 2015	+65% [+51%] vs 2015

3.13 Japan

Pledge	Key target	Submission date
NDC	Economy-wide target to reduce GHG by 46% below 2013 levels by 2030	21/10/2021
Net zero	Carbon neutral by 2050	21/10/2021

Japan **is projected to miss its NDC target**. Our current policies scenario projections this year show a stronger downwards trend towards 2030 which results in slightly lower emissions compared to 2022. This is due to lower expected energy-related emissions in 2030, stemming from a combination of lower total demand, and higher shares of nuclear and renewable electricity generation.

Japan uses a gross-net approach to account for the land use sector in its NDC. This means that it does not include the land use sector in the base year of its NDC target, but it does include it in the target year. Since the land use sector is a sink in Japan, this accounting approach makes it slightly easier for Japan to reach its target.



Source: PBL IMAGE model; NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 17: Impact of climate policies on greenhouse gas emissions in Japan (upper end: NewClimate Institute calculations, lower end: PBL IMAGE model). The grey bar gives the range of our 2022 projections. See our methodological annex (A3) on the consideration of LULUCF and overseas credits in line with the Kyoto accounting rules for the NDC quantification.

Targets

Half a year after the announcement, in October 2021 Japan officially submitted its new 2030 GHG emission reduction target of a 46% reduction below 2013 levels as an updated NDC. The updated Plan for Global Warming Countermeasures and the updated long-term strategy under the Paris Agreement were adopted simultaneously (MOEJ, 2021).

Japan's 2050 net zero target covers all GHGs and economic sectors and is enshrined in domestic law. However, it fails to report the expected share of emissions removed through LULUCF sinks, technological CDR and other removal options such as carbon credits (Government of Japan, 2019).

Recent developments

In February 2023, the Japanese government adopted the Green Transformation (GX) Basic Policy, an initiative that lays out Japan's new decarbonisation strategy and is aimed at generating approximately JPY 150 trillion (approximately USD 1 trillion) of public and private investment over the next 10 years. Through the GX Basic Policy, Japan intends to prolong reliance on coal-based technologies, putting a strong emphasis on developing Carbon Capture and Storage (CCS) technologies, and integrating ammonia and hydrogen co-firing in the power sector (METI, 2023a).

Japan plans to restart its currently idled nuclear reactors with an extended lifetime and build new generation reactors, as part of the GX Basic Policy (METI, 2023b). Despite this reversal, many regulatory and political hurdles remain, and it remains uncertain if nuclear power would help Japan meet its 2030 target in a significant way (Renewable Energy Institute, 2023).

On the energy demand side, a significant policy development in the amendment of the Building Energy Efficiency Act in June 2022 (ECCJ, 2022). As of April 2025, all new buildings are now required to meet the minimum energy efficiency standards; previously it was not obligatory for the builders to meet them. The potential impact of this policy update is not quantified in this year's analysis.

Table 15: 2015 historical data and 2030 projections of key GHG indicators for Japan.

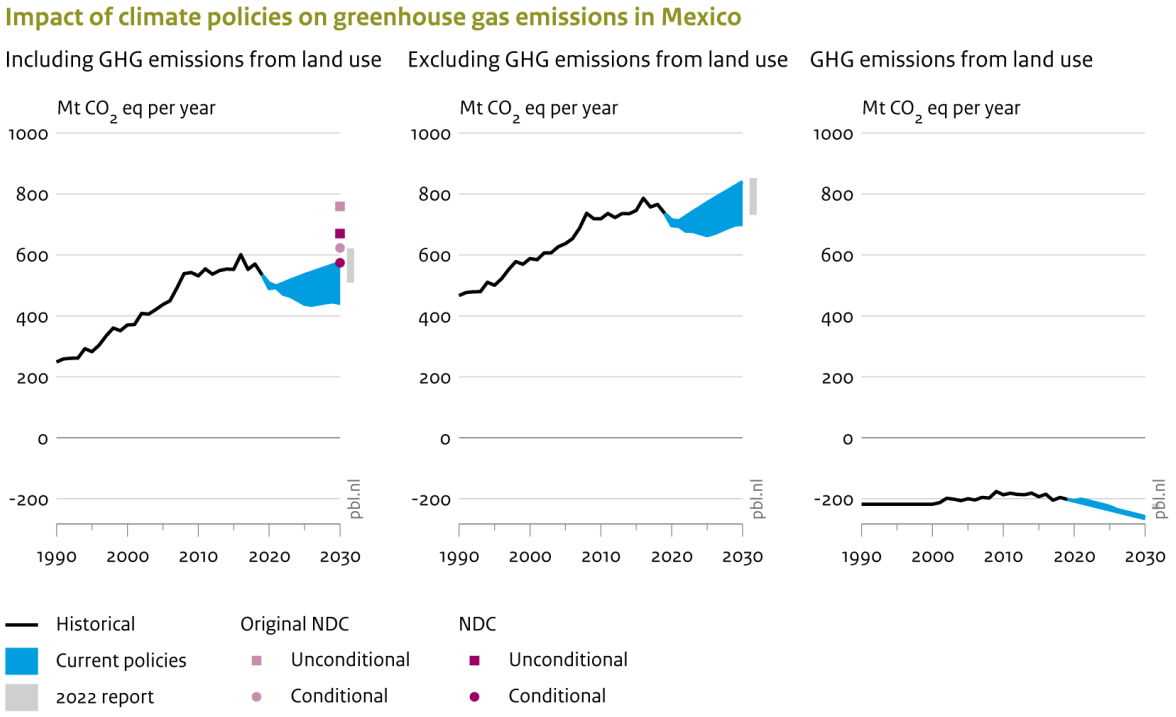
Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional target
GHG emissions - incl. LULUCF (MtCO2e)	1,260	850 to 930	760
	-2% vs 2000	-33% to -26% vs 2015	-40% vs 2015
GHG emissions per capita (tCO_2e/cap)	9.9	7.1 to 7.8	6.4
	-3% vs 2000	-28% to -21% vs 2015	-35% vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	0.21	0.13 to 0.14	0.12
	-12% vs 2000	-37% to -31% vs 2015	-44% vs 2015

3.14 Mexico

Pledge	Key targets	Submission date
NDC	Economy-wide unconditional target to reduce GHG by 30% below BAU by 2030 and conditional target to reduce GHG by 35% below BAU by 2030	17/11/2022
Net zero	No target	

Mexico is **on track to meet its NDC targets** with existing policies. Our current policy projections show a substantial range for emissions in the country considering the uncertainty in the implementation of some policies. For example, Mexico's clean energy targets include fossil fuel plants that are based on efficient cogeneration or that have clean energy certificates. The expected share of distinct technologies is not publicly available and increases the uncertainty on the country's future power mix.

However, overall projections this year are lower compared to our 2022 update report. This is due to Mexico implementing policies to control its methane and F-gases and an increase in projected land use sinks in line with historical developments.



Source: PBL IMAGE model; NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 18: Impact of climate policies on greenhouse gas emissions in Mexico (upper end: NewClimate Institute calculations, lower end: PBL IMAGE model). The grey bar gives the range of our 2022 projections.

Targets

Mexico's updated NDC includes a target to reduce emissions by 30% below BAU, and a 5% further reduction conditional on international finance.

In November 2022, Mexico submitted an updated NDC after its previous one was revoked. This was due to a civil society lawsuit under the argument that Mexico's updated NDC was less transparent & ambitious – contrary to the Paris Agreement and Mexican Law (Expansión, 2022; Greenpeace México, 2021; Poder Judicial de la Federación, 2021; Secretaría de Relaciones Exteriores, 2022).

Recent developments

The operational phase of the Mexican ETS was expected to start in 2023 but has been delayed to 2024 due to lack of clarity regarding final regulations (Lithgow, 2023). When in force, the instrument aims to promote private sector's participation in mitigation actions through a cap-and-trade approach targeting large emitting industries (Secretaría de Medio Ambiente y Recursos Naturales, 2021). In addition, Mexico presented plans to reduce its emissions from the energy sector, through the modernization of 40% of its hydroelectric power plants and an electric mobility strategy (CAF, 2023).

However, Mexico continues to foster exploration, production and consumption of fossil fuels. Examples of these policies include fossil fuel transport subsidies, increased funding for fossil fuel infrastructure, acquisition of new oil refineries and reforms to laws that previously promoted renewable energy generation (Secretaría de Relaciones Exteriores, 2022; SENER, 2019). The Energy Regulatory Commission (CRE) updated the reference values for defining clean and efficient technologies, the main updates include electricity generation from combined cycle fossil gas plants are not considered as efficient as cogeneration (heat and power) plants. Other updates include restrictions on the use of hydrogen and set limits for emissions associated with carbon dioxide capture and geological storage processes (CAF, 2023).

In the forestry sector, there has been an increase in community forest management practices, commercial forest plantations, forest restoration, payment for environmental services and an increase in areas under protection (natural protected areas) (Government of Mexico, 2023).

Table 16: 2015 historical data and 2030 projections of key GHG indicators for Mexico.

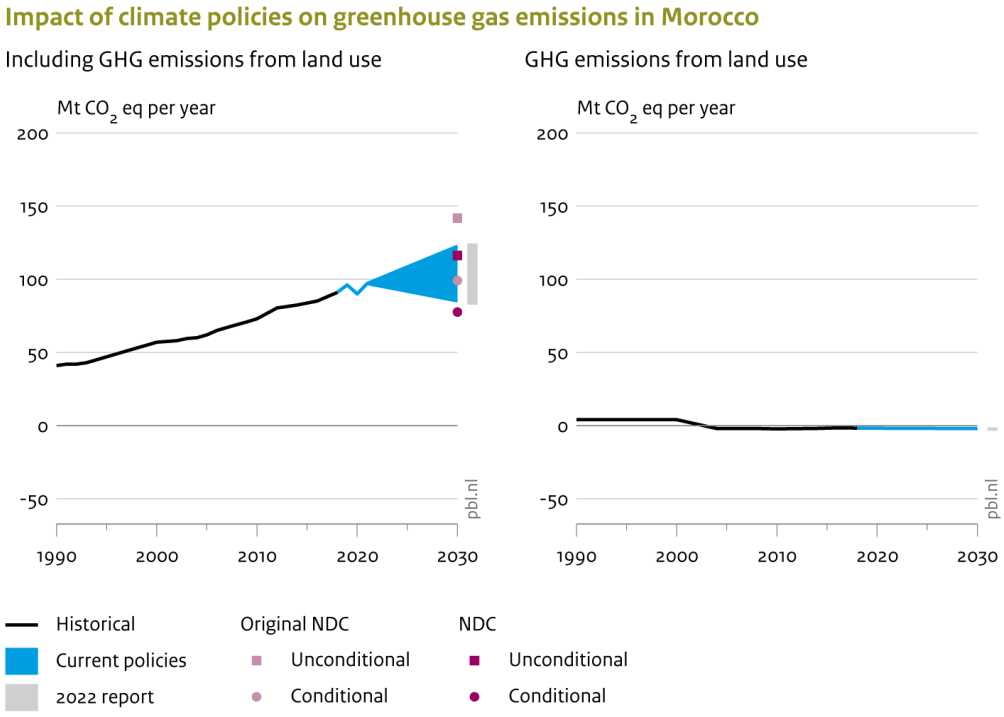
Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional [conditional] target
GHG emissions – incl. LULUCF (MtCO2e)	550	440 to 570	670 [574]
	+49% vs 2000	-20% to +4% vs 2015	+21% [+4%] vs 2015
GHG emissions per capita (tCO_2e/cap)	4.6	3.3 to 4.3	5.0 [4.3]
	+21% vs 2000	-29% to -7% vs 2015	+8% [-7%] vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	0.45	0.3 to 0.39	0.45 [0.38]
	+11% vs 2000	-35% to -15% vs 2015	0% [-15%] vs 2015

3.15 Morocco

Pledge	Key targets	Submission date
NDC	Economy-wide unconditional target to reduce GHG by 18.3% below BAU by 2030 and conditional target to reduce GHG by 45% below BAU by 2030	22/11/2022
Net zero	No target (intention to become net zero within the century announced).	21/12/2021

Morocco **will likely meet its unconditional and miss its conditional NDC target** with existing policies. Our current policies scenario projections this year show that emissions in Morocco are highly uncertain. Morocco has ambitious targets, but policy implementation remains unclear.

Our 2023 projections are higher than in 2022 due to new data on the implementation of Morocco's mitigation policies towards 2030. Compared to our 2022 update report, our new current policy projections show that Morocco could decrease its emissions already now compared to recent historical years, while last year's projections showed it to still increase its emissions after 2020 even in the lower bound of the projections.



Source: NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 19: Impact of climate policies on greenhouse gas emissions in Morocco. Emissions trajectories are based exclusively on NewClimate and IIASA projections. The grey bar gives the range of our 2022 projections.

Targets

Morocco submitted an updated NDC in July 2021, increasing its unconditional emissions reduction target from 17% to 18.3% below business as usual (BAU) and the conditional one from 42% to 45.5% below BAU. It also substantially decreased its projected BAU emissions, from 171 to 142 MtCO2e in 2030 (Government of Morocco, 2021a).

In its 2021 LTS submission, Morocco announced its intention to reach net zero within the century but stopped short of committing to a specific year for net zero, or to provide any further details regarding the

gas coverage, sector scope, role of LULUCF sinks, technological CDR or international carbon credits (Government of Morocco, 2021b).

Recent developments

Renewable energy targets drive Morocco's current emission reduction efforts. Already in 2009, Morocco set out a target to reach 42% of renewable energy in electric capacity by 2020. Despite its failure to meet its 2020 target, Morocco decided to put forward an even more ambitious plan. It currently aims to increase renewable energy capacity to 52% of its electricity mix by 2030. Renewable capacity stood at 37% of total installed capacity in 2021 (Kingdom of Morocco, 2022). Renewable energy installation increased substantially until 2018 but has slowed down in the recent years (IRENA, 2022c). Morocco's electricity mix remains heavily dominated by coal, with lifetime extensions recently planned for key coal-fired plants. At COP26, Morocco agreed to cease permit issuance and construction of new plants but has not committed to a coal phase-out.

Table 17: 2015 historical data and 2030 projections of key GHG indicators for Morocco.

Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional [conditional] target
GHG emissions – incl. LULUCF (MtCO2e)	80	90 to 120	120 [78]
	+47% vs 2000	+2% to +46% vs 2015	+39% [-7%] vs 2015
GHG emissions per capita (tCO_2e/cap)	2.4	2.1 to 3.1	2.9 [1.9]
	+21% vs 2000	-12% to +26% vs 2015	+19% [-20%] vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	0.68	0.5 to 0.69	0.66 [0.44]
	-26% vs 2000	-29% to +2% vs 2015	-4% [-36%] vs 2015

3.16 Republic of Korea

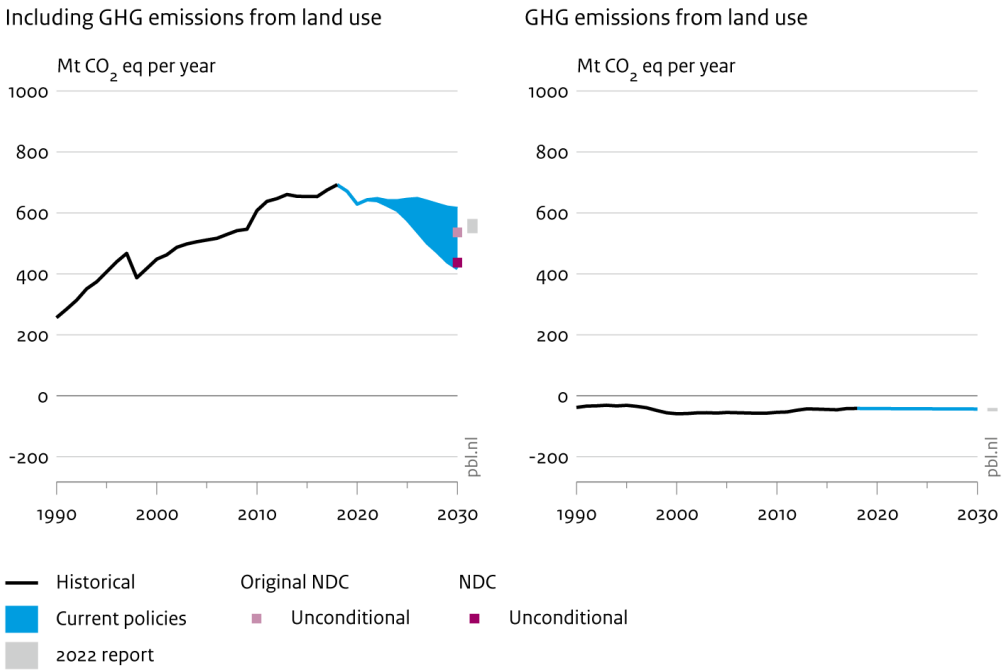
Pledge	Key target	Submission date
NDC	Economy-wide target to reduce GHG by 40% below 2018 levels by 2030	23/12/2021
Net zero	Carbon neutral by 2050 (gas coverage not specified)	30/12/2020

The Republic of Korea **will likely miss its NDC target** with existing policies but could meet it if it implements policies in line with on the lower end of our emission projections. Our current policies scenario projections show a slow decrease in the country's emissions in the period up to 2030, having peaked in 2018.

This year's projections are lower than in 2022, especially because of the Phase III Allocation Plan of Korea's ETS, that runs from 2021-2025. The lower end of our projections this year assumes that the Korean ETS will continue running in the period between 2025-2030.

The Republic of Korea uses a gross-net approach to account for the land use sector in its NDC. This means that it does not include the land use sector in the base year of its NDC target, but it does include it in the target year. Since the land use sector is a sink in the country, this accounting approach makes it easier for the Republic of Korea to reach its target.

Impact of climate policies on greenhouse gas emissions in Republic of Korea



Source: PBL IMAGE model; NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 20: Impact of climate policies on greenhouse gas emissions in Republic of Korea (upper end: NewClimate Institute calculations, lower end: PBL IMAGE model). The grey bar gives the range of our 2022 projections. See our methodological annex (A3) on the consideration of LULUCF for the NDC quantification.

Targets

The Republic of Korea submitted a stronger NDC in December 2021, including emissions reductions from land use and international credits. The NDC includes an economy-wide target to reduce emissions

by 40% below 2018 levels, a significant improvement compared to the previous target of 24.4% below 2017 (Republic of Korea, 2021).

The Republic of Korea submitted an LTS in 2020 including a carbon neutrality target which was later enshrined in law. It is not clear whether the 2050 target includes all GHGs or only CO_2. The Republic of Korea's plan for its carbon neutrality target specifies that the target will be achieved without the use of international carbon credits, and it also specifies the role expected for LULUCF sinks as well as the individual contributions from specific sectors towards the target (Republic of Korea, 2020).

Recent developments

The Republic of Korea's new administration has seen a move away from the country's previous 100% renewables target and towards revitalizing the nuclear power industry. This is reflected in its 10th basic electricity plan, published in January 2023 (MOTIE, 2023). The new plan does not change existing targets for coal and fossil gas. The renewables target was revised downwards from 30% of power generation in 2030, to 21.8%, bringing it back closer to the target set out in the 9th Basic Plan for Long-term Electricity Supply and Demand 2020-2034 (MOTIE, 2020).

Despite its changes in direction for its power sector planning, the Republic of Korea continues to implement plans to reach its carbon neutrality goal, which is enshrined in law. Implementation plans include the incorporation of emissions reduction targets into national budget planning and the creation of a climate response fund to support the transition of carbon intensive industries (MOE, 2023).

Table 18: 2015 historical data and 2030 projections of key GHG indicators for the Republic of Korea.

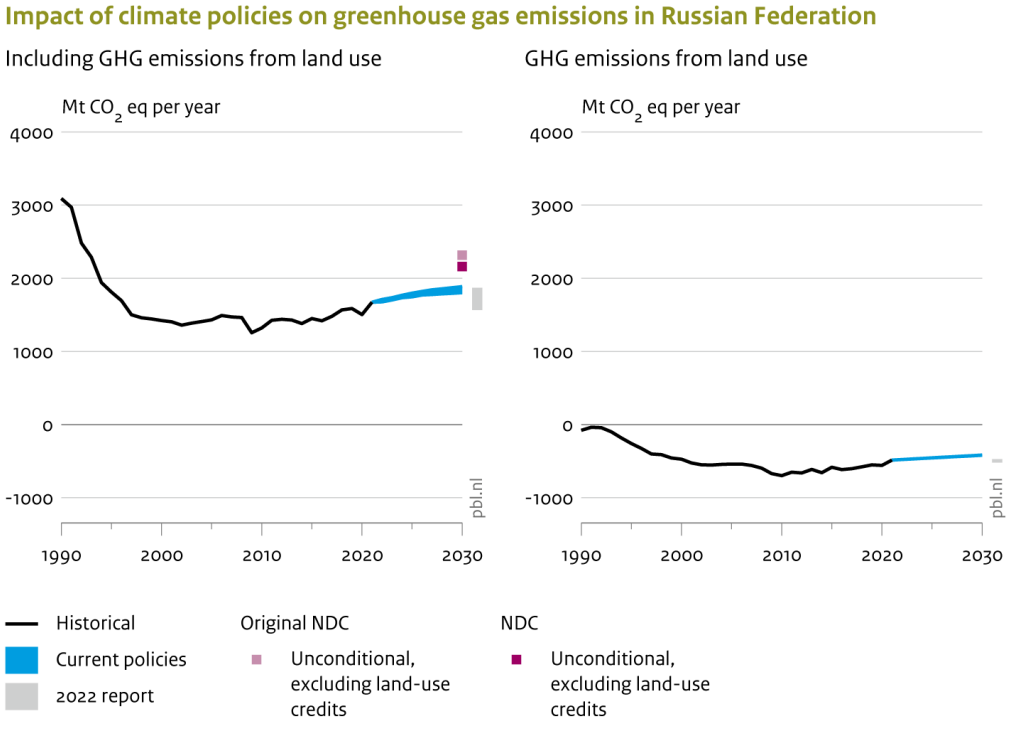
Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional target
GHG emissions - incl. LULUCF (MtCO2e)	650	420 to 610	440
	+46% vs 2000	-36% to -6% vs 2015	-33% vs 2015
GHG emissions per capita (tCO_2e/cap)	12.9	8.1 to 12.0	8.5
	+34% vs 2000	-37% to -7% vs 2015	-34% vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	0.49	0.2 to 0.33	0.23
	-24% vs 2000	-55% to -33% vs 2015	-52% vs 2015

3.17 Russian Federation

Pledge	Key target	Submission date
NDC	Economy-wide target to reduce GHG by 70% below 1990 levels by 2030	25/11/2020
Net zero	GHG neutral by 2060 at the latest	05/09/2022

The Russian Federation will **likely meet its unconditional NDC target with existing policies**. Emissions are still expected to remain on a slightly upwards trend until 2030. This year's current policy projections are higher than those from 2022, partially due to changes in the assumptions about the Russian Federation reaching its 2024 renewable energy target and maintaining flaring limits.

The effect of the ongoing invasion of Ukraine is not fully quantified, although some of its implications are quantified in scenarios used in our analysis (IEA, 2022). The effects of the sanctions on emissions may be significant in Russia (Liu et al., 2023), but they are not expected to substantially alter the current emissions trajectory.



Source: PBL IMAGE model; NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 21: Impact of climate policies on greenhouse gas emissions in the Russian Federation (upper end: NewClimate Institute calculations, lower end: PBL IMAGE model). The grey bar gives the range of our 2022 projections.

Targets

The Russian Federation's 2020 NDC includes a target to reduce emissions by at least 70% below 1990 levels. This target is the lower bound of Russia's original NDC target range of 70-75% reduction below 1990 (Government of the Russian Federation, 2020).

In the lead up to the COP26 UN climate negotiations in Glasgow, the Russian Federation announced it would set a 2060 net zero target. This was followed by government approval of the 'Strategy of socio-economic development of the Russian Federation with low GHG emissions levels by 2050' which

formalised this target and included a target of reaching an 80% reduction in GHG emissions below 1990 levels by 2050 under its 'intensive' scenario. The long-term strategy reiterating these targets was submitted to UNFCCC in September 2022 (Government of the Russian Federation, 2022).

Recent developments

In September 2023, the government approved the "Energy Saving and Increasing Energy Efficiency" state program, that aims to decrease the energy intensity of the country's gross domestic product by 35% by 2035 compared to 2019. This is one of the goals of the strategy for the socio-economic development of the Russian Federation with low emissions until 2050.

However, environmental protection and emission reduction policies were rolled back, based on the argument that these rollbacks provide Russian businesses with the opportunity to adjust to the new financial landscape and in general are required to boost economic activity in the country. For example, Russian car manufacturers no longer have to adhere pollution control standards used by the European Union (Zelenaya, 2022). It is unclear how the Russian Federation's energy policy and emissions will be further affected under recent developments – the invasion of Ukraine and subsequent sanctions on energy exports, airspace closures, among others. New LNG projects (with few exceptions) have been put on hold, although their construction is unlikely to be abandoned (BCS Express, 2022).

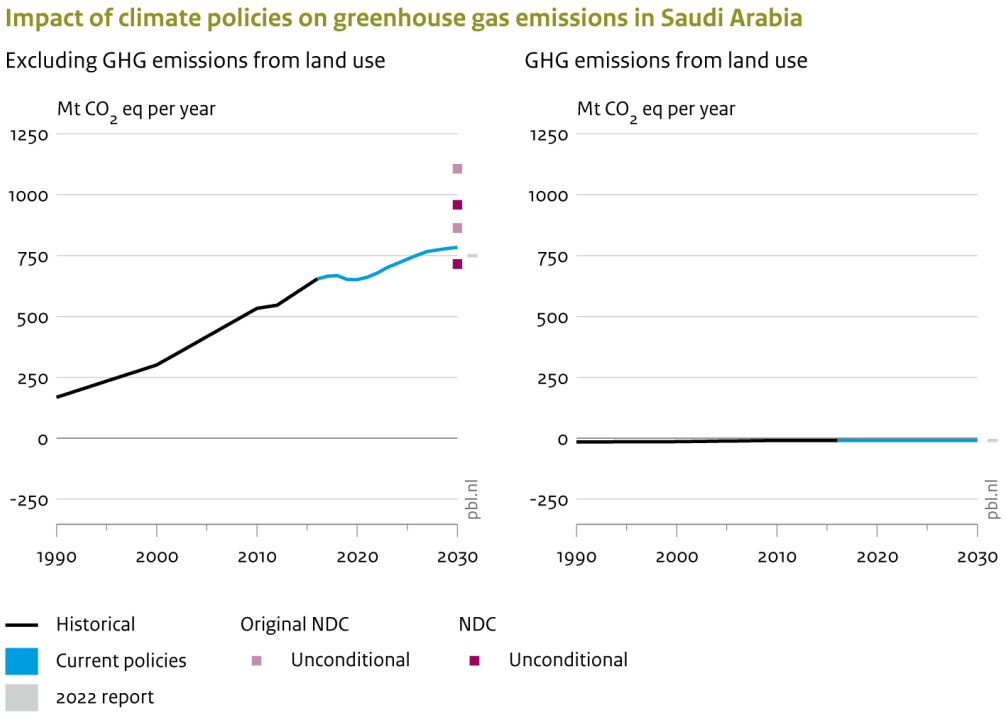
Table 19: 2015 historical data and 2030 projections of key GHG indicators for the Russian Federation.

Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional target
GHG emissions - incl. LULUCF (MtCO2e)	1,450	1,800 to 1,890	2,160
	+2% vs 2000	+24% to +30% vs 2015	+49% vs 2015
GHG emissions per capita (tCO_2e/cap)	10.0	12.7 to 13.3	15.2
	+4% vs 2000	+27% to +33% vs 2015	+52% vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	0.81	0.86 to 0.90	1.04
	-48% vs 2000	+7% to +12% vs 2015	+28% vs 2015

3.18 Saudi Arabia

Pledge	Key target	Submission date
NDC	Economy-wide target to reduce GHG by 278 MtCO2e by 2030 (reference unclear)	23/10/2021
Net zero	Net zero by 2060 (gas coverage not specified)	23/10/2021

Saudi Arabia **will likely fall within its NDC target range** with existing policies. We assume that both original and latest NDC targets refer to reductions below the same baseline scenario of 990-1240 MtCO2e in 2030, in the absence of official estimates (Climate Action Tracker, 2020). Our current policy projections are higher than in 2022, mostly due to updated historical data.



Source: NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 22: Impact of climate policies on greenhouse gas emissions in Saudi Arabia. Emissions trajectories are based exclusively on NewClimate and IIASA's projections. The grey bar gives the range of our 2022 projections.

Targets

Saudi Arabia's updated NDC includes a target to reduce GHG emissions by 278 MtCO2e by 2030. Although it is not explicitly mentioned in the document, this target implies a reduction below an undisclosed BAU scenario (Kingdom of Saudi Arabia, 2021b). Our estimates result in absolute emissions between 715 – 958 $MtCO_2e$ in 2030. Other studies interpret Saudi Arabia's target differently and project emissions ranging between 310 – 800 $MtCO_2e$ in 2030 (Climate Action Tracker, 2022; Meinshausen et al., 2021). The lack of transparency and clarity on the reference for the target increases the uncertainty of the analysis of progress towards Saudi Arabia's NDC.

Saudi Arabia's net zero by 2060 target was announced in 2021 but has so far not been submitted to the UNFCCC as part of the country's LTS. Sectoral and gas coverage of the target remain unclear, as well as the intended role of LULUCF sinks, technological CDR and the use of international carbon credits for achieving the target (Kingdom of Saudi Arabia, 2021a).

Recent developments

Saudi Arabia updated its NDC and announced a net-zero target by 2060 as part of the Saudi Green Initiative launch in October 2021. The Saudi Green Initiative lists measures through which the updated NDC target is to be reached (Kingdom of Saudi Arabia, 2021a). These measures include increasing the share of renewable energy to 50% by 2030, enhancing energy efficiency, producing hydrogen, using carbon capture to produce methanol and improving waste management.

Saudi Arabia has not adopted substantial climate policies in the last few years. The current target to reach 50% of renewable energy in the electricity mix by 2030 is part of Saudi Arabia's Vision 2030 strategy. Saudi Arabia had previously announced it would install 27 GW of renewable electricity capacity by 2023 and 58 GW by 2030. However, as of 2022, there was just 0.4 GW of installed renewable capacity, with no additional capacity installed between 2021 and 2022 (IRENA, 2023). At the current pace, the 50% renewable electricity target by 2030 remains out of reach.

Despite diversification plans away from fossil fuels, Saudi Arabia remains highly dependent on fossil revenues (KMPG, 2023). The government is currently betting on carbon, capture and storage (CCS) technologies to reach its climate goals, while sustaining its extensive fossil fuel productions and exports (Kingdom of Saudi Arabia, 2021c). Aramco, Saudi Arabia's national oil company, is still aiming to increase oil production to 13 million barrels of oil per day by 2027, and is currently building one of the world's largest carbon capture and use or storage (CCUS) hubs (Aramco, 2023).

Table 20: 2015 historical data and 2030 projections of key GHG indicators for Saudi Arabia.

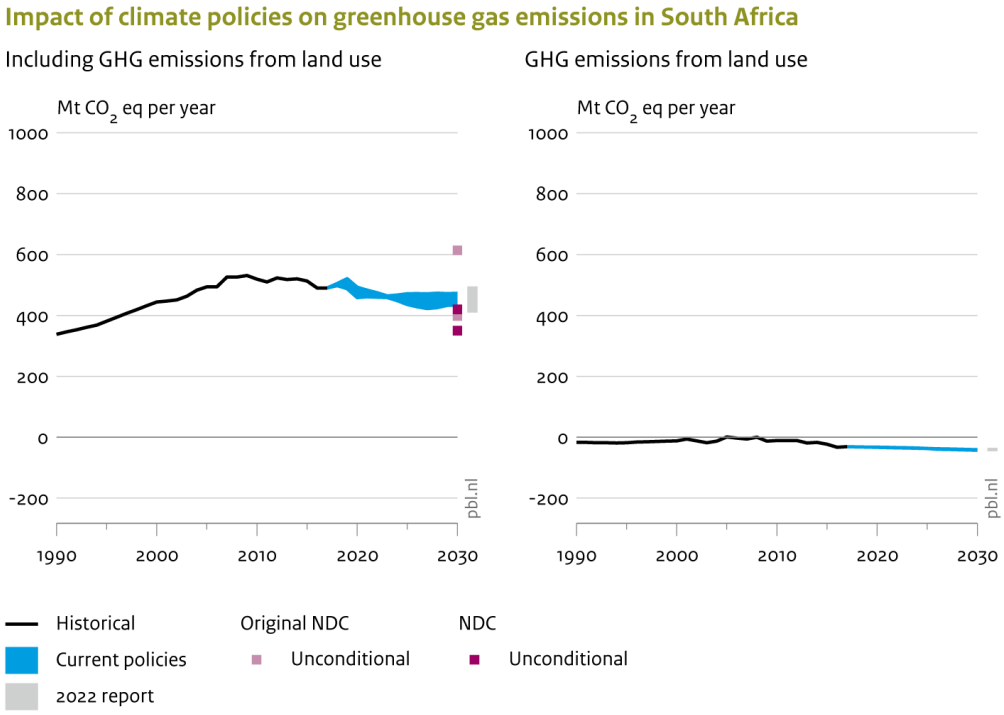
Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional target
GHG emissions - excl. LULUCF (MtCO2e)	630	780	720 to 960
	+108% vs 2000	+25% vs 2015	+14% to +53% vs 2015
GHG emissions per capita (tCO_2e/cap)	19.3	19.5	17.8 to 23.8
	+37% vs 2000	+1% vs 2015	-8% to +23% vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	0.91	0.79	0.72 to 0.96
	+10% vs 2000	-13% vs 2015	+6% to -21% vs 2015

3.19 South Africa

Pledge	Key target	Submission date
NDC	Economy-wide target to limit GHG to 350–420 MtCO2e by 2030	27/09/2021
Net zero	Intention to commit to net zero CO_2 by 2050	23/09/2020

South Africa is **set to miss its current 2030 targets under current policies**. Our current policies scenario projections this year show that emissions in South Africa could plateau in the period towards 2030 or decline slightly at the lower end of current policy projections.

This year's estimates are in line with our 2022 projections. Although there is no substantial progress in policy adoption, our projections are based on additional information about the implementation of policies in force, which results is a narrowing of the range towards 2030.



Source: PBL IMAGE model; NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 23: Impact of climate policies on greenhouse gas emissions in South Africa emissions and removals (upper end: NewClimate Institute calculations, lower end: PBL IMAGE model). The grey bar gives the range of our 2022 projections.

Targets

South Africa's updated NDC of 2021 includes an economy-wide target to limit emissions to 350–420 $MtCO_2e$ including LULUCF by 2030 (Republic of South Africa, 2021). This updated target is 12% lower than the previous target on the lower end of the range, and 30% lower on the upper end. This represents an increase in ambition, as the target range is now lower and narrower compared with the first NDC.

South Africa submitted an LTS in 2020, in which it commits to "moving towards a goal of net zero carbon emissions by 2050" (Government of South Africa, 2020). However, the draft Climate Change Bill (under Parliamentary review) currently sets an interim emissions target range of between 212-428 $MtCO_2e$ by

2050 (Government of South Africa, 2022a). South Africa remains in the process of developing its 2050 target, thus all elements on scope, architecture and transparency, such as reliance on LULUCF sinks, technological CDR and international carbon credits to achieve its target remain unclear.

Recent developments

In November 2022, the South African government launched the Just Energy Transition Partnership (JETP) investment plan, mapping out almost USD 100 billion in required financing between 2023 and 2027 (European Commission, 2022a; Government of South Africa, 2022b; Presidential Climate Commission South Africa, 2023). So far, international partners have committed to programming at least USD 8.5 billion over this period, with the aim to accelerate the retirement of coal plants, increase energy security, and protect vulnerable social groups through the energy transition.

In July 2022, President Ramaphosa proposed a long list of policy actions to bolster the South African energy system (Ramaphosa, 2022). Only a few – such as discrete amendments to the Electricity Regulatory Act – have passed into legislated to date. Others are still being developed and timelines are unclear. For example, the 2023 Integrated Resource Plan (an update of the 2020 least-cost power generation plan which sets the basis for new power procurement and coal plant decommissioning) missed previously set deadlines for completion in early 2023 and, as of September 2023, has not yet been released for public consultation (Roelf & du Plessis, 2023).

The draft Climate Change Bill has been formally introduced to Parliament in February 2022 (Department of Environmental Affairs, 2018; Government of South Africa, 2021, 2022a) and adopted in September 2023. Notable aspects include adaptation strategies by the Ministry of Forestry, Fisheries and the Environment, and an obligation to determine a national GHG emissions trajectory and sectoral emissions targets (Government of South Africa, 2022a). The Bill makes no reference to concrete plan of action to achieve the Paris Agreement targets of 1.5°C and 2°C however (Natural Justice, 2022). The Presidential Climate Commission released a framework for a just transition in South Africa in June 2022 to enable deep, just and transformational shifts (Presidential Climate Commission, 2022).

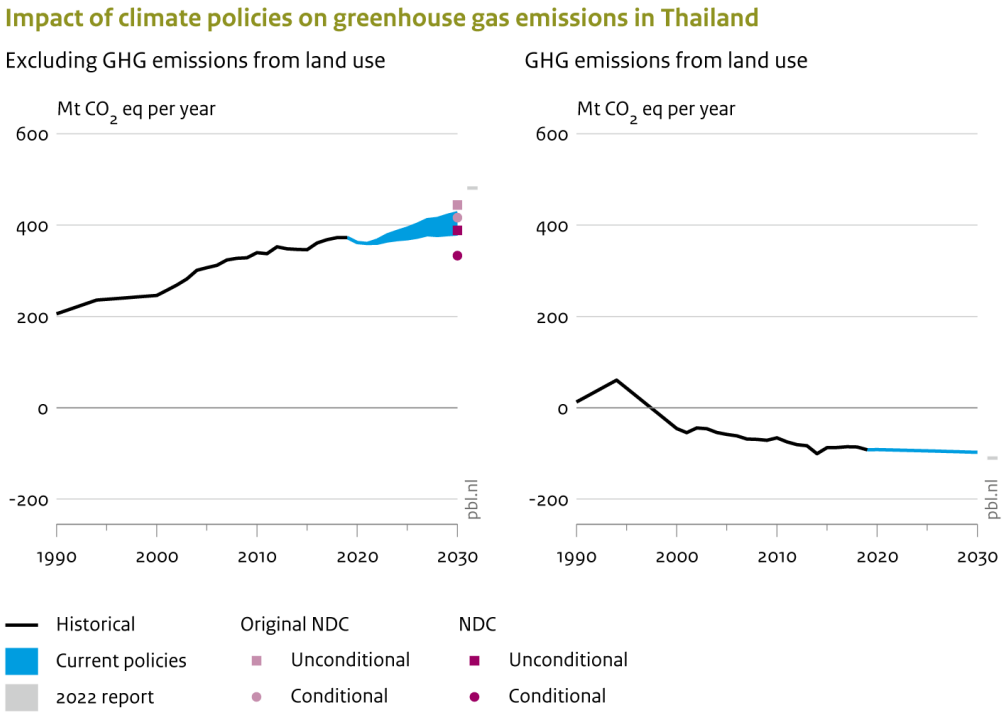
Table 21: 2015 historical data and 2030 projections of key GHG indicators for South Africa.

Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional target
GHG emissions - incl. LULUCF (MtCO2e)	510	430 to 470	350 to 420
	+16% vs 2000	-16% to -8% vs 2015	-32% to -18% vs 2015
GHG emissions per capita (tCO_2e/cap)	9.3	6.7 to 7.3	5.4 to 6.5
	-2% vs 2000	-28% to -21% vs 2015	-41% to -30% vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	1.10	0.81 to 0.88	0.8 to 0.65
	-28% vs 2000	-27% to -20% vs 2015	-41% to -29% vs 2015

3.20 Thailand

Pledge	Key targets	Submission date
NDC	Economy-wide unconditional target to reduce GHG by 30% below BAU by 2030 excl. LULUCF and conditional economy-wide target to reduce GHG by 40% below BAU by 2030 excl. LULUCF.	02/11/2022
Net zero	Carbon neutral by 2050 and net zero GHG by 2065	07/11/2022

Thailand **will likely miss its conditional NDC target** with existing policies but could meet the unconditional target if it implements policies in line with the lower end of our projections. Our current policies scenario projections this year show Thailand's emissions on a strong upwards trajectory towards 2030. Our 2023 projections are slightly lower than in 2022, mostly due to updates in GDP growth forecasts for the period until 2030.



Source: NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 24: Impact of climate policies on greenhouse gas emissions in Thailand. Emissions trajectories are based exclusively on NewClimate and IIASA's projections. The grey bar gives the range of our 2022 projections.

Targets

In 2022, Thailand submitted a stronger NDC, increasing its unconditional target from 20% to 30% below BAU, and its conditional target from 25% to 40% below BAU all excluding LULUCF. BAU emissions are expected to be 555 $MtCO_2e$ by 2030 excluding LULUCF (Government of Thailand, 2022a).

Thailand submitted a target to reach "carbon neutrality" by 2050 and net zero GHG by 2065 to the UNFCCC before COP27, in November 2022. Thailand plans to use considerable land use sinks and CCS/CCUS to reach those targets (Government of Thailand, 2022b).

Recent developments

Thailand is still finalising its National Energy Plan, which would consolidate all national energy and power sector policies. However, it remains unclear whether the existing Power Development Plan (PDP) and Alternative Energy Development Plan (AEDP) are being revised after (Government of Thailand, 2021). Currently the PDP foresees a large reduction of coal power generation (compared to previous plans), with a large shift towards fossil gas.

Since 2021, Thailand has been pursuing a range of measures to increase energy security with a push towards both fossil fuels (such as postponing the retirement of coal-fired power plants, building new gas-fired plants, and purchasing new gas fields in neighbouring countries) and renewables (policies for increasing renewable energy purchases from small producers and residential sector) (Electricity Generating Authority of Thailand, 2022; Praiwan, 2022). In the revised version of its Long-term Low Greenhouse Gas Emission Development Strategy, Thailand plans for approximately 1.6 million hectares of afforestation, projected to achieve the 120 MtCO2e carbon removal needed for its net-zero targets (Government of Thailand, 2022b).

Table 22: 2015 historical data and 2030 projections of key GHG indicators for Thailand.

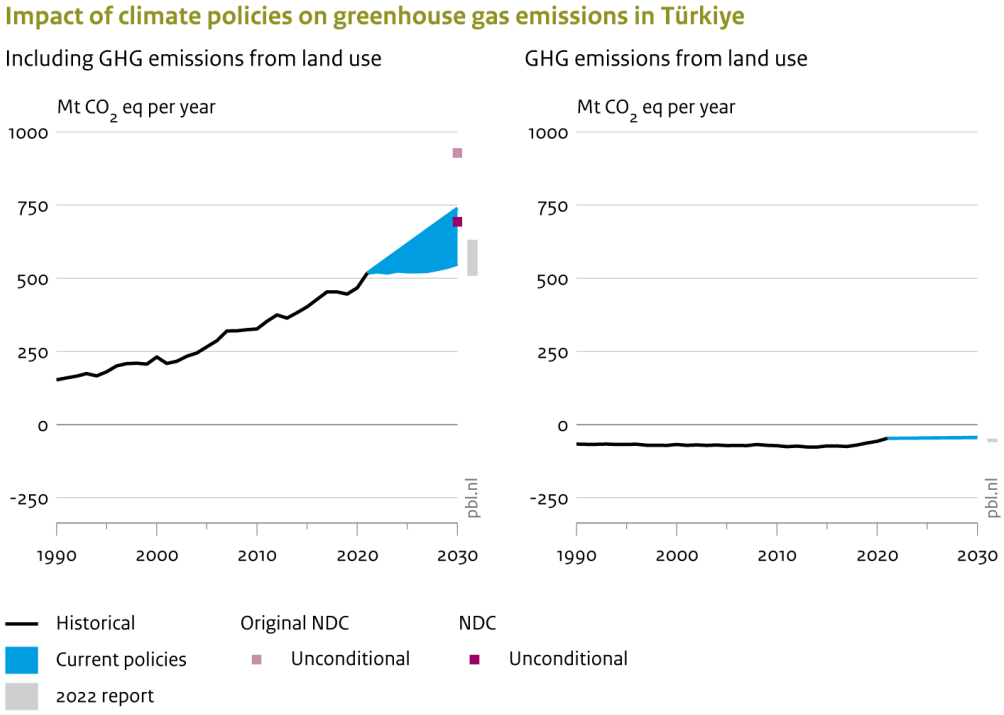
Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional target
GHG emissions - excl. LULUCF (MtCO2e)	350	380 to 430	390
	+41% vs 2000	+10% to +23% vs 2015	+12% vs 2015
GHG emissions per capita (tCO_2e/cap)	4.9	5.3 to 5.9	5.4
	+26% vs 2000	+7% to +20% vs 2015	+9% vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	0.88	0.67 to 0.75	0.69
	-22% vs 2000	-23% to -14% vs 2015	-22% vs 2015

3.21 Türkiye

Pledge	Key target	Submission date
NDC	Economy-wide target to reduce GHG by 41% below BAU by 2030	12/04/2023
Net zero	Net zero by 2053 (gas coverage not specified)	11/10/2021

Türkiye **will likely meet its updated NDC target** with existing policies, although substantial uncertainty regarding emission projections in the country. Emissions projections in Türkiye are highly dependent on socio-economic assumptions. Current policies lead to higher emissions compared to our 2022 projections especially due to most up-to-date historical emissions, which show a faster growth in emission in 2021, and higher economic growth expectations.

The latest NDC is more ambitious than the previous one but still results in increasing emissions compared to today's levels. Emissions under current policies are also expected to strongly increase. Despite this trend, the middle of the current policy range remains below the updated NDC target.



Source: PBL IMAGE model; NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 25: Impact of climate policies on greenhouse gas emissions in Türkiye (upper end: NewClimate calculations, lower end: PBL IMAGE model). The grey bar gives the range of our 2022 projections.

Targets

In 2023, Türkiye submitted its first update NDC target (Government of Türkiye, 2023). Türkiye's previous NDC was its 2015 INDC resubmitted as an NDC in October 2021 when Türkiye finally ratified the Paris Agreement. The NDC communicates an unconditional target of reducing economy-wide emissions by 41% below a business-as-usual (BAU) projection in 2030. The reference BAU projection of 1,175 MtCO2e in 2030 in the updated NDC is the same as in its previous NDC submission. In its NDC, Türkiye mentions it intends to peak its emissions at the latest by 2038.

Türkiye also committed to reach net-zero emissions by 2053 (Government of Türkiye, 2021). The emission coverage of this target remains unclear. Türkiye also does specify how they intend to use offsets, carbon dioxide removal and whether the target includes aviation and shipping. However, the target is included in a national policy document; Türkiye included its net zero target in its latest climate policy roadmap developed in February 2022.

Recent developments

In December 2022, Türkiye published its National Energy Plan for 2020-2035 (Turkish Ministry of Energy and Natural Resources, 2022). The plan foresees a modest increase in the share of renewable energy in primary energy consumption from 16.7% in 2020 to 23.7% in 2035. However, it does not include a plan to exit coal and sets the ambition for the country to become a fossil gas hub (Robins, 2023). These developments are at odds with the country's net zero emissions target.

Türkiye continues to make way towards their goal to start its nuclear power fleet, that is expected to be start operation by 2025 (Dalton, 2023). The country also advanced in its goal to improve electric vehicle penetration. Sales of electric vehicles have improved substantially in 2023 but the domestic manufacturing industry is still in its infancy (Daily Sabah, 2023; Ozbek, 2022).

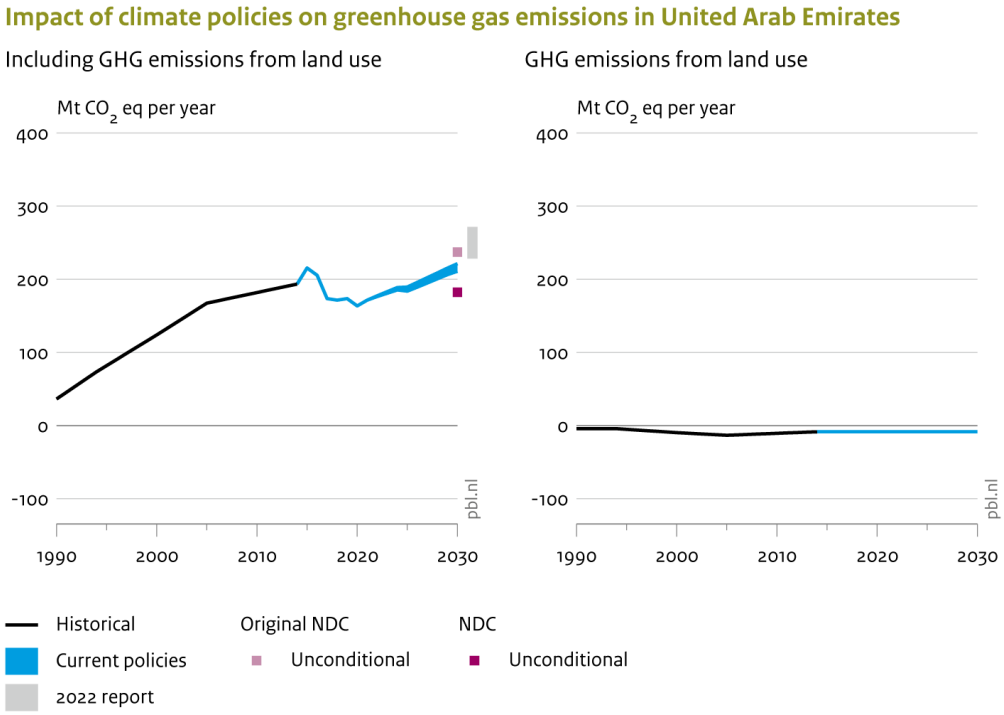
Table 23: 2015 historical data and 2030 projections of key GHG indicators for Türkiye.

Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional target
GHG emissions - incl. LULUCF (MtCO2e)	400	550 to 740	690
	+74% vs 2000	+36% to +84% vs 2015	+72% vs 2015
GHG emissions per capita (tCO_2e/cap)	5.1	6.2 to 8.3	7.8
	+40% vs 2000	+21% to +64% vs 2015	+53% vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	0.37	0.29 to 0.39	0.36
	-19% vs 2000	-22% to +5% vs 2015	-1% vs 2015

3.22 United Arab Emirates

Pledge	Key target	Submission date
NDC	Economy-wide target to limit GHG to 184 MtCO2e by 2030	11/07/2023
Net zero	Net zero GHG by 2050	07/10/2021

The United Arab Emirates (UAE) is **set to miss its latest target** submitted in 2023. Current policies projections remain in an upwards trend between 2020 and 2030, but are slightly lower than our 2022 projections, partly due to the UAE updating its Energy Strategy 2050 and removing coal power generation from its plans, as well as clarifying the expected development of renewables towards 2030. The reduction this year's current policy projections is also explained by updates to the historical data, which now show lower emissions in 2020.



Source: NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 26: Impact of climate policies on greenhouse gas emissions in the United Arab Emirates Emissions trajectories are based exclusively on NewClimate and IIASA projections. The grey bar gives the range of our 2022 projections.

Targets

The UAE submitted an updated NDC in July 2023. It sets the economy-wide and unconditional goal of reducing GHG emissions to 182 $MtCO_2e$ (incl. LULUCF) by 2030 (Government of the UAE, 2023a). The new NDC represents a 14% improvement compared to the previous target and includes sectoral measures to support its economy-wide target.

In 2021, the government announced a 2050 net zero target and released several official communications on its net zero plans since (Government of the UAE, 2021). However, the UAE have yet to submit a Long-Term Strategy to the UNFCCC or to disclose key details on how they plan to achieve net zero.

Recent developments

The UAE has been very active in the climate policy field on the run to its COP28 presidency. Alongside the submission of a new and stronger NDC, it has updated its major energy policy and announced new investments in low-carbon energy, including renewables and nuclear, both domestically and abroad.

The updated Energy Strategy 2050 includes a new 2030 clean energy target of 30% of installed capacity and removes its 2050 12% coal capacity target (Government of the UAE, 2023b). To support its new renewable target, the UAE announced a commitment of USD 54 billion over the next seven years, although it remains unclear whether these investments will be additional to the previous USD 160 billion the country pledged towards its 2050 targets (Associated Press, 2023). The updated Energy Strategy also includes targets for the uptake of EVs, including reaching 691,000 vehicles by 2030 and over 3 million by 2050.

However, alongside its plans to reduce emissions, the UAE continues to invest heavily into oil and gas, with no clear plan to phase down production in the foreseeable future. The UAE is planning investments of USD 150 billion to support oil and gas expansion, and it recently brought its oil production target up from 2030 to 2025 (The Guardian, 2023).

Table 24: 2015 historical data and 2030 projections of key GHG indicators for UAE.

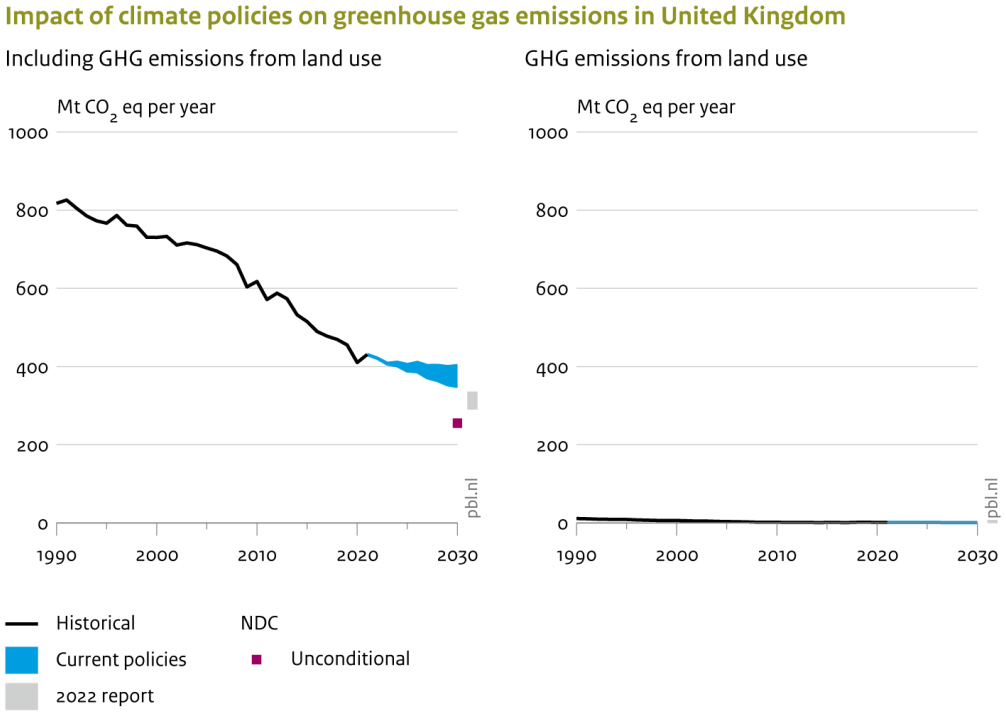
Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional target
GHG emissions - incl. LULUCF (MtCO2e)	220	210 to 220	180
	+74% vs 2000	-2% to +3% vs 2015	-16% vs 2015
GHG emissions per capita (tCO_2e/cap)	24.3	21.2 to 22.2	18.3
	-38% vs 2000	-13% to -9% vs 2015	-25% vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	0.57	0.36 to 0.37	0.31
	-22% vs 2000	-37% to -34% vs 2015	-46% vs 2015

3.23 United Kingdom

Pledge	Key target	Submission date
NDC	Economy-wide target to reduce GHG by 68% below 1990 levels by 2030	23/09/2022
Net zero	Net zero GHG by 2050	19/10/2021

The UK is **set to miss its NDC target** under current policies. Emissions have been and are now expected to remain on a downwards trend up to 2030. Emissions are higher in comparison to our 2022 projections mostly due to an update in our current policy scenarios.

The upper end of the range only includes policies where there are proven delivery mechanisms, a credible combination of public/private financing and clear timelines in place. The lower end of the range includes policies which display some risks related to delivery mechanisms, financing or implementation timelines. The September 2023 announcements that indicate a rollback in diverse climate policies are not yet quantified.



Source: NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 27: Impact of climate policies on greenhouse gas emissions in United Kingdom. Emissions trajectories are based exclusively on NewClimate and IIASA's projections. The grey bar gives the range of our 2022 projections.

Targets

In 2022, the UK submitted an updated NDC, which did not increase the strength of its target of 68% emissions reductions below 1990 levels but added complementary information about the NDC process and implementation plan, increasing transparency of the communication (Government of the UK, 2022). This target was recommended by the Climate Change Committee, which currently considers only less than 40% of the emission reductions required to achieve the NDC target are covered by credible policies (CCC, 2022).

The UK enshrined its 2050 net-zero emissions target in law in 2019 and has introduced multiple policies and sectoral plans that support emissions reductions in the aftermath. Based on these policies, the UK government released a Net Zero Strategy in October 2021 and submitted it to the UNFCCC (Government of the UK, 2021). However, the UK government was ordered by the Royal Courts of Justice to update its strategy due to inadequate level of transparency, which was considered in breach with the Climate Change Act of 2008 (Royal Courts of Justice, 2022). The updated Net Zero Strategy, called the "Carbon Budget Delivery Plan", was published in March 2023, and clarifies how government measures will reduce emissions. The updated plan highlights the large gap between the UK's current policies and its legally binding emissions targets.

Recent developments

At the UN Secretary General's Climate Ambition Summit in September 2023, the UK announced that it is backtracking on several key climate policies, including the 2030 phase out of new petrol and diesel cars, 2035 phase-out of gas boilers, and energy efficiency measures in homes (Government of the UK, 2023a). The UK's updated zero emission vehicle mandate requires 80% of new cars and 70% of new vans need to be zero emission by 2030 and 100% by 2035 (Government of the UK, 2023b). The phase out of new gas boilers by 2035 will now only cover around 80% of UK homes and the previous ban on off-grid oil boilers by 2026 has been delayed till 2035 and likewise will only apply to 80% of homes (Carbon Brief, 2023). It was also announced that homeowners and landlords will no longer be required to meet energy efficiency targets.

In July 2023, the government announced that it will issue hundreds of new oil and gas licences (Government of the UK, 2023c). The announcement further calls into question the UK's position as a leader on climate change mitigation and is not compatible with achieving the UK's climate targets and meeting the goals of the Paris Agreement (Carbon Brief, 2021; Walker, 2023).

As of September 2023, the government has still not provided several key sectoral measures advised by the Climate Change Committee in 2020-2022, including developing comprehensive decarbonisation roadmaps for the electricity, agriculture and land-use sectors (Government of the UK, 2023d).

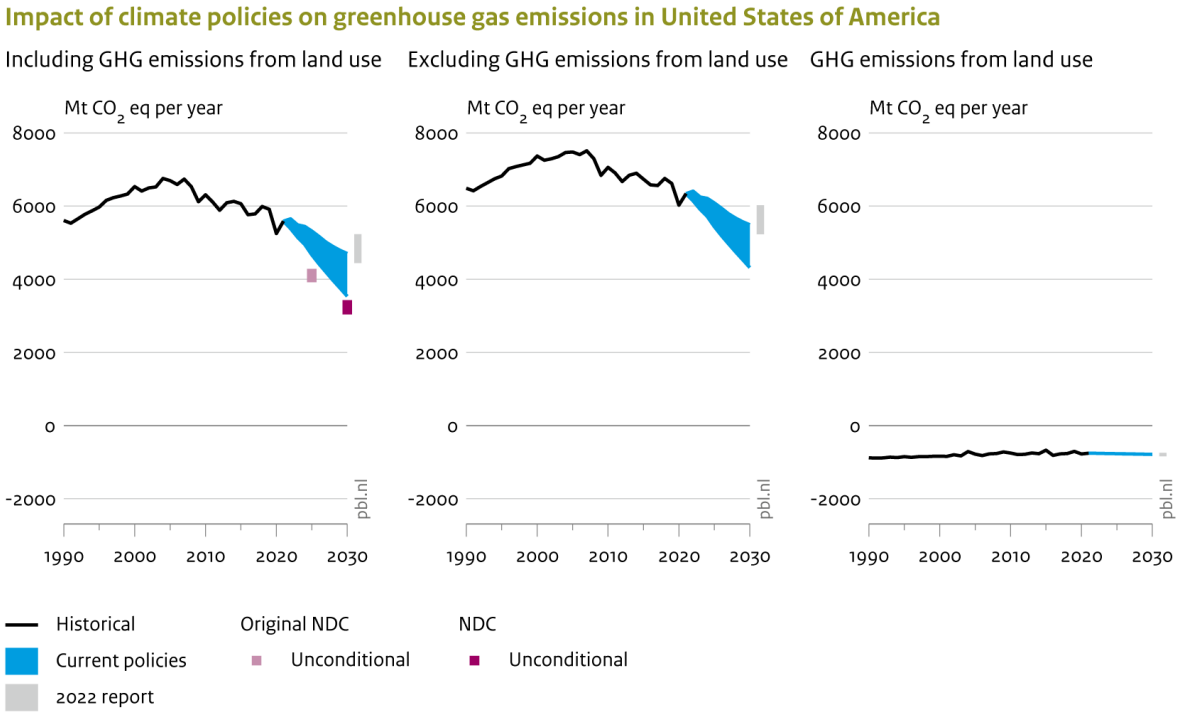
Table 25: 2015 historical data and 2030 projections of key GHG indicators for the United Kingdom.

Indicator	2015 (change rate vs 2000 and 1990)	2030 projections (change rate vs 2015 and 1990)	
		Current policies scenario	NDC unconditional target
GHG emissions - Excl. LULUCF (MtCO2e)	510	350 to 400	260
	-29% vs 2000	-32% to -22% vs 2015	-50% vs 2015
	-37% vs 1990	-57% to -51% vs 1990	-68% vs 1990
GHG emissions per capita (tCO_2e/cap)	7.9	5.1 to 5.8	3.7
	-36% vs 2000	-36% to -26% vs 2015	-53% vs 2015
	-45% vs 1990	-65% to -59% vs 1990	-74% vs 1990
GHG emissions per GDP (tCO_2e/thousand USD)	0.19	0.10 to 0.12	0.08
	-46% vs 2000	-44% to -35% vs 2015	-59% vs 2015
	-60% vs 1990	-78% to -74% vs 1990	-84% vs 1990

3.24 United States of America

Pledge	Key target	Submission date
NDC	Economy-wide target to reduce GHG by 50-52% below 2005 levels by 2030	22/04/2021
Net zero	Net zero GHG by 2050	01/11/2021

The United States **will likely miss its NDC target** with existing policies. Emissions under current policies in the US are projected to decrease in the period towards 2030, but there is uncertainty regarding the rate of decline. Our current policies scenario projections this year is lower than our 2022 projections, mostly because of the effect of the Inflation Reduction Act. The Act brings the US closer but remains insufficient to put the country on track to meet its latest NDC target (Jenkins et al., 2022; Mahajan et al., 2022; Rhodium Group, 2022). Other factors explaining the reduction in this year's projections compared to last year's are the expected uptake of EVs, the increase in renewables, and curtailment of coal power.



Source: PBL IMAGE model; NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 28: Impact of climate policies on greenhouse gas emissions in the United States of America (upper end: NewClimate Institute calculations, lower end: PBL IMAGE model). The grey bar gives the range of our 2022 projections.

Targets

In 2021, the US submitted a new NDC after re-joining the Paris Agreement. The target includes a reduction of 50-52% below 2005 levels by 2030 including LULUCF (Government of The United States of America, 2021b). The new NDC target is likely stronger than the original NDC target of 26-28% reduction below 2005 by 2025, but both targets are not directly comparable as they target emission reductions in distinct years.

The Biden administration has taken steps to address climate change as one of its priorities and reverse climate policy rollbacks of their predecessor. This includes setting economy-wide and sectoral

decarbonisation goals such as net zero emissions by 2050, carbon-free power sector by 2035 and make half of all new vehicles sold in 2030 zero-emissions vehicles. For its net zero target, the United States specifies that it expects land use sinks to reach between minus 600 and minus 1,400 MtCO2e in 2050, while technological CDR could reach between minus 300 and minus 500 MtCO2e (Government of The United States of America, 2021a).

Recent developments

In August 2022, President Biden signed into law the Inflation Reduction Act. The Act injects USD 369 billion in the form of tax credits, grants and loans directed to develop and deploy the clean energy technologies and investments that will be essential to decarbonisation of the economy (Jenkins et al., 2022). One year after its implementation, the IRA has mobilized historic public and private investments in clean energy technologies, accelerating state and local action.

In contrast, recent developments in the oil and gas industry undermine the full potential of the Inflation Reduction Act to decarbonise the economy. In 2022, the United States continued to reach record-high oil and gas production and exports and it is planning to increase its liquified natural gas (LNG) export capacity by about 50% by 2026, compared to 2022 (U.S. Energy Information Administration, 2019). The Biden administration approved in March 2023 a major oil drilling project on federal land (the Willow project in Alaska) and the Supreme Court authorised in July 2023 the construction of the Mountain Valley Pipeline – a 300-mile-long project to transport gas from West Virginia to Virginia.

At sectoral level, in April 2023, the administration proposed a rule to set stricter vehicle emissions standards for light- and medium-duty from model year 2027 that could aid in the transition to EVs. This proposal is expected to avoid 7.3 $GtCO_2e$ from light- and medium-duty activity through 2055 and deliver health benefits from reduced air pollution (U.S. Environmental Protection Agency, 2023a). In May 2023, the EPA proposed new regulations aiming to set tighter carbon emissions limits for coal-fired power plants as well as new and existing large fossil gas plants (U.S. Environmental Protection Agency, 2023b). The regulation could retire most of the coal fleet earlier than currently planned (before 2035) and prevent installation of new coal-fired power plants.

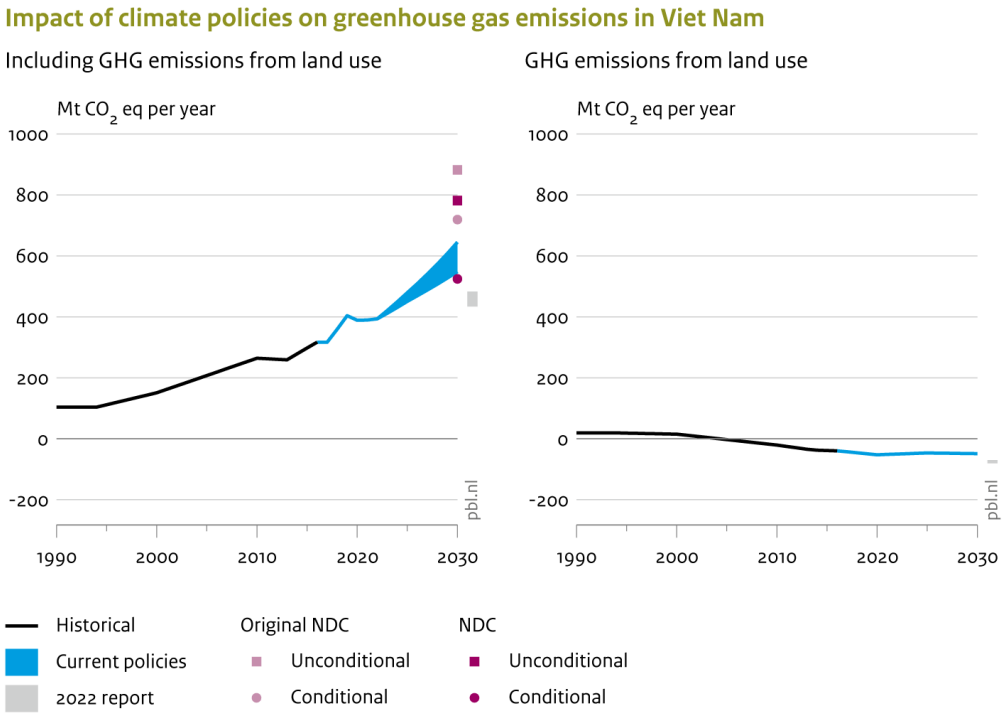
Table 26: 2015 historical data and 2030 projections of key GHG indicators for the United States of America.

Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional target
GHG emissions - incl. LULUCF (MtCO2e)	6,070	3,540 to 4,700	3,170 to 3,300
	-7% vs 2000	-42% to -22% vs 2015	-48% to -46% vs 2015
GHG emissions per capita (tCO_2e/cap)	18.8	10.1 to 13.4	9.0 to 9.4
	-19% vs 2000	-46% to -29% vs 2015	-52% to -50% vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	0.36	0.16 to 0.21	0.14 to 0.15
	-31% vs 2000	-56% to -41% vs 2015	-59% to -60% vs 2015

3.25 Viet Nam

Pledge	Key targets	Submission date
NDC	Economy-wide unconditional target to reduce GHG by 15.8% below BAU by 2030 and conditional target to reduce GHG by 43.5% below BAU by 2030	09/11/2022
Net zero	Net zero GHG by 2050	02/11/2021

Viet Nam is **on track to meet its unconditional NDC target but will likely miss its conditional target**. Both targets are well above 2020 emission levels. Current policies are expected to remain on an upwards trend in the next decade. Our 2023 projections are higher than those of last year, mainly due to an increase in the expected power demand and utilization of the existing and planned coal fleet.



Source: NewClimate Institute calculations; IIASA GLOBIOM/G4M model (2023)

Figure 29: Impact of climate policies on greenhouse gas emissions in Viet Nam (including LULUCF). Emissions trajectories are based exclusively on NewClimate and IIASA projections. The grey bar gives the range of our 2022 projections.

Targets

Viet Nam submitted an updated NDC in November 2022, which includes an unconditional target to reduce emissions by 15.8% by 2030 compared to a BAU scenario and a conditional target to scenario reduce emissions by 43.5% by 2030. Viet Nam's new NDC is slightly more ambitious than its previous NDC, mainly due to the expanded coverage of sectors.

The target is also included in Viet Nam's National Strategy on Climate Change for 2050, approved mid-2022. This plan includes additional targets to peak national emissions by 2035 and reach net-zero by 2050. Sectoral emissions targets are also set for 2030 and 2050 (Government of Viet Nam, 2022).

In 2021, Viet Nam announced its net zero by 2050 target, which was enshrined in law in 2022. The target covers all GHGs and all economic sectors (Government of Viet Nam, 2022). The climate change strategy supporting the target estimates that emissions in 2050 will be around 185 $MtCO_2e$ or a 90%

reduction in emissions compared to the BAU level in 2050, giving an indication of the expected role of land use sinks, technological carbon dioxide removal and international credits.

Recent developments

In 2022, Viet Nam presented an action programme on green energy transformation, reducing carbon and methane emissions in the transport sector. In December 2022, it joined the Just Energy Transition Partnership (JETP). As part of this partnership, Viet Nam is expected to receive USD 15.5 billion from donor countries to support peaking its power sector emissions at 170 $MtCO_2$ by 2030 and increasing its share of renewable power generation to 45% by 2030 (European Commission, 2022b).

Vietnam released its Eight Power Development Plan (PDP8) in May 2023, which contains a planning for the period of 2021-2030 (Barnes, 2023; Vu & Guarascio, 2023; Wengel, 2023). Under the PDP8, coal would remain an important energy source, accounting for 20% of the energy mix by 2030 (down from nearly 31% in 2020). However, because of the expected increase in total energy use, coal-based capacity is projected to increase to more than 30 GW by the end of the decade. Power plants using domestic and imported liquefied natural gas (LNG) are also set to become a an important source of electricity by 2030, with a combined installed capacity of 37 GW (15% of the total), more than a fourfold increase from 2020. Wind, solar and other renewable sources, excluding hydropower, are set to cover almost one-third of the country's energy needs by 2030, from about 25% in 2020, with a 19.5% to be covered by hydropower.

At COP26 Viet Nam signed the Coal to Clean Power Transition Statement, aiming to rapidly scale up renewables and energy efficiency measures, cease issuance of permits for new unabated coal-fired power plants, and strengthen efforts to achieve a just transition from coal in the 2040s. Viet Nam also signed the Global Methane Pledge to cut methane emissions by 30% by 2030.

Table 27: 2015 historical data and 2030 projections of key GHG indicators for the Viet Nam.

Indicator	2015 historical	2030 projections	
		Current policies scenario	NDC unconditional [conditional] target
GHG emissions - incl. LULUCF (MtCO2e)	300	550 to 640	780 [520]
	+97% vs 2000	+84% to +117% vs 2015	+162% [76%] vs 2015
GHG emissions per capita (tCO_2e/cap)	3.2	5.4 to 6.3	7.6 [5.1]
	+69% vs 2000	+65% to +94% vs 2015	+135% [58%] vs 2015
GHG emissions per GDP (tCO_2e/thousand USD)	1.54	1.18 to 1.39	1.68 [1.13]
	-28% vs 2000	-23% to -10% vs 2015	+9% [-27%] vs 2015

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