Climate Pledges Explorer

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Background

The Climate Pledges Explorer has been developed by the International Energy Agency (IEA) to track country's mitigation pledges in Nationally Determined Contributions (NDCs) and long-term Net Zero Emissions (NZE) pledges. The IEA Climate Pledges Explorer aims to summarise the main mitigation targets in the energy sector implied by these commitments.

This tracking was originally developed to support the calibration of the Global Energy and Climate (GEC) model, which is used across many of the IEA's major publications including the World Energy Outlook (WEO). NDCs and NZE pledges are among the key calibration points used to define the IEA's Announced Pledges Scenario, which assumes all countries' individual climate and energy targets are met on time and in full. The IEA has decided to make this data freely available to the public in support of the first Global Stocktake of the Paris Agreement, and plans to keep this dataset updated regularly.

As of October 2024, this database includes data for 195 countries, and the analysis draws upon 445 official documents. For each pledge, the analysis integrates general information (submission date, scope) and emission-related targets (unconditional and conditional to international support).

The following methodology describes the data fields associated with each type of climate pledge, and all the associated calculations used in the tracker.

Analysis of climate pledges

The Climate Pledges Explorer (hereinafter "the Explorer") systematises key data from countries' NDCs and NZE targets to estimate a target level of GHG emissions from fuel combustion and fugitive emissions in the energy sector implied by the pledges. Given each pledge is unique and does not necessarily specify all the needed information and data to isolate the energy sector component, a number of steps are required to estimate it and make the resulting emissions cross-comparable and consistent with IEA data. The general steps include:

1. Estimating economy-wide GHG emissions implied by the mid- or long-term pledge for the specific target year.

2. Excluding other sectors than energy, i.e. Industrial Processes and Product Use (IPPU); Agriculture; Land-Use, Land-Use Change and Forestry (LULUCF) and Waste.

3. Aligning computed energy-related GHG emissions with IEA data.

Finally, when aggregating regional analyses, national data gaps are filled, and targets are compiled according to IEA regional definitions (included below).

Given the many associated uncertainties, the Explorer shows confidence ranges for implied emissions, which are larger for pledges where targets and emissions contributions are less transparent. The different computations are explained in greater detail below, alongside definitions of tags used to provide an estimate of key data.

Estimating target year emissions implied in NDCs and NZE pledges

Counties formulate NDC mitigation targets in different ways, namely (i) relative targets (compared to a given year), (ii) absolute targets, (iii) targets against a forward-looking counterfactual (business-as-usual) scenario, or (iv) intensity targets (expressed in energy intensity mitigation). The Climate Pledge Explorer calculates the implied emissions in the NDC target year depending on its type according to the schedule below.

Relative targets

These targets set a mitigation goal as a percentage mitigation from an earlier year's emissions level specified in the NDC. Target emissions are straightforward to calculate as follows:

$$\text{Target emissions} = \text{Base emissions} \cdot (1 - \%_{\text{reduction rate}})$$

Absolute targets

Some NDCs set a specific emissions level to not be exceeded in the target year. The Explorer takes this level of emissions directly, while adjusting as needed to make the target compatible with IEA data.

Business As Usual (BAU) targets

Most developing economies include in their NDC a forward-looking counterfactual scenario, called a BAU scenario, which estimates how their emissions would evolve if no mitigation actions were implemented. These scenarios are based on growth assumptions, notably for GDP and population growth. The mitigation target is then compared to this scenario in the target year, which means emissions may still rise in absolute terms from today's levels, albeit lower than they would have been if no mitigation action was taken.

$$\text{Target emissions}_{2030} = \text{BAU emissions}_{2030} \cdot (1 - \%_{\text{reduction rate}})$$

If the country's mitigation target is fully conditional to international support, the unconditional target for this country considers the BAU emissions as target for 2030.

Intensity targets

A few NDCs set their mitigation target in terms of emissions intensity per unit of economic activity, e.g. Mt CO_2-eq / USD of GDP. To get the target year emissions, data has been processed as follow:

$$\text{Target emissions} = \frac{\text{Base emissions}}{\text{GDP}_{\text{base year}}} \cdot \text{GDP}_{\text{target year}} \cdot (1 - \%_{reduction\ rate})$$

Where $\text{GDP}_{\text{base year}}$ and $\text{GDP}_{\text{target year}}$ are based on GEC assumptions. Regarding base year emissions, if these are not explicitly reported in the NDC document, our methodology used selected emissions specified in [UNFCCC GHG inventories](), using the specific value needed according to gas & sector scope.

Conditional and unconditional targets

Many emerging market and developing economies have conditional and unconditional targets in their NDCs. These targets can take the form of any of the above mentioned types, but have two separate targets: one that reflects commitments the country will fulfil with domestic resources under any circumstance (unconditional), and a target that will be fulfilled contingent on international support.

The Explorer reports these targets separately, using the appropriate aforementioned methodology to determine target emissions. These ranges are stated in the explorer separately.

NZE targets

The analysis of NZE pledges takes a widder range of documents that NDCs to estimate where countries could stand under their carbon or climate neutrality goal. It includes Long-Term Low-Emission Development Strategies (LT-LEDS), NDCs, Biennial Update Report (BUR) and any official national strategy made publicly available. For those without a clear pathway and milestones, the assumption taken is an economy-wide zero emission target by the pledged year.

Excluding non-energy sector emissions from targets

For some NDCs and NZE targets, isolating the share of the energy sector emissions from the economy-wide mitigation target is not feasible due to a lack of information in official documents. Considering the economy-wide target for the energy sector could overestimate the mitigation ambition of countries, especially if a country intends to rely more heavily on the LULUCF sector to reach their mid-term goal.

Accordingly, the Explorer adopts one of two computation methods to isolate energy-related emissions, listed in order of preference, based on the availability of data on the country's NDC:

1. If the NDC specifies energy-related emissions in the NDC target year, this is reflected directly in the Explorer. As of October 2024, this methodology applies to 66 countries.

2. If the NDC only specifies economy-wide estimates, but other official documents issued by the country, referring to the same target, provide more details (e.g. Biennial Update Reports (BUR), National Communications (NC)), then these other estimates are used to isolate the energy sector. As of October 2024, this methodology applies to 32 countries.

3. If the NDC specifies economy-wide estimates, and no other source could be used to single out the energy sector, assumptions for the trajectory of non-energy sectors are made and described below. The uncertainty ranges stemming from these assumptions are represented in the Explorer. As of October 2024, this methodology applies to 100 countries.

For pledges falling in the third case, the IEA computes upper and lower values for each of the respective covered sector:

- **AFOLU** would follow the trends modelled by the International Institute for Applied Systems Analysis (IIASA) for the AFOLU sector. It would take into account either 1- current policy trends or 2- announced pledges in this specific sector.

- **Industrial processes** would follow either 1- the same regional trend from the IEA STEPS, 2- the same trend from the APS, or 3- the same mitigation rate as the economywide target.

- **Product use and waste** would 1- follow a five-year compound average growth rate (CAGR) or 2- have the same mitigation rate as the economywide target.

For all sectors, the increase or decrease in emissions are tied to the emissions reported by the Party to the UNFCCC, using their GHG inventory. The LULUCF emissions have a special treatment as they can move to negative or positive values across time. The increase/decrease delta in emissions from IIASA data is plainly applied to historical inventory, in absolute terms rather than relative.

Aligning with IEA's emissions data

There are statistical differences between emissions reported by countries to the UNFCCC through their NDCs or Biennial Update Reports (BURs), and IEA's data on energy sector emissions. For consistency purposes, base year GHG emissions stated in NDCs are re-baselined to IEA data, but maintain the same rate of change implied by the NDC, as follows:

$$\text{Target emissions}_{\text{GHG,IEA}} = \text{Base emissions}_{\text{GHG,IEA}} \cdot \frac{\text{Target emissions}_{\text{GHG,NDC}}}{\text{Base emissions}_{\text{GHG,NDC}}}$$

The base year differs between each country. It occurs for few documents that the base year and/or base year emissions are not specified. For those cases, the last year with available data submitted to the UNFCCC (through a BUR or a National Communication for example) is used as reference year in the analysis.

Regional energy-related GHG emissions targets

Normalising all NDC emissions targets to 2030

NDCs may have a different target year as NDCs are updated, most frequently for 2025, 2030, and 2035. To aggregate these at a regional level, the IEA normalised the target year to 2030, as a vast majority of current submission (as of October 2024) have this year as main target.

For the few NDCs having a different target year, a 2030 value is interpolated using the annual rate of change induced by the NDC between its base year and target year:

$$\text{Base emissions}_{TY} = \text{Base emissions} \cdot (CAGR)^{2030-BY}$$

where $CAGR = (1 + \frac{\text{Target emissions}_{TY}}{\text{Base emissions}_{TY}})^{\frac{1}{TY-BY}-1}$, TY stands for target year and BY for base year.

Filling the gaps for parties without submission or quantifiable targets

Some regions have an important relative share of emissions not covered by an NDC, or do not enable the computation of quantifiable emission reduction targets.

In those cases, it is considered that the country would have a similar relative growth in emissions compared to the past five years, using a compound annual growth rate:

$$CAGR = ((\frac{\text{GHG emissions}_{2021}}{\text{GHG emissions}_{2016}})^{\frac{1}{2021-2016}} - 1$$

Aggregating by modelling regions

Countries are eventually summed up to GEC regions. This applies to unconditional and conditional mitigation targets.

A global value can eventually also be computed, by summing all the regions. This global estimate needs to be compared with values excluding international aviation and shipping, which are eventually excluded from this estimate.

Definitions

Table 1.   Mid-term targets definitions

Flow	Definition
Unconditional target	The NDC's mitigation targets are to be achieved through national means and national finances. The NDC's implementation is not conditional to international support.

Conditional target	The full NDC's implementation is conditional to international support. The NDC's mitigation targets are to be achieved (partly or fully) through the provision of financial support from the international community, including technology transfers and capacity building.
Type of target	• **Business-as-Usual (BAU)**: The mitigation contribution is expressed relative to a baseline scenario. • **Relative**: The mitigation contribution is expressed relative to baseline emissions. • **Absolute**: The mitigation contribution is expressed as an absolute quantity of CO_2 emissions to be emitted by a target year. • **Intensity**: The mitigation contribution is defined by a reduction of CO_2 emissions per unit of GDP. • **No target**: The NDC does not include any quantifiable emission target.
Base year	Reference year for the mitigation target. If no reference year is displayed, the latest year quoted in the GHG inventory is used.
Base emissions	CO_2 energy-related emissions for the reference year. CO_2 emissions from fuel combustion are IEA estimates.
Target year	Target year for the mitigation target. The NDC presents one main target year. This target is set to evolve every 5 years, with the new round of updated NDCs.
Target emissions	CO_2 emissions aimed to be achieved by the target year, based on IEA base year emissions (see section on methodology for more details).
NDC submission year	Date when the NDC was submitted to the UNFCCC. Document available on the NDC registry of the UNFCCC.
NDC gas scope	The NDC economy-wide mitigation target may cover the following GHGs: CO_2, CH_4, N_2O, HFCs, NF3, SF6 and PFCs.
NDC sectoral scope	The NDC economy-wide mitigation target may cover the following main sectors: Agriculture, Land Use, Land-Use Change and Forestry (LULUCF), Energy, Waste and Industrial Processes and Product Use (IPPU).

Table 2. Long-term targets definitions

Flow	Definition
Target year	Year aimed at reaching the economy-wide NZE target.
Legal status	• **In law**: the NZE pledge is set into a binding legal framework. • **Proposed legislation**: the NZE pledge is in the process to be passed into a law. • **In policy document**: The NZE pledge is set into a policy framework e.g. LT-LEDS.

- **In policy document** (achieved): the country is already climate or carbon neutral.
- **Oral pledge**: the NZE pledge was announced orally, with a script or recording.

NZE gas scope	The NZE pledge may cover all GHG emissions (climate neutrality) or CO_2 emissions only (carbon neutrality).
NZE sectoral scope	The NZE pledge may cover the following main sectors: Agriculture, Land Use, Land-Use Change and Forestry (LULUCF), Energy, Waste and Industrial Processes and Product Use (IPPU).

Geographical coverage

The tracker aims to cover all published NDCs from countries included in the IEA's Global Energy and Climate Models (GEC).

Table 3.   Countries and regions

Countries/regions	Countries
Africa	Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Cote d'Ivoire, Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Sierra Leone, Senegal, Seychelles, Somalia, South Sudan, South Africa, Sudan, Togo, Tunisia, Uganda, United Republic of Tanzania, Zambia, Zimbabwe
Asia Pacific	Afghanistan, Australia, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, Cook Islands, Democratic People's Republic of Korea, Fiji, India, Indonesia, Japan, Kiribati, Republic of Korea, Lao People's Democratic Republic, Malaysia, Maldives, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, Palau, Papua New Guinea, People's Republic of China, Philippines, Samoa, Singapore, Samoa, Solomon Islands, Sri Lanka, Thailand, Timor-Leste, Tonga, Vanuatu, Viet Nam
Central and South America	Argentina, Antigua and Barbuda, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela
Europe	Albania, Austria, Belarus, Belgium, Bulgaria, Bosnia and Herzegovina, Croatia, Cyprus, Czech Republic, Denmark, Estonia, European Union, Finland, France, Germany, Greece, Holy See, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lithuania, Luxembourg, Malta, Monaco, Montenegro, Netherlands, North Macedonia, Norway, Poland, Portugal, Republic of Moldova, Romania, San Marino, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom
Eurasia	Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Russian Federation, Tajikistan, Turkmenistan, Uzbekistan
Middle East	Bahrain, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, United Arab Emirates
North America	Canada, United States, Mexico
Not included in IEA modelling	Andorra, Liechtenstein, Nauru, Niue, State of Palestine, Marshall Islands, Micronesia, Tuvalu

Abbreviations and acronyms

AFOLU	Agriculture, Forest and Other Land Use
BAU	Business-as-Usual
BUR	Biennial Update Reports
CAGR	Compound Annual Growth Rate
CH_4	Methane
CO_2	Carbon dioxide
GDP	Growth Domestic Product
GEC	Global Energy and Climate scenarios
GHG	Greenhouse Gases
HFCs	Hydrofluorocarbons
IEA	International Energy Agency
IIASA	International Institute for Applied Systems Analysis
IPPU	Industrial Processes and Product Use
LT-LEDS	Long-Term Low-Emission Development Strategies
LULUCF	Land Use, Land-Use Change and Forestry
$MtCO_{2eq}$	Million metric ton of CO_2 equivalent
NC	National Communication
NDC	Nationally Determined Contribution
NZE	Net Zero Emissions
N_2O	Nitrous oxide
NF_3	Nitrogen trifluoride
PFCs	Perfluorochemicals
SF_6	Sulfur hexaflouride
UNFCCC	United Nations Framework Convention on Climate Change
USD PPP	US dollar Purchasing Power Parity
WEO	World Energy Outlook