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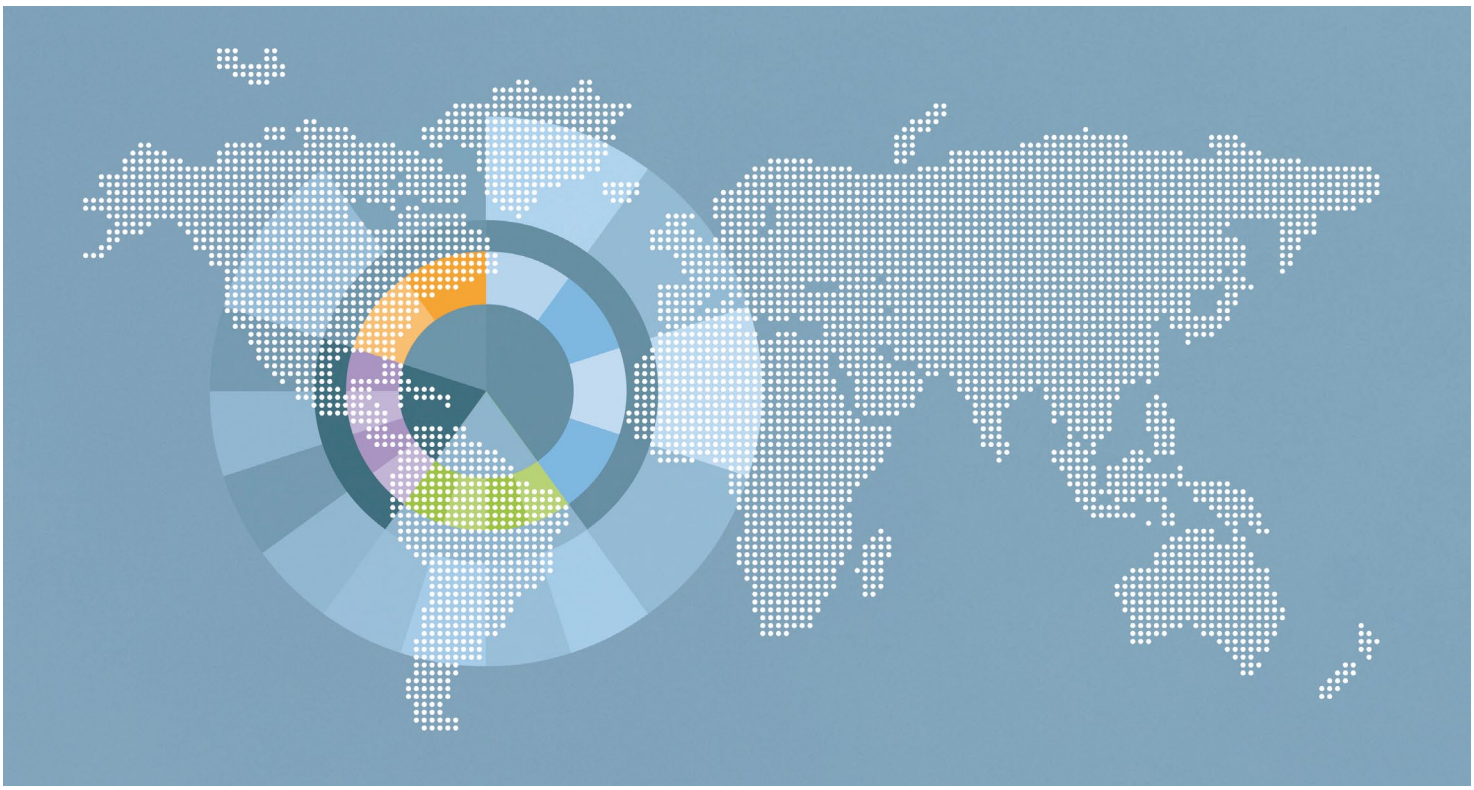
CCPI
Climate Change
Performance Index

Jan Burck
Thea Uhlich
Christoph Bals
Niklas Höhne
Leonardo Nascimento

BACKGROUND AND METHODOLOGY



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Authors:
Jan Burck, Thea Uhlich, Christoph Bals, Niklas Höhne and Leonardo Nascimento

With the Support of: Björk Lucas, Ana Tamblyn and Jonas Reuther

Layout: Dietmar Putscher, Björk Lucas and Ana Tamblyn

Editing: Janina Longwitz, Tobias Rinn and Hanna Fuhrmann

Publishers:

Germanwatch e.V.
Bonn Office:
Kaiserstrasse 201
D-53113 Bonn, Germany
Phone +49 (0)228 / 60 492-0, Fax -19

Berlin Office:
Stresemannstrasse 72
D-10693 Berlin, Germany
Phone +49 (0)30 / 28 88 356-0, Fax -1

Internet: www.germanwatch.org
E-mail: info@germanwatch.org

NewClimate Institute
Cologne Office:
Clever Str. 13-15
D-50668 Cologne, Germany
Phone +49 (0)221 / 99 983 300, Fax -19
Internet: www.newclimate.org
E-mail: info@newclimate.org

Berlin Office:
Schönhauser Allee 10-11
D-10119 Berlin, Germany
Phone +49 (0)30 / 20 849 27 00

Climate Action Network-International
Kaiserstrasse 201
D-53113 Bonn, Germany
Internet: www.climatenetwork.org

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Summary

The Climate Change Performance Index (CCPI) is an independent monitoring tool for tracking countries' climate protection performance. It aims to enhance transparency in international climate politics and enables comparison of climate protection efforts and progress made by individual countries. This publication explains how the CCPI 2022 is calculated. Furthermore, it lists the literature and data sources used for these calculations.

Content

Foreword: Enhancing Transparency in International Climate Politics

Getting a clear understanding of national and international climate policy is difficult, as the numerous countries which need to be taken stock of, each have various initial positions and interests. To untangle the knot of differentiated responsibilities as well as kept and broken promises and to encourage steps towards an effective international climate policy, Germanwatch developed the Climate Change Performance Index (CCPI). As of now, the index compares 60 countries + the European Union (EU) that together are responsible for more than 90% of global greenhouse gas (GHG) emissions.

The climate change performance is evaluated according to standardised criteria and the results are ranked. With reaching the Paris Agreement in 2015, every country has put forward own mitigation targets and the global community emphasised the need to limit global temperature rise well below 2°C or even 1.5°C. The CCPI evaluates how far countries have come in achieving this goal. It helps to access and judge the countries' climate policy, their recent development, current levels and well-below-2°C compatibility of GHG emissions, renewable energies, energy use (as an indication of their performance in increasing energy efficiency) and their targets for 2030.

The component indicators provide all actors with an instrument to probe in more detail the areas that need to see movement. As an independent monitoring tool of countries' climate protection performance, it aims at enhancing transparency in international climate politics and enables the comparability of climate protection efforts and progress made by individual countries. With this in mind, the NewClimate Institute, the Climate Action Network and Germanwatch present the CCPI every year at the UN Climate Change Conference, thus creating as much attention as possible in the observed countries and pushing forward the discussion on climate change. The astounding press echo to the CCPI shows its relevance: Both at the national and international level, numerous media report about the outcomes and on how well their country performed in the latest edition of the index. Awareness was also raised in politics. Many delegates at the climate conferences as well as national government institutions inform themselves on ways of increasing their countries' rank.

By simplifying complex data, the index does not only address experts, but everyone. We would like to emphasise that so far no country has received the overall rating "very high". That is why, up until now, the first three ranks of the CCPI have been left open. We want to use the picture of an empty podium to stress that not one country in the listed in the CCPI has done enough to prevent dangerous climate change. We hope that the index provides an incentive to significantly change that and step up efforts. As a tool for climate protection information and communication, the index is also available online for general public interest at: **www.ccpi.org**

The following publication explains the background and the methodology of the Climate Change Performance Index.

As has been the case with the previous editions, the CCPI 2022 would not have been possible without the help of about 500 climate experts from all over the world, who evaluated their countries' climate policy. We would like to express our deep gratitude and thank all of them.

1 Methodology

The climate change performance is assessed in four categories:

1. "GHG Emissions" (40% of overall score);
2. "Renewable Energy" (20% of overall score);
3. "Energy Use" (20% of overall score);
4. "Climate Policy" (20% of overall score).

A country's performance in each of the categories 1-3 is defined by its performance regarding four different equally weighted indicators, reflecting four different dimensions of the category: "Current Level", "Past Trend (5-year trend)", "2°C-Compatibility of the Current Level" and the "2°C-Compatibility of 2030 Target". These twelve indicators are complemented by two indicators under the category "Climate Policy", measuring the country's performance regarding its national climate policy framework and implementation as well as regarding international climate diplomacy.

Figure 1 gives an overview of the composition and weighting of the four categories and 14 indicators defining a country's overall score in the CCPI. For details on the constitution of a country's scoring, please see chapter 2 "Calculation and Results".

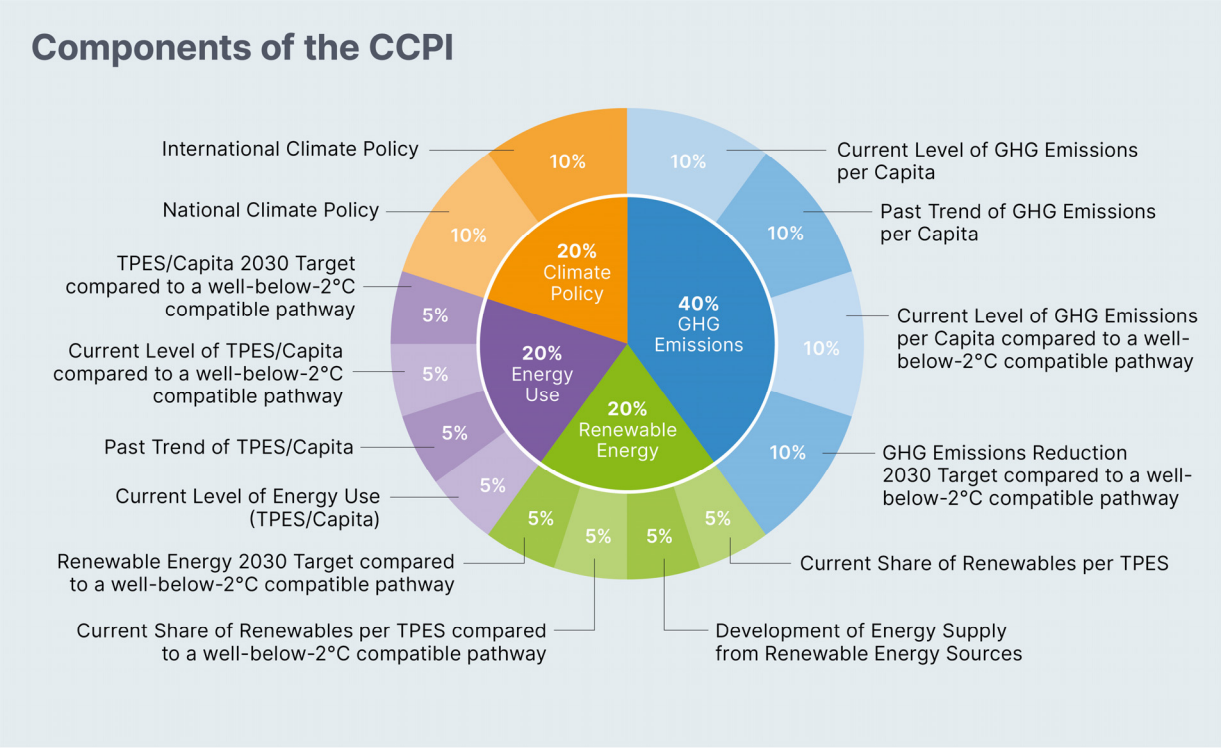


Figure 1: Components of the CCPI: Fourteen indicators (outer circle) in four categories (inner circle)

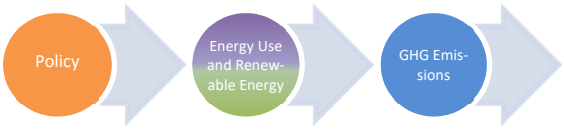
The index rewards policies which aim for climate protection, both at the national level and in the context of international climate diplomacy. Whether or not countries are stimulating and striving towards a better performance can be deduced from their scores in the "Climate Policy" indicators. Whether these policies are effectively implemented, can be read – with a time lag of a few years – in the country's improving scores in the categories "Renewable Energy" and "Energy Use" and lastly in positive developments in the category "GHG Emissions" (s. figure 2). Following this logic, the index takes into account the progress in the three areas ultimately showing their effect in a country's GHG emissions performance with a weighting of 20% each:

- an effective climate policy,
- an expansion of renewable energy,
- improvements in energy efficiency and thus control over domestic energy use.

This weighting scheme leaves the CCPI responsive enough to adequately capture recent changes in climate policy and newly achieved improvements on the way to reduce GHG emissions. As GHG emissions reductions are what needs to be achieved for preventing dangerous climate change, this category weighs highest in the index (40%). Measuring both, emissions trends and levels within this category, the CCPI provides a comprehensive picture of a country's performance, neither too generously rewarding only countries, which are reducing emissions from a very high level, nor countries, which still have low levels but a vast increase. This combination of looking at emissions from different perspectives and since 2017 also taking into account a country's performance in relation to its specific well-below-2°C pathway ensures a balanced evaluation of a country's performance.

For each of these indicators the countries receive a rating between "very high" and "very low". The indicator-specific limits for the rating can be found in the section focussing on the very indicator.

Logic followed by the CCPI



Data Sources and Adaptions

The CCPI is using the PRIMAP[1] data base to assess all GHG emissions arising across all sectors. As the PRIMAP data base does not cover Land Use, Land Use Change and Forestry (LULUCF) emissions, the LULUCF emissions are taken from FAO[2], the national inventory submissions 2021[3] and the biannual country reports[4]. For all energy-related data in the categories "Renewable Energy" and "Energy Use", the index continues to use data from the International Energy Agency (IEA)[5], generally following the definitions given by the IEA. However, the CCPI assessment excludes non-energy use from all data related to total primary energy supply (TPES) as well as traditional biomass from all numbers provided by the IEA for both, TPES numbers and the assessment of renewable energy.[6]

[1] PRIMAP (annually updated)
[2] FAO (annually updated)
[3] UNFCCC (2021-a)
[4] UNFCCC (2021-b)
[5] IEA (2021): Renewables Information. Paris.

[6] Since the IEA does not explicitly identify traditional biomass as such, it is assumed that the residential use of biomass (explicitly listed in the IEA statistics) strongly coincides with traditional use of biomass, especially in developing countries. In industrialised countries this quantity is negligible in most cases.

Box 1: Comparability of Different Editions of the CCPI

An index that compares the climate change performance of different countries over several years encourages comparing a country's ranking position to the past years. We need to point out that three factors limit the comparability across CCPI editions.

Revision of Historic Data in Databases

The first reason is limited comparability of the underlying data. The calculation of the CCPI is partly based on different databases by the International Energy Agency (IEA) and from PRIMAP. In many cases the IEA and others have revised historic data retroactively in later editions, if it needed to complete former results, e.g. due to new measuring sources. Consequently, it might not be possible to reproduce the exact results of one year with updated data from the same year but taken from a later edition of the databases.

Survey Respondents

The second factor that leads to limited comparability is that our expert pool providing the data basis for the "Climate Policy" category is continuously being extended and altered. We strive to increase the number of experts so that new evaluations of the countries' policies depict a more differentiated result. At the same time, some experts are not available anymore, e.g. due to a change of job. When the people acting as the judges of a country's policy change, differences in judgements can occur.

Methodological Changes

Thirdly, in 2017, the underlying methodology of the CCPI has been revised and adapted to the new climate policy landscape of the Paris Agreement. Even though the new methodology is based on similar ranking categories and data sources, some indicators as well as its weighting scheme have been adapted. With its new composition, the CCPI was extended to measuring a country's progress towards the globally acknowledged goal of limiting temperature rise well below 2°C. Furthermore, the index now also evaluates the country's 2030 targets. And finally, the former scope of looking at energy-related CO_2 emissions has been extended to GHG emissions.

The CCPI G20 Edition of July 2017 and the CCPI 2018 were the first index publications based on the new methodology, therefore the country-scores of CCPI 2018, CCPI 2019, CCPI 2020, CCPI 2021 and CCPI 2022 are comparable. Chile (CCPI 2020), Philippines and Viet Nam (CCPI 2022) were added after the last methodological change.

The evaluation of the countries' mitigation targets is based on their Nationally Determined Contributions (NDCs), communicated to the UNFCCC.[7] Since clear guidelines and frameworks for the framing of NDCs are not existent, the countries' targets partly had to be inter-/extrapolated to 2030 in order to assure comparability (for details, please see chapters 2.1.4 for GHG reduction targets, 2.2.4 for RE targets and 2.3.4 for energy use targets). Evaluations of countries' performance in climate policy is based on an annually updated survey among national climate and energy experts from the country's civil societies (for details, please see chapter 2.4).

[7] UNFCCC (2021-c)

1.1 GHG Emissions (40% of Overall Score)

The greenhouse gas (GHG) emissions of each country are what ultimately influences the climate. Therefore, they may be perceived as the most significant measure in the success of climate policies. That is why the "GHG Emissions" category contributes 40% to the overall score of a country.

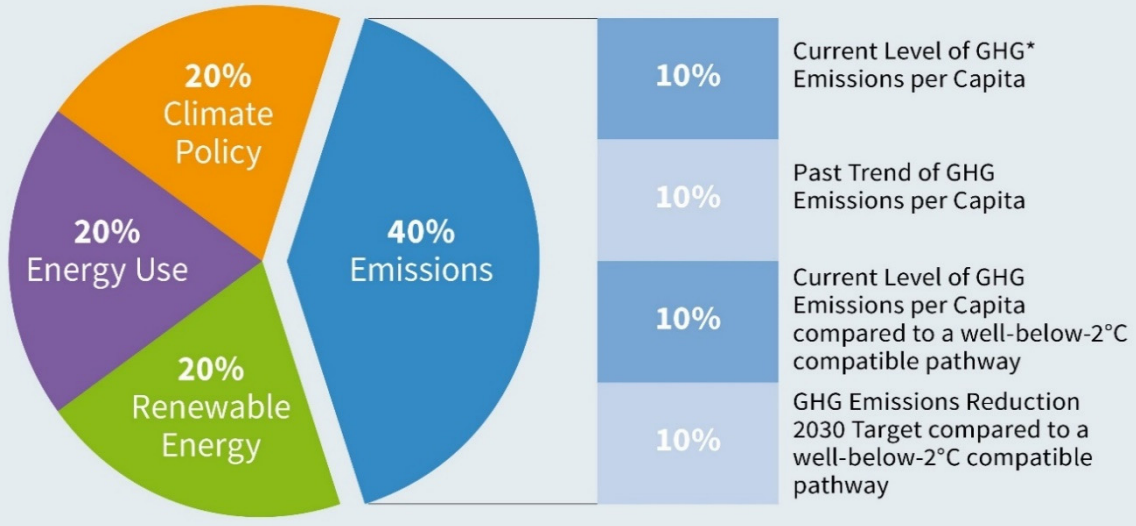
However, the diversity of countries evaluated in the CCPI is enormous. It is therefore indispensable that more than just one perspective be taken on the emissions level and how the GHG emissions of a given country have developed in the recent past.

The "GHG Emissions" category thus is composed of four indicators: "Current Level" and "Past Trend" of per capita GHG emissions are complemented by two indicators, comparing the countries' current level and 2030 emissions reduction targets to its country-specific well-below-2°C pathway. All of these indicators are weighted equally with 10% each.

Since the CCPI edition 2018, the index covers all major categories of GHG emissions. This includes energy-related CO_2 emissions, CO_2 emissions from land use, land use change and forestry (LULUCF), methane (CH_4), nitrous oxide (N_2O), and the so-called F-gases hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) for which we use data from PRIMAP provided by the Potsdam Institute for Climate Impact Research (PIK)[8]. As the PRIMAP data base does not cover LULUCF emissions, the LULUCF emissions are taken from FAO[9], the national inventory submissions 2021[10] and the biannual country reports[11] submitted to UNFCCC.

With using overall GHG-related instead of only energy-related CO_2 emissions as in previous editions of the CCPI, the index now reflects a more comprehensive picture of the actual mitigation performance of a country, taking into account that emissions from other sectors play a crucial role in some of the evaluated countries.

Figure 2: Weighting of Emissions Level Indicators



[8] PRIMAP (annually updated)
[9] FAO (annually updated)
[10] UNFCCC (2021-a)
[11] UNFCCC (2021-b)

Box 2: Emissions Accounting and Trade

The currently prevailing way of accounting for national emissions encompasses all emissions emerging from domestic production using a territorial system boundary while excluding international trade. In this sense, the nation producing the emissions is also the one held accountable, no matter if those emissions are closely connected to an outflow of the produced goods to other countries. Considering that national governments can only exert political influence on domestic production but have no power over production-related emissions abroad, this conception seems plausible at first sight.

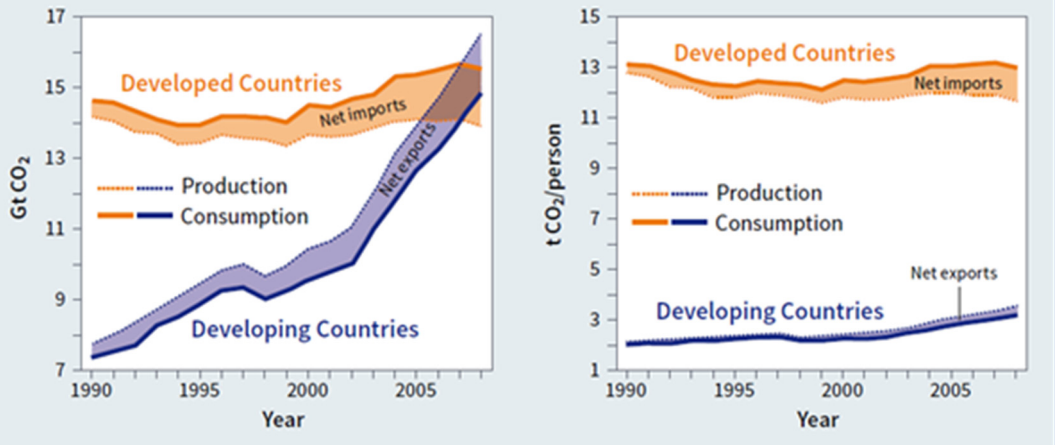
In the course of globalisation, international trade has caused an increasing spatial separation between the production and consumption of goods. Thus, on the one hand, China, Kazakhstan and South Africa, who belong to the group of high-producers and greenhouse gas exporters, currently report emission levels that are considered too high. On the other hand, Sweden, Switzerland and the UK are large importers of CO_2-intensive goods but the emissions imported are not charged to their account.

With increasing international trade influencing national economies as well as related emissions, an alternative emission accounting approach has emerged from scientific research. In contrast to the production-based approach, it is focused on emissions caused by national consumption. As a basis for calculating nation-level emissions this account uses the total of national consumption as the sum of all goods produced, less the ones exported, plus the ones imported by a country. Measuring emissions based on what is consumed would lead to an increase of the absolute amount of CO_2 for several of the industrialised countries, induced by their emission intensive trade record. In contrast, countries like China and other emerging economies have proactively attracted production industries and continue to do so. In general, those countries also profit from their exports of emission intensive goods and should therefore not be entirely relieved of their responsibility.

The evaluation of emission data from the production and consumption of goods and services as presented in the graph in figure 3 by Caldeira and Davis (2011: 8533) shows significant differences between consumption-based and production-based data, while their development is clearly related. Generally, the amount of emissions embodied in global trade is constantly growing, increasing the importance of understanding and acknowledging consumption-based emission data. At the same time, the graph implies a high level of aggregation, wiping away diversity within the aggregate groups of developed and developing countries. Acknowledging this diversity, however, would require far more detailed analyses.

This CCPI is calculated with production emissions only.

Figure 3: Historic CO_2 Emissions from Production and Consumption of Goods and Services[10]



1.1.1 Current Level of GHG Emissions per Capita

Even with an ambitious climate policy, the level of current per capita GHG emissions usually only changes in a longer-term perspective. Thus, it is less an indicator of recent performance of climate protection than an indicator of the respective starting point of the countries being investigated. From an equity perspective, it is not fair to use the same yardstick of climate protection performance on countries in transition and on developed countries. The level of current emissions (incl. LULUCF) therefore is a means of taking into account each country's development situation and thus addressing the equity issue.

For a maximum of 2.5 CO_2te/Capita, a country receives a "very high" ranking for this indicator. Emissions of up to 5.5 or 8 CO_2te/Capita receive either a "high" or "medium" rating, while more than 11 CO_2te/Capita represent a "very low" rating.

1.1.2 Past Trend of GHG Emissions per Capita

The indicator describing the recent development of GHG emissions accounts for 10% of a country's overall score in the CCPI. To reflect the development in this category, the CCPI evaluates the trend over a five-year period of greenhouse gases per capita. The indicator measuring recent development in emissions is comparatively responsive to effective climate policy, and is therefore an important indicator of a country's performance. Due to the volatile character of LULUCF emissions we exclude them in this indicator.

Only countries with a decrease of emissions by more than 7% over the past 5 years will receive a "high" rating, while only a decrease of at least 20% means a "very high rating". If emissions are even increasing, a country receives a "low" rating whereas countries are categorized/rated "very low", if emissions have increased by more than 5% over the past 5 years.

1.1.3 Current Level of GHG Emissions per Capita Compared to a Well-Below-2°C Compatible Pathway

The benchmark for a well-below-2°C compatible pathway in the index category "GHG Emissions" is based on a global scenario of GHG neutrality in the second half of the century, which is in close alignment with the long-term goals of the Paris Agreement. To stay within these limits, GHG emissions need to be drastically reduced, a peak needs to be reached by 2020 and CO_2 emissions need to decline to net zero by around 2050.[12]

The calculation of individual country target pathways is based on the common but differentiated convergence approach (CDC).[13] It is based on the principle of "common but differentiated responsibilities and respective capabilities" laid forth in the Framework Convention on Climate Change. "Common" because all countries need to reduce their per capita emissions to the same level (here net zero) within the same time-period. "Differentiated" because developed countries start on this path as of 1990, while developing countries do so once they reach the global average per capita emissions. Hence, some developing countries can temporarily increase their emissions without letting the overall limit of well below 2°C out of sight.

For this indicator we measure the distance of the country's current (2019) level of per capita emissions (incl. LULUCF) to this pathway. If a country undercuts its pathway, it will receive a "high" rating or even a "very

[12] IPCC (2018)

[13] Höhne, N. et al. (2006)

high" if the difference is above 3 CO_2te/Capita. "Medium" and "low" ratings are defined by a difference of up to 2 and 4 CO_2te/Capita to the pathway. Anything above is a "very low" performance.

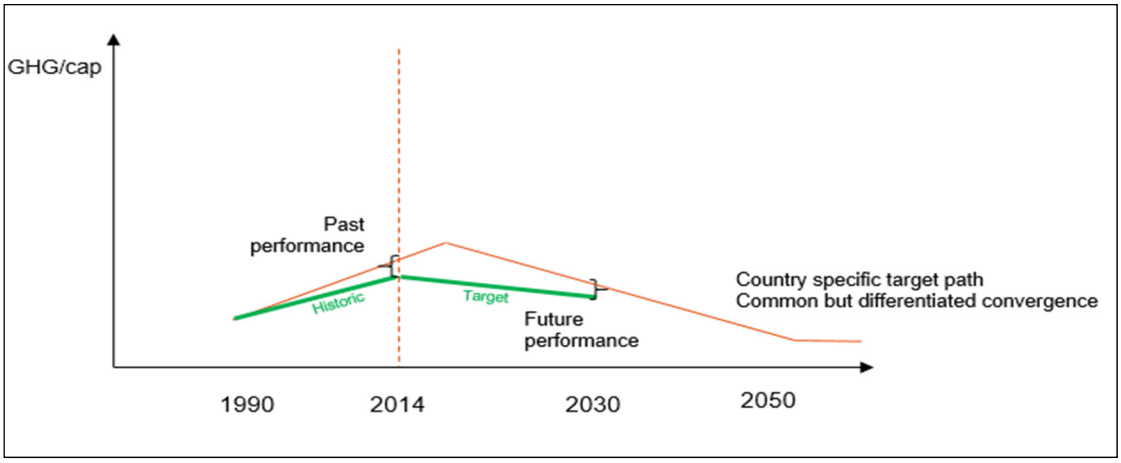


Figure 4: GHG emissions: Actual pathway (green) vs. well-below-2°C target pathway (orange). Example of an over-performing country.
Illustration: Germanwatch | NewClimate Institute

1.1.4 GHG Emissions Reduction 2030 Target Compared to a Well-Below-2°C Compatible Pathway

The CCPI also evaluates a country's 2030 mitigation target, i.e. its emissions reduction plans for 2030. We do so by measuring the distance between this target and the country's pathway determined using the common but differentiated convergence approach (see 2.1.3). This difference is measured in absolute terms (tCO_2e/capita).

In this year's edition, we include greenhouse gas emissions targets adopted up until October 2021. Announcements presented in COP26 were only included when national legislation supporting their adoption has been adopted before the cut-off date.

GHG targets are usually not presented in absolute terms when communicated by countries in their NDCs, or other formal commitments. Targets must often be interpreted to arrive at absolute GHG emission limits for 2030. We take other studies, which have done this interpretation, as a starting point for our quantification. We take absolute emissions from the sources (Climate Action Tracker (CAT)[14] or NDC & INDC Factsheets by PIK and the University of Melbourne[15]), divide this by the population in both target and base year to obtain the emissions per capita in both years – that allows for the calculation of growth factors. The CAT country assessments are updated up to twice a year, so it is the preferred source. If a country is not included in the CAT analysis the respective factsheet is used to quantify the emissions. We apply the resulting growth factors to the CCPI tool emission values in the base year, to arrive at a target value that is consistent with the emissions dataset used in the other CCPI indicators.

We apply the growth rates from the CAT and factsheets, which *exclude* LULUCF, to emissions from CCPI, which *include* LULUCF. We choose this approach due to the lack of consistent LULUCF projections across all the countries in the index. LULUCF emissions estimates vary strongly between different datasets and the methodologies used for those estimates. Our current approach has the underlying assumption that the growth

[14] Climate Action Tracker (2019)

[15] Meinshausen, M. and Alexander, R. (2017)

of the LULUCF sector is equivalent to the growth in the other sectors of the economy.

Both the CAT and the factsheets use UN population medium fertility variant projections, which we use to adjust the absolute emissions to per capita.

Some countries have updated their targets but are not analysed separately by the CAT: France, Portugal and Chinese Taipei. In these cases, we quantify the absolute emissions level in 2030 individually using the respective target definitions as described in the Annex. In countries where the LULUCF sector is responsible for a large share of emissions, we calculate targets including LULUCF. This is the case for Brazil and Indonesia.

A "high" or "very high" rating can be achieved with a target below the country's pathway. If the difference is even above -1 CO_2te/Capita, a country will receive the best rating "very high". In case of a difference of up to 1 CO_2te/Capita the country will receive the rating "high". Targets with a difference of up to 2 CO_2te/Capita to the pathway are assessed as a "medium" performance and a difference of up to 4 CO_2te/Capita as "low". If there is no target or it is even above 4 the country receives a rating of "very low"

1.2 Renewable Energy (20% of Overall Score)

Since 2016 was the first year with a constant CO_2 concentration in the atmosphere above 400 parts per million, swift action is required.[16] Most of the researchers anticipate that a permanent transgression of this threshold will lead to a temperature rise above 2°C.[17] Therefore, a constant expansion of renewable energies and a decline in fossil fuel combustion are essential.

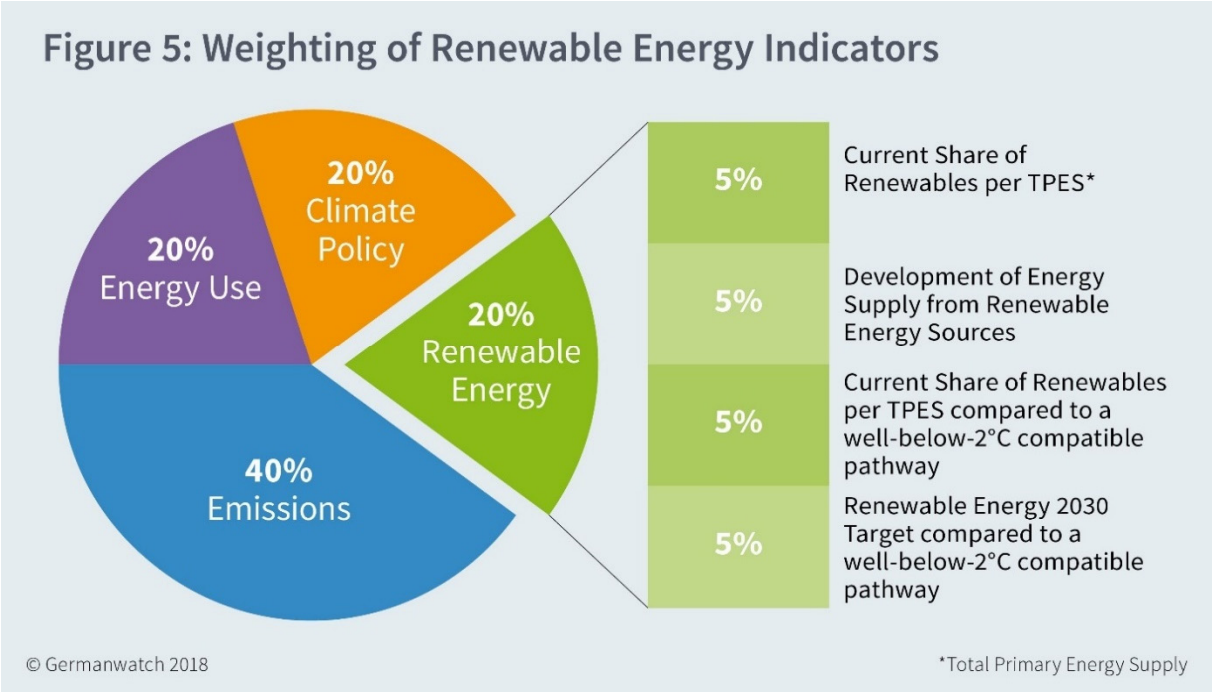
Substituting fossil fuels with renewable energies is one of the most prominent strategies towards a transformed economic system that is compatible with limiting global warming well below 2°C. It is equally important to increase energy efficiency, leading to a reduction in global energy use. For example, in the year 2015, renewable energies in Germany accounted for approximately 14.9% of total final energy consumption. Calculations show that deployment of renewable energies resulted in a net avoidance of 156 mt CO_2 in 2015.[18] This shows that a targeted increase in the share of renewable energies can make a vital contribution to climate change protection efforts. The "Renewable Energy" category assesses whether a country is making use of this potential for emissions reduction. This category, therefore, contributes with 20% to the overall rating of a country, within which each of the four indicators accounts for 5%.

In the absence of data assessing traditional biomass only, all renewable energy data are calculated without residential biomass for heat production, in order to prevent disadvantages for countries increasing their efforts to replace the unsustainable use of traditional biomass in their energy mix.

The recent developments and the 2°C compatibility of the current level exclude hydropower, while values for the current level and the 2°C compatibility of the 2030 target include hydropower (see Box 3).

Furthermore, all values for total primary energy supply (TPES) integrated in the CCPI exclude non-energy use, such as oil usage for other reasons than combustion, in order not to distort the picture and avoid disadvantages for countries with e.g. a larger chemical industry which is usually predominantly export-oriented, leading to the allocation problems mentioned in Box 2.

[16] Betts, R.A. et al. (2016)
[17] OECD (2012)
[18] BMWi (2015)



1.2.1 Current Share of Renewable Energy Sources per Total Primary Energy Supply (TPES)

To recognise countries such as Brazil that have already managed to gain a major share of their total energy supply from renewable sources and therefore have less potential to further extend their share of renewable energies, 5% of the overall ranking is attributed to the share of renewable energies in the total primary energy supply (incl. hydropower).[19]

For a minimum of 35%, a country receives a “very high” ranking for this indicator. A share of at least 20% or 10% receives either a “high” or “medium” rating, while less than 5% represent a “very low” rating.

1.2.2 Past Trend of Energy Supply from Renewable Energy Sources per TPES

The second indicator of a country's performance in the “Renewable Energy” category shows the recent development of energy supply from renewable sources over a five-year period. Like the other indicators in this category, this dynamic indicator accounts for 5% of the overall CCPI score. To acknowledge the risks surrounding an expansion of hydropower (see box 3) and to adequately reward countries that concentrate on more sustainable solutions, it excludes this technology from the underlying data and therefore focuses on "new" renewable energy sources, such as solar, wind and geothermal energy.

Only countries with an increase of the share of renewables by more than 30% over the past 5 years will receive a “high” rating, while only an increase of at least 75% means a “very high rating”. If the share of renewables is even decreasing, a country receives a ”very low” rating. “Medium” and ”low” ratings mean an increase in the share of renewables of at least 15% or 5%.

[19] See Box 3: Hydropower and Human Rights Violation, p.14

Box 3: Hydropower and Human Rights Violation

One of the largest contributors to renewable energy supply is the generation of hydropower. However, many large hydropower projects are considered to be not sustainable. Large hydropower projects often have profound negative impacts on local communities, wildlife and vegetation in the river basins and sometimes even produce additional greenhouse gas emissions where water catchments are particularly shallow.

This causes a double challenge to the CCPI. Firstly, countries that already meet a large share of their energy demand with supply from renewable energies – often old and potentially non-sustainable hydropower – can hardly raise their production in relative terms as easily as a country that starts with near-zero renewable energy supply. On the contrary, if a country already covers nearly 100% of its demand via renewable energy supply and at the same time increases efficiency, the total renewable energy supply might even fall. In such an extreme case a country would receive a very low CCPI score in the "Renewable Energy" category while demonstrating exemplary climate change performance.

Secondly, if the CCPI fully included large hydropower, it would reward to some degree the development of unsustainable dam projects when an increase in renewable energy supply is solely driven by such projects. Such an approach is not regarded as adequate climate protection by the authors of the CCPI.

Unfortunately, data availability on the structure or even sustainability of hydropower generation and a distinction between large non-sustainable projects and sustainable small-scale hydropower generation is insufficient. In its attempt to balance the extent of rewarding countries for expanding large-scale hydropower, the CCPI excludes all hydropower from one of four indicators in the "Renewable Energy" category. As a result, the recent developments in renewable energy exclude hydropower, while the other three indicators include hydropower.

If data availability on large-scale and non-sustainable hydropower changes in the future, we will include these data and therefore exclude non-sustainable hydropower only from all four indicators.

Non-sustainable approaches and human rights violations related to the expansion of renewable energy are also increasingly affecting other renewable energy technologies. The drain of land resources for energy generation from biomass and the resulting conflict with land resources for food production is only one example of the complexity surrounding the necessary expansion of renewable energies. Also, both fields of conflict are increasingly being seen in reaction to the expansion of onshore wind power generation. The authors of the CCPI are well aware of the increasing importance of these developments and will continuously examine possibilities to acknowledge them in future editions of the ranking.

1.2.3 Current Share of Renewables per TPES Compared to a Well-Below-2°C Compatible Pathway

The benchmark for a well-below-2°C compatible pathway within the index category "Renewable Energy" is a share of 100% renewable energy by 2050 (incl. hydropower). The Paris Agreement requires net zero greenhouse gas emissions in the second half of the century, while energy-related emissions need to reach zero already by the middle of the century. Renewable energy will play a significant role in the transition. Accordingly, the CCPI continues to emphasise the necessity of making progress in renewable energy, even if other low or zero carbon options which result in other severe challenges could be available (nuclear or carbon capture and storage). Although the target is very ambitious, studies emphasise the possibility of reaching almost 100% renewable energy even with current technologies by mid-century.[20] Many non-governmental organisations therefore support a 100% renewable target to set the right incentives for countries in transforming their energy systems, also taking into account the necessity to establish and follow a consistent approach to sustainable development and inter-generational justice.

If a country overshoots its pathway, it will receive a “very high” rating, while “high” is an undercutting of up to 10%. “Medium” and “low” ratings are defined by a difference of up to 15% and 17.5% to the pathway. Anything above is a “very low” performance.

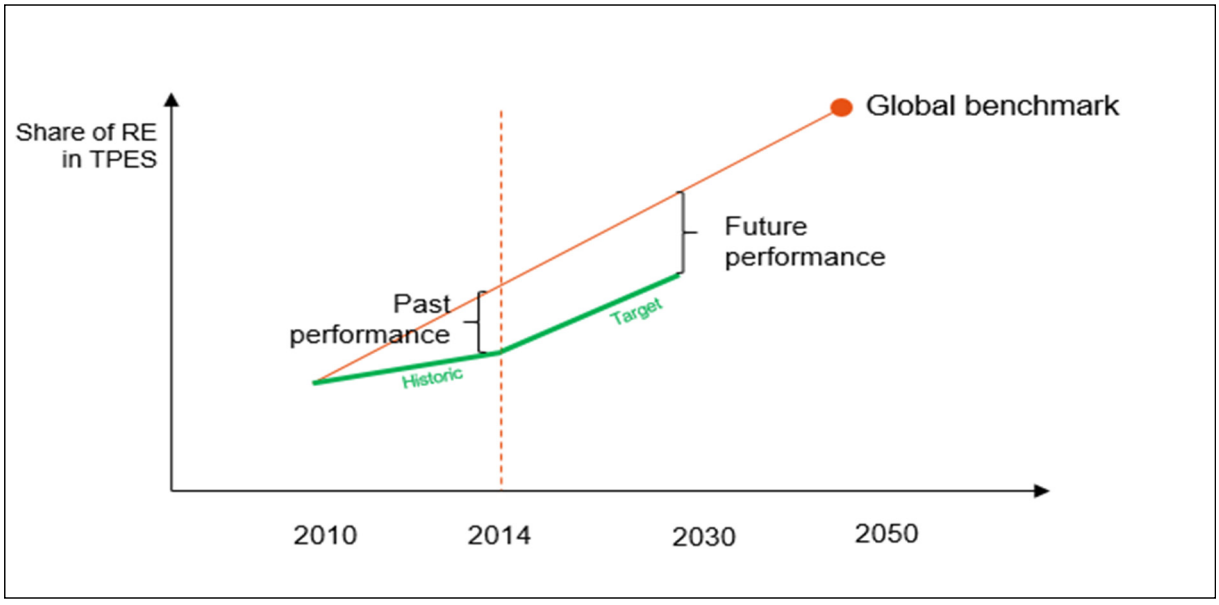


Figure 6: Renewable energy pathway
Illustration: Germanwatch | NewClimate Institute

[20] WWF et al. (2011)

1.2.4 Renewable Energy 2030 Target Compared to a Well-Below-2°C Compatible Pathway

The CCPI also evaluates the distance between a country's renewable energy targets for 2030 and the country's desired pathway from 2010 to 100% renewable energy in 2050, including hydropower (using a linear pathway for methodological reasons).

Comparing renewable energy targets is a substantial challenge because countries put forward their renewable energy targets in many ways, as there is an absence of uniform rules for such target setting. Some countries only have targets for subnational states, others have national targets. Some define their targets in terms of installed capacity rather than the share of renewables in the TPES.

In order to convert these different types of targets into a future share of renewable energy in the TPES, we proceeded as follows:

- Targets provided as renewable energy targets as share of the TPES are taken directly.
- Generation targets are converted to share of renewable energy in the TPES according to the method described in the appendix. In case only installed capacity targets are available, country-specific capacity factors are used to convert capacity targets into generation targets, before the conversion to TPES.
- Whenever a target is formulated for a year other than 2030, a 2030 value is calculated by linear interpolation of the target share.
- All numbers for the current share of renewables in a country's energy supply are taken from the IEA energy balances.

The table in the annex explains the approach chosen for each individual country including the main assumptions (see also the legend below the annex table for an explanation of assumptions a to e).

A “very high“ rating can be achieved with a target above the country’s pathway. If the difference is only up to 10%, a country will receive the second best rating. Targets with a difference of up to 30% to the pathway are assessed as a “medium” performance and a difference of up to 40% or even above as “low” and “very low”.

1.3 Energy Use (20% of Overall Score)

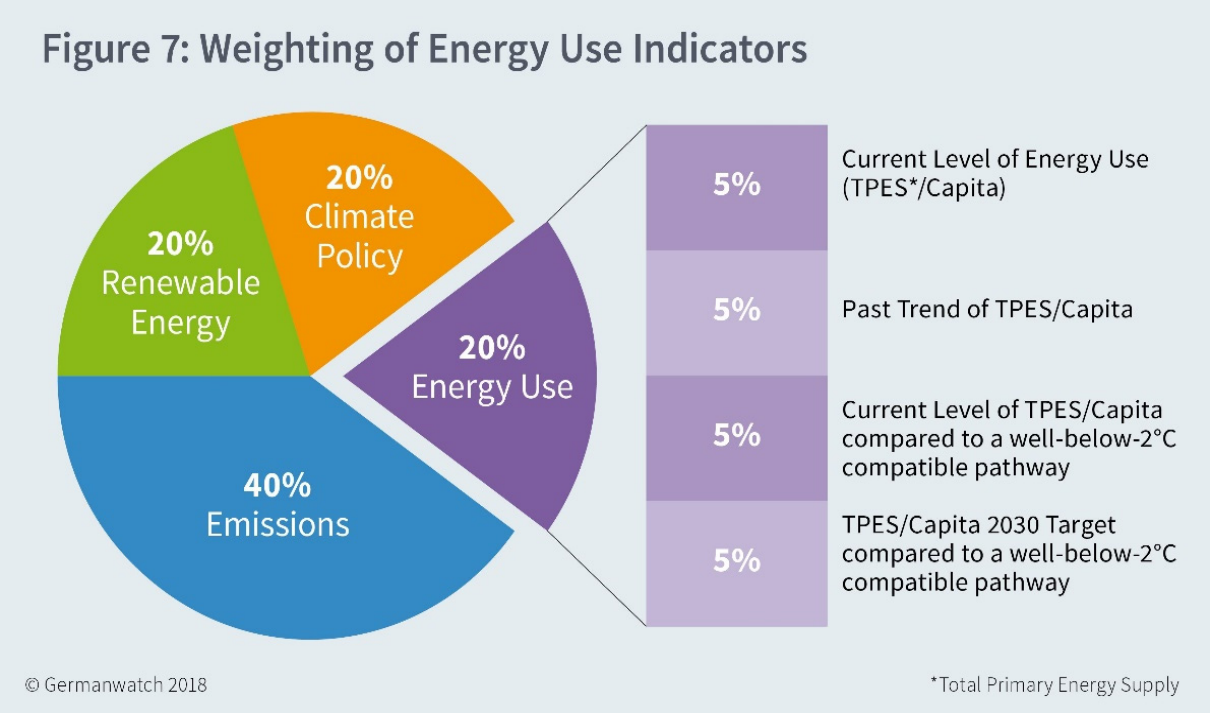
Besides an expansion of renewable energies, a vast increase in energy efficiency is crucial to achieving global decarbonisation and overall greenhouse gas neutrality by mid-century. The more efficient energy can be used, the faster and easier countries can reach net-zero emissions. Therefore, one major step in combatting the global climate crisis is to reduce the energy needed to provide for products and services.

Increases in energy efficiency in its strict sense are complex to measure and would require a sector-by-sector approach, for which there are no comparable data sources available across all countries at the present time. The CCPI therefore assesses the per capita energy use of a country and measures progress in this category.[21] As in the categories "GHG Emissions" and "Renewable Energy", the CCPI aims to provide a comprehensive picture and balanced evaluation of

[21] Rebound effects can diminish positive effects of increased efficiency or even reverse them. Still, we cannot forgo these efficiency improvements, but rather must complement them with adequate measures that limit rebound effects.

each country, acknowledging the different development stages of countries and thus basing their performance evaluation in per capita energy use on four different dimensions: current level, recent development and the 2°C compatibility of both the current level and the 2030 target.

As in the "Renewable Energy" category, TPES data excludes values for non-energy use and traditional biomass (see chapter 2.2).



1.3.1 Current Level of Energy Use Measured as TPES per Capita

To recognise some countries increasing their per capita energy use but doing so from a still very low level, this indicator gives the current TPES/capita values, which account for 5% in the overall index ranking.

For a maximum of 60 UnitTPES/Capita, a country receives a "very high" ranking for this indicator. Energy Use of up to 90 or 120 UnitTPES/Capita receives either a "high" or "medium" rating, while more than 160 UnitTPES/Capita represent a "very low" rating.

1.3.2 Past Trend of Energy Use measured as TPES per Capita

In accordance with the categories "Renewable Energy" and "GHG Emissions", the indicator measuring recent developments in per capita energy use describes the trend in the period of the last five years for which there is data available that allows for comparison across all evaluated countries. This indicator also accounts for 5% of the overall CCPI ranking.

Countries with a decrease of energy use by more than 5% over the past 5 years will receive a "high" rating, while only a decrease of at least 15% means a "very high rating". If energy use is even increasing, a country receives a "low" or "very low" rating, if energy use has increased by more than 10% over the past 5 years.

1.3.3 Current Level of TPES per Capita Compared to a Well-Below-2°C Compatible Pathway

For 2°C and 1.5°C scenarios, a decrease in emissions by reducing the (growth in) energy use is as crucial as deploying renewable (or other low-carbon) technologies. The IPCC carried out a scenario comparison using a large number of integrated assessment models.[22]

From the scenarios available, we observe that the total amount of global energy use in 2050 has to be roughly the same level or a bit higher than it is today, with a margin of uncertainty. At the same time population will grow slightly between today and 2050. We therefore pragmatically chose the well-below-2° compatible benchmark to be "same energy use per capita in 2050 as the current global average", which is 80 gigajoules per capita in total primary energy supply (TPES).

Current energy use per capita is very diverse. At the present time, the value for India is only a third of the global average, while for the United States it is more than three times higher than the global average. Consequently, the chosen benchmark would allow India to triple its energy use per capita by 2050, while absolute energy demand can grow even further due to population growth. The United States would need to cut per capita energy use to one third by 2050.

We calculate a linear pathway from 1990 to the described benchmark in 2050 and measure the distance of the country's current level to this pathway.

If a country undercuts its pathway, it will receive a "high" rating or even a "very high" if the difference is above 30%. "Medium" and "low" ratings are defined by a difference of up to 10% and 30% to the pathway. Anything above is a "very low" performance.

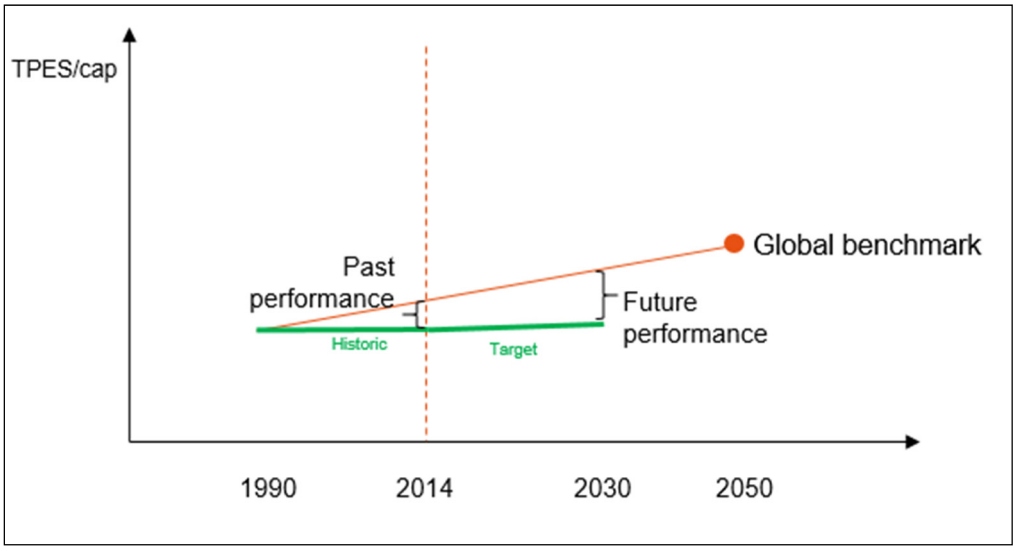


Figure 8: Energy use pathway

Illustration: Germanwatch | NewClimate Institute

[22] Clarke, L.et al. (2014)

1.3.4 Energy Use TPES per Capita 2030 Target Compared to a Well-Below-2°C Compatible Pathway

The CCPI also evaluates the distance between the country's energy targets for 2030 along the country's pathway to the 2050 benchmark. This distance is measured in absolute terms rather than in relative terms.

Energy efficiency and energy use targets are not formulated in standardised units. Some countries present targets as efficiency gains compared to a baseline scenario, whereas others announce reduction targets for the economy energy intensity.

We combined various data sources to transform all targets expressed in different units into a targeted future per capita energy use. For this purpose, we relied on population projections by the United Nations.[23]

Since 2020, when no explicit economy-wide target was available, we assume the trend in per capita energy use of the previous five years is maintained until 2030.

Whenever a target is indicated for a year other than 2030, we interpolated or extrapolated the result linearly to obtain a value for 2030. The table in the annex specifies the approach we chose for each individual country. All historical data on TPES are taken from the IEA energy balances.[24]

A “very high“ or “high” rating can be achieved with a target undercutting the country’s pathway. If the difference is only up to 30% to its pathway, a country will receive the second best rating. Targets with a difference of up to 10% difference to the pathway are assessed as a “medium” performance and a difference of up to 40% difference or even above as “low” and “very low”.

1.4 Climate Policy (20% of Overall Score)

The “Climate Policy” category in the CCPI considers the fact that measures taken by governments to reduce greenhouse gases often take several years to show their effect on the categories “GHG Emissions”, “Energy Use” and “Renewable Energy”. On top of this, the most current greenhouse gas emissions data enumerated in sectors of origin, provided by PRIMAP and the IEA, is about two years old. However, the assessment of climate policy includes much more recent developments. The effect that current governments benefit or suffer from the consequences of the preceding administration’s climate actions is thereby reduced.

The data for the category “Climate Policy” is assessed annually in a comprehensive research study. Its basis is the performance rating by climate and energy policy experts from non-governmental organisations, universities and think tanks within the countries that are evaluated. In a questionnaire, they give a rating on a scale from one (“weak”) to five (“strong”) on the most important measures of their government. In order to obtain more differentiated results, there is also the possibility to further evaluate and comment on single aspects. Both the national and international efforts and impulses of climate policies are scored (s. 2.4.1 and 2.4.2).

To compensate the absence of independent experts in some countries (due to the lack of functioning civil society or research structures), the national policy of such countries is flatly rated as scoring average points. The goal is to close these gaps in the future and steadily expand the network of experts. For the CCPI 2022, about 500 national climate experts contributed to the evaluation of the 60 countries plus the EU. They each evalu-

[23] UN (2017)

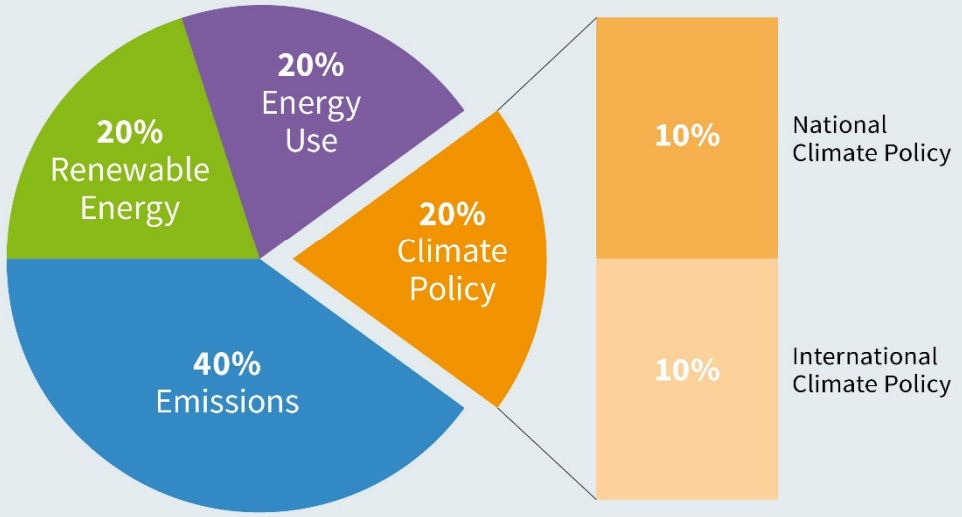
[24] IEA (annually updated-b)

ated their own country's national and international policy. The latter is also rated by climate policy experts who closely observe the participation of the respective countries at climate conferences.

Climate policy has an overall weight of 20%, with national and international policy making up 10% each. Despite the apparently low influence of climate policy, this category has quite a considerable influence on short-term changes in the overall ranking. Unlike the rather "sluggish" categories of "Emissions", "Renewable Energy" and "Energy Use", a positive change in climate policy can lead a country to jump multiple positions. On the other hand, the "sluggish" categories can only be changed through successful climate change mitigation – policy therefore plays a decisive role for future scores within the CCPI.

The ratings for the Climate Policy category are quite simple: Grades above 4.5 or 3.5 in our survey receive a "very high" or "high" rating. Anything above 2.5 would still receive "medium", while anything below 1.5 is a "very low" performance.

Figure 9: Weighting of Climate Policy Indicators



1.4.1 National Climate Policy

For the indicator "National Climate Policy", the annual climate policy performance questionnaire covers concrete policies on the promotion of renewable energies, the increase in energy efficiency and other measures to reduce greenhouse gas emissions in the electricity and heat production sector, the manufacturing and construction industries, and transport and residential sectors. Beyond that, current climate policy is evaluated with regard to a reduction in deforestation and forest degradation brought about by supporting and protecting forest ecosystem biodiversity, and national peat land protection. Within each of these policy areas, experts evaluate both strength and the level of implementation of the respective policy framework.

In line with the Paris Agreement, experts also evaluate the ambition level and well-below-2°C compatibility of their country's Nationally Determined Contributions (NDCs) as well as their progress towards reaching these goals.

1.4.2 International Climate Policy

The CCPI also evaluates countries' performance at UNFCCC conferences and other international conferences and multilateral agreements. The questionnaire asks experts to assess the recent performance of their country in international fora.

2 Calculation and Results

The current evaluation method sets zero as the bottom cut off, and 100 points are the maximum that can be achieved. A country that performed best in one indicator receives full points (in that indicator). Important for interpretation is the following: 100 points are possible in principle, but for each partial indicator, and for the overall score, this still only means the best relative performance, which is not necessarily the optimal climate protection effort.

The CCPI's final ranking is calculated from the weighted average of the achieved scores in the separate indicators with the following formula:

$$I = \sum_{i=1}^{n} w_i X_i$$

I: Climate Change Performance Index,
X_i: normalised Indicator,
w_i: weighting of X_i,
$\sum_{i=1}^{n} w_i = 1 \; and \; 0 \leq w_i \leq 1$

i: 1,...., n: number of partial indicators (currently 14)

$$\text{Score} = 100 \left(\frac{actual\ value - minimum\ value}{maximum\ value - minimum\ value} \right)$$

The differences between countries' efforts to protect the climate are only to be seen clearly in the achieved score, not in the ranking itself. When taking a closer look at the top position of the CCPI 2022, one can see that Denmark as the highest-ranking country was not at the top in all indicators, let alone has it achieved 100 points. This example shows that failures and weak points of a country can only be recognised within the separate categories and indicators.

The current version of the Climate Change Performance Index including model calculations and the press review can be downloaded from:

www.ccpi.org

Development and Prospects

The CCPI was first introduced to a professional audience at the COP11 – Montreal Climate Conference in 2005.

Since the beginning CAN International supports the index through its international network of experts working on the issue of climate protection.

Following a methodological evaluation of the seventh edition of the CCPI, we began to include the carbon emissions data from deforestation. However, due to the lack of comparable data for various other sectors, like agriculture, peatland or forest degradation, the corresponding emissions could not be taken into account until 2017.

Due to the methodological revision in 2017, we are able to assess all GHG emissions arising across all sectors. The index also includes assessments of the countries' current performance and own targets set for the future in relation to their country-specific well-below-2°C pathway.

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4 Annex

Legend for general assumptions used for many countries:

a) The share of electric energy remains constant in the total final consumption.
b) The average efficiencies of transforming primary energy into secondary energy (before losses and energy industry own use) remain constant for energy from renewable and from fossil sources with respect to today.
c) The "energy industry own use" is distributed between the electric and non-electric energy sector according to the share they hold in the TPES – in both sectors renewable energy generation is assumed not to consume any energy for energy generation.
d) Within the non-electric sector, the share of renewable energy remains constant in TPES and TFC respectively.
e) The share of renewable energy in the final consumption of electricity is the same as the share of renewable energy in electricity generation, i.e. losses affect equally electricity from renewable and fossil sources.

GHG Table

Countries	Comment
Algeria	Algeria did not submit a new NDC. Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Argentina	Argentina's updated NDC lowers its target for emissions in 2030 from 422 to 313 $MtCO_2e$ (excl. LULUCF). Quantification of emissions in 2030 based on Climate Action Tracker 2021.
Australia	Australia's updated NDC does not lead to emissions below the previous one. Quantification of emissions in 2030 based on Climate Action Tracker 2021. Australia's net zero proposal does not affect the 2030 target.
Austria	Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Belarus	Belarus did not submit a new NDC. Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Belgium	Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Brazil	Brazil's updated NDC does not lead to emissions below the previous. Quantification of emissions in 2030 based on NDC, the analysis by the Climate Action Tracker and https://newclimate.org/wp-content/uploads/2019/12/GHG-Mitigation-Scenarios-Dec2019.pdf. In the case of Brazil, we consider both target and historical emissions including LULUCF due to the high contribution of the sector to total emissions. The Brazilian target to reduce emissions by 50% by 2030 was announced after the cut-off date of this analysis and has not been considered. We note that until the baseline for the target is clarified the effect of this target on emissions remain unclear.
Bulgaria	Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Canada	Canada's updated NDC lowers its target for emissions in 2030 from 526 $MtCO_2e$ to 428-465 $MtCO_2e$ (excl. LULUCF). Quantification of emissions in 2030 based on Climate Action Tracker 2021.
Chile	Chile's new NDC lowers its target for emissions in 2030 from 131 $MtCO_2e$ to 95 $MtCO_2e$ (excl. LULUCF). Quantification of emissions in 2030 based on Climate Action Tracker 2021.
China	China's updated NDC, submitted in the lead up to COP26, lowers its target for emissions in 2030 from 13,744-15,194 $MtCO_2e$ to 12,921-14,410 $MtCO_2e$ (excl. LULUCF). Quantification of emissions in 2030 based on Climate Action Tracker 2021 analysis.
Chinese Taipei	Chinese Taipei has a national target of 50% reduction below a BAU of 428 $MtCO_2e$ (excl. LULUCF) in 2030.
Colombia	Colombia's updated NDC lowers its target for emissions in 2030 from 200 $MtCO_2e$ to 156-188 $MtCO_2e$ (excl. LULUCF). Quantification of emissions in 2030 based on Climate Action Tracker 2021.
Croatia	Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Cyprus	Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Czech Republic	Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).

Denmark	Denmark's 2020 Climate Act set a target to reduce emissions by 70% by 2030, compared to 1990 (incl. LULUCF). Quantification of emissions based on total emissions level (incl. LULUCF) presented in Denmark's latest greenhouse gas emissions inventory.
Egypt	Egypt did not submit a new NDC. Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Estonia	Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
European Union (27)	The EU's updated NDC sets a stronger 2030 domestic emissions target of "at least 55%" net reduction below 1990 levels. This target is reflected in the first European Climate Law, for which the Commission reached a preliminary agreement in April 2021. Quantification of emissions in 2030 based on Climate Action Tracker 2021.
Finland	Finland's Climate Act set a long-term target for reducing emissions by 80-95% by 2050, compared to 1990 (incl. LULUCF). Finland's national target for 2030 is the same as its binding EU target under the EU's Emission Sharing Regulation (ESR). Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
France	France's Law No. 2015-992 on Energy Transition and Green Growth sets a target to reduce emissions by 40% by 2030, compared to 1990 (incl. LULUCF). In the NECP France presents target-related 2030 projections. The LULUCF emissions projections presented in the NECP are used to exclude LULUCF emissions from the national target.
Germany	Germany's 2021 Climate Law increases the national emissions reduction target from 55%, to 65% below 1990 levels by 2030. The quantification is based on the 2030 total emissions level (excl. LULUCF) as presented in the 2021 Climate Law.
Greece	Greece's NECP sets a target to reduce emissions by 42% by 2030, compared to 1990, which in absolute terms is 60.6 $MtCO_2e$ (incl. LULUCF). This target is significantly more ambitious than Greece's binding target under the EU ESR. Quantification of emissions based on total emissions level (incl. LULUCF) presented in Greece's latest greenhouse gas emissions inventory.
Hungary	Hungary's Law on Climate Protection (June 2020) sets a target to reduce emissions by 40% by 2030, compared to 1990. The absolute values for emissions in the base and target years are provided in Hungary's NECP.
India	India did not submit a new NDC before the cut-off date of this analysis. The announcement of more ambitious 2030 and net zero targets is therefore not included in the quantification, which is based on Climate Action Tracker's September 2021 analysis.
Indonesia	Indonesia's updated NDC does not lead to emissions below the previous one. Quantification based on Climate College Factsheet (AR4). In the case of Indonesia, we consider emissions incl. LULUCF.
Ireland	Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Islamic Republic of Iran	Iran did not submit a new NDC. Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Italy	Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Japan	The updated NDC, announced at the Leaders' Summit on Climate and submitted in the lead up to COP26, increased Japan's target to 46% below 2013 levels, equivalent to around 813 $MtCO_2e$ (excl. LULUCF). Quantification of emissions in 2030 based on Climate Action Tracker 2021.
Kazakhstan	Kazakhstan did not submit a new NDC. Quantification of emissions in 2030 based on Climate Action Tracker 2021.
Korea	Korea's Climate Crisis Response Act, passed in August 2021, sets a target to reduce emissions by 35% by 2030, compared to 2018. The CAT estimates that the domestic component of this target is 524 $MtCO_2e$ (excl. LULUCF), which is more ambitious than Korea's 2020 NDC update of 578 $MtCO_2e$ (excl. LULUCF). Quantification of emissions in 2030 based on Climate Action Tracker 2021.
Latvia	Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Lithuania	Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Luxembourg	Luxembourg's national target, presented in its 2020 NECP, set a target to reduce emissions by 55% by 2030, compared to 2005. This is more ambitious than the target mandated by the EU Effort Sharing Regulation.
Malaysia	Malaysia did not submit a new NDC. Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Malta	Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Mexico	Mexico's updated NDC does not lead to emissions below the previous one. Quantification of emissions in 2030 based on Climate Action Tracker 2021.
Morocco	Morocco's new NDC lowers the target for emissions in 2030 from 145 $MtCO_2e$ to 115 $MtCO_2e$ (excl. LULUCF). Quantification of emissions in 2030 based on Climate Action Tracker 2021.
Netherlands	The Dutch Climate Act sets a target to reduce emissions by 49% by 2030, compared to 1990 (incl. LULUCF). The forecast LULUCF emissions in 2030 is shown in Table 4.3 of the NECP (5.6 $MtCO_2e$). Excluding LULUCF emissions, we estimate the target as 111 $MtCO_2e$ in 2030.
New Zealand	New Zealand's updated NDC does not lead to emissions below the previous one. Quantification of emissions in 2030 based on Climate Action Tracker 2021.

Norway	Norway's new NDC lowers its target for absolute emissions in 2030 from 32.3 to 24.6-27.2 $MtCO_2e$ (excl. LULUCF). Quantification of emissions in 2030 based on Climate Action Tracker 2021.
Philippines	The Philippines submitted its first NDC in April 2021, setting unconditional (2.71%) and conditional (72.29%) emissions reductions targets, with respect to BAU emissions of 3340.3 $MtCO_2e$ in 2030 (incl. LULUCF). Quantification of emissions in 2030 based on Climate Action Tracker 2021 and Climate & Energy College factsheets (AR4).
Poland	Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Portugal	Portugal's Long-Term Strategy for Carbon Neutrality sets a target to reduce emissions by 45-55% by 2030, compared to 2005 (incl. LULUCF).
Romania	Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Russian Federation	Russia's updated NDC removes the upper limit for absolute emissions in 2030, while the lower target remains unchanged. Quantification same as previous CCPI. Quantification of emissions in 2030 based on Climate Action Tracker 2021.
Saudi Arabia	Saudi Arabia did not submit a new NDC. Quantification of emissions in 2030 based on Climate Action Tracker 2021.
Slovak Republic	Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Slovenia	Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
South Africa	South Africa's updated NDC strengthens the country's target range for 2030. Quantification of emissions in 2030 based on Climate Action Tracker 2021.
Spain	Spain's Law on Climate Change and Energy Transition sets a target to reduce emissions by 23% by 2030, compared to 1990 (excl. LULUCF).
Sweden	Quantification of emissions based on total emissions level (excl. LULUCF) in 2030 from Climate & Energy College factsheets (AR4).
Switzerland	Switzerland updated its NDC in 2020. The new NDC raised the country's domestic emissions reduction target from 30% to 37.5% by 2030, compared to 1990. Quantification of emissions in 2030 based on Climate Action Tracker 2021.
Thailand	Thailand's updated NDC does not lead to emissions below the previous one. Quantification of emissions in 2030 based on Climate Action Tracker 2021.
Turkey	As of September 2021, Turkey has yet to ratify the Paris Agreement. There has been no update to the INDC submitted in 2015. Quantification of emissions in 2030 based on Climate Action Tracker 2021.
Ukraine	Ukraine's updated NDC lowers its target for emissions in 2030 from 544 to 322-385 $MtCO_2e$ (excl. LULUCF). Quantification of emissions in 2030 based on Climate Action Tracker 2021.
United Kingdom	The UK's updated NDC lowers its target for emissions in 2030 from 356 to 251 $MtCO_2e$ (excl. LULUCF). Quantification of emissions in 2030 based on Climate Action Tracker 2021.
United States	The US' updated NDC lowers its target for emissions in 2030 from 5310-5787 $MtCO_2e$ to 3715-4219 $MtCO_2e$ in 2030 (excl. LULUCF). Quantification of emissions in 2030 based on Climate Action Tracker 2021.
Viet Nam	Viet Nam's updated NDC lowers its target for emissions in 2030 from 919 to 903 $MtCO_2e$ (excl. LULUCF). The new NDC is economy-wide (industrial processes are now included). Quantification of emissions in 2030 based on Climate Action Tracker 2021.

RE Table

Countries	Description for report
Algeria	Target of 27% share of renewable electricity by 2030 was translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh).
Argentina	Target of 20% share of renewable electricity by 2025 was combined with current share of large hydro power, which is assumed to follow the scenarios from the Energy Secretariat, and translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh). Share is assumed to remain constant from 2025 and 2030.
Australia	Australia has no national target for renewables. We recognize national projections lead to 55% renewable electricity in 2030. However, these figures are driven by sub-national targets and the CCPI assesses national climate policy.
Austria	The EU increased its target to 40% in gross final energy demand. Member states must now adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
Belarus	No quantifiable national target.
Belgium	The EU increased its target to 40% in gross final energy demand. Member states must now adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
Brazil	The 2016 iNDC presents a target of 45% renewables share in TPES by 2030, and the new Ten-Year Energy Expansion Plan (PDE 2029) projects 48% by 2029. The updated 2020 NDC does not include a target for renewables. We consider the target presented in the iNDC.
Bulgaria	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
Canada	No quantifiable national target.
Chile	Target of at least 60% share of renewable electricity by 2030 was translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh).
China	China has a target of 20% non-fossil share in total primary energy supply by 2030. We quantify renewable share using the average value of current policy projections presented in the Climate Action Tracker as a proxy to exclude non-renewable sources.
Chinese Taipei	Target of 20% share of renewable electricity by 2025 was translated to renewables share in TPES in 2030 assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh).
Colombia	Colombia's National Energy Plan (NEP) 2020-2050 sets a target for non-conventional renewable energy to account for 10-20% of primary energy supply by 2050. In the NEPs Actualisation Scenario (most conservative scenario), renewables (incl. hydro) account for 25% of primary energy supply in 2030, we consider this as Columbia's target for renewables in 2030.
Croatia	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
Cyprus	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.

Czech Republic	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
Denmark	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
Egypt	Target of 37-42% share of renewable electricity by 2030 was translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh).
Estonia	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
European Union (27)	The EU's target is 40% in gross final energy demand, which is 20 percentage points above the 2019 level. We applied this percentage-point to the EU27 bloc.
Finland	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
France	Target of 40% share of renewable electricity by 2030, incl. hydro, was translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh).
Germany	Target of 65% share of renewable electricity by 2030, incl. hydro, was translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh).
Greece	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
Hungary	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
India	India's targets for installed renewables capacity need to be converted into TPES. The expected power generation under the current policy scenario of the WEO 2020 (compatible with current RE targets) was translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh). Share is assumed to remain constant from 2026 and 2030. India's COP26 announcements were not included in the quantification.
Indonesia	Target of 23% of total primary energy supply by 2025. Share is assumed to remain constant until 2030.
Ireland	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.

Islamic Republic of Iran	Target of 5 GW renewable power (excl. hydro) installed by 2020 is translated into 8% renewable electricity, adding a third of capacity (5 GW) and share to the currently 10 GW hydro/5% share in electricity production. This was translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh).
Italy	Target of 55% share of renewable electricity by 2030, incl. hydro, was translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh).
Japan	Target of 36-38% share of renewable electricity by 2030 was translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh).
Kazakhstan	Target of 15% share of alternative and renewable electricity by 2030 was translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh). We assume the share of nuclear energy to remain zero.
Korea	Target of 20% share of renewable electricity by 2030, incl. hydro, was translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh). Share is assumed to remain constant until 2030.
Latvia	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
Lithuania	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
Luxembourg	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
Malaysia	Target of 20% share of renewable electricity by 2030 was translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh).
Malta	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
Mexico	No quantifiable national target. The Revised Energy Transition Law, published in February 2020, includes clean energy targets for Mexico for the year 2033 (39.9% of electricity generation) and 2050 (50%). Clean energy according to Mexican law includes renewable energy sources, nuclear power, CCS as well as efficient cogeneration.
Morocco	Target of 52% of installed electricity production capacity from renewable sources by 2030 was translated into 35% share of renewables assuming factor 1.5 for capacity of the renewables over average production. This was translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh).
Netherlands	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.

New Zealand	Target of 90% share of renewable electricity by 2025 was translated to renewables share in TPES in 2030 assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh). Share is assumed to remain constant until 2030.
Norway	Target of 67.5% share of renewable in gross final energy consumption in 2020 was assumed to apply for TPES.
Philippines	NREP target of 35% renewable electricity by 2030 was translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh).
Poland	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
Portugal	Portugal's Long-Term Strategy for Carbon Neutrality projects renewable energy to reach between 264-279 PJ in 2030 compared to 630-654 PJ of total primary energy supply. The quantification is based on the average of the range.
Romania	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
Russian Federation	Target of 4.5% share of renewable electricity by 2024 was combined with current share of large hydro power, which is assumed to remain constant, and translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh). Share is assumed to remain constant from 2025 and 2030. Share is assumed to remain constant until 2030.
Saudi Arabia	The Saudi Green Initiative sets a target to increase the share of renewable electricity to 50% by 2030. This was translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh).
Slovak Republic	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
Slovenia	The EU increased its target to 40% in gross final energy demand. Member states must now adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
South Africa	The power generation share from the Integrated Resource Electricity Plan (IRP) published in 2019 was translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh).
Spain	The EU increased its target to 40% in gross final energy demand. Member states are still to adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.
Sweden	The EU increased its target to 40% in gross final energy demand. Member states must now adopt new targets to align with the overarching EU target. We rate EU member states based on the previous EU target of 32% in gross final energy demand, which is 15 percentage points above the 2015 level. We applied this 15 percentage-point increase to each member state's 2015 level. Many EU member states present targets in their NECPs, these targets have not been quantified due to insufficient data for the conversion between final energy consumption and total primary energy supply for all countries.

Switzerland	Target of increasing renewable electricity from non-hydro sources to 11,400 GWh and hydro up to 37,400 GWh in 2035, was translated into share in electricity generation. The 2030 share was obtained by linearly interpolating between 2016 and 2035. The electricity share was converted to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh).
Thailand	The Alternative Energy Development Plan (AEDP2015) sets a target of 30% renewable energy in final energy consumption by 2036. In the reference case presented in IRENA's Renewable Energy Outlook Thailand, the difference between the share of renewables in TFEC and TPES is 6% in 2036. The 2036 target for renewables in TFEC is converted to 2030 TPES by assuming linear growth of renewables between 2015 and 2036, and that the share of renewables in TPES is 6% lower than in TFEC in 2030.
Turkey	Target of 38.8% share of renewable electricity by 2023 was translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh). Share is assumed to remain constant until 2030.
Ukraine	Ukraine's Energy Strategy (2017) sets targets to increase the share of renewables in TPES from 4% in 2015 to 12% in 2025 and 25% in 2035. We linear interpolate to obtain an indicative 2030 value of 18.5%.
United Kingdom	The UK does not have a target for renewables in TPES in 2030. The 2010 NREAP sets a target for renewables in TFEC of 10% and 30% in the electricity mix by 2020. The target of 30% share of renewable electricity by 2020 was translated to renewables share in TPES assuming renewables input increases proportionally to share in electricity production and that replacing fossil electricity reduces TPES by a factor one to two (approximately 1kWh from renewables instead of 1kWh coal (produced with efficiency 1 to 3) reduces TPES by (-3+1) kWh). Share is assumed to remain constant until 2030.
United States	No quantifiable national target.
Viet Nam	Target of 15-20% renewables in energy mix by 2030 communicated in the Resolution No 55/NQ/TW on the orientation of the National Energy Development Strategy (Feb 2020).

EE Targets

Countries	Description for report
Algeria	Algeria has no energy efficiency target. The TPES per capita is assumed to follow the trend observed in the last five years (between 2014 and 2019).
Argentina	In a Renewable Energies and Energy Efficiency Subsecretariat report, a 2030 target is set to reduce energy consumption by 8.8% compared to a BAU scenario. The absolute energy supply level is estimated by the government to reach between 93.3 and 109.2 Mtoe in 2030. We take the average of these targets.
Australia	Australia's National Energy Productivity Plan sets a target to increase in energy productivity by 40% between 2015 and 2030. The 2030 energy use per capita is estimated by combining the 2015 energy use per capita with a GDP growth of 2.24% per year between 2015 and 2030.
Austria	Austria's NECP sets out a 2030 target to improve primary energy intensity by 25-30% relative to the base year 2015. The expected absolute value of TPES with a 25% reduction is 28.7 Mtoe and with a 30% reduction it is 30.8 Mtoe. We take the average of these targets.
Belarus	Belarus had a target to reduce energy intensity by 60% between 2005 and 2020. In the absence of a later target, the TPES per capita is assumed to follow the trend observed in the last five years (between 2014 and 2019).
Belgium	Belgium's NECP sets a target to reduce primary energy consumption by 15% by 2030, compared to the PRIMES 2007 scenario. The expected absolute value of TPEC is 42.7 Mtoe.
Brazil	The PDE 2029 presents a target for total primary energy supply per capita of 1.7 toe in 2029. We assume this value to remain constant until 2030.
Bulgaria	Bulgaria's NECP sets a target to reduce primary energy consumption by 27.89% by 2030, compared to the PRIMES 2007 scenario. The expected absolute value is 17.5 Mtoe.
Canada	Canada has no energy efficiency target. The TPES per capita is assumed to follow the trend observed in the last five years (between 2014 and 2019).
Chile	Chile's Energy Efficiency Law aims to reduce energy intensity by at least 10% by 2030, compared to 2019. The 2030 energy use per capita is estimated by combining the 2019 energy use per capita with a GDP growth of 2.07% per year between 2019 and 2030.
China	China's 14th Five Year Plan does not set a limit for total energy consumption, while the 13th Plan set an energy consumption cap of 6,000 Mtce in 2030. The ratio of energy consumption in 2018 to the 2030 target (Mtce) is combined with the population growth to extend the 2018 TPES per capita to 2030.
Chinese Taipei	Chinese Taipei has a target to reduce energy intensity by 50% by 2025, compared to 2005. The 2025 energy use per capita is estimated by combining the 2005 energy use per capita with a GDP growth of 2% per year between 2005 and 2025. No further reduction is assumed after 2025 and the energy use per capita increases by 2% per year, proportional to the GDP.
Colombia	Colombia's 2017-2022 Program for Rational and Efficient Energy Use and Non-Conventional Energy Sources (PROURE) sets a goal to reach 9.05% energy efficiency improvement in the transport and industry sectors. In the absence of an economy-wide target, the TPES per capita is assumed to follow the trend observed in the last five years (between 2014 and 2019).
Croatia	Croatia's NECP sets a target of 344.3 PJ primary energy consumption in 2030.
Cyprus	Cyprus' NECP sets a target to reduce primary energy consumption by 17% by 2030, compared to the PRIMES 2007 scenario. The expected absolute value is 2.4 Mtoe.
Czech Republic	Czechia's NECP sets out a 2030 target formulated as a reduction of energy intensity of GDP to 0.157 MJ/CZK. The expected absolute value of primary energy consumption is 1735 PJ.
Denmark	Denmark's NECP sets a target to reduce final energy consumption by 0.8% between 2021 and 2030. The expected absolute value for primary energy consumption in 2030 is 767.4 PJ.
Egypt	Egypt's Integrated Sustainable Energy Strategy 2035 presents a most likely scenario that would lead to an 8% reduction in energy use between 2006 and 2022. We assume the level of TPES to remain constant until 2030. We also assume this target to be in terms of energy use per capita as total energy use continues to increase up to 2030.
Estonia	Estonia's NECP sets a target to reduce primary energy consumption by 14% by 2030, compared to 2013. The absolute value for 2013 was 69.4 TWh. The primary energy target is also formulated in terms of keeping primary energy consumption below 230 PJ.
European Union (27)	EU's target is a reduction of 32.5% below the 2007 baseline by 2030. We applied the percentage reduction from 2013 to 2030 required at the EU level to the per capita energy use of each individual member states.
Finland	Finland's NECP sets out a target of 290 TWh final energy consumption in 2030. The corresponding value for primary energy consumption is 405 TWh.
France	France's Law on Energy Transition for Green Growth of 2015 and the Law on Energy and Climate of 2019 set a target to reduce total final consumption by 20% by 2030, compared to 2012. We assume this reduction to also apply to total primary energy supply.

Germany	Germany's NECP sets a target to reduce total final consumption by 30% by 2030, compared to 2008. We assume this reduction to also apply to total primary energy supply.
Greece	Greece's NECP sets a target to reduce final energy consumption by 38% and primary energy consumption by 43% by 2030, compared to the 2007 PRIMES scenario. In absolute terms the final energy consumption target is 16.5 Mtoe, and the primary energy consumption target is 20.6 Mtoe.
Hungary	Hungary's NECP states that its energy efficiency target is to ensure that the country's final energy consumption does not exceed the value of 2005 in 2030 (785 PJ). Upon implementation of the new policy measures, the value of primary energy consumption is forecast to reach 30.7 Mtoe in 2030 (approximately 1 284 PJ).
India	India has no energy efficiency target. The TPES per capita is assumed to follow the trend observed in the last five years (between 2014 and 2019).
Indonesia	Indonesia has a target to reduce energy intensity by 1% per year between 2009-2025. The 2025 energy use per capita is estimated by combining the 2009 energy use per capita with a GDP growth of 4.9% per year between 2009 and 2025. No further reduction is assumed after 2025 and the energy use per capita increases by 4.84% per year, proportional to the GDP.
Ireland	EU's target is a reduction of 32.5% below the 2007 baseline by 2030. We applied the percentage reduction from 2013 to 2030 required at the EU level to the per capita energy use of each individual member states. Ireland's NECP sets out to contribute to the EU target without setting a national target.
Islamic Republic of Iran	Iran had a target to reduce energy intensity by 50% between 2010 and 2020. In the absence of a later target, the TPES per capita is assumed to follow the trend observed in the last five years (between 2014 and 2019).
Italy	Italy's NECP sets a target to reduce primary energy consumption by 43% by 2030, compared to the 2007 PRIMES scenario. The expected absolute value for primary energy consumption is 125.1 Mtoe.
Japan	Japan's Energy Outlook projects its 2030 energy demand to be 9.7% below 2013 levels due to energy efficiency improvements.
Kazakhstan	Kazakhstan has a target to reduce the energy intensity of GDP by 30% by 2030, compared to 2008. The 2030 energy use per capita is estimated by combining the 2008 energy use per capita with a GDP growth of 3.64% per year between 2008 to 2030.
Korea	South Korea has a target to reduce final energy consumption by 18.6% between 2017 and 2040. We apply this reduction to energy use per capita and linearly interpolate to obtain a 2030 value.
Latvia	Latvia's NECP sets a target for cumulative final energy savings of 1.76 Mtoe in the period 2021-2030. The expected absolute value of primary energy consumption ranges between 165 and 170 PJ.
Lithuania	Lithuania's NECP sets a target to reduce energy intensity by 1.5 times by 2030, compared to 2017. The expected absolute value of primary energy consumption is 5.5 Mtoe.
Luxembourg	Luxembourg's NECP sets out a 2030 target of 40-44% compared to the PRIMES 2007 scenario. In the absence of a baseline or target in terms of primary energy consumption we use the EU target instead. EU's target is a reduction of 32.5% below the 2007 baseline by 2030. We applied the percentage reduction from 2013 to 2030 required at the EU level to the per capita energy use of each individual member states.
Malaysia	Malaysia's National Energy Efficiency Action Plan 2016-2025 focuses on electricity and sets a target of 8% reduction against a BAU scenario. Malaysia's Green Technology Master Plan sets a target of 15% reduction. In the absence of a primary energy target we assume the TPES per capita follows the trend observed in the last five years (between 2014 and 2019).
Malta	Malta's NECP sets a target of new savings each year from 1 January 2021 to 31 December 2030 equivalent to 0.24% of annual final energy consumption averaged over the most recent three-year period prior to 1 January 2019. The expected absolute values of primary energy and final energy consumption are 1.1 Mtoe and 0.8 Mtoe respectively.
Mexico	Mexico's Transition Strategy to Promote the use of Cleaner Fuels and Technologies sets a target of 2.2% annual improvement in final energy consumption between 2020 and 2035, compared to a BAU scenario. The expected absolute value of final energy consumption is 5363 PJ in 2030. The 5-year average ratio of TFC to TPES was used to convert this target from total final consumption to total energy supply.
Morocco	Morocco's new NDC sets a target to achieve an energy saving of 20% by 2030 compared to 2016 levels. The 2030 energy use per capita is estimated by combining the 2016 energy use per capita with a GDP growth of 2.52% per year between 2016 and 2030.
Netherlands	The Netherlands' NECP sets a target for cumulative energy savings in the 2021-2030 period based on 0.8% savings per year of average final energy consumption in the years 2016, 2017 and 2018 (the reference consumption). The expected absolute value of primary energy consumption in 2030 is 1950 PJ.
New Zealand	New Zealand has no energy efficiency target. The TPES per capita is assumed to follow the trend observed in the last five years (between 2014 and 2019).
Norway	Norway's White Paper on energy policy sets a target to reduce energy intensity (energy consumption/GDP) by 30% by 2030, compared to 2016.
Philippines	The Philippines' Energy Efficiency Roadmap 2017-2040 communicates a target of improving energy intensity by 3% by 2040, equivalent to annual energy savings of 1.6%. We apply this annual saving to TPES between 2017 and 2030.

Poland	Poland's NECP sets a target to reduce primary energy consumption by 23% by 2030, compared to the PRIMES 2007 scenario. The expected absolute value for primary energy consumption is 91.3 Mtoe.
Portugal	Portugal's NECP sets a target to reduce primary energy consumption by 35% by 2030, compared to the PRIMES 2007 scenario. The expected absolute value for primary energy consumption ranges between 15.6 and 21.5 Mtoe.
Romania	Romania's NECP sets a target to reduce energy consumption by 45.1% by 2030, compared to the PRIMES 2007 scenario. The expected absolute value for primary energy consumption is 32.3 Mtoe and for final energy consumption is 25.7 Mtoe.
Russian Federation	Russia's Energy Strategy 2035 sets a target of reducing energy intensity (energy consumption/GDP) by 44% by 2030, compared to 2005. We assume this target applies to TPES.
Saudi Arabia	Saudi Arabia has no energy efficiency target. The TPES per capita is assumed to follow the trend observed in the last five years (between 2014 and 2019).
Slovak Republic	Slovakia's NECP sets a target to reduce primary energy consumption by 28.4-30.3% by 2030, compared to the PRIMES 2007 scenario. The expected absolute value for primary energy consumption ranges between 15.7 and 16.2 Mtoe. We take the average of these values and assume it applies to total primary energy supply.
Slovenia	Slovenia's NECP sets a target to reduce primary energy consumption by 35% by 2030, compared to the PRIMES 2007 scenario. The expected absolute value for primary energy consumption is 6.4 Mtoe.
South Africa	The Draft Post-2015-2030 National Energy Efficiency Plan includes a target to reduce final energy consumption by 29% by 2030, compared to 2015. Even though the legislation is mentioned in many policy documents, it has to date not been adopted. We therefore consider that South Africa has no energy efficiency target for the year 2030. The TPES per capita is assumed to follow the trend observed in the last five years (between 2014 and 2019).
Spain	Spain's Climate Change and Energy Transition Law sets a target to reduce primary energy consumption by 39.5% by 2030, compared to the PRIMES 2007 scenario. The expected absolute value for primary energy consumption is 98.5 Mtoe.
Sweden	Sweden's NECP sets a target to improve energy efficiency by 50% by 2030, compared to 2005. This target is also expressed as energy supplied (primary energy) in relation to real GDP. Assuming the economy grows at 2% a year, the primary energy consumption on meeting the target in 2030 will be 461 TWh and the final energy consumption will be 339 TWh.
Switzerland	Target to reduce average per capita energy consumption by 43% below 2000 values in 2035 was applied and linear interpolated to obtain the 2030 value.
Thailand	Thailand has a target to reduce energy intensity by 30% by 2036, compared to 2010. The 2036 energy use per capita is estimated by combining the 2010 energy use per capita with a GDP growth of 3.1% per year between 2010 and 2036. The 2030 value is linearly interpolated.
Turkey	Turkey has a target to reduce energy intensity by 20% by 2023, compared to 2008. The 2023 energy use per capita is estimated by combining the 2008 energy use per capita with a GDP growth of 3.1% per year between 2008 and 2023. No further reduction is assumed after 2023 and the energy use per capita increases by 3.96% per year, proportional to the GDP.
Ukraine	Ukraine's target to reduce the energy intensity of GDP from 0.28 in 2015 to 0.13 by 2035 (toe/1000 USD 2015 PPP) is equivalent to a 40% reduction by 2030. The 2030 energy use per capita is estimated by combining the 2015 value with a GDP growth of 1.5% per year until 2030.
United Kingdom	The UK's target for primary energy consumption in 2030 is 151 Mtoe.
United States	The US has no national energy efficiency target. The TPES per capita is assumed to follow the trend observed in the last five years (between 2014 and 2019).
Viet Nam	Viet Nam's National Energy Development Strategy to 2030 sets a target for primary energy consumption in 2030 of 175-195 Mtoe.

Germanwatch

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Climate Action Network

CAN members work to achieve this goal through information exchange and the coordinated development of NGO strategy on international, regional, and national climate issues. CAN has regional network hubs that coordinate these efforts around the world.

CAN members place a high priority on both a healthy environment and development that “meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland Commission). CAN’s vision is to protect the atmosphere while allowing.

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