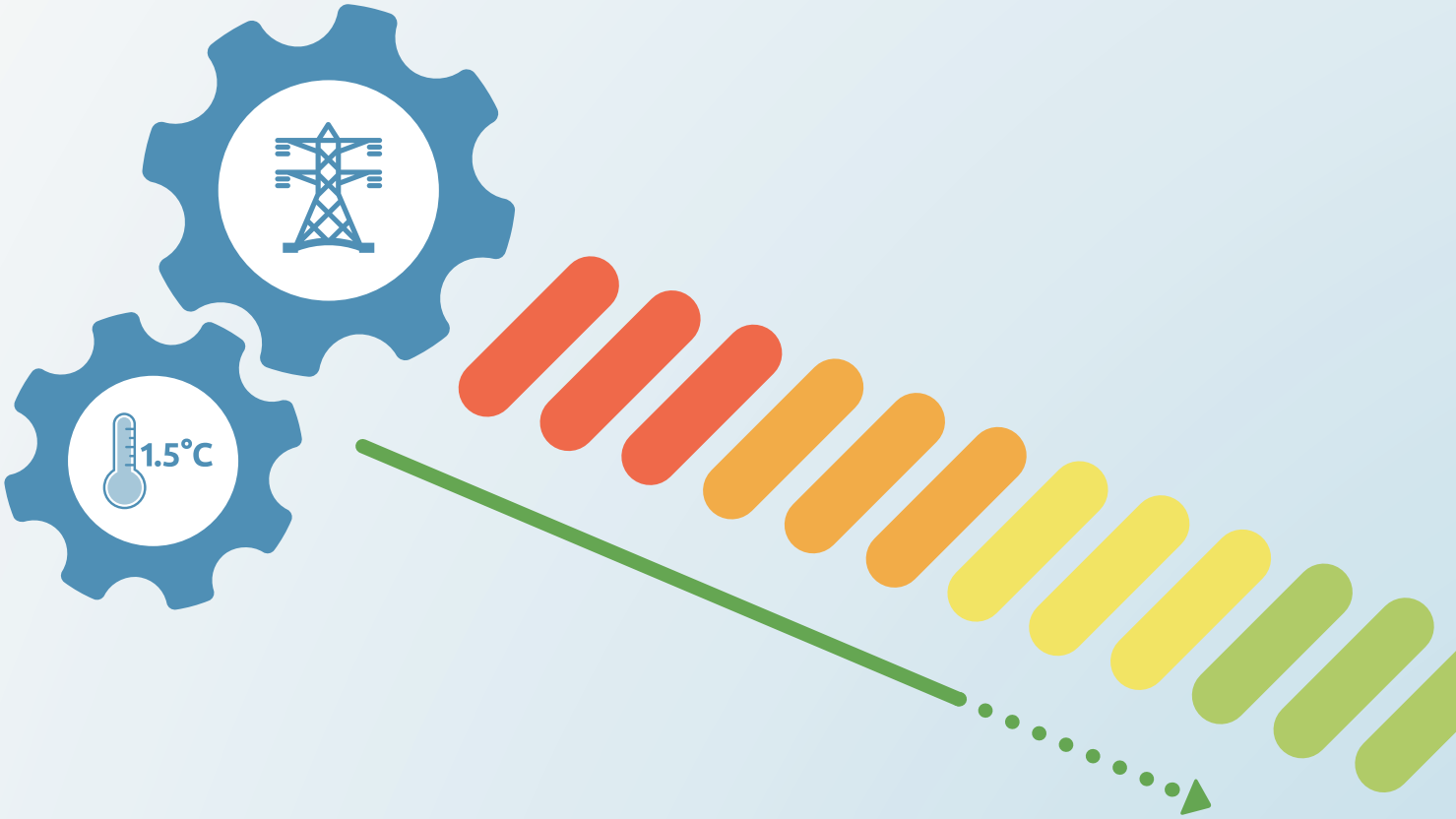
Climate Action Tracker



Climate Action Tracker

Power sector decarbonisation
Country evaluation methodology

May 2025

CLIMATE ANALYTICS

NEW CLIMATE INSTITUTE

1 Introduction

Decarbonising how our electricity is produced - the power sector - is fundamentally important to meeting 1.5 °C, and must happen as fast as possible. The CAT has determined national 1.5 °C compatible benchmarks to outline the required speed and scale of power sector decarbonisation. More specifically, we show how quickly fossil fuels need to be phased out and renewables expanded.

As of May 2025, the CAT has enhanced its evaluation of country progress toward decarbonising the power sector with additional analysis and visuals for a selection of countries.

In each country's "Policies and action" tab we now have more data, graphics and insights into power sector decarbonisation progress. We highlight where a country has phased out a fossil fuel completely, who is making the most rapid progress ("**making headway**"), where governments are sending "**mixed signals"**, and who is headed completely in the "**wrong direction"**.

We analyse each fuel individually to make it clear, for example, where both coal and renewable electricity generation is growing, and if fossil gas is replacing coal. We show the data and explain the national context for each country.

We have based this evaluation around four key components, adapting it to the specific fuel source relevant to that country. To build a complete picture of current and ongoing action in the country, we look at:

- **Recent historical trends** in electricity generation to track real developments.
- What governments have said they will do under the **targets** they have set.
- Whether their actions are consistent with those targets in terms of **planned infrastructure.**
- Finally, we check whether a recently elected government is taking action that might lead to deviations from existing trends, targets or plans, such as by **implementing new policies.**

In this document you can read in detail about the evaluation method, including what the underlying data sources are.

Some of our analysis relies on a comparison to 1.5C compatible benchmarks for the power sector. More detail about how those benchmarks were defined can be found here.

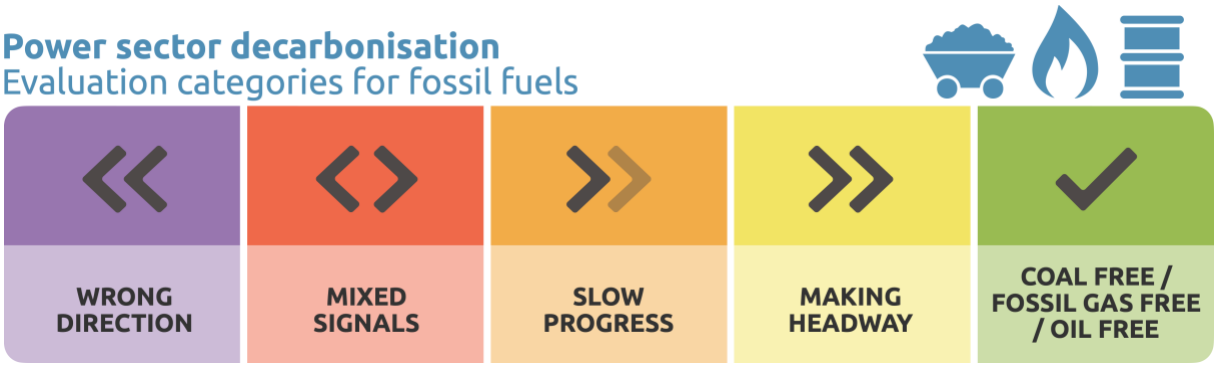
2 Fossil fuels

Aligning with 1.5˚C means phasing out fossil fuels from all power systems. Developed countries should take the lead, phasing out coal by 2030 and unabated fossil gas by 2035. While the pace of action could be slower in developing countries than in wealthier nations, they should still aim to eliminate coal and unabated fossil gas from electricity generation by 2040 (CAT, 2023).

In our new, country-specific analysis we summarise progress toward phasing out individual fossil fuels in each country by looking at both historical actions and signalled intentions, using four components, namely:

- What has been the **trend** in power generation over the last five years?
- Does the government have a 1.5˚C aligned **target** to phase out coal/fossil gas/other fossil fuels?
- Is the government **planning** to construct new capacity?
- Has the government enacted new **policies** that are likely to lead to a significant change in direction in the near term?

These evaluation components for fossil fuels are then combined into five simplified categories that are defined to reflect a range of different possible situations.



- **Wrong direction** - Policies and actions are heading in the wrong direction with no indication of change coming.
- **Mixed signals** - Inconsistent or contradictory actions across the metrics evaluated.
- **Slow progress** - Some progress, but far too limited or slow.
- **Making headway** - Solid, consistent, forward movement.
- **Coal-free | Fossil Gas-free | Oil free** - Clear frontrunners that have either completely removed this fossil fuel from their power system or never included it.

The evaluation categories are defined according to table 1. Once an initial category has been assigned from these quantitative, data-based criteria, an evaluation may be raised or lowered by one category if a government has implemented recent policy changes that are not yet reflected in the available input data. For example, historical data for the UK is available until 2024 and doesn't reflect the closure of the final coal plant. The UK evaluation for coal has therefore improved to "coal free".

Evaluation	Historic Trend	Planned new capacity?	Sufficient Phase-out Target?
X free	No coal in generation	No	Yes
	No coal in generation	No	No
Making headway	Decrease	No	Yes
Slow progress	Stagnant	No	Yes
	Decrease	No	No
Mixed signals	Increase	No	Yes
	Stagnant	Yes	Yes
	Stagnant	No	No
	Decrease	Yes	Yes
	Decrease	Yes	No
	No coal in generation	Yes	Yes
	No coal in generation	Yes	No
Wrong direction	Increase	Yes	Yes
	Increase	Yes	No
	Increase	No	No
	Stagnant	Yes	No

In a few CAT countries, including Bangladesh, Pakistan, Saudi Arabia, and Senegal, oil is a commonly-used fuel source for power generation. We analyse oil in a similar way to coal and fossil gas for those countries where the contribution to overall power generation is greater than 5%.

2.1 Methodological details

In this section we outline the details of how each of the components are calculated and assessed, including the underlying data sources.

2.1.1 Historical Trend

Historical trends in absolute generation are calculated over the last five available data years using data from Ember (2025). For example, as of May 2025 the latest available data is 2024 for most countries, so the trend is calculated using data from 2020 to 2024.

Using absolute values for trends ensures that we capture increases in generation from a specific fuel, even where that fuel's share of overall generation is decreasing. This distinction is especially important in countries where total electricity demand is growing.

Historical trends are categorised as increasing, stagnant, or decreasing. The stagnant category indicates that growth / decline rates are less than 2% per year.

In the graphics on the country pages, we show the contribution of each fuel in terms of shares of generation (%), absolute generation (TWh), and capacity (GW). The graphics allow you to look at the power system from different perspectives. For example, coal power may be increasing in absolute terms but it's decreasing as a share of overall generation because renewable generation is increasing even more quickly.

We assign a category of “No coal/gas/oil in generation” when average annual generation over the 5-year period is below 0.5% of total generation.

2.1.2 Target

Governments' targets signal intentions and direction of travel and we use them as an indicator of government plans and priorities. We evaluate targets slightly differently depending on the fuel source.

Coal - we have defined 1.5 compatible benchmarks for the power sector. These benchmarks outline how quickly fossil fuels should be phased out, and how quickly renewables need to be ramped up, in terms of % share of total generation.

Here, we compare a country's coal phase-out target, if it has one, to the latest phase-out year implied by the 1.5˚C compatible benchmarks.

Only 1.5°C aligned targets are given a positive evaluation in this component.

Fossil gas - no government has announced a phase-out target for fossil gas, but some have announced reduction targets. For gas, we differentiate if a country has, or does not have, a target for limiting gas in total power supply.

Oil - no government has a phase-out target for oil-powered generation and the CAT doesn't provide separate benchmarks for oil. However, all fossil fuels need to be phased out rapidly to keep warming within the 1.5°C limit.

2.1.3 Pipeline Capacity

If a country is building new fossil fuel infrastructure, this is a clear indication that it is not on a clear pathway toward phasing out fossil fuels, even if its targets are ambitious.

We assess whether a country is planning to build substantial new fossil fuel infrastructure using information from the Global Energy Monitor (GEM). GEM collects information about coal, gas and oil plants, at all stages of construction and operation, from announced to retired. If a country has announced, pre-permit, permitted, or begun construction on new capacity, we count this as part of its planned pipeline.

If the pipeline capacity for a specific fuel source is less than 1% of current operating capacity from that fuel source, we do not include it in the evaluation because we consider it is unlikely to materialise or significantly impact future generation.

Similarly, for small pipelines we verify the likelihood that announced or permitted plants will actually materialise, using GEM's detailed information for each specific power plant.

2.1.4 Policies and recent developments

While our method is based on a clearly defined and structured framework, we recognise that recent developments may not yet be reflected in the latest available data. We also assess the most recent developments in each country - for example a newly elected government that's rolling back policies - to check if a situation has changed. If there is evidence that the situation has changed significantly, we may adjust the overall category accordingly.

One example of such an adjustment would be for coal power generation in the UK. Latest available data and our use of annual generation means that the phase-out of coal generation at the end of 2024 would not be recognised in the current methods. In this case, the evaluation category would be changed to "Coal free".

Another example is coal power generation in Chile. Although Chile's phase-out target of 2040 is later than 2030, the phase-out year required to be aligned with 1.5˚C, the recent pace of phase-out has been very fast. If it continues at the historical rate, it would put Chile on track to phase out coal before 2030. We have therefore raised the evaluation category to "making headway".

Such adjustments are, however, only made in a few cases and are explained in the country profiles wherever they are.

3 Renewables

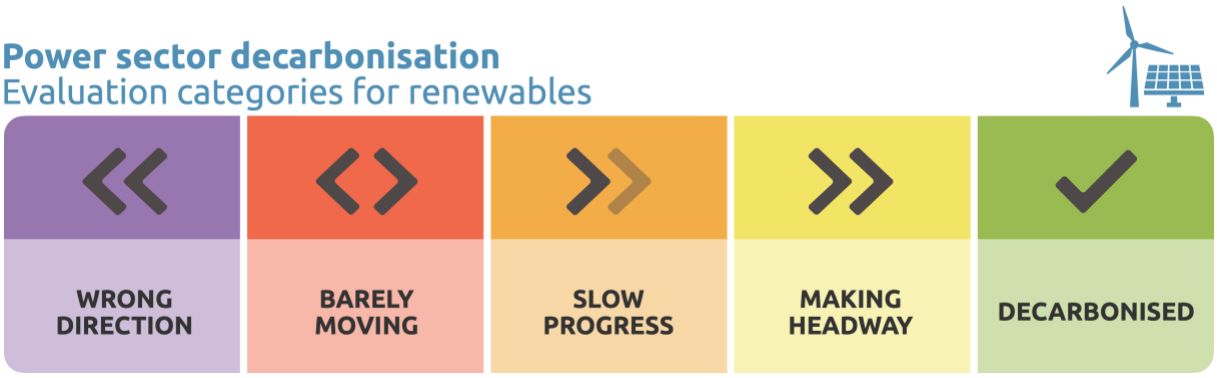
Renewable energy sources for power generation - especially wind and solar - have rapidly improved in affordability since the Paris Agreement. They are fundamental to achieving decarbonised power systems. Our evaluation allows you to see progress toward that target.

The evaluation of renewable power is slightly different to that of fossil fuels but is similarly based on historical trends and new policies.

The evaluation is based on three components:

- What is the **current share** of all renewables in the power generation mix?
- **Historical trends -** how quickly are wind and solar generation increasing?
- Has the current government enacted **policies** that are likely to lead to a significant change in direction in the near-term?

We then combine these components to give an evaluation of "wrong direction", "barely moving", "slow progress", "making headway", and "decarbonised". As of May 2025, no country lands in the "wrong direction" category.



More concretely, the evaluation categories are defined based on current shares of renewables and historical trends in wind and solar generation. We define five levels of renewables shares in total generation, and four levels of wind and solar generation trends.

Once an initial category is assigned, based on the defined criteria, it can be adjusted up or down by one level if recent developments or recent policy changes have taken place that aren't yet reflected in the data.

Evaluation	Current share (%) all RE	Historic Trend WnS
Decarbonised	Above 95%	Fast Increase
	Above 95%	Increase
	Above 95%	Slow Increase
Making headway	30%<60%	Fast Increase
	60%<95%	Fast Increase
	60%<95%	Increase
Slow progress	5%<30%	Fast Increase
	5%<30%	Increase
	30%<60%	Increase
	60%<95%	Slow Increase
Barely moving	<5%	Fast Increase
	<5%	Increase
	<5%	Slow Increase
	5%<30%	Slow Increase
	30%<60%	Slow Increase
	Above 95%	Decrease
	60%<95%	Decrease
Wrong direction	<5%	Decrease
	5%<30%	Decrease
	30%<60%	Decrease

3.1 Methodological details

3.1.1 Current share of renewable power

Current shares of renewable generation in each country are separated into five categories; <5%, 5<30%, 30-60%, 60-95%, and >95%. These boundaries indicate where the most change is needed (<5%), and at the other end, where some countries are close to having a fully decarbonised power sector.

3.1.2 Historical trends

The historical trend looks at increases in wind and solar generation only. Our trends focus on wind and solar because these are the two sources that are - and should be - increasing most rapidly to achieve a full energy system transformation. Unlike other energy sources, they are highly scalable, quicker to deploy, increasingly cost-competitive, and come with lower risks of stranded assets, as well as fewer social and environmental impacts. Their distributed nature also makes them well-suited to modern power grids, and their growth offers a strong signal of progress toward power sector decarbonisation.

Historical trends are calculated over the five most recent years of available data, using wind and solar data from Ember (2025). For most countries, this corresponds to the period from 2020 to 2024 (as of May 2025).

Trends are categorised into four groups: **decrease**, **slow increase**, **increase**, and **fast increase**. These classifications are based on the average annual growth in wind and solar generation over the five-year period, expressed as a share of the current total electricity generation of the country.

Specifically, a fast increase is defined as an average annual increase greater than 2.5% of the current total generation, while a slow increase corresponds to growth of less than 0.2%. Values between these thresholds are classified as increasing, while negative trends are labelled as decreasing.

Category	Range
Fast increase	x>2.5% / year
Increase	0.2<x<2.5 % / year
Slow increase	0<x<0.2% / year
Decreasing	x<0 % / year

3.1.3 Targets and policies

Our renewable energy analysis doesn't include an analysis of targets, mainly because renewable targets are heterogenous (e.g. capacity vs generation vs share targets, renewable vs clean vs by source, etc.) and therefore difficult to compare to the CAT benchmarks. Governments should be setting clear and ambitious targets for upscaling renewables over the next 5-10 years.

As with the fossil fuel analysis, we also check the available data and method against recent policy changes and national circumstances.

Especially for renewables, we check whether the remaining fuel sources are non-fossil fuels, such as nuclear. Where nuclear and renewables add up to a combined >95% of generation, we also evaluate the country as "decarbonised" as not many renewable energy additions are needed to reach 100% clean power. Switzerland is an example where this applies.

4 FAQS

4.1 How do you evaluate the contribution of nuclear the power mix?

We do not separately evaluate the contribution of nuclear to the power mix in each country. The share of nuclear in the overall energy mix is shown in all figures and its role in the power sector discussed where relevant in the country text.

The contribution of nuclear power to total generation is considered in our evaluation of renewables. If renewables and nuclear combined provide over 95% of generation, we count it as "decarbonised". This is the case for Switzerland.

Although nuclear electricity generation does not emit CO_2, the CAT doesn't see nuclear as the solution to the climate crisis due to its risks such as nuclear accidents and proliferation, high and increasing costs compared to alternatives such as renewables, long construction times, incompatibility with flexible supply of electricity from wind and solar and its vulnerability to heat waves. Our analysis therefore focuses on the shift toward a wind and solar based power system.

4.2 What do we mean by "unabated" fossil gas?

Current debates on the future of fossil fuels in a zero-carbon energy system often mix "abated" fossil fuels, where Carbon Capture and Storage (CCS) is used to reduce CO2 emissions from a point source, and carbon dioxide removal (CDR), where CO2 is removed from the atmosphere as permanently as possible. They are quite different technologies.

The IPCC defines "abated" fossil fuels as those which are produced and used with interventions which substantially reduce the amount of GHGs emitted throughout the lifecycle (IPCC, 2022). This is defined as capturing over 90% of emissions from a power plant, and 50-80% of fugitive emissions from energy supply.

Abated fossil fuel use in the power sector would therefore require strong action to eliminate fugitive emissions from fossil fuel production and fitting fossil fuel plants with carbon capture and storage technology, or CCS. However, while proponents of CCS have suggested that it could enable coal and gas-fired power plants to continue to operate in a zero-carbon future, there are major doubts over the viability or desirability of large-scale fossil CCS in the power sector.

First, the track record of CCS in the power sector has been very poor (Martin-Roberts et al, 2021).

Second, CCS in the power sector is low emissions, but not zero-carbon. Even with the IPCC's stringent definition of abated fossil fuels there would still be residual emissions from imperfect capture rates and upstream emissions.

Third, CCS in the power sector is no longer essential. And while CCS suffered its "lost decade", the cost of renewables plummeted (IRENA, 2023), significantly eroding the value of CCS in the power sector (Grant et al, 2021).

As such, the latest modelling assessed by the CAT finds no role for coal-fired CCS in 1.5˚C compatible transitions, and, at best, a marginal role for fossil gas equipped with CCS (Climate Action Tracker, 2023). The future of fossil fuels in a 1.5˚C compatible power sector transition, whether abated or unabated, is the same – one of swift decline and phase out

For a more detailed explanation, please see p9 Climate Action Tracker, 2023b.

4.3 How is equity considered in the analysis?

Our power sector analysis focuses on the real emissions reductions that need to happen to be compatible with the Paris Agreement, but not on who pays for the transition.

Transition challenges and capacity to drive them differ substantially by country but the end goal of phasing out fossil fuels and expand renewables to meet demand are the same.

When defining 1.5 compatible benchmarks, the CAT does take some elements of fairness and regional differentiation into account. For example, the principle that developed countries should take the lead and decarbonise faster than developing countries leads to slightly earlier fossil fuel phase out dates in developed countries. However, this is not a full treatment of equity in the global power transition.

The power sector evaluation provides insights into what needs to happen and where. In some countries, improving the evaluation will require international support. Our analysis highlights where that support is needed.

It's also important to note that the power sector evaluation also does not impact the overall CAT rating for a country.