I4C Italy for Climate

10 Global key trends on climate and energy

From Paris to Antalya



Introduction

10 Global key trends on climate and energy is the Report with which Italy for Climate, at the opening of COP31, intends to take stock of global climate and transition trends ten years after the Paris Agreement signed in 2015.

The Report analyses the trends, up to 2025, of a series of key indicators, looked at first globally and then in detail for the major players with a decisive role on the world stage: **China, Europe, India and the United States.**

The picture shows two major, apparently opposing trends. On one hand, the climate crisis is accelerating: the last three years are the hottest on record, with an average above the +1.5°C threshold, and direct damages have reached $300 billion a year, double the level of the early 2000s.

On the other hand, green technologies are transforming the energy system: renewables are the world's leading source of electricity, batteries have grown tenfold in four years and one in four cars sold is electric. Investment and jobs in clean technologies have now overtaken those in fossil fuels.

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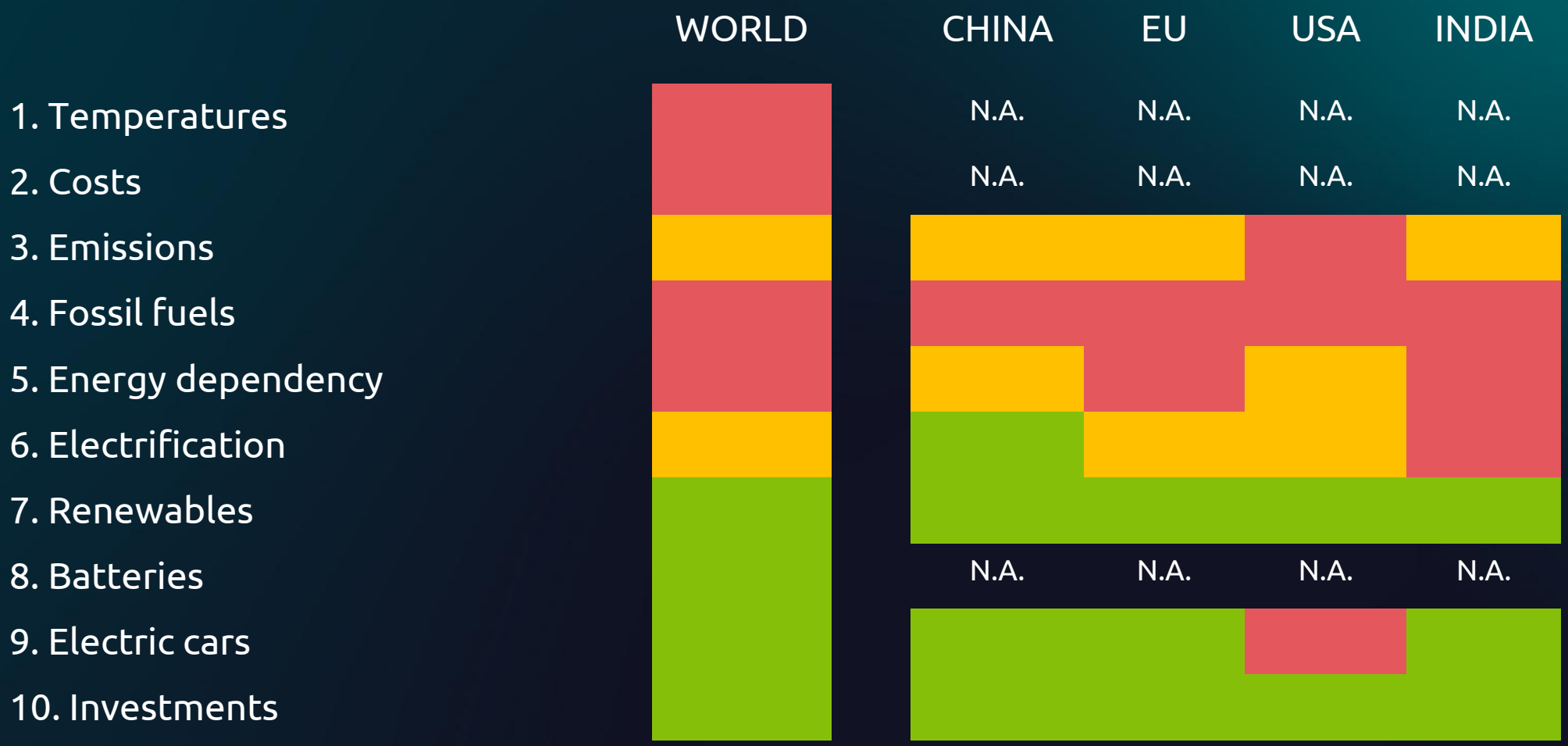
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10 Global key trends on climate and energy

From Paris to Antalya

+1,5 °C	Increase in the global average temperature over the last three years compared with the 1850-1900 baseline
+66%	Increase in the average direct costs of natural disasters worldwide over the last decade
+0,8%	Average annual emissions growth since the Paris Agreement, half the rate of the previous decade
12,6 Gtep	Fossil fuel consumption in 2025, reaching yet another record high
90%	Share of proven fossil fuel reserves held by the world's top ten countries
23%	Share of final energy consumption met by electricity in 2025
1°	Renewables ranked as the leading source of electricity generation from 2025 onwards, ahead of coal
307 GWh	New industrial battery capacity installed in 2025
25%	Share of electric cars in total vehicle sales in 2025
2 trillion $	Clean energy investments in 2025, nearly double those in oil and gas

Big emitters compared: how did the energy transition go in 2025?

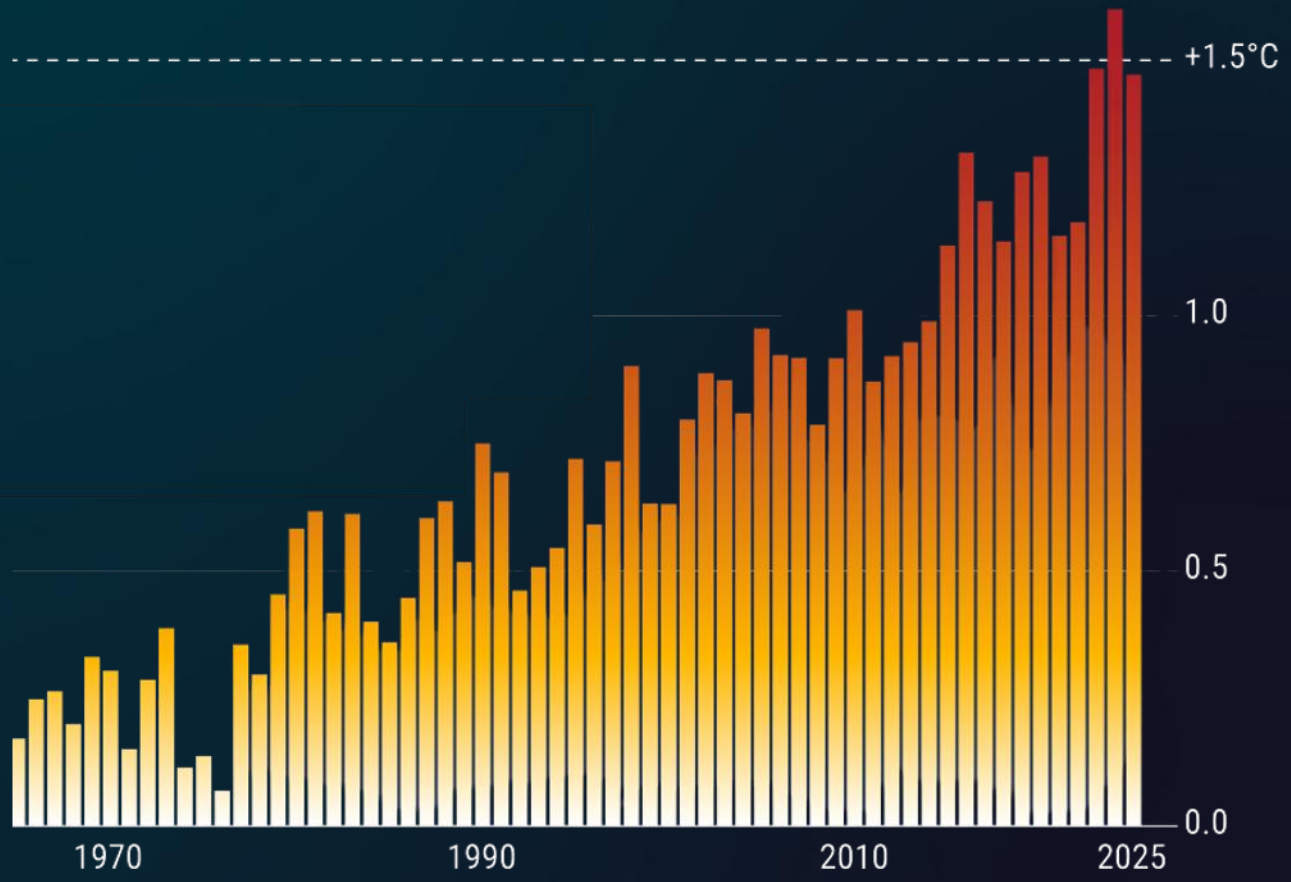


Editors' note: The colours in this table do not indicate that an indicator is on track to meet the climate and energy goals of the Paris Agreement. Green and yellow simply show that performance in 2025 improved on 2024 (as with renewables and electric cars), or that results were at least modestly encouraging after years of setbacks (as with global emissions). N.A. means there are no comparable data.

1. TEMPERATURES

The +1.5 °C threshold above pre-industrial levels has been passed, the last three years the hottest on record

Increase in average surface temperature since the pre-industrial era



Data source: Copernicus-ERA5, UNEP, WMO

Record global average temperatures have been recorded over the last three years, never reached in hundreds of thousands of years. This increase is largely concentrated in the last 50 years, showing a clear accelerating trend.

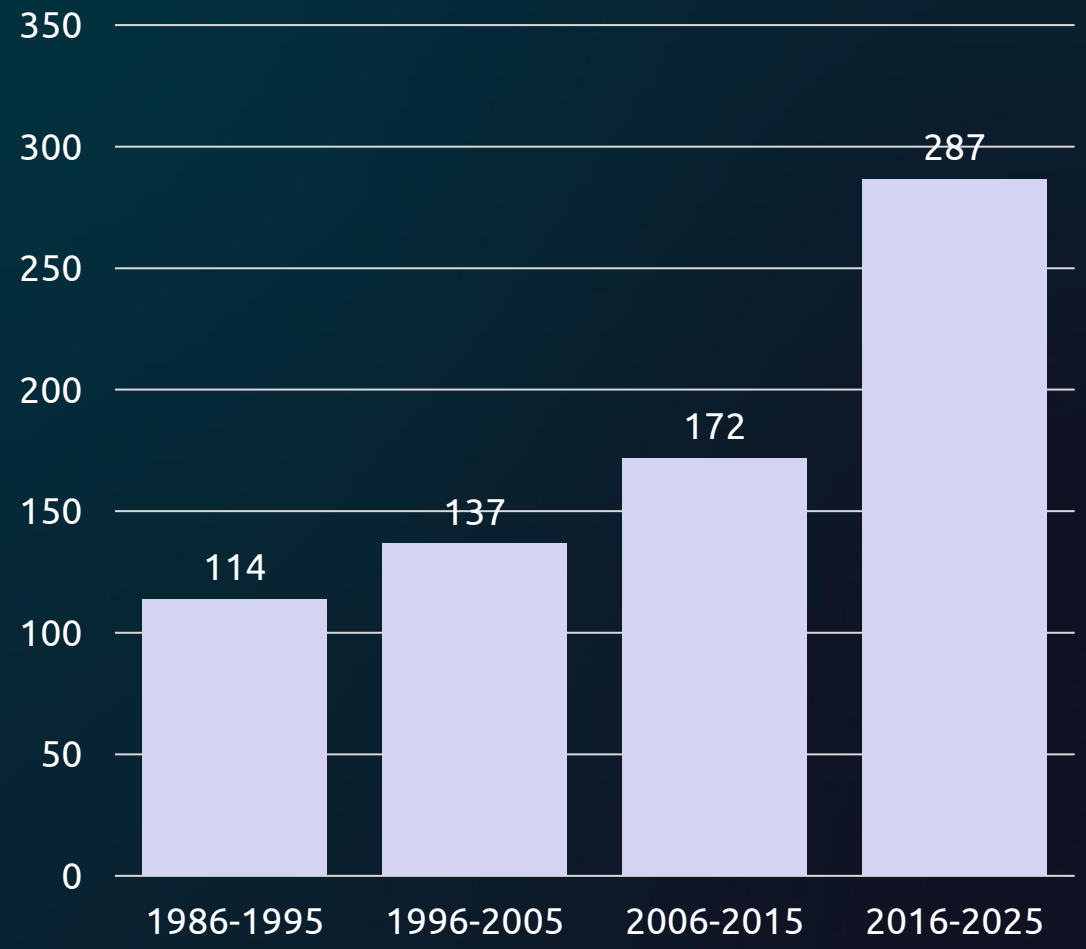
From 1999 to 2025 sea levels rose by 9.4 cm and over the last ten years the rate of growth has increased by more than 30%. Since 2000, the world has **lost 7,500 billion tonnes of glacier mass** and in 2025 alone a volume equal to 5 times the Alpine glaciers was lost.

According to the United Nations, exceeding the +1.5 °C threshold agreed in Paris in 2015 will be irreversible for at least the coming decades.

2. COSTS

Natural disasters cost almost $300 billion a year, +66% in the decade after the Paris Agreement

Global economic losses from billion-dollar natural disasters - $ billion per year, decade average



Data source: Italy for Climate analysis of data from Munich Re

+66% annual economic losses in the decade after Paris compared with the previous decade

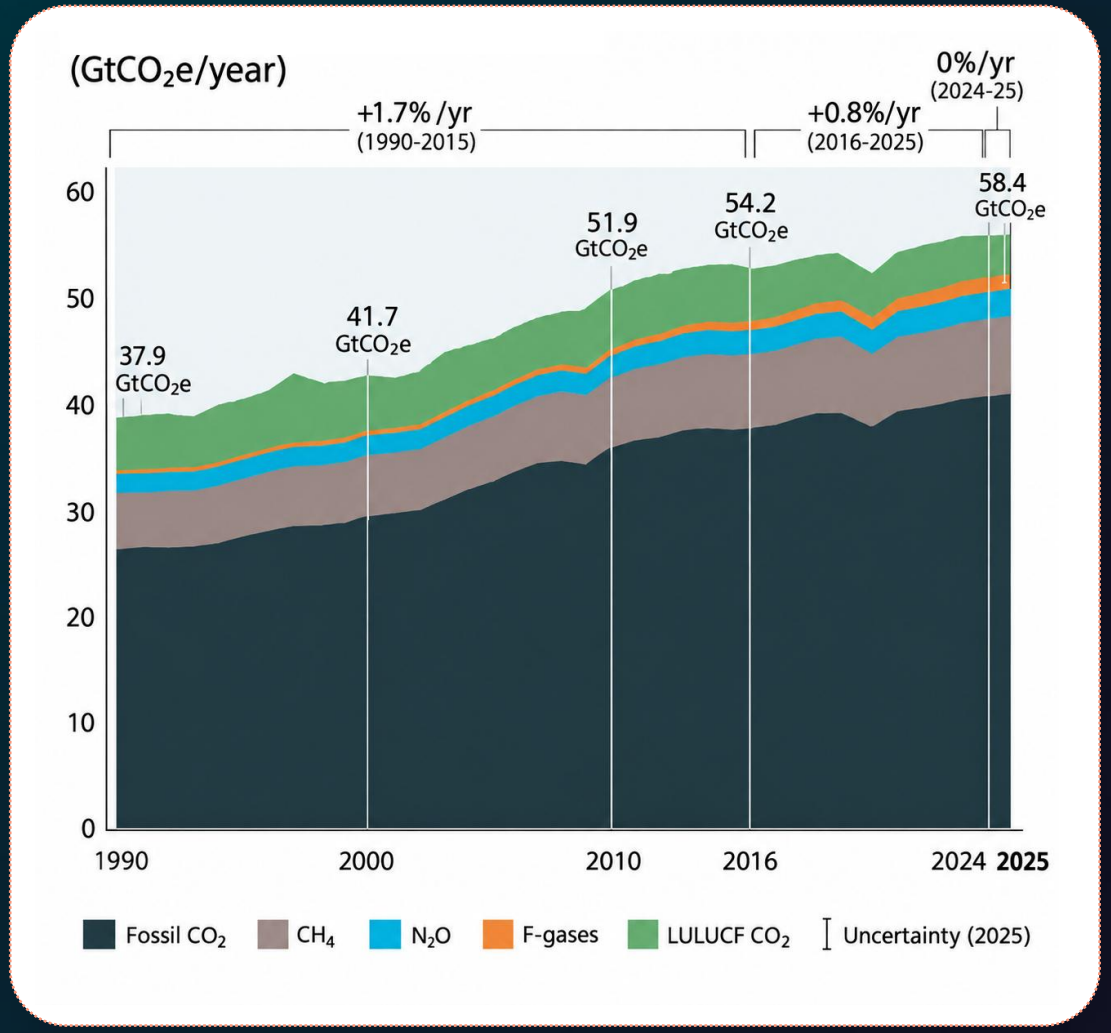
Since 1980 Munich Re has estimated at **$7,400 billion the damage caused by natural disasters**. In the last decade since the Paris Agreement alone, almost $300 billion of damage a year has been recorded on average.

In reality these are **very conservative estimates**, which only take into account direct damage, for example to infrastructure, and **only for events with damage above $1 billion.**

3. EMISSIONS

Greenhouse gas emissions have never been so high, but since 2015 the growth rate has halved, and in 2025 it was almost zero

Global Greenhouse Gas Emissions



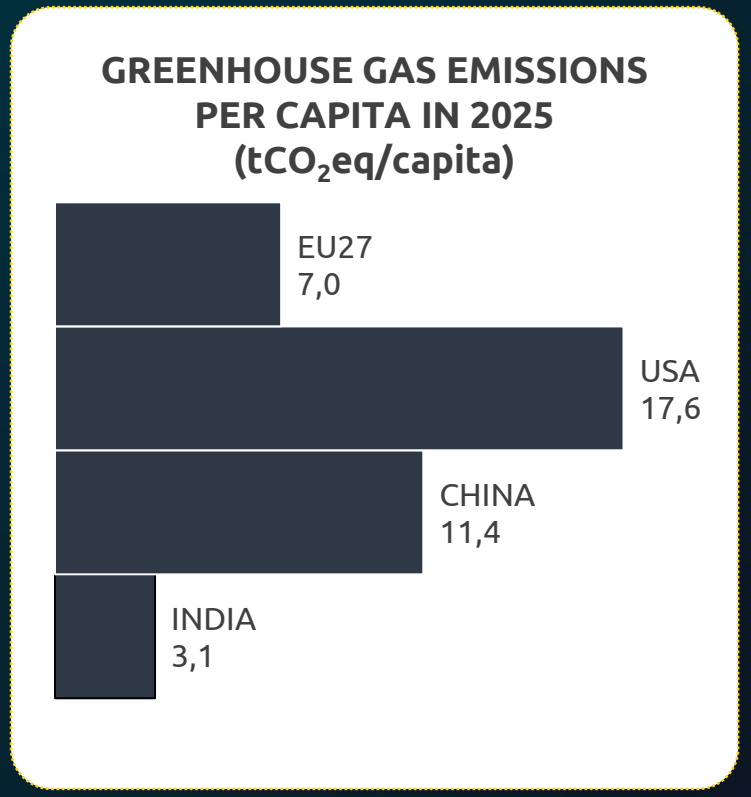
Data source: UNEP

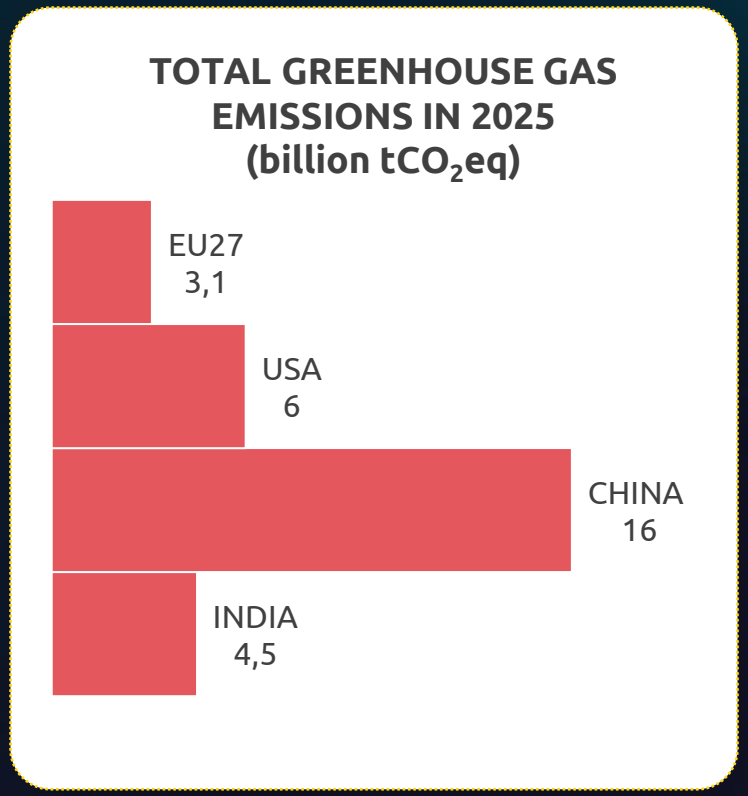
In the 25 years before the Paris Agreement emissions grew at **+1.7%** per year, a figure that fell in the last decade to **+0.8%**

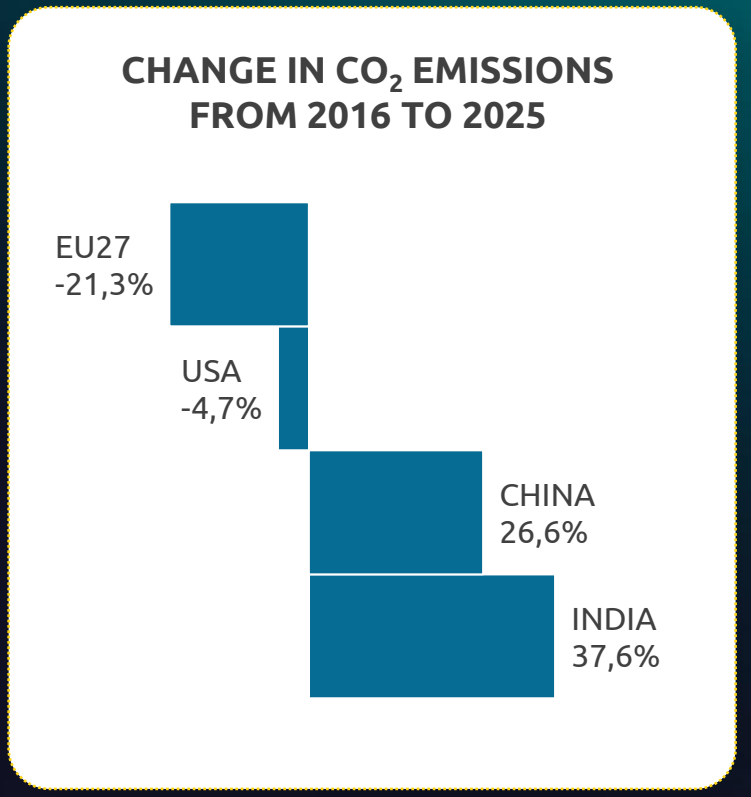
In 2025 global greenhouse gas emissions reached a record 58.4 billion tonnes. This is a 54% increase on 1990, the reference year of the Framework Convention on Climate Change. CO_2 emissions from the use of fossil fuels account for around 70% of global emissions and were responsible for around 85% of the increase recorded since 1990.

Since the Paris Agreement we have seen a slowdown in emissions growth, up to 2025 when they were roughly stable compared with the previous year. But it is still too early to say that we have reached the peak and started to decarbonise.

Big emitters compared: greenhouse gas emissions





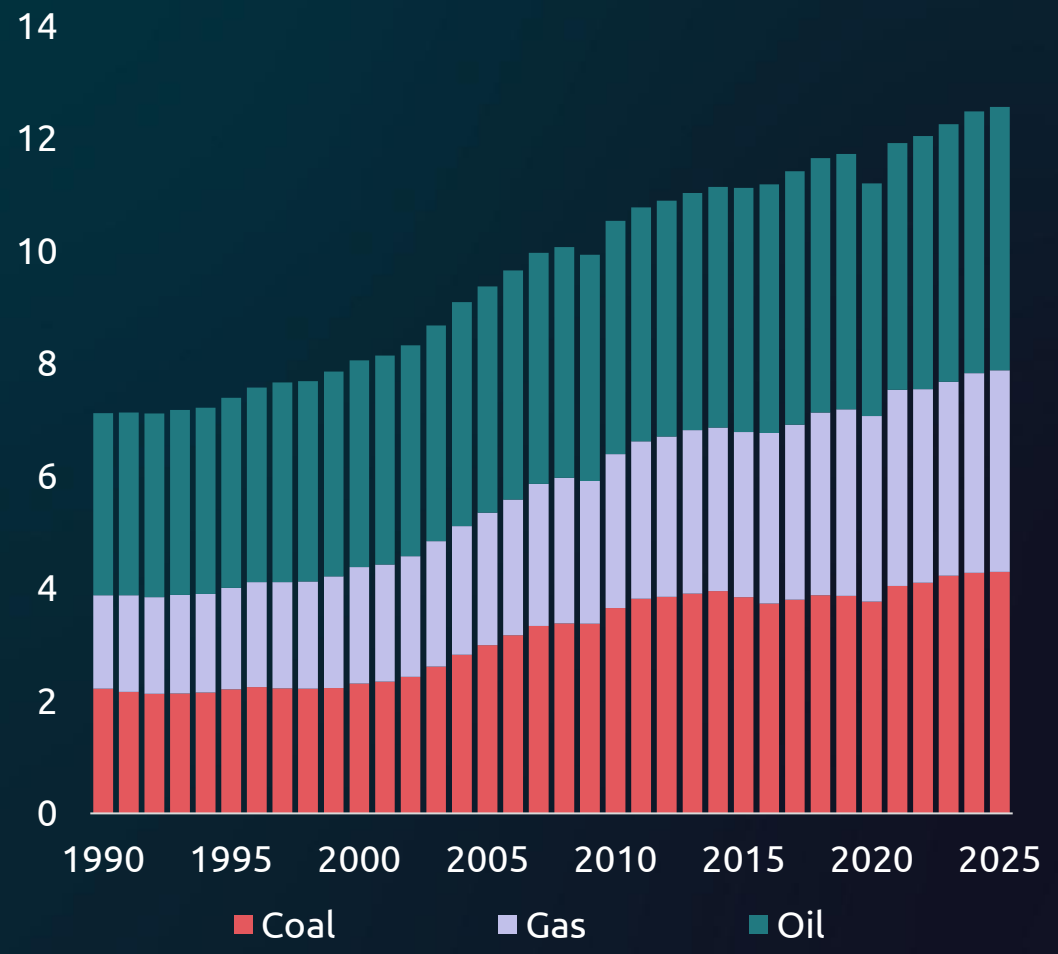


Data source: UNEP, Global Carbon Budget

4. FOSSIL FUELS

12.6 billion tonnes of oil equivalent consumed in 2025: fossil fuel growth continues

Global fossil fuel consumption (billion tonnes of oil equivalent)



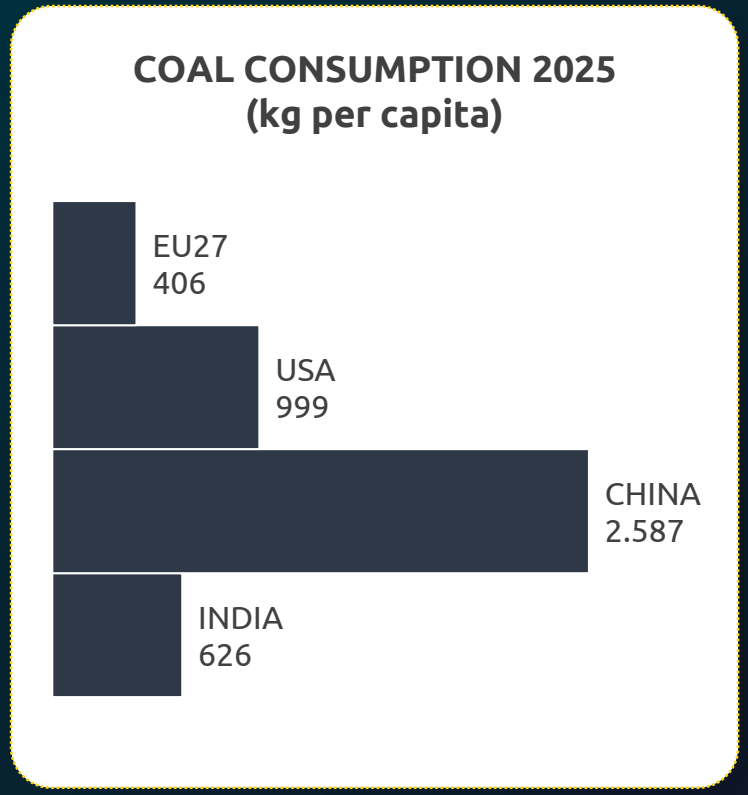
Data source: IEA

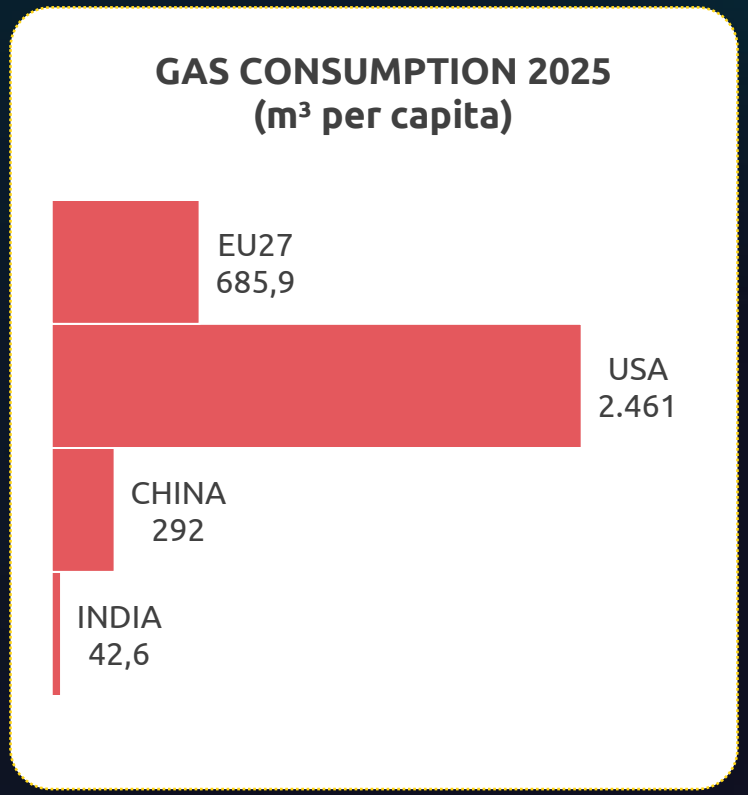
In the decade after Paris, fossil fuel consumption grew on average by **+1.2%** per year against **+1.5%** in the previous decade

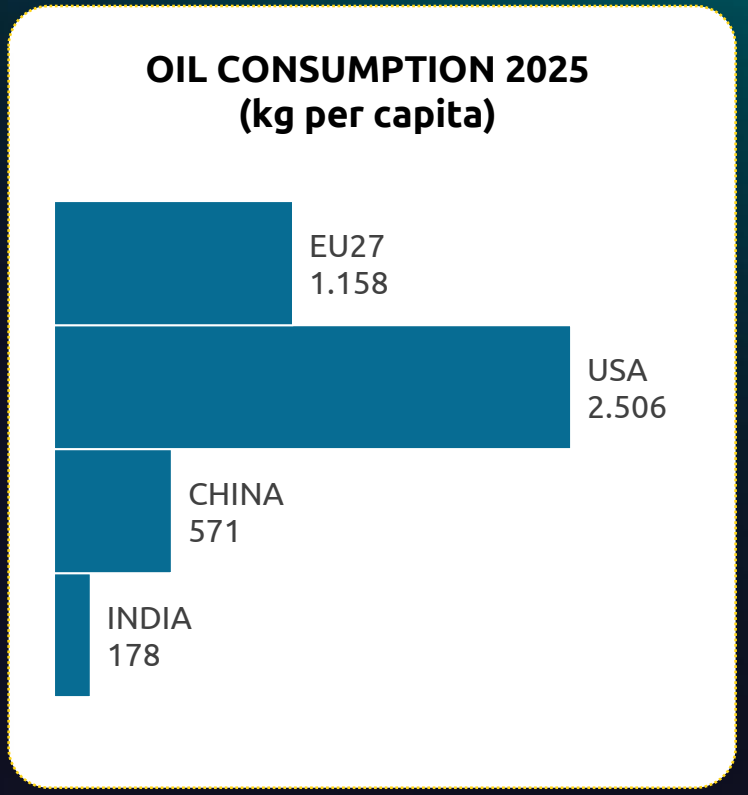
Growth in the consumption of fossil fuels, the main source of greenhouse gas emissions, is still not stopping. **In 2025, with 12.6 billion tonnes of oil equivalent, +0.6% on the previous year,** a new record was reached.

Oil products are still the world's largest source of fossil fuel consumption, but since the Paris Agreement they have also grown the least, +6% in ten years, against +15% for coal and as much as +18% for gas.

Big emitters compared: fossil fuel consumption







Data source: IEA

5. ENERGY DEPENDENCY

An increasingly volatile fossil fuel market and 90% of the resources held by just 10 countries

Proved reserves for coal amount to 1 trillion tonnes: 92% is held by 10 countries



1.	**United States**	**23.6%**
2.	Russia	15.3%
3.	Australia	14.2%
4.	China	13.6%
5.	India	10.5%
6.	Germany	3.4%
7.	Indonesia	3.3%
8.	Ukraine	3.3%
9.	Poland	2.7%
10.	Kazakhstan	2.4%

Data source: Italy for Climate analysis of BP - Statistical Review of World Energy data

Proved reserves for gas amount to 200 trillion cubic metres: 82% is held by 10 countries



1.	**Russia**	**20%**
2.	Iran	17.2%
3.	Qatar	13.2%
4.	Turkmenistan	7.3%
5.	United States	6.8%
6.	China	4.5%
7.	Venezuela	3.4%
8.	Saudi Arabia	3.2%
9.	United Arab Emirates	3.2%
10.	Nigeria	2.9%

Data source: Italy for Climate analysis of BP - Statistical Review of World Energy data

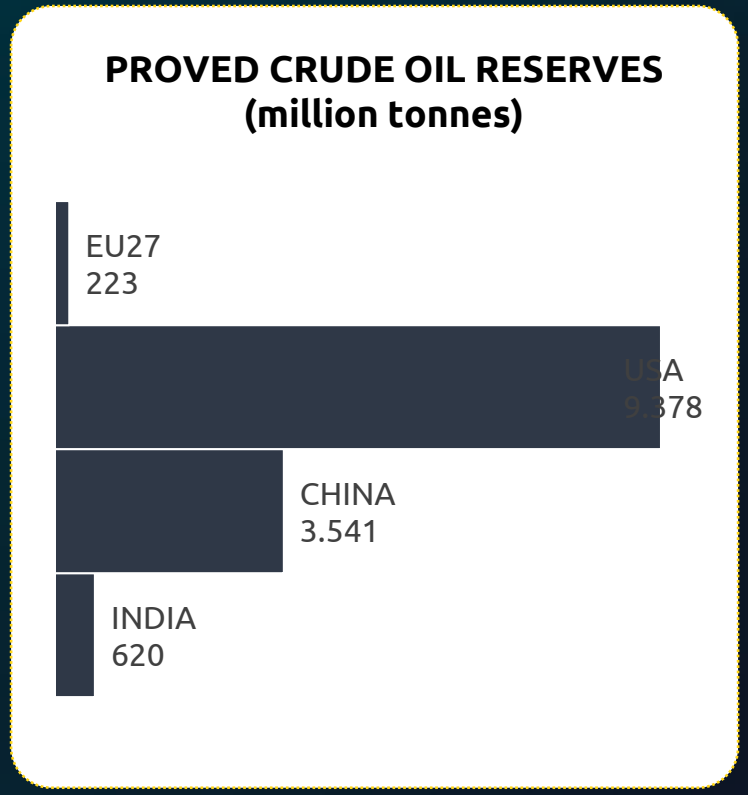
Proved reserves for **oil** amount to over 200 billion tonnes: 87% of them is held by 10 countries

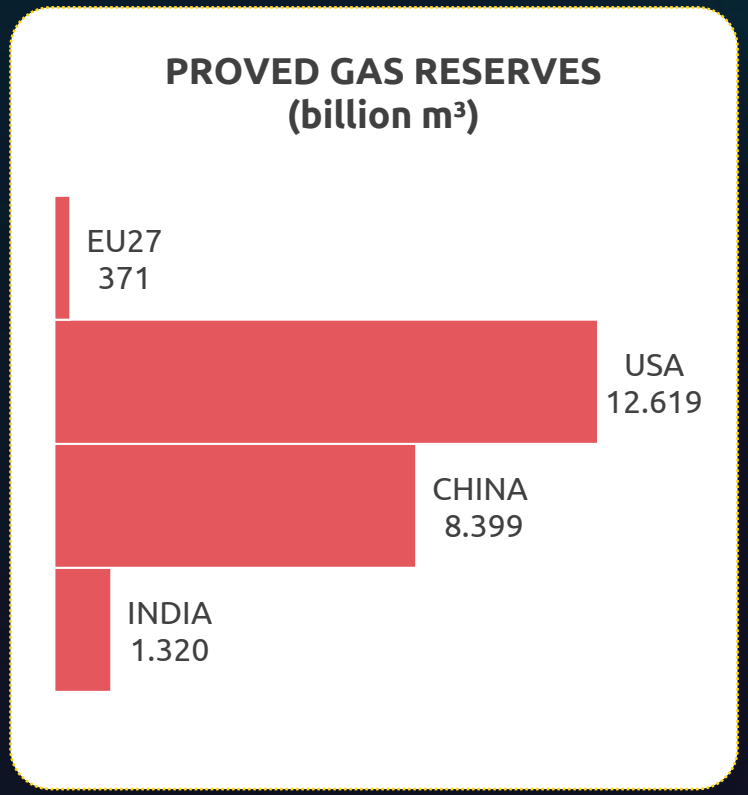


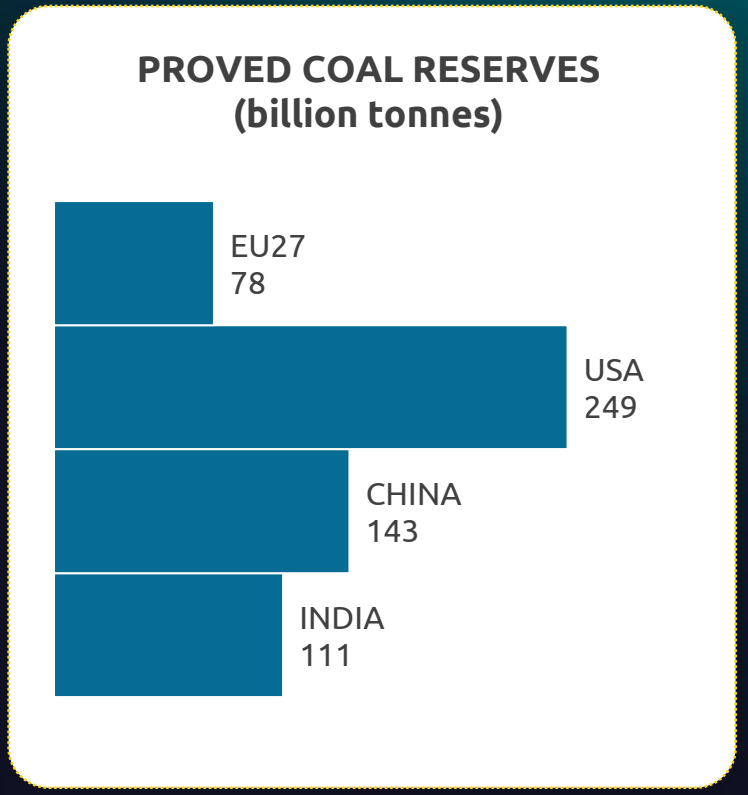
1.	**Venezuela**	**17.6%**
2.	Saudi Arabia	17.3%
3.	Canada	9.7%
4.	Iran	9.2%
5.	Iraq	8.4%
6.	Russia	6.3%
7.	Kuwait	5.9%
8.	United Arab Emirates	5.7%
9.	United States	4%
10.	Libya	2.8%

Data source: Italy for Climate analysis of BP - Statistical Review of World Energy data

Big emitters compared: fossil fuel reserves





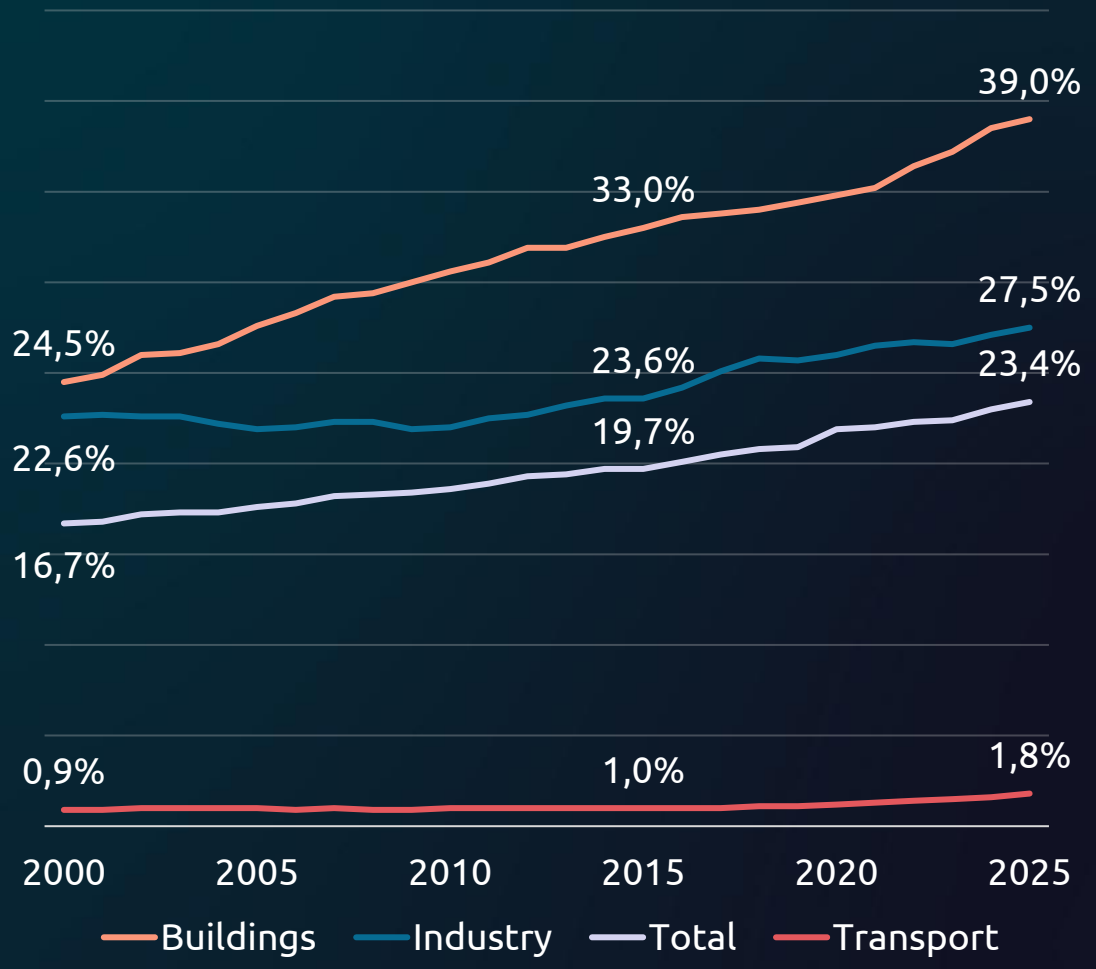


Data source: Italy for Climate analysis of BP - Statistical Review of World Energy data

6. ELECTRIFICATION

23% of energy demand
met by electricity in 2025

Total and sector electrification rate in the world
(% of final consumption met by electricity)



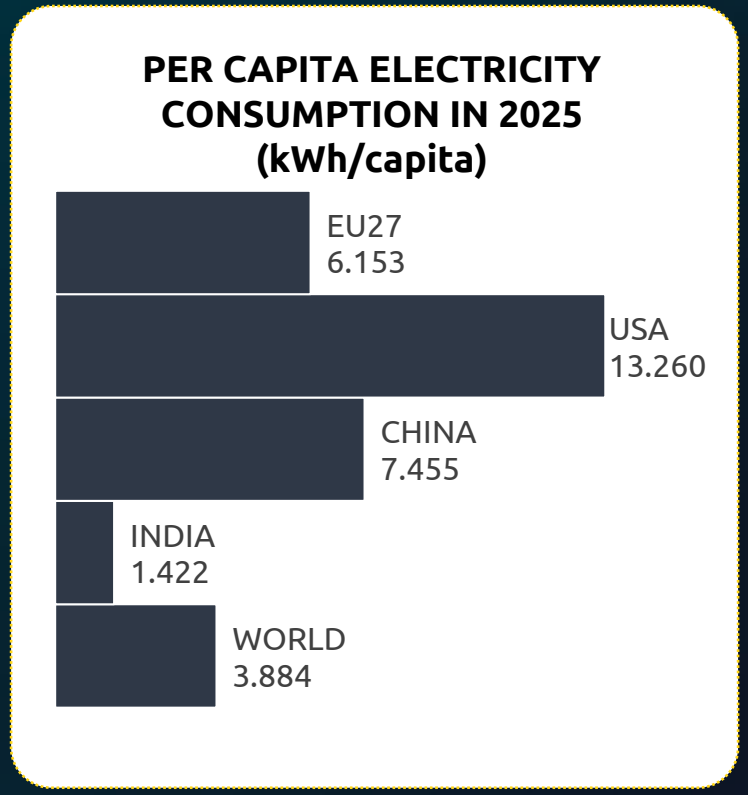
Data source: Italy for Climate analysis of IEA data

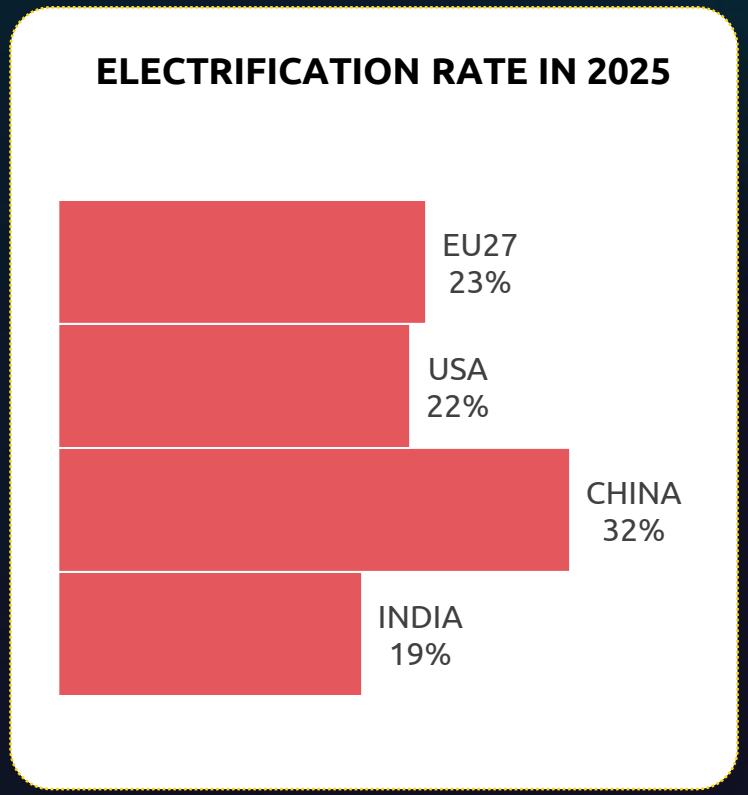
Since the Paris Agreement the electrification rate has grown by **almost four percentage points**, about double the previous decade

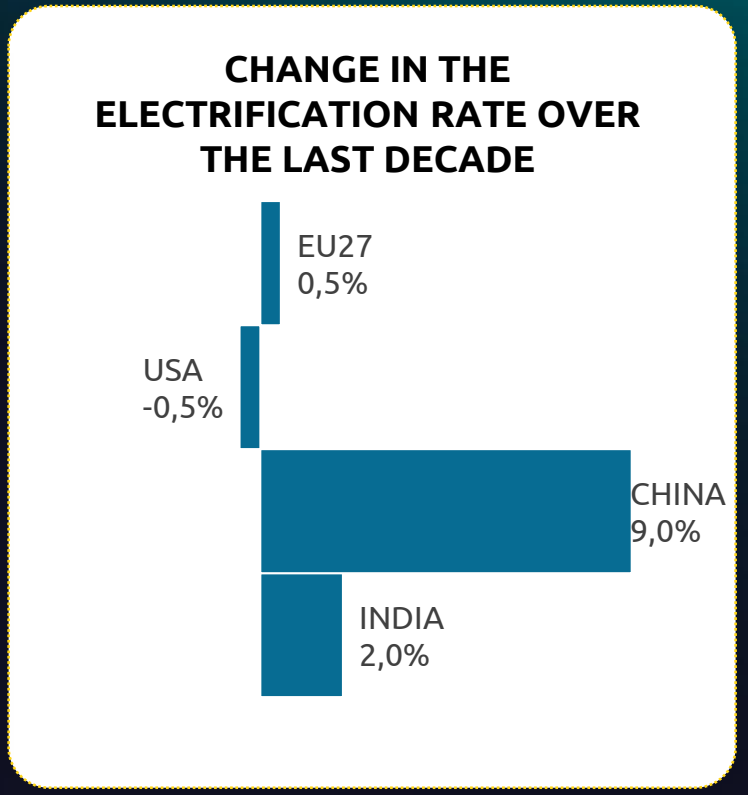
The **share of energy consumption met by electricity** is growing, reaching 23% in 2025. Unfortunately the pace **is not enough to meet the targets** set by the scientific community of 35% by 2035 and over 50% by mid-century.

The main driver of growth is the buildings sector, where electricity meets almost 40% of energy demand (it was below 25% at the start of the millennium). Industry is also doing fairly well, having accelerated precisely over the last decade to almost 28%. Transport, on the other hand, is doing badly, at under 2%, even though it has almost doubled this value since Paris.

Big emitters compared: the numbers on electrification





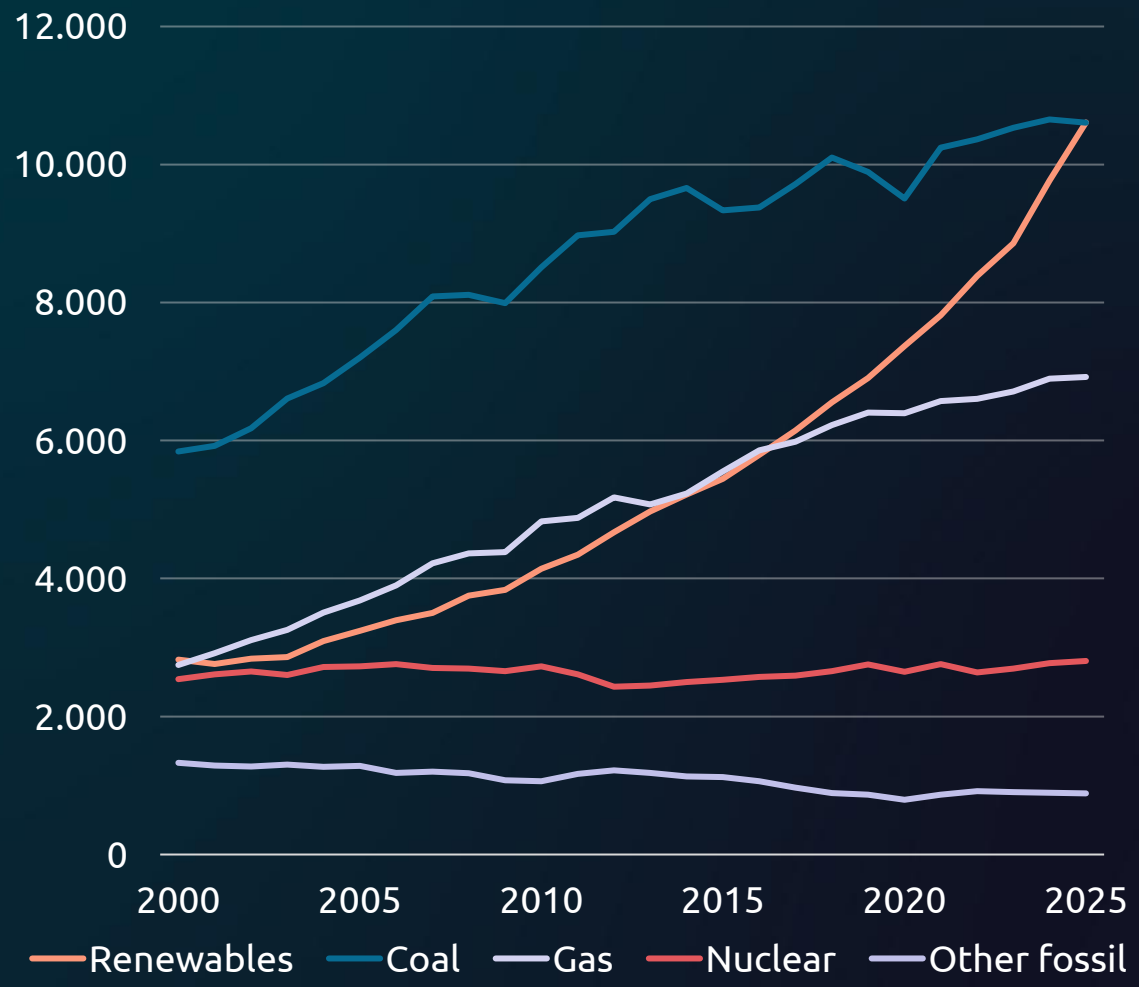


Data source: Italy for Climate analysis of IEA data

7. RENEWABLES

In 2025 renewables overtook coal and became the world’s leading source of electricity generation

Global electricity generation by source (billion kWh)



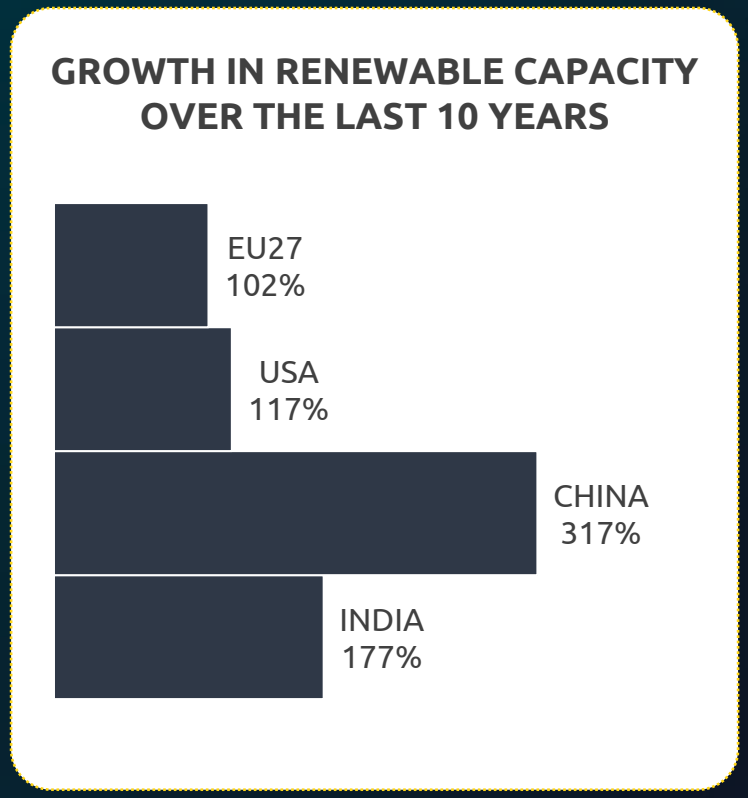
Data source: Italy for Climate analysis of Ember data

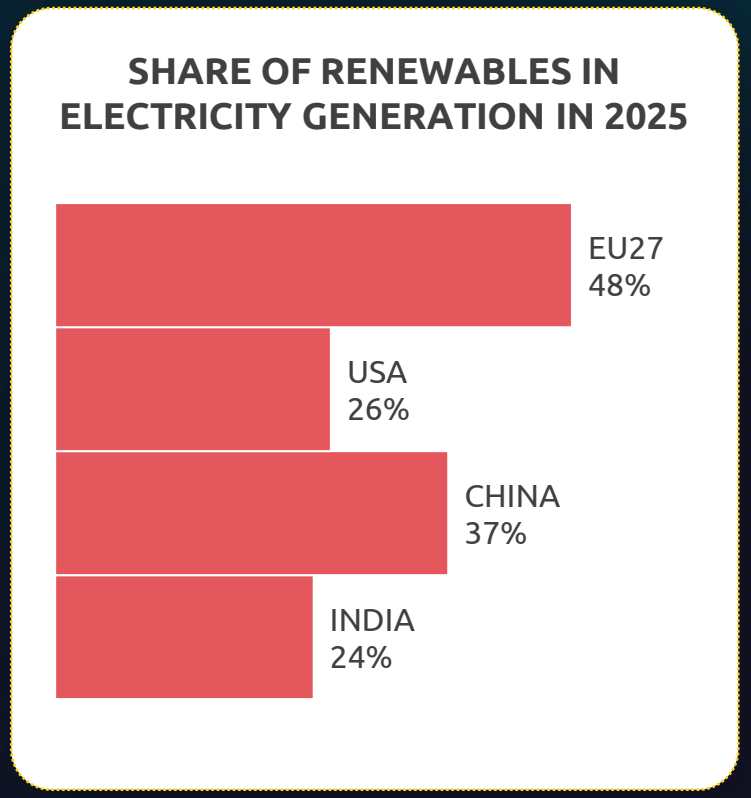
Since the Paris Agreement, electricity generation from renewable sources has grown by an average of **500 TWh a year**, more than double the previous decade

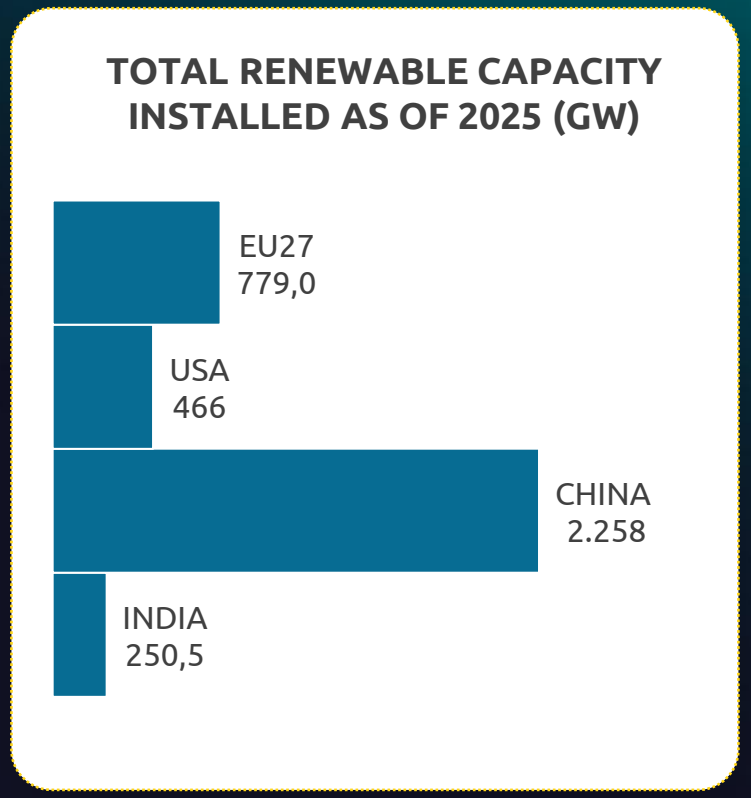
In 2025 renewables passed the threshold of 10,000 billion kWh, catching up with coal and becoming the leading source of electricity generation in the world. **Today a third of all the electricity produced in the world is renewable**.

This acceleration has been driven by **solar PV and wind, pushed by falling generation costs**: since 2015 they have fallen by almost 70% for the former and more than halved for the latter. These technologies, which for many years needed incentives to grow, are now the cheapest way - and also safe for the environment and society - to produce electricity.

Big emitters compared: renewable electricity





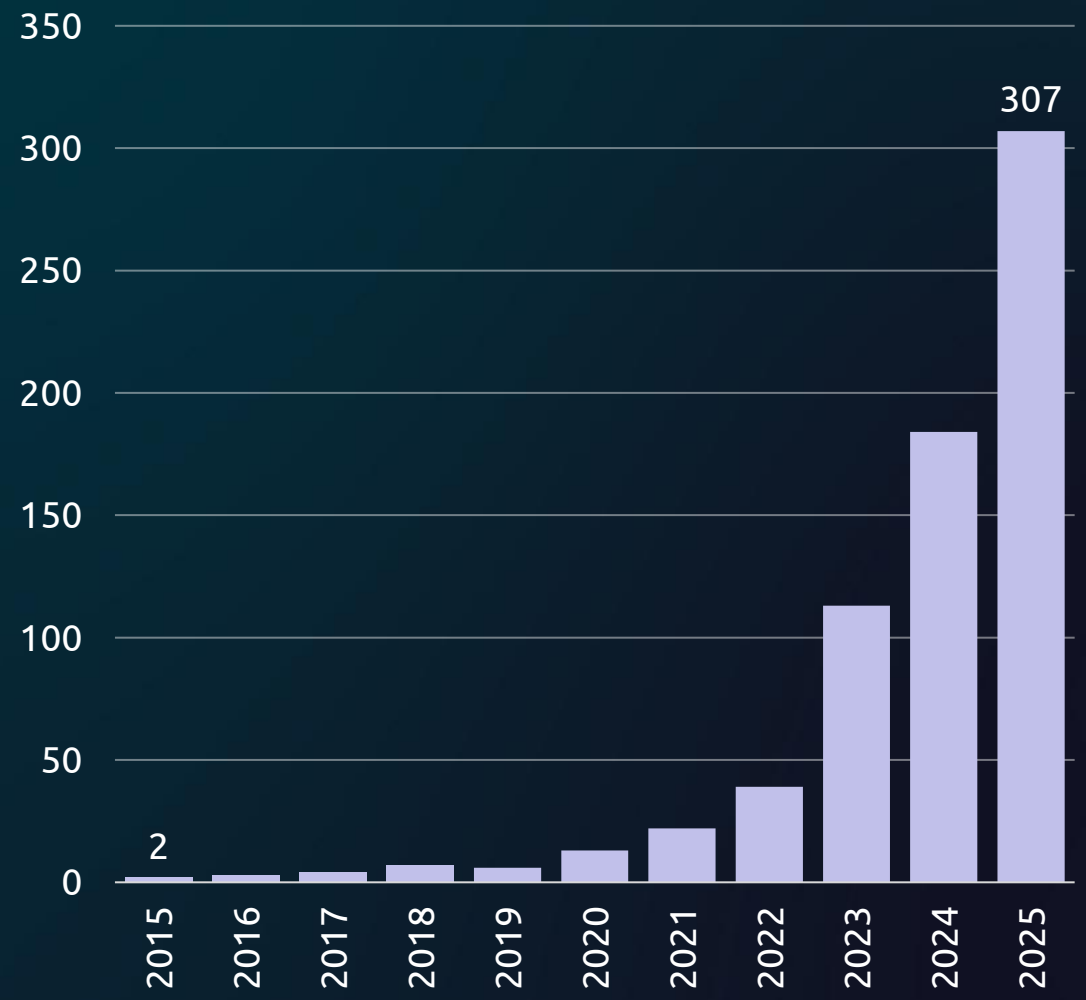


Data source: Italy for Climate analysis of Irena, Ember data

8. BATTERIES

307 GWh of industrial batteries installed worldwide in 2025, +67% on the previous year

Annual growth in gross capacity of BESS – Battery Energy Storage Systems (GWh)



Data source: Italy for Climate analysis of IRENA - BNEF data

Since the Paris Agreement, the new capacity of industrial batteries installed worldwide each year has grown by **more than 150 times**

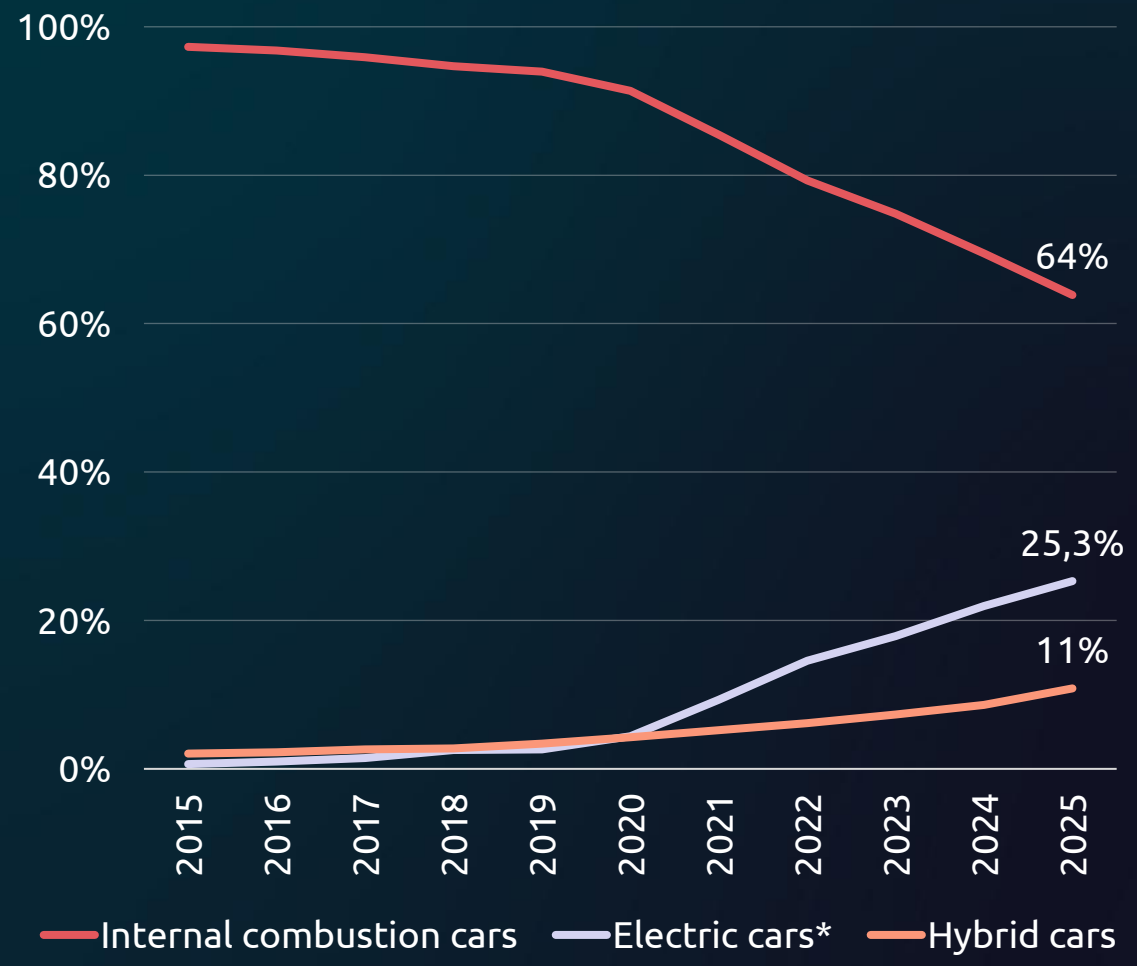
Batteries are **the most widespread technology for short-term storage of electricity**. In the year of the Paris Agreement, 2 GWh of industrial (utility-scale) batteries were installed worldwide; ten years later this rose to over 300 GWh. Here too the driver is China, with 56% of the new capacity installed in 2025, followed by the USA with 18% and Europe with 11%.

As with renewables, **their incredible spread is directly linked to falling costs**: from 2015 to 2025 the total installed cost (TIC) fell from over $1,700 to $140 per kWh, a cut of more than 90% in just a decade.

9. ELECTRIC CARS

21 million vehicles: in 2025 1 in 4 cars sold worldwide was electric

Annual share of cars sold by powertrain



** Include battery electric (BEV) and plug-in hybrid cars*
Data source: Italy for Climate analysis of IEA data

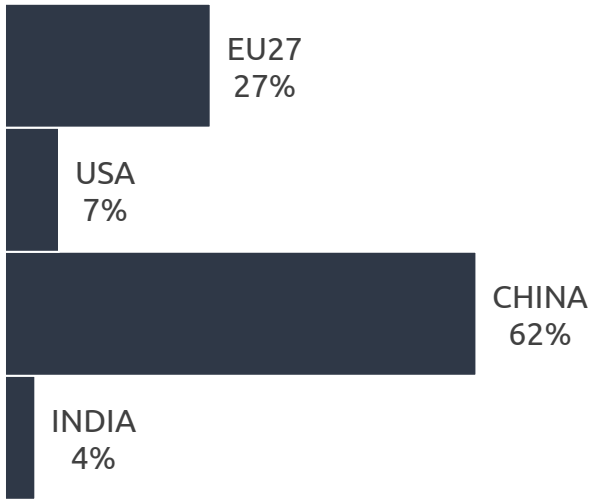
In the year of the Paris Agreement **0.6%** of cars sold worldwide were electric; in 2025 this rose to **25%** of sales

Sales of electric vehicles (EVs) worldwide are growing, **rising from 17 million sold in 2024 to 21 million in 2025**: one car in four sold is electric.

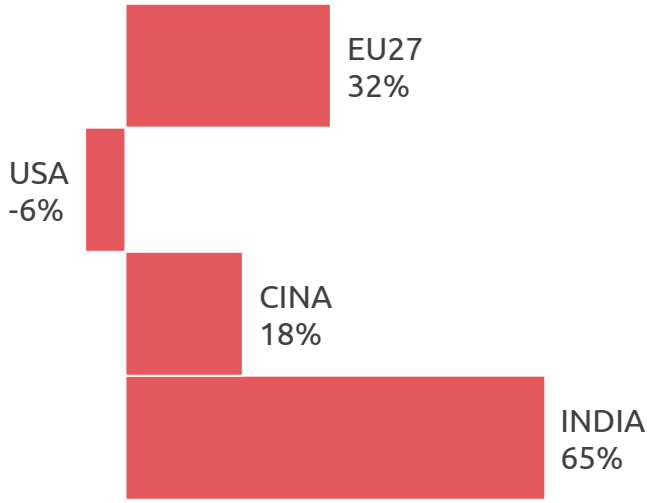
EVs include both plug-in hybrids (PHEVs, which have an electric motor and a traditional internal combustion engine) and battery electric cars (BEVs). Specifically, the BEV share of total car sales rose from almost 14% in 2024 to 16.5% in 2025. The PHEV share of sales also grew, from 8% in 2024 to 9% in 2025: it is the “pure” electric cars that are driving the growth.

Big emitters compared: the growth of electric cars

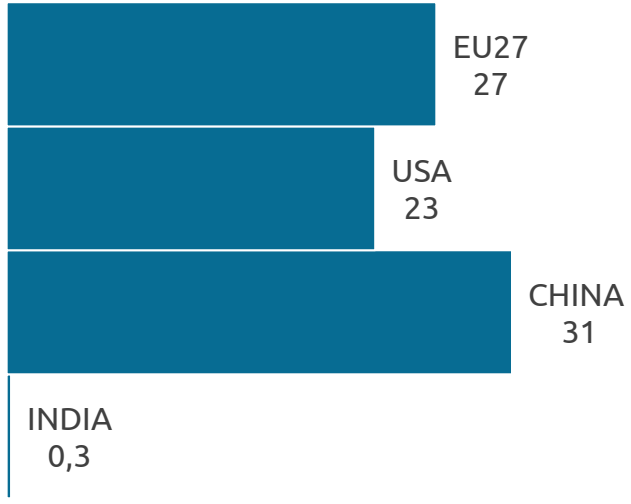
SHARE OF ELECTRIC CARS SOLD IN 2025



% CHANGE IN ELECTRIC CARS SOLD IN 2025 VS 2024



ELECTRIC CARS PER THOUSAND INHABITANTS, 2025

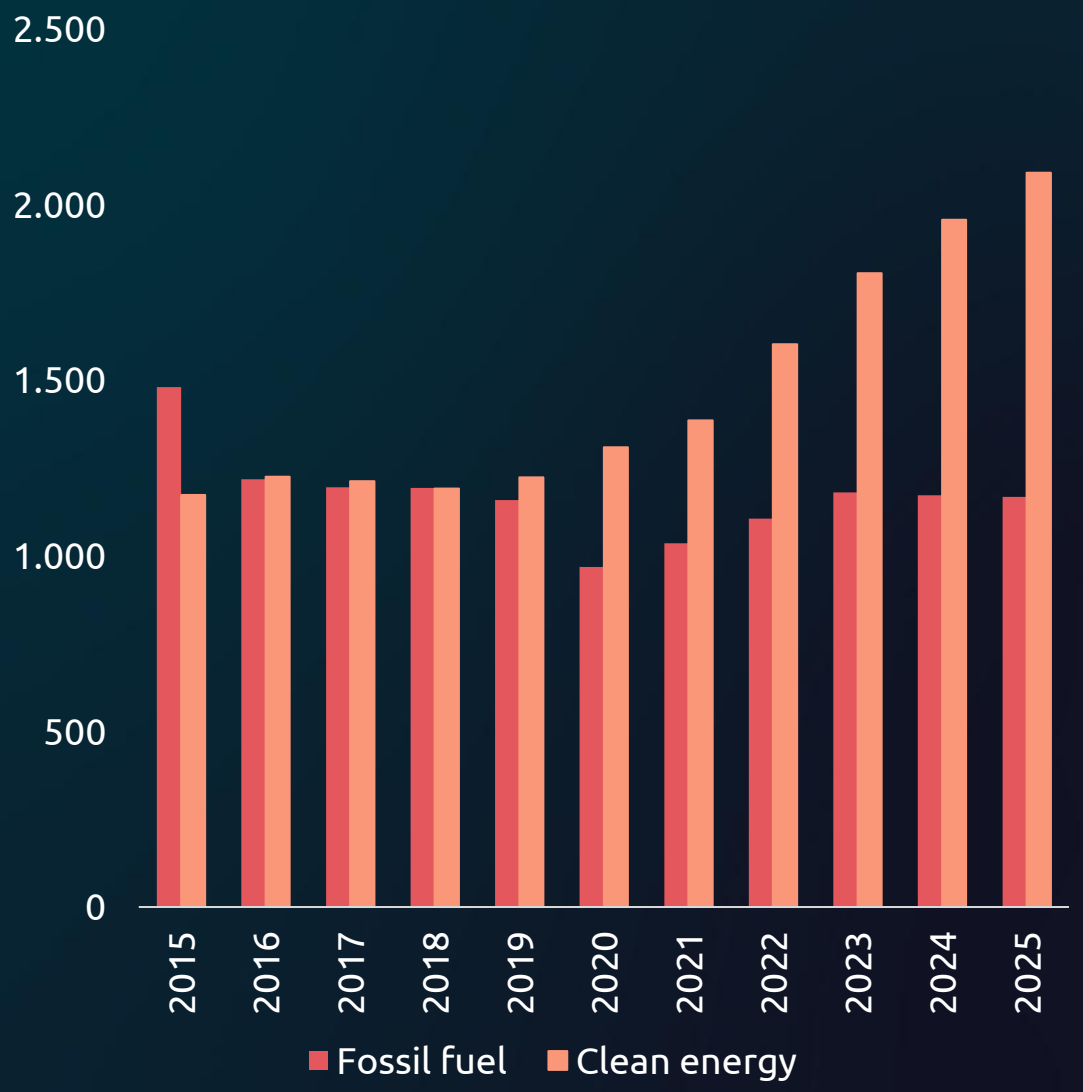


Data source: Italy for Climate analysis of IEA data

10. INVESTMENTS

In 2025, $2.6 trillions of investments in clean energy, almost double that in fossil fuels

Global energy investment by type ($ billion)



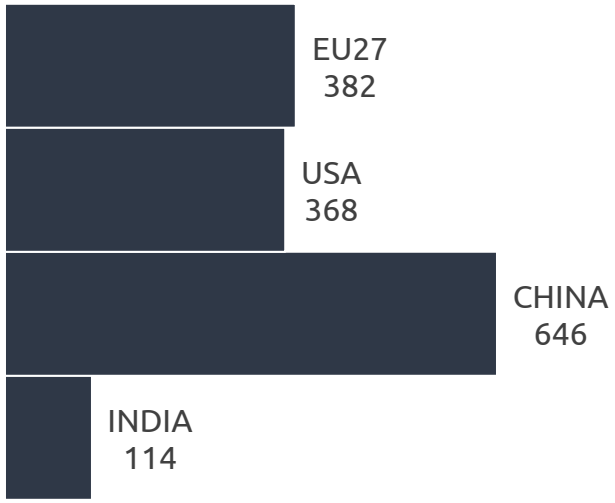
Data source: Italy for Climate analysis of IEA data

Since the Paris Agreement, global investment in clean energy has grown by almost **80%** and in 2025 it is **almost double** that in fossil fuels

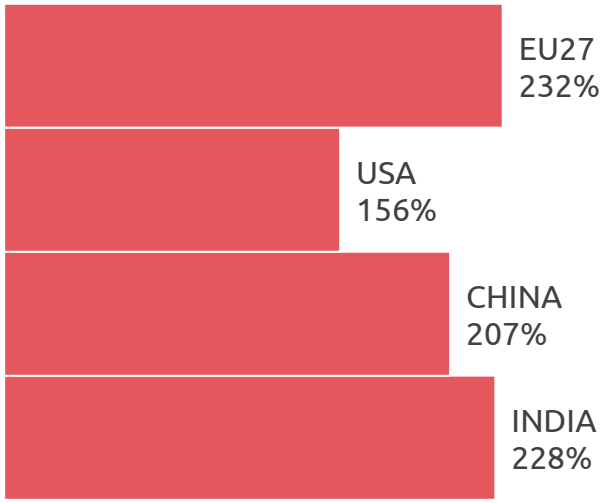
In the year of the Paris Agreement **energy sector investment** was $2.6 trillion, in 2025 **it rose to $3.3 trillion**. This growth was driven entirely by investment in clean energy, which in 2015 accounted for about 44% of total investment and in 2025 overtook fossil fuels, reaching 65% of global energy investment.

Big emitters compared: investment in clean energy

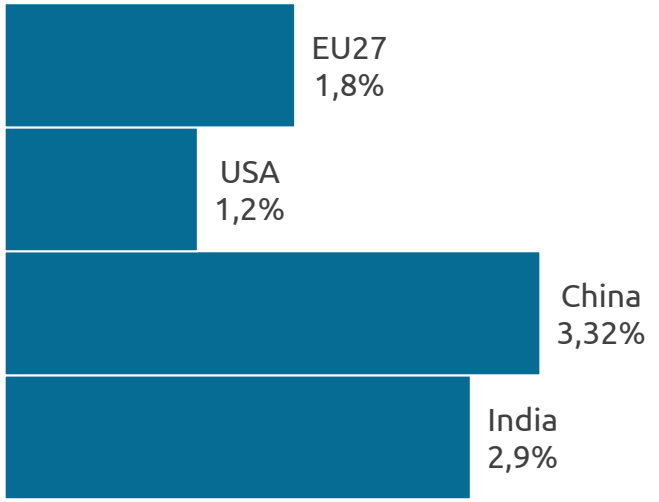
INVESTMENT IN GREEN ENERGY, 2025, $ BILLION



SHARE OF GROWTH IN GREEN INVESTMENT 2015-2025



GREEN INVESTMENT AS A SHARE OF GDP, 2025



Data source: Italy for Climate analysis of IEA data

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Authors: Andrea Barbabella, Chiara Montanini, Ludovica Saccone

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I4C Italy for Climate

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FONDAZIONE PER LO SVILUPPO SOSTENIBILE
Sustainable Development Foundation

in partnership with

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Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile

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