



20
25

GLOBAL ENERGY TRENDS

Edition

Continued growth in energy
consumption and emissions

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Authors:

Géraldine DUFFOUR
Senior Analyst

Quentin BCHINI
Energy – Climate Expert



Chapter 1

2023 & 2024 DATA BENCHMARKS

- ➔ Key energy & climate figures for G20
- ➔ Trends by energy for G20
- ➔ Summary

Key energy & climate figures for G20*

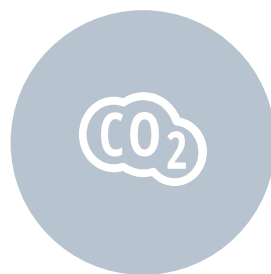
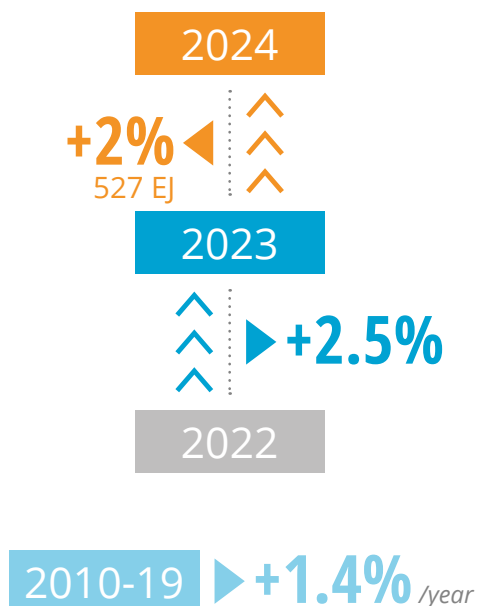


*G20 countries represent approximately **80%** of global energy consumption.



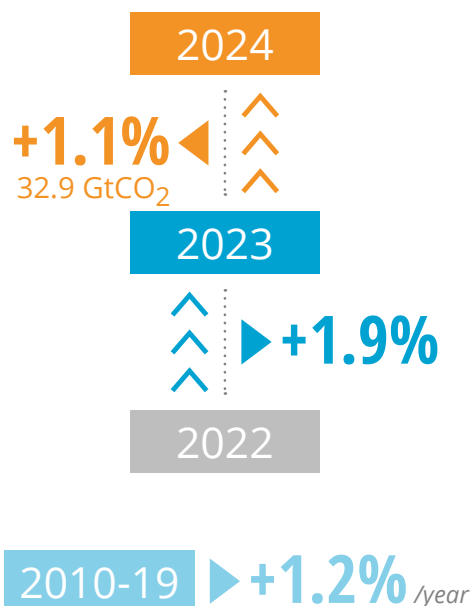
ENERGY CONSUMPTION

Faster growth than historical pace



CO₂ EMISSIONS***

Steady growth



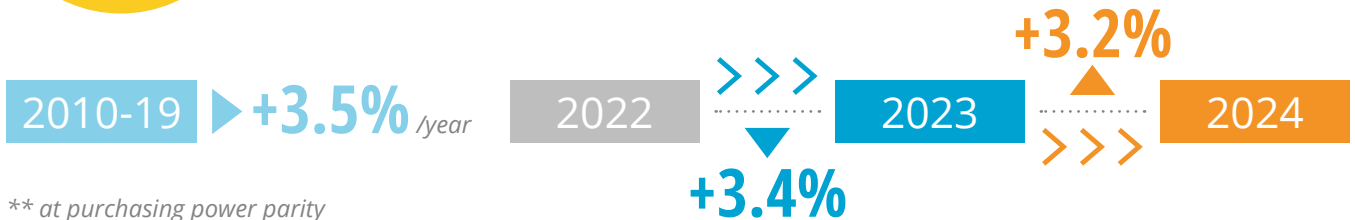
Source: Enerdata – www.enerdata.net

*** CO₂ emissions from energy combustion (> 80% of all CO₂ emissions) and from industrial processes



ECONOMIC GROWTH**

In line with its historical trend

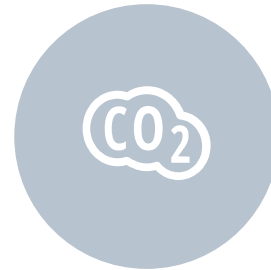
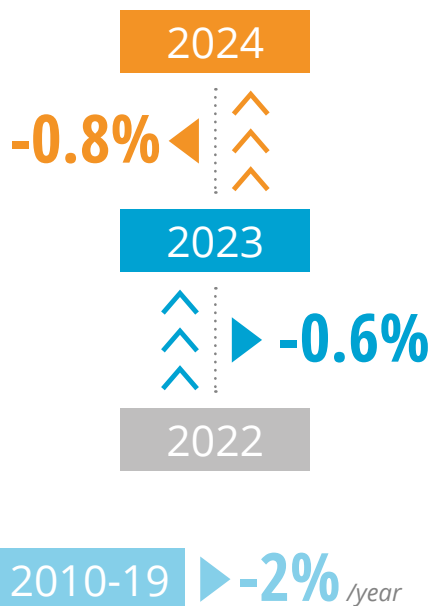


** at purchasing power parity



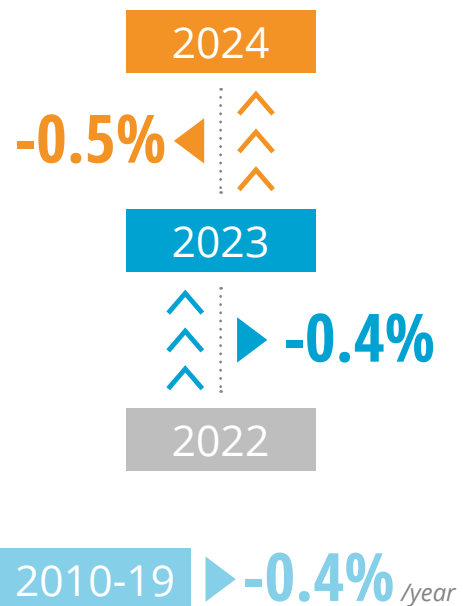
ENERGY INTENSITY

Slow improvement



CARBON FACTOR****

Small decrease



**** CO₂ emissions from energy combustion / energy consumption

Source: Enerdata – www.enerdata.net



ECONOMIC GROWTH

GDP grew by its average rate of 3%/year in 2024

In **2024, economic growth**** was **close to its 2010-2019 average**. It was **strong in non-OECD countries** (+4.8%), such as China, India, Indonesia, Russia and Brazil. **China's GDP grew by 5% in both 2023 and 2024, below its average +7%/year over the 2010-2019 period, due to the lingering effects of the real estate crisis**, but the country still accounted for 25% of the G20's GDP in 2024. Economic growth was **slower in OECD countries** (+1.8%), even though economic growth remained steady in the USA (+3%) and strengthened in the EU (+1%). Overall, **all G20 countries experienced GDP growth in 2024, except Germany and Argentina**.

GDP growth (%/year) in G20 countries

2010-2019 2023 2024

%
/G20*

USA

19%
/G20

+2.4% +2.9% +2.8%

Brazil

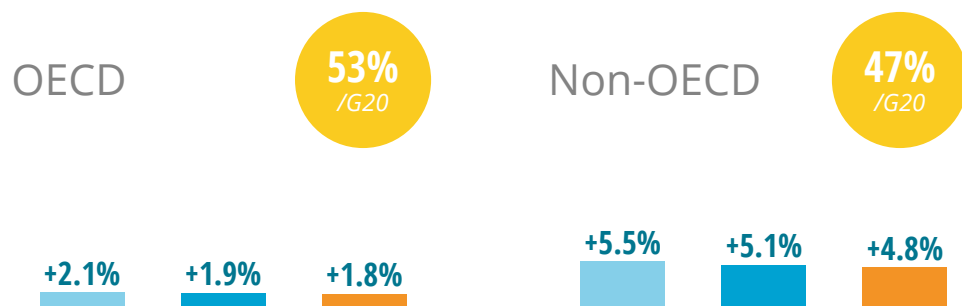
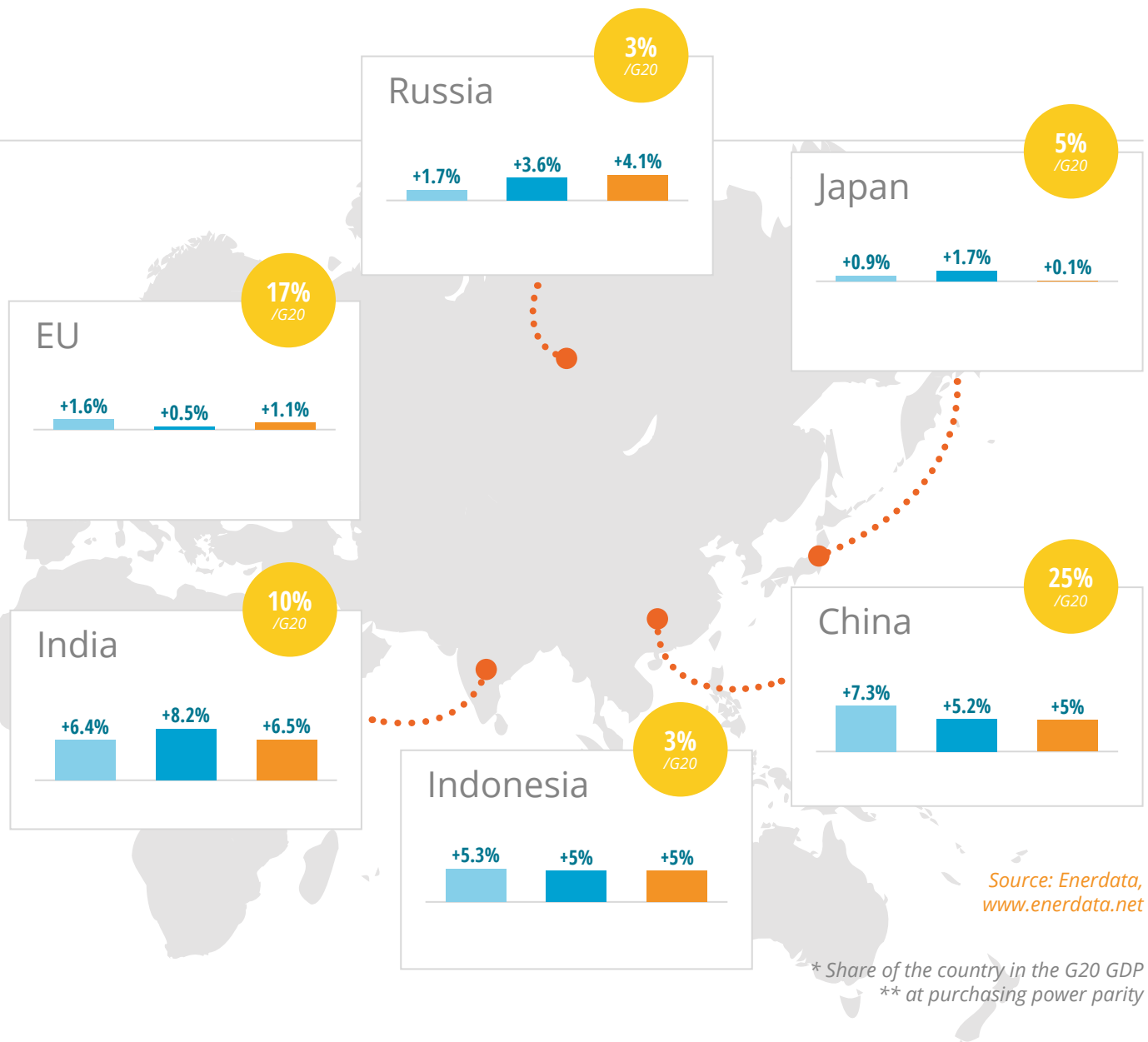
3%
/G20

+0.7% +2.9% +3.4%

G20



+3.5% +3.4% +3.2%





ENERGY CONSUMPTION

**rose by 2% in
2024, faster than
2010-2019**

The **G20's energy consumption increased by 2% for the third consecutive year in 2024**, outpacing its 2010-2019 trend (+1.4%/year). It **grew rapidly in non-OECD countries**, especially China (+4%), India (+5%) and Indonesia (+6%). Despite a slowdown in 2024, **China still accounted for 35% of the G20's energy consumption, consuming twice as much energy as the USA.**

India also reached 10% of the G20's energy consumption in 2024, – nearly as much as the EU's energy consumption.

Energy consumption **stagnated in OECD countries** (+0.4%), after two years of decline, with a 1% in the USA and continued stagnation in the EU (-0.4%).

Total G20 energy consumption growth (%/year)

2010-2019 2023 2024

%
/G20*

USA

17%
/G20

0% -0.7% +0.8%

Brazil

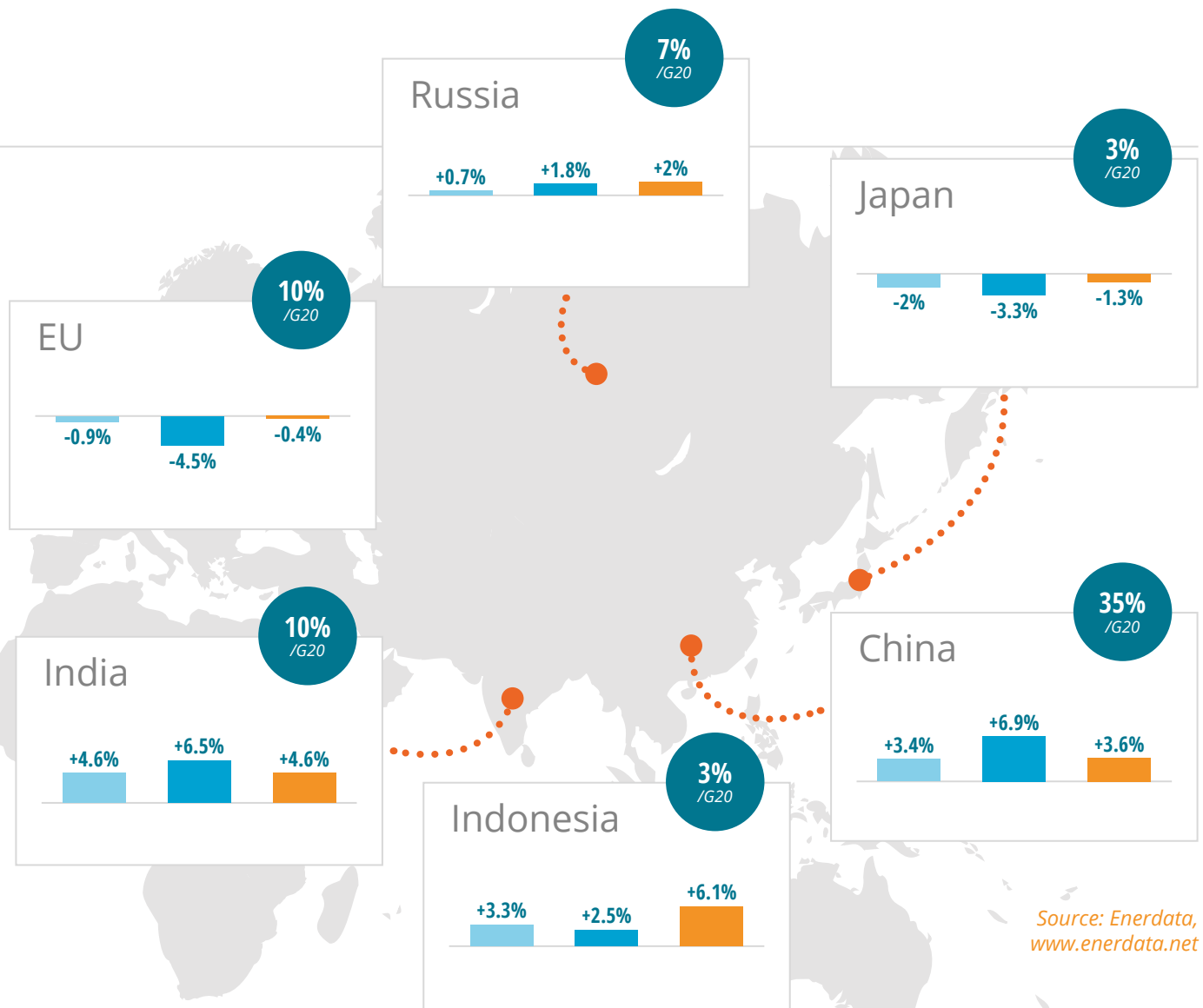
3%
/G20

+0.9% 4.7% -1.7%

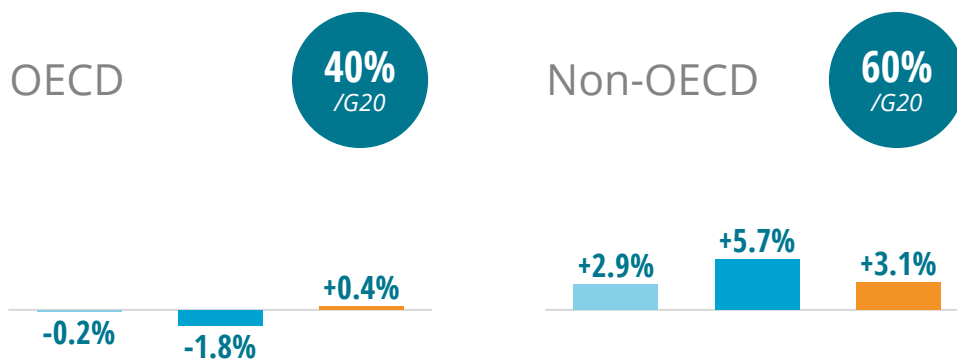
G20



+1.4% +2.5% +2%



* Share of the country in the G20 energy consumption





FINAL ENERGY INTENSITY*

Slow improvements in 2024 (-0.8%)

Final energy intensity (final energy consumption per unit of GDP) **has been declining since 2010 in the G20, thanks to structural effects** (energy efficiency improvements, economy tertiarisation, etc.) that have been **partly offset by new energy uses** (data centers, cooling, SUVs in transports, etc.). **Improvements have slowed in recent years** (-0.8% in 2024), **especially** in non-OECD countries such as **China**, where **energy consumption is rising rapidly. This rate of improvement is incompatible with the 2 °C objective**, which requires a 3% annual reduction in energy intensity.

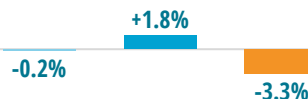
Final energy intensity trends (%/year) in G20 countries

2010-2019 2023 2024

USA



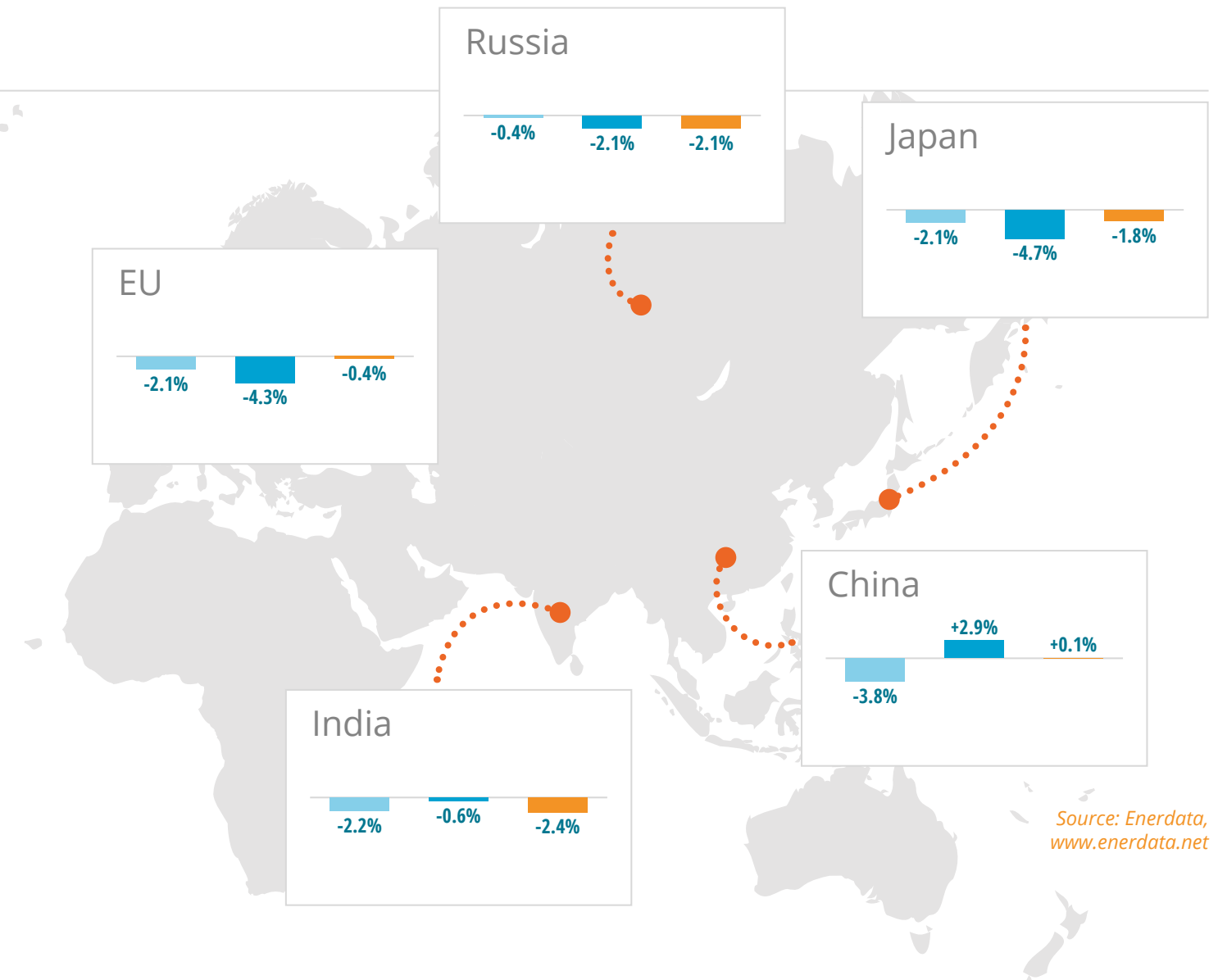
Brazil



* "Final energy intensity" = final energy consumption / GDP

G20





OECD

Non-OECD





CO₂ EMISSIONS

Slower growth in 2024, spurred by China and India

Total CO₂ emissions from energy combustion and industrial processes in the G20 increased again in 2024 (+1.1%), consistent with their 2010-2019 average.

The **largest contributors** to this growth were **coal-dependent countries** – **China, India, and Indonesia** – which together **accounted for 55% of the G20's emissions**.

However, the **growth in global renewable power generation helped slow emissions growth** in China and India and reduced them in OECD countries (-0.7%). This rate of improvement remains **insufficient** to decarbonise the G20 economy and **meet a 2 °C pathway**.

CO₂ emissions (%/year) in G20 countries

2010-2019 2023 2024

%
/G20*

USA

14%
/G20

-1.2%

-3.5%

-0.7%

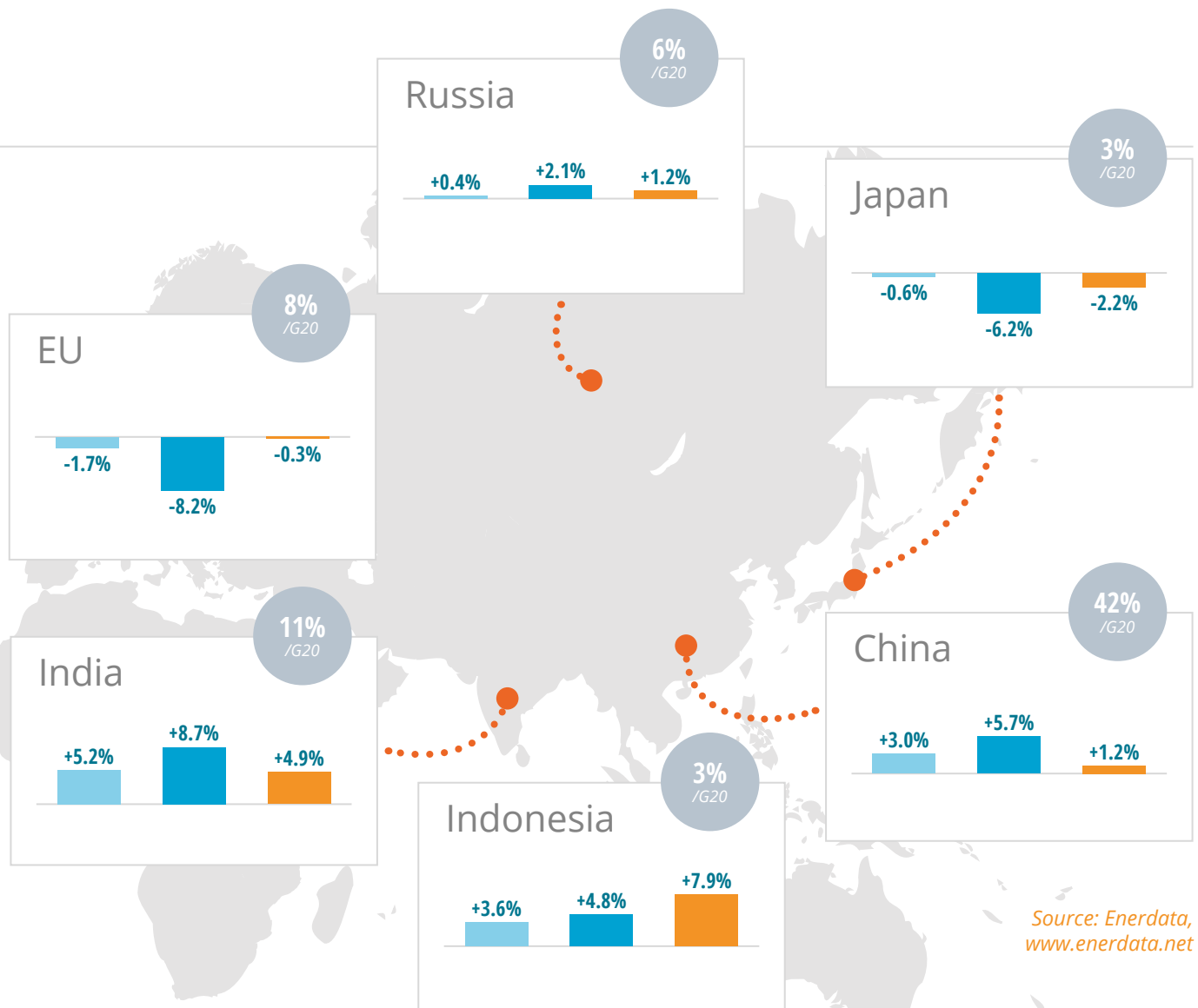
G20



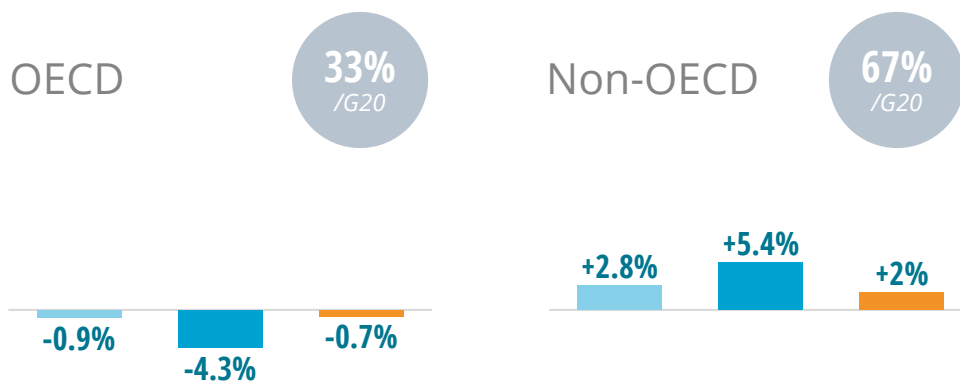
+1.2%

+1.9%

+1.1%



*Share of the country in the G20 CO₂ emissions





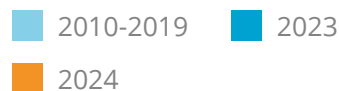
CARBON FACTOR*

A very slow decline in the carbon factor, insufficient to meet global targets

The G20's carbon factor declined slightly in 2024 (-0.5%), with a **stagnation** in **non-OECD countries** (-0.3%) and a **1.1% drop** in **OECD countries**.

The carbon factor dropped by around 1% in China, Japan, and the USA, while remaining broadly flat in India, the EU, and Brazil. These **slow improvements** in carbon factors make it **increasingly difficult to stay on a 2 °C pathway**, as **fossil fuels still cover over 80% of the G20's primary energy consumption** and 60% of its power mix in 2024.

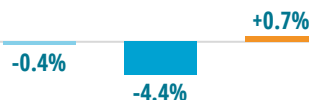
Carbon factor trends (%/year) in G20 countries



USA



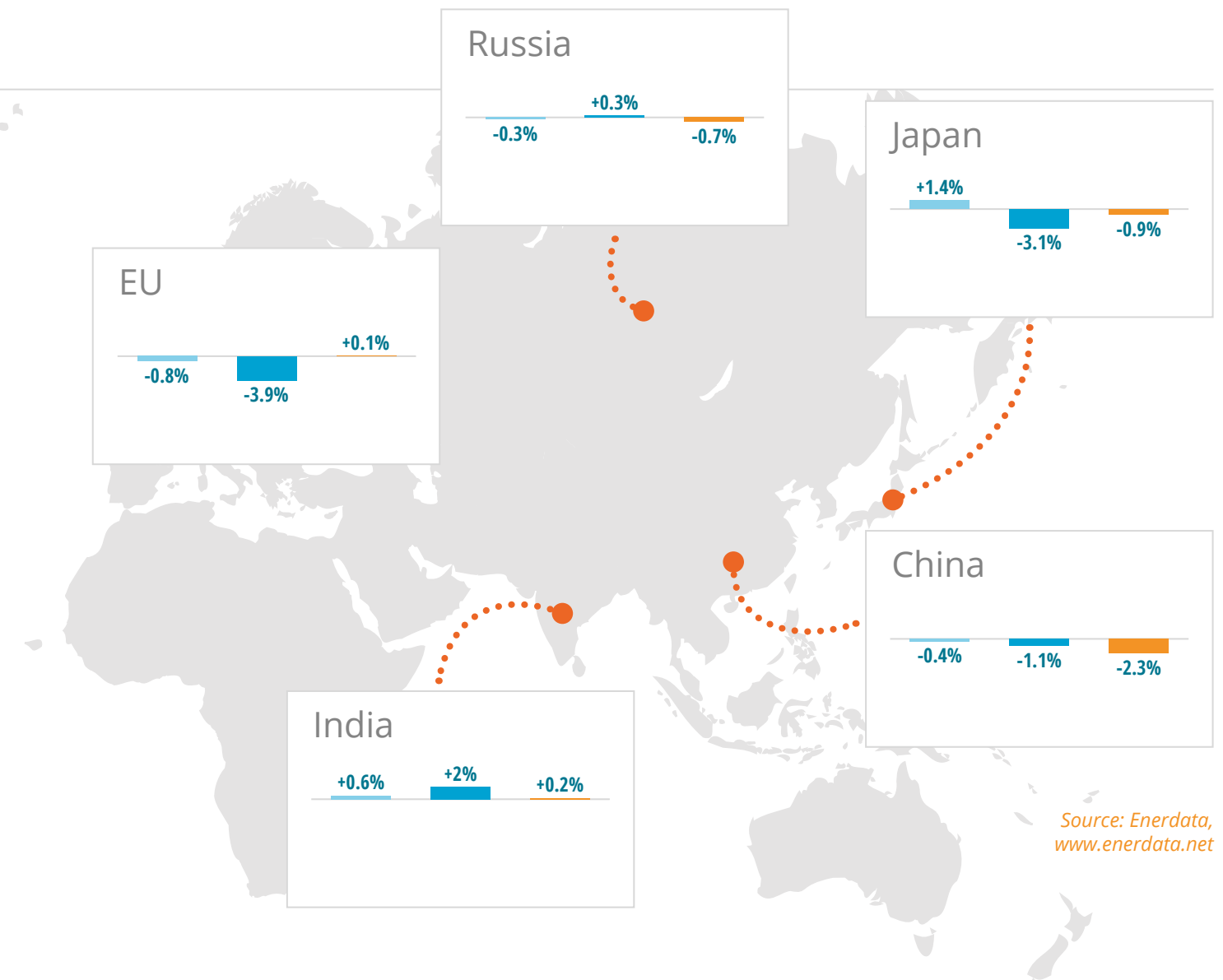
Brazil



*"Carbon factor" = CO₂ emissions / energy consumption

G20

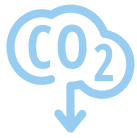




OECD

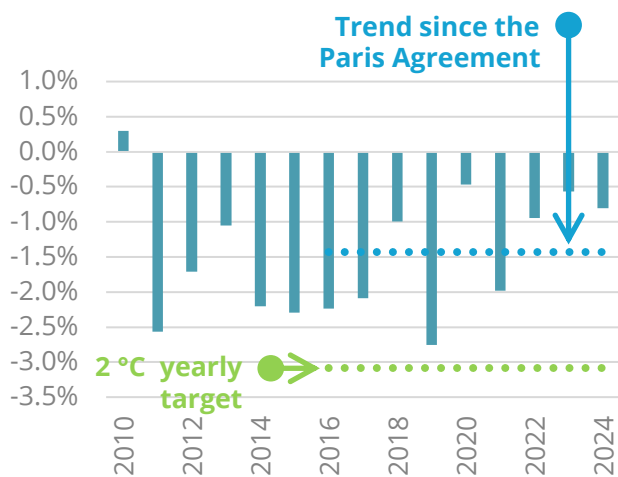
Non-OECD



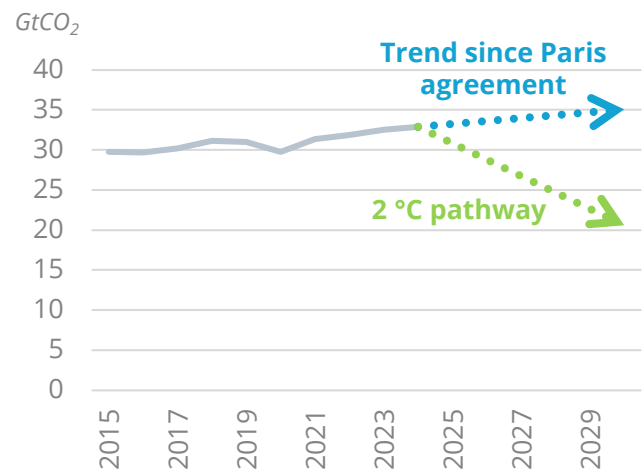


DECARBONISATION EVOLUTION

Energy intensity
evolution: G20

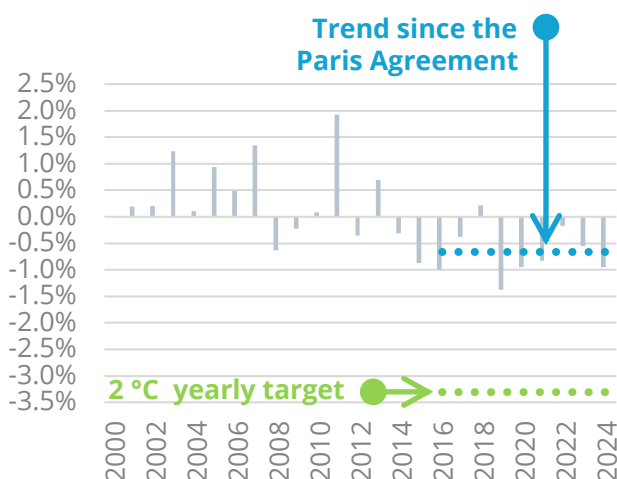


Energy-related*
CO₂ emissions (combustion): G20

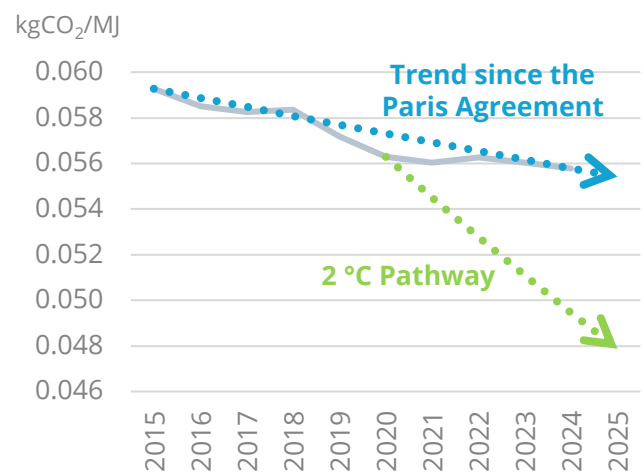


*The CO₂ emissions considered are related to energy combustion

Carbon factor
evolution: G20



Carbon factor
trend: G20



Source: Enerdata – www.enerdata.net



The G20's carbon factor declined very slightly in 2024.

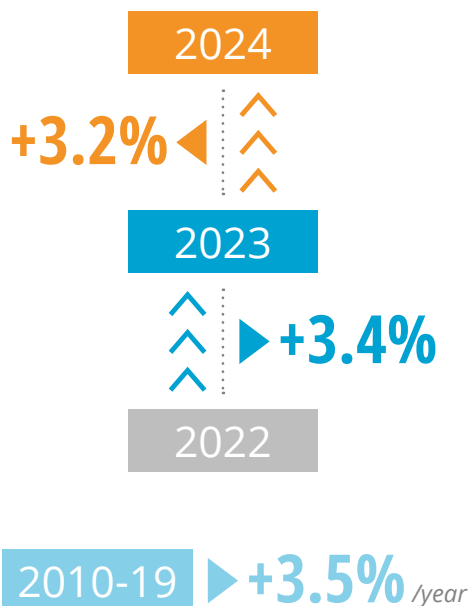
The **G20's carbon factor** registered a **modest decrease** (-0.5%, close to its 2010-2019 trend), with a stagnation in non-OECD countries (-0.3%) and a 1.1% drop in OECD countries. The carbon factor dropped by around 1% in China, Japan, and the USA, while remaining broadly flat in India, the EU, and Brazil. The **G20's energy consumption remains too CO₂-intensive**, as **fossil fuels** still cover over **80% of the G20's primary energy consumption** and **60% of its power mix** in 2024.

These **slow improvements** in carbon factors make it **increasingly difficult to stay on a 2 °C pathway**, since a 3%/year decrease would be required to meet global targets.

Trends by energy for G20



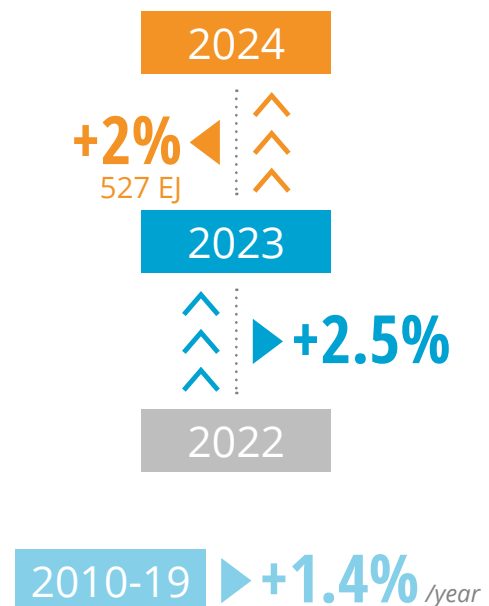
ECONOMIC GROWTH*
is in line with its historical trend



* at purchasing power parity



ENERGY CONSUMPTION
is growing faster than its historical pace

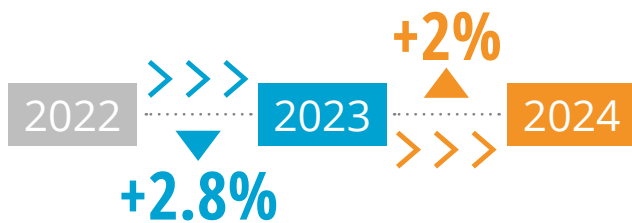


Source: Enerdata – www.enerdata.net



COAL – 34%

The share of coal in the G20's primary energy consumption

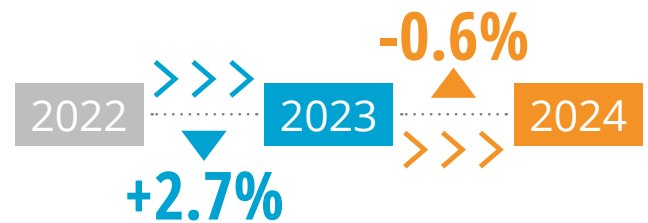


2010-19 ▶ +0.7% /year



OIL – 27%

The share of oil in the G20's primary energy consumption



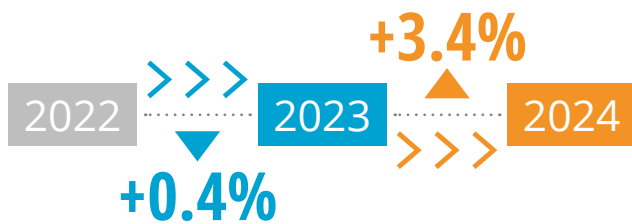
2010-19 ▶ +1% /year

Source: Enerdata
www.enerdata.net



GAS – 21%

The share of gas in the G20's primary energy consumption

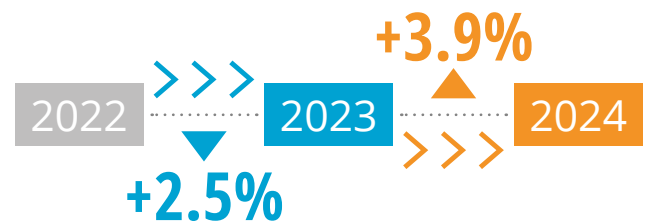


2010-19 ▶ +2.2% /year



ELECTRICITY – 23%

The share of electricity in the G20's final energy consumption



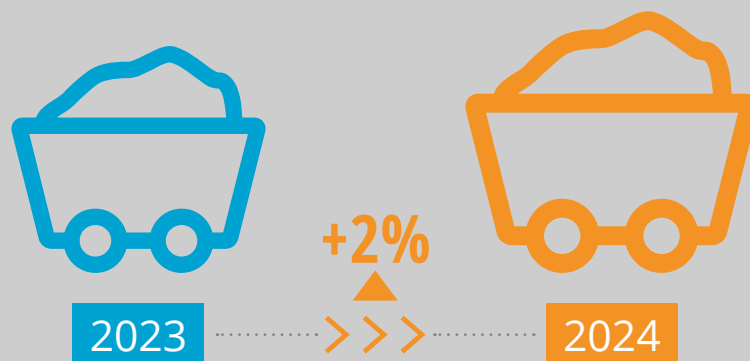
2010-19 ▶ +2.6% /year



COAL



Consumption continues to rise by 2% in 2024, driven by China, India, and Indonesia

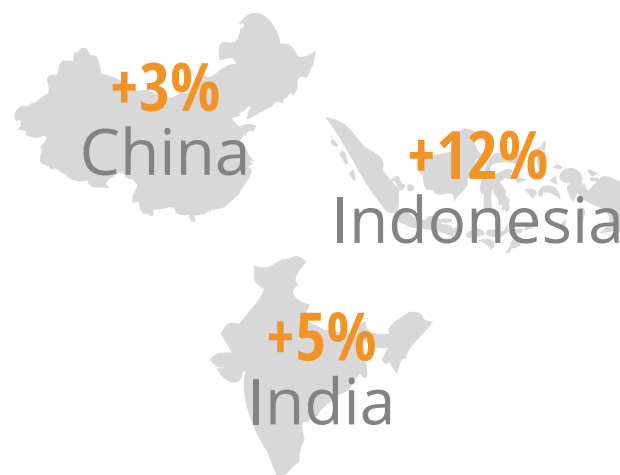


Continuous growth in non-OECD countries and fall in OECD countries.

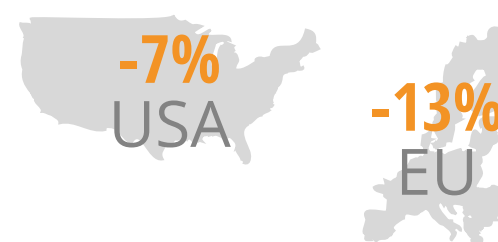
In 2024, **China, India, and Indonesia** – accounting for **81% of G20 coal demand** – were the **main drivers of rising coal consumption**, despite a slowdown in China (+3%, partly due to lower demand from the cement sector) and India (+5%, due to higher renewable power generation). Coal consumption also rose in Australia (due to lower renewable generation), and in South Africa (thanks to improved power plant availability). **In contrast, coal phase-out policies and rising renewable power generation helped reduce consumption in OECD countries** (-6%), with significant declines in the USA, the EU, South Korea and the UK.

► Key data

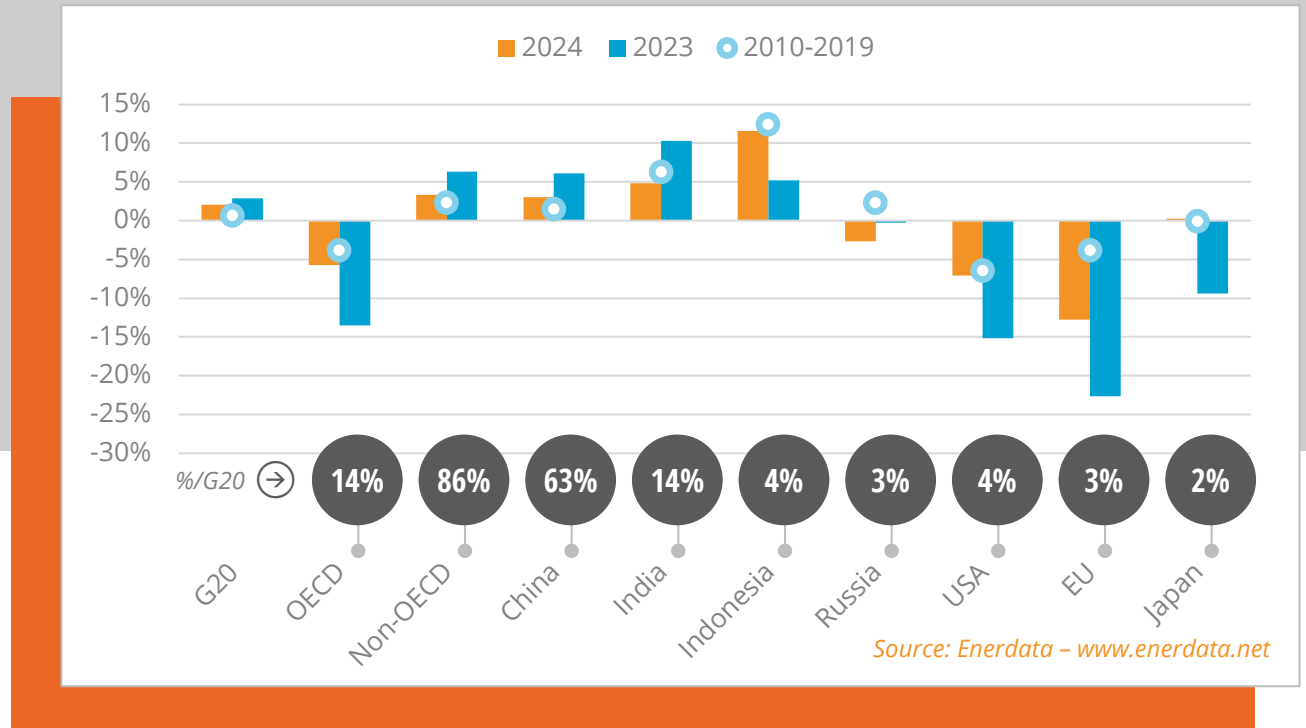
➔ **New increase in consumption in Asian coal producers.**



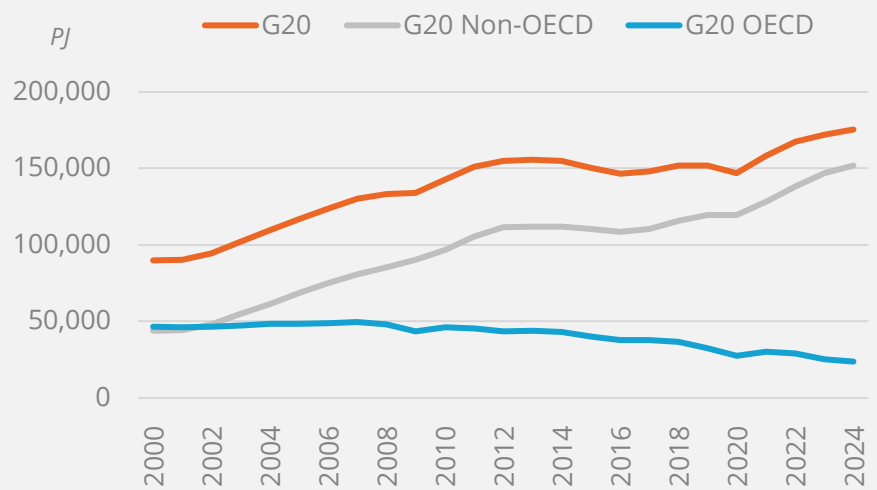
➔ **Continuous decrease in OECD countries over coal phase-out policies.**



Trends in coal consumption in G20 countries (%/year)



Primary consumption of coal (PJ)





OIL



Slight decline in oil consumption in 2024, due to China and the USA



2023



-0.6%



2024

After rising 2.7% in 2023, oil demand dipped by 0.6% in 2024, despite lower oil prices.

Oil consumption slowed down in the USA (+1%, as the higher petrochemical demand was offset by lower demand from transport sector). It dipped in China (-1%), following a 11% surge in 2023, driven by the rapid deployment of EVs and LNG-fueled trucks. **Both countries** now account for **23% of G20 oil demand**. Oil demand also declined in the EU (-1%, consistent with its 2010-2019 average), Saudi Arabia, Russia, Japan and Brazil.

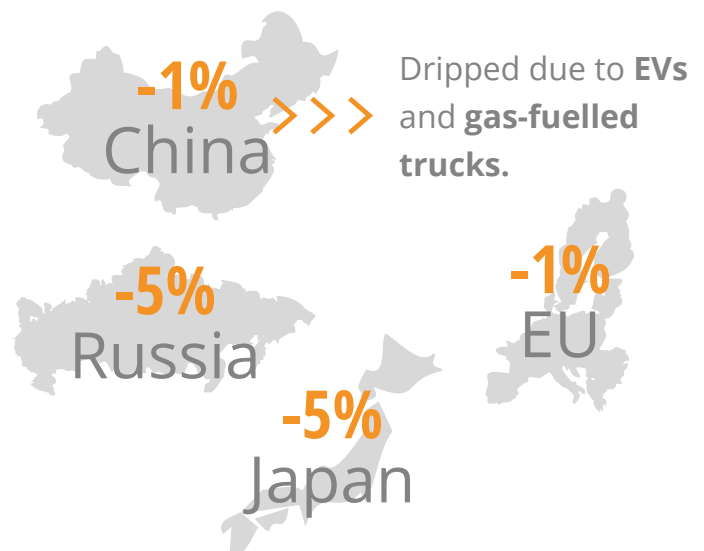
In contrast, it rose in India (+3%) supported by economic growth and increasing car ownership, in South Korea and Mexico.

Despite a **2.5% decline in 2024**, **global crude oil prices remained 28% higher than in 2019**.

► Key data

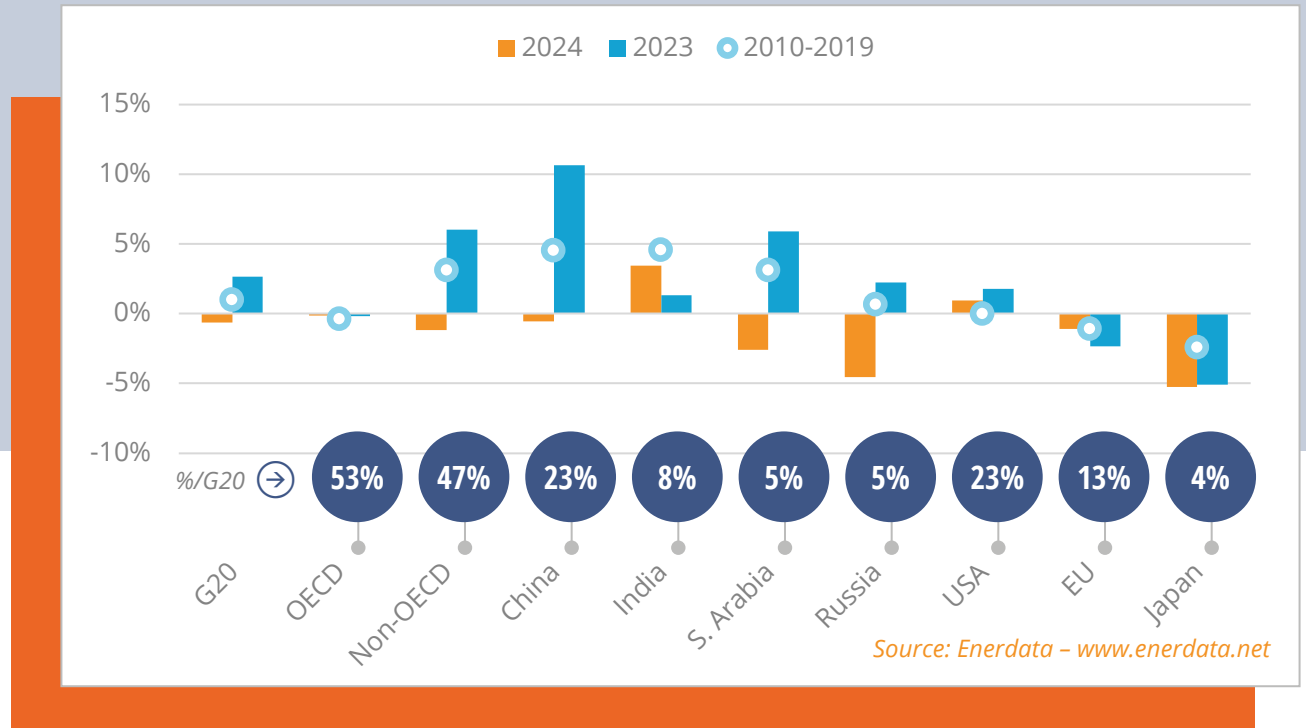


Decline in major non-OECD countries.

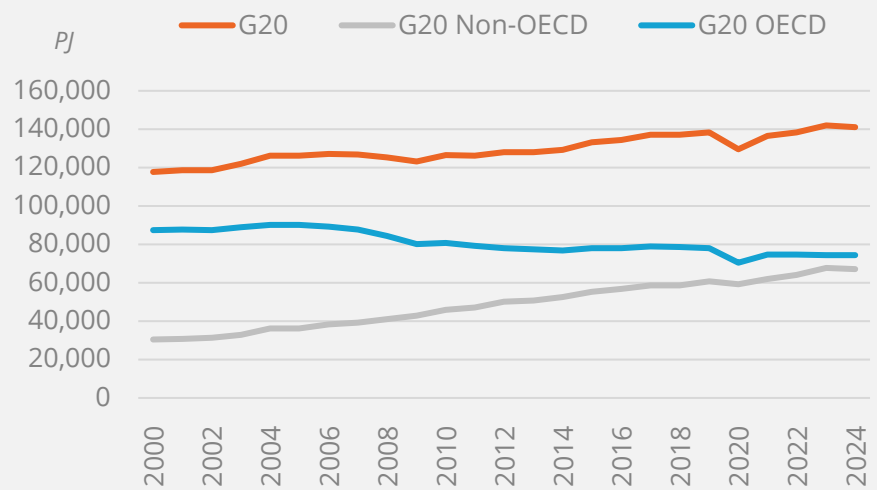


Lower but volatile world oil prices, with rising production in the USA vs. OPEC+ production cuts and geopolitical uncertainties.

Trends in oil consumption in G20 countries (%/year)



Primary consumption of oil (PJ)





Strong rebound in gas consumption despite high gas prices (lower than in 2023)



Rising gas consumption in the three largest consumers: the USA, Russia, and China.

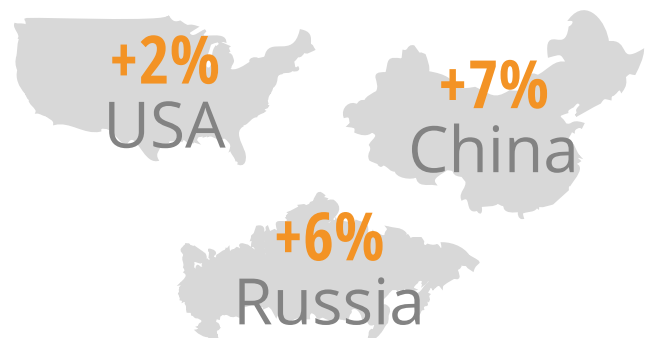
In 2024, gas consumption rebounded by 2% in the USA (driven by the power sector). It rose by 6% in Russia (due to the domestic gasification policy) and by over 7% in China (supported by the power sector and LNG-based transport). **These three countries account for 61% of the G20 gas consumption.**

Whereas it remained stable in the EU and Japan, gas consumption rose by 7% in both India and South Korea (driven by higher demand from the power sector).

Global gas prices fell by around 15% in 2024; European and Asian LNG prices remain above their 2019 average, while USA LNG prices are now 15% lower, due to high domestic output.

► Key data

➔ Global growth driven by the two largest consumers.

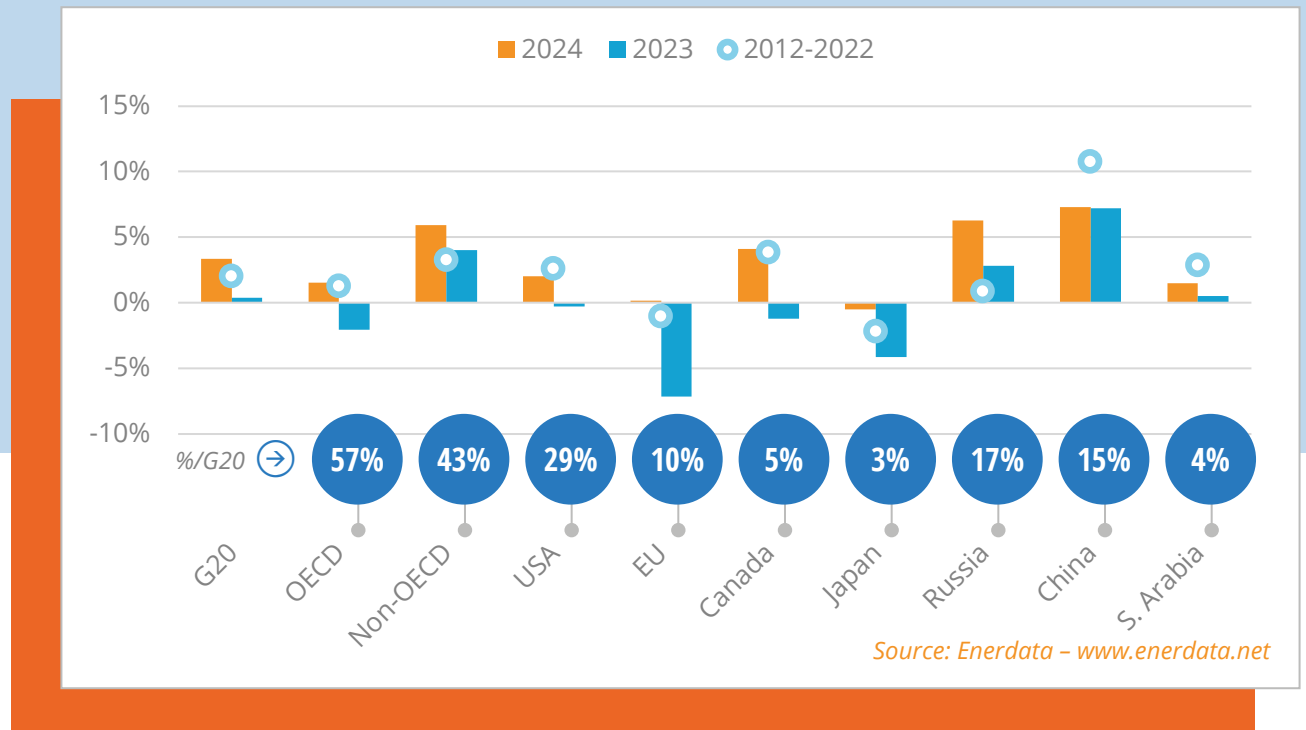


+6%
NON-OECD >>> Strong rebound

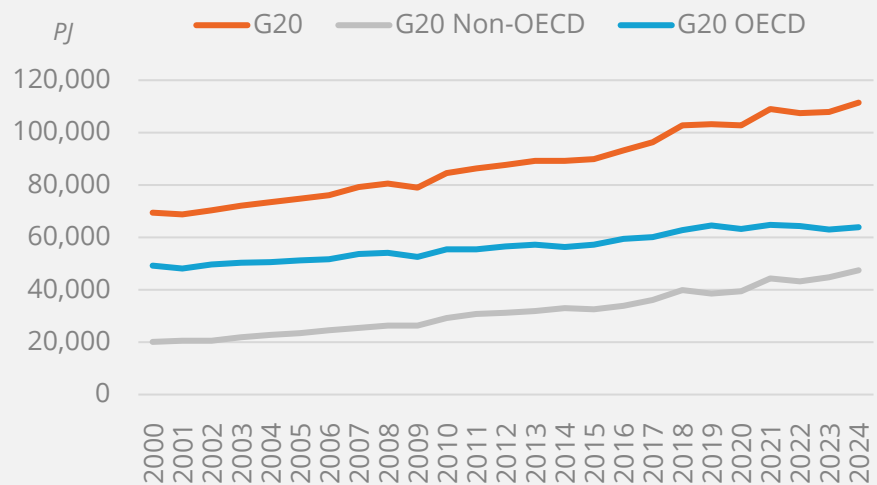
➔ Gas prices fell in 2024.



Trends in gas consumption in G20 countries (%/year)



Consumption of natural gas (PJ)





ELECTRICITY



Electricity consumption rises, especially in China, the USA, and India



2023

+3.9%



2024

China accounted for 66% of the growth in G20 electricity consumption.

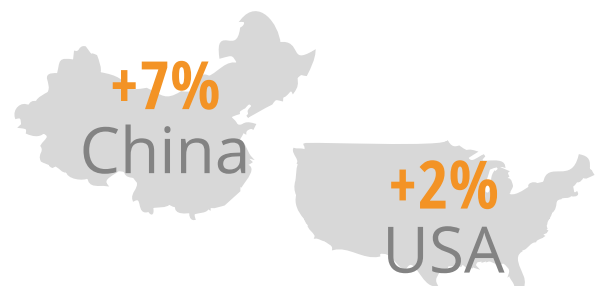
Electricity consumption grew by **4% in 2024, outpacing its 2010-2019 average**. It rose in the **two largest consumers** – **China** (39% of the G20 electricity demand) and **the USA** (18%) – driven by higher industrial demand (including from data centres), building cooling needs amid heatwaves, and EV charging. **China alone accounted for two thirds of the consumption increase**.

Electricity consumption also rose in the EU (+1%, with stagnation in Germany and France), India (+4% due to increased electrification and heatwaves), Russia and Brazil. Overall, it **grew in all countries**, except Argentina, which was hit by the economic crisis.

► Key data



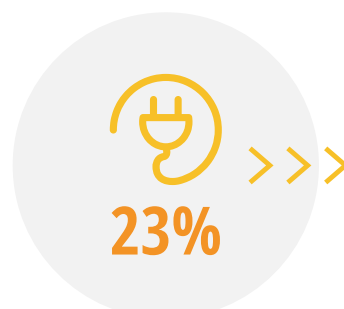
Global growth, especially in the two largest consumers.



Higher growth in non-OECD than in OECD.

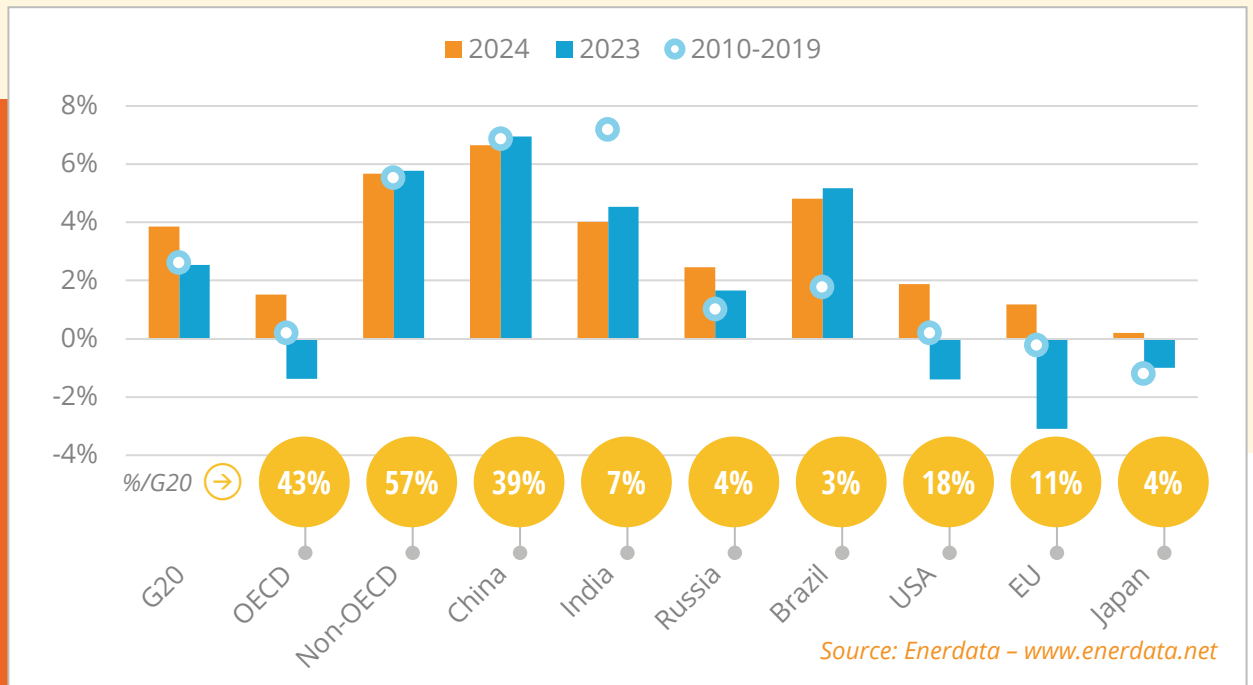
+6%
NON-OECD

+2%
OECD

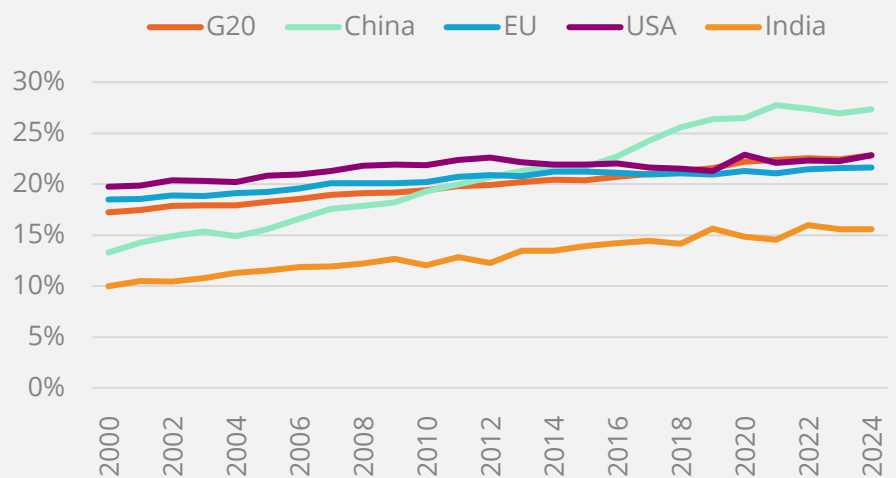


The share of electricity in the G20's final energy consumption (up from 17% in 2010).

Trends in electricity consumption in G20 countries (%/year)



Electricity share in final consumption



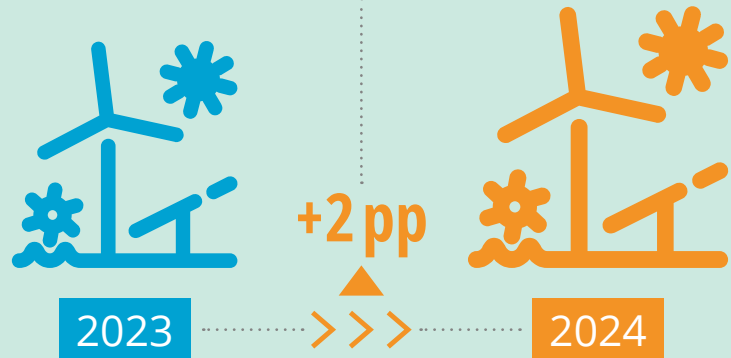


ENERGY MIX

Growth in renewable energy, yet fossil fuels remain dominant



Increase in the share of wind and solar in the power mix, in percentage points

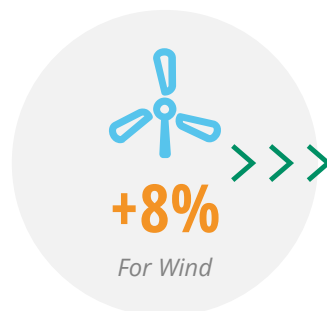


Fossil fuel consumption keeps rising, including in the power sector.

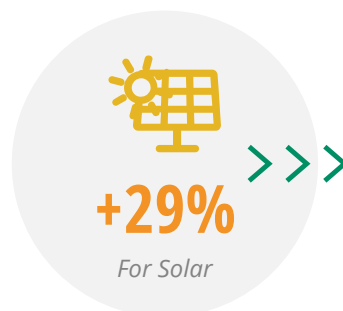
Fossil fuels accounted for **over 80%** of the **G20's primary energy consumption in 2024**. The share of **coal has grown from 27% in 2000 to 34% in 2024**, at the expense of oil (which fell from 35% to 27%). The **shares of gas, primary electricity, and other renewable sources have remained stable**, at 21%, 11%, and 7%. Meanwhile, **thermal power generation** (nearly 60% of the G20 power mix) **continued to rise** (+1% in 2024), though at a **slower pace than renewables** (+16% for wind & solar). Following growth in 2023, **solar and wind generation rose steadily** in 2024 (+29% and +8%), and now cover 7% and 9% of the power mix, respectively.

► Key data

➔ **Fossil fuels fall below the 60% threshold**, while **renewables** continue their rise, reaching **30% of the power mix** in 2023 (vs 19% in 2010)

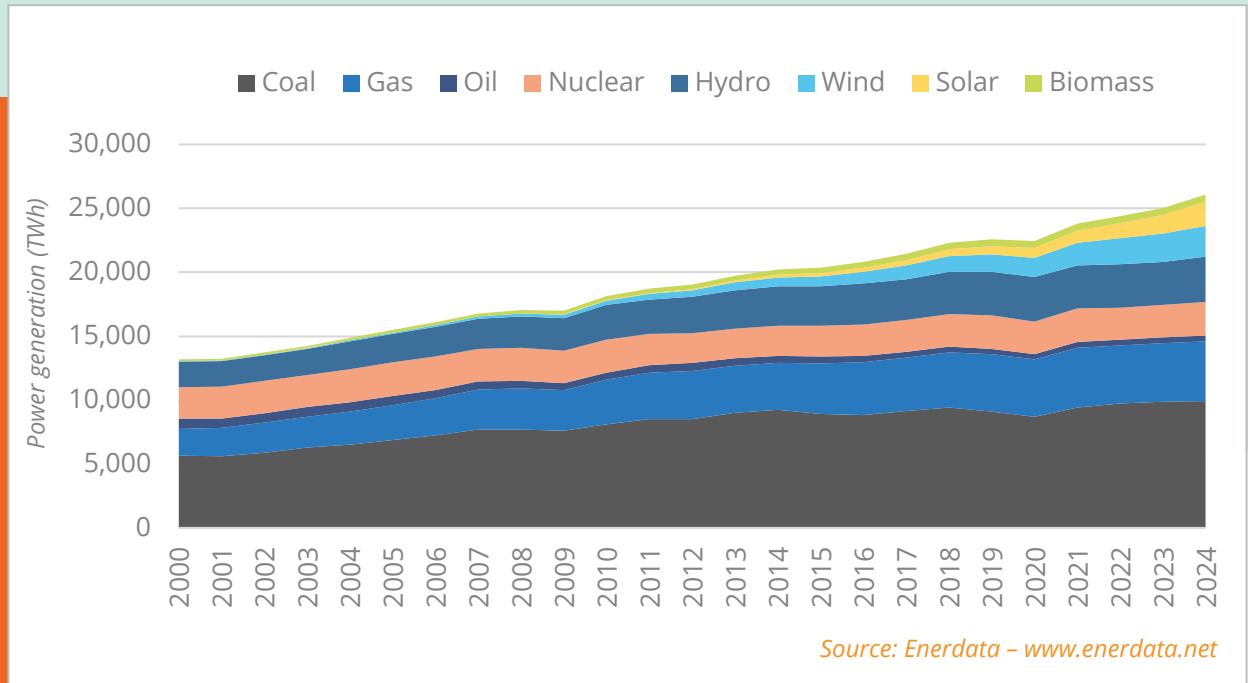


Accounts for **9%** of the power mix (2% in 2010).

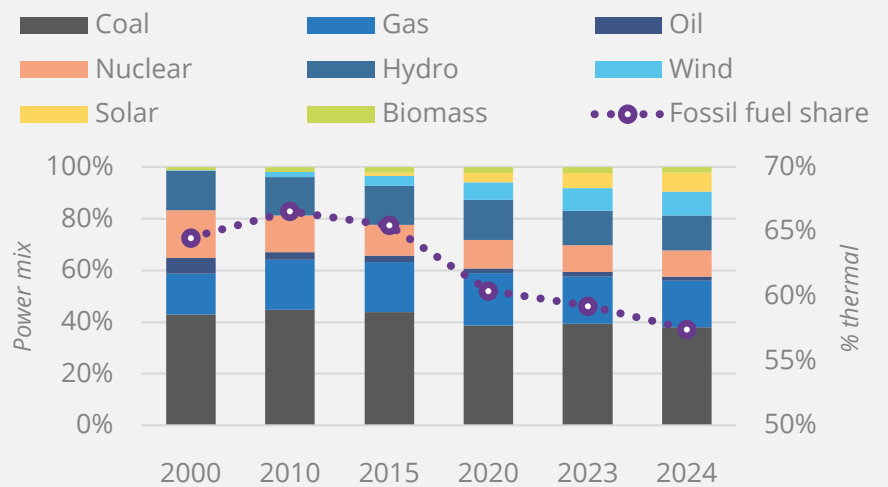


Accounts for **7%** of the power mix (0% in 2010).

Evolution of power generation by source in G20 countries



Power mix – G20



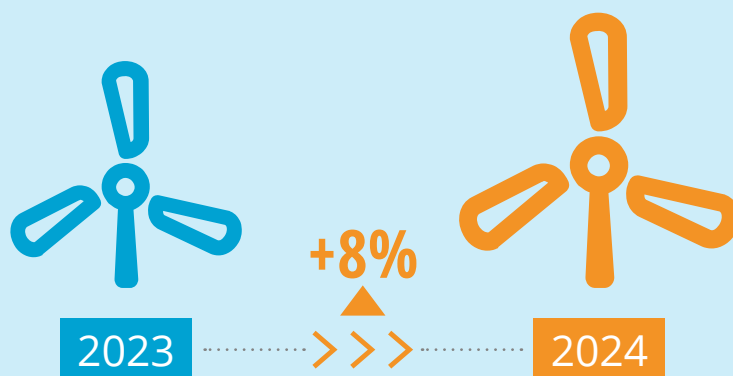
Source: Enerdata – www.enerdata.net



WIND



Wind power generation continues to grow, driven by China



China accounted for three-quarters of new G20 wind capacity, adding 80 GW in 2024.

G20 wind capacity additions slowed slightly in 2024 (+105 GW, after +112 GW in 2023), especially in the EU (+6.3 GW) and the USA (+3.7 GW), but remained stable in India (+3.4 GW). As in previous years, **China accounted for most of the increase in capacity** (+80 GW) and **power generation** (+13%); it now represents **41% of the G20 wind generation** (around 20% each for the EU, the USA, and the rest of the G20).

Overall, **wind generation grew by 8% in 2024, reaching 9% of the G20 power mix**, with double-digit growth in China, Brazil, Canada, and Japan. It rose by 8% in the USA but stagnated in the EU.

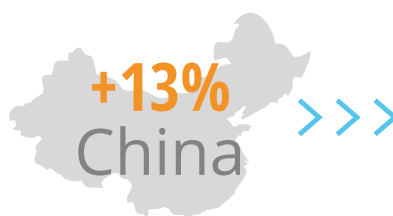
► Key data

➔ **Steady wind installations.**



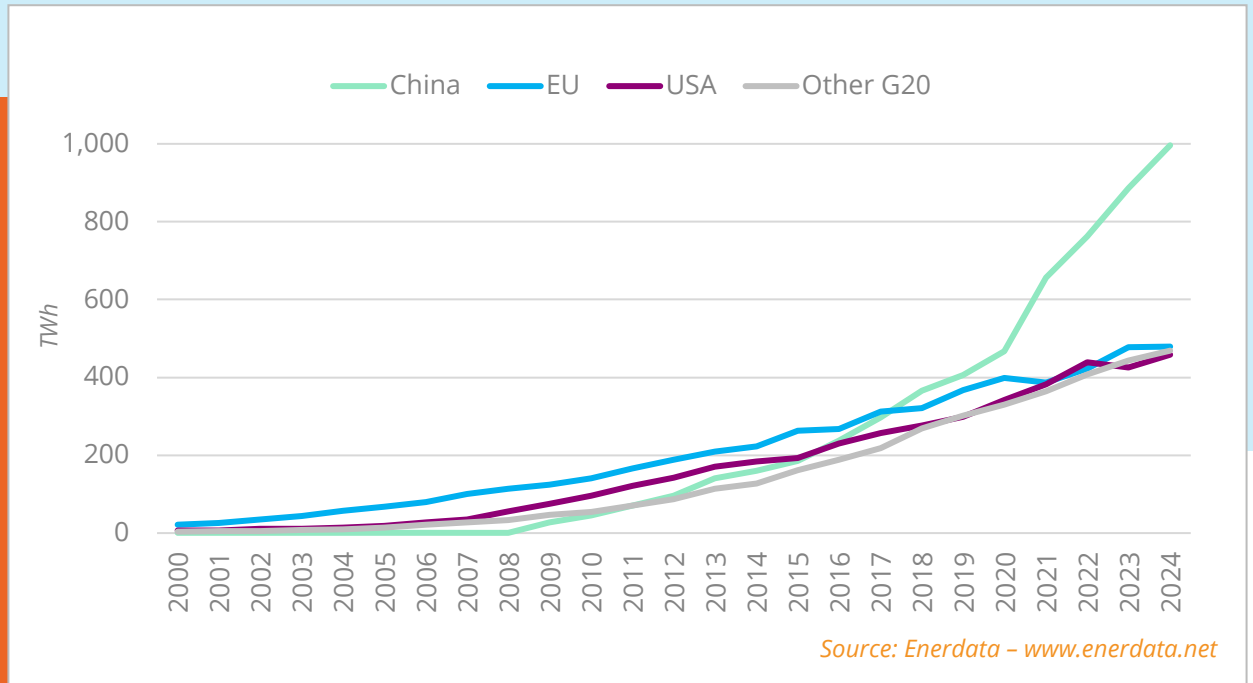
Slow down after 112 GW added in 2023.

➔ **Growth in wind power generation driven by China.**

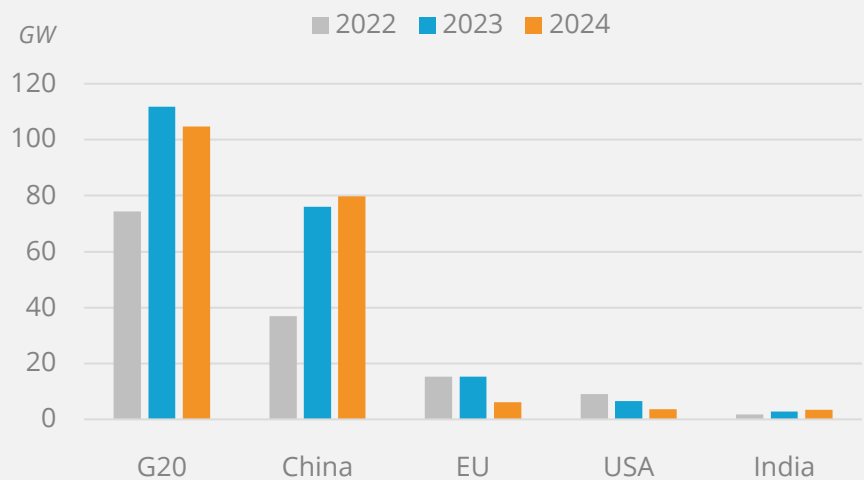


Generates **41% of G20 wind power generation**, as much as the EU and the USA together.

Wind power generation in the main G20 countries (TWh)



Wind power: New capacity additions (GW)

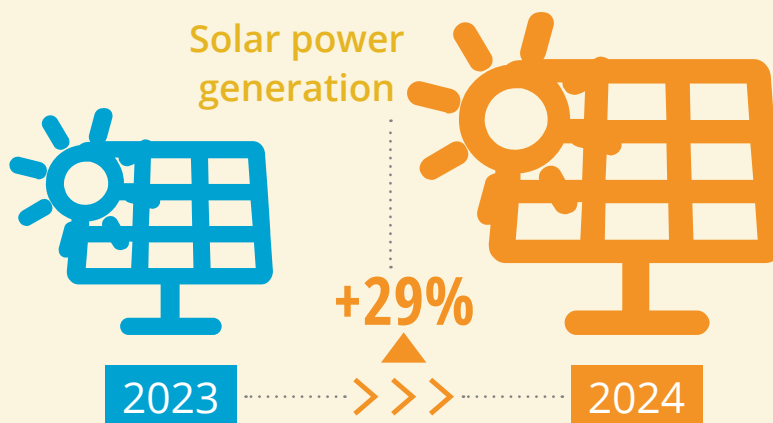




SOLAR



New surge in solar installations in 2024 (+406 GW to 1 722 GW)



China doubled its solar capacity in 2 years, reaching half of the G20 capacity.

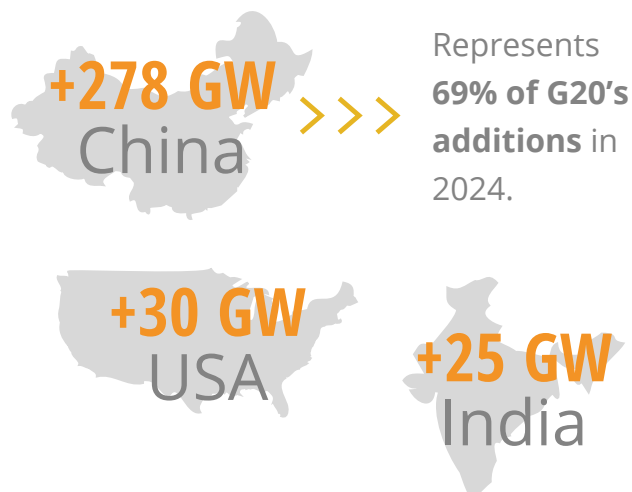
In 2024, **solar installations accelerated further in China** (+278 GW), which accounted for **69% of G20 solar additions**. China's solar capacity **reached 888 GW in 2024**, more than twice its 2022 level and constituting 52% of the G20 solar capacity.

Installations also accelerated in the USA (+30 GW) and **India** (+25 GW) but **slowed in the EU** (+38 GW).

Solar power generation surged by 29% in 2024, spurred by China (+44%), **the USA**, **the EU** (especially in Germany) **India**, and **Brazil**. Overall, **China accounted for 44% of the G20's solar power generation** (equal to the EU, the USA, India, and Japan together).

► Key data

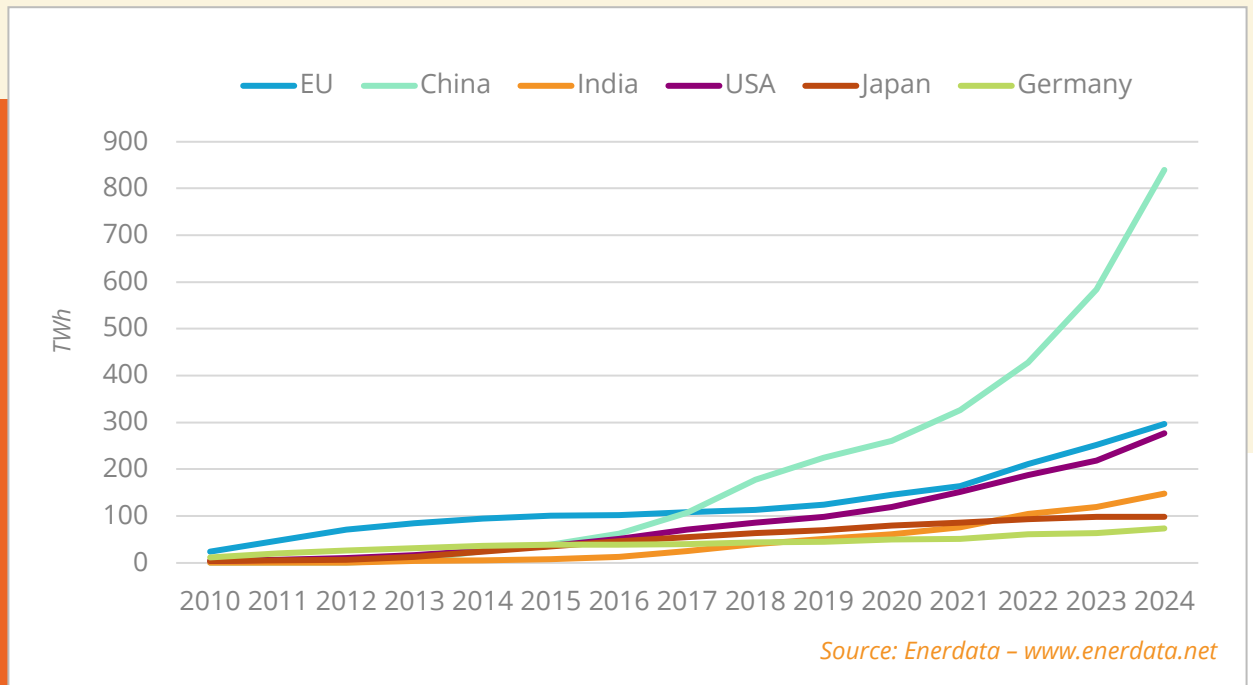
➔ **Installations surged by 406 GW.**



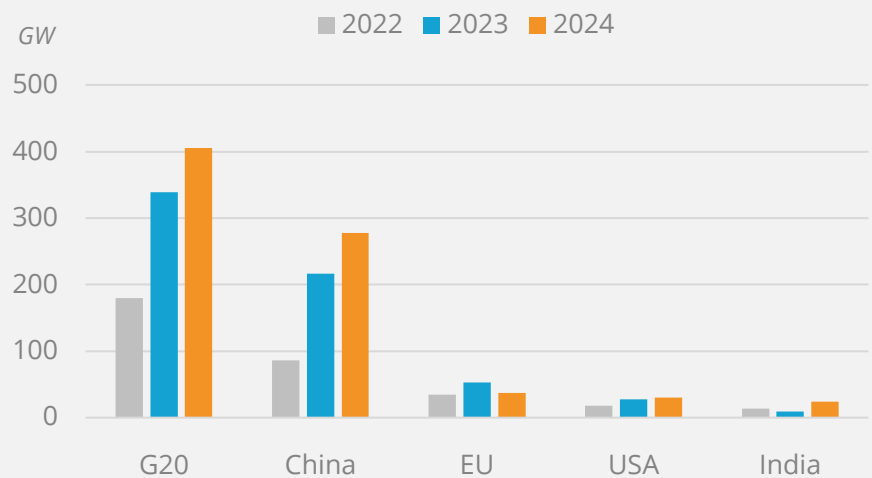
➔ **Slowdown in the EU.**

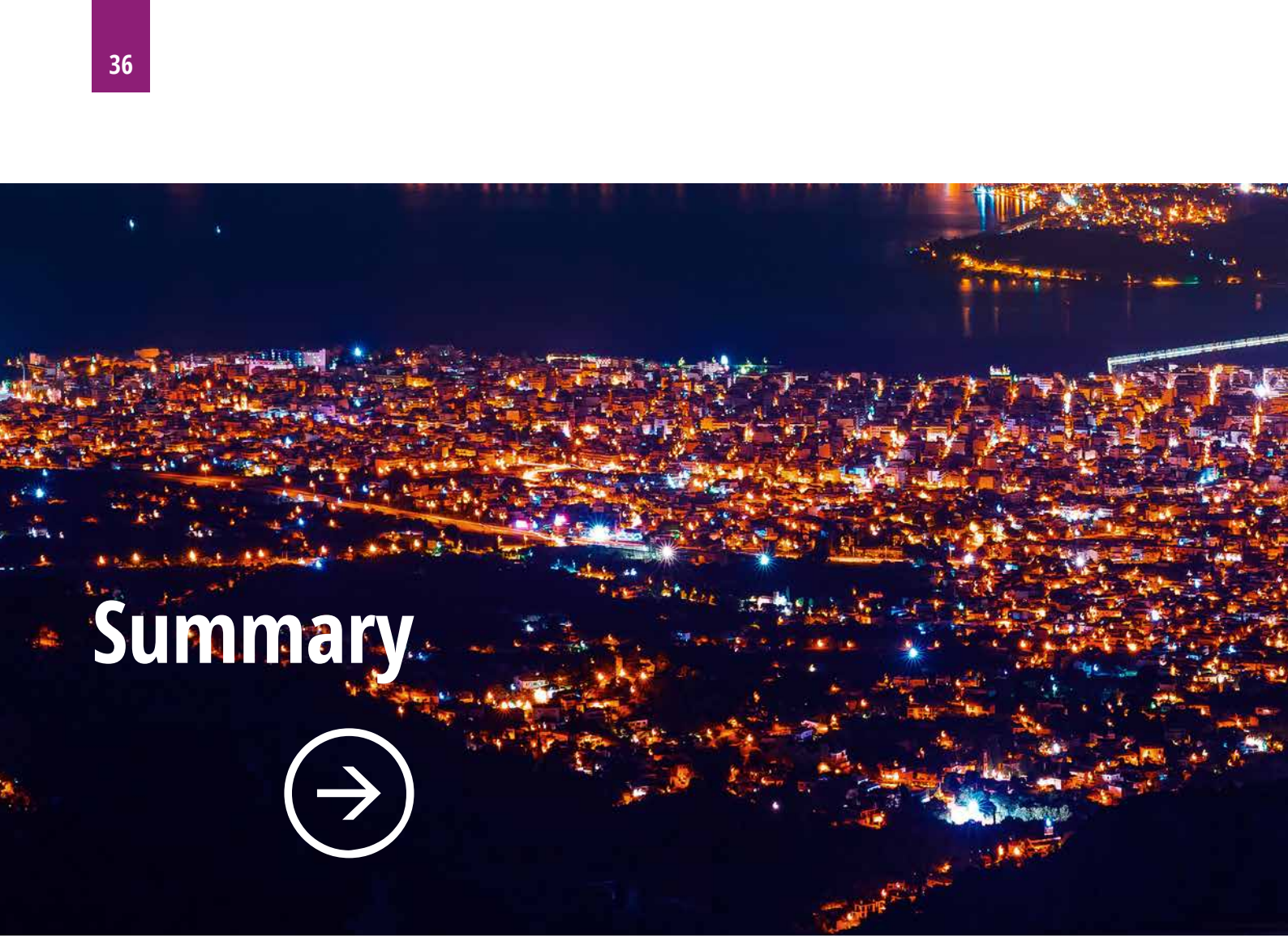


Solar power generation in the main G20 countries (TWh)



Solar power: New capacity additions (GW)





Summary

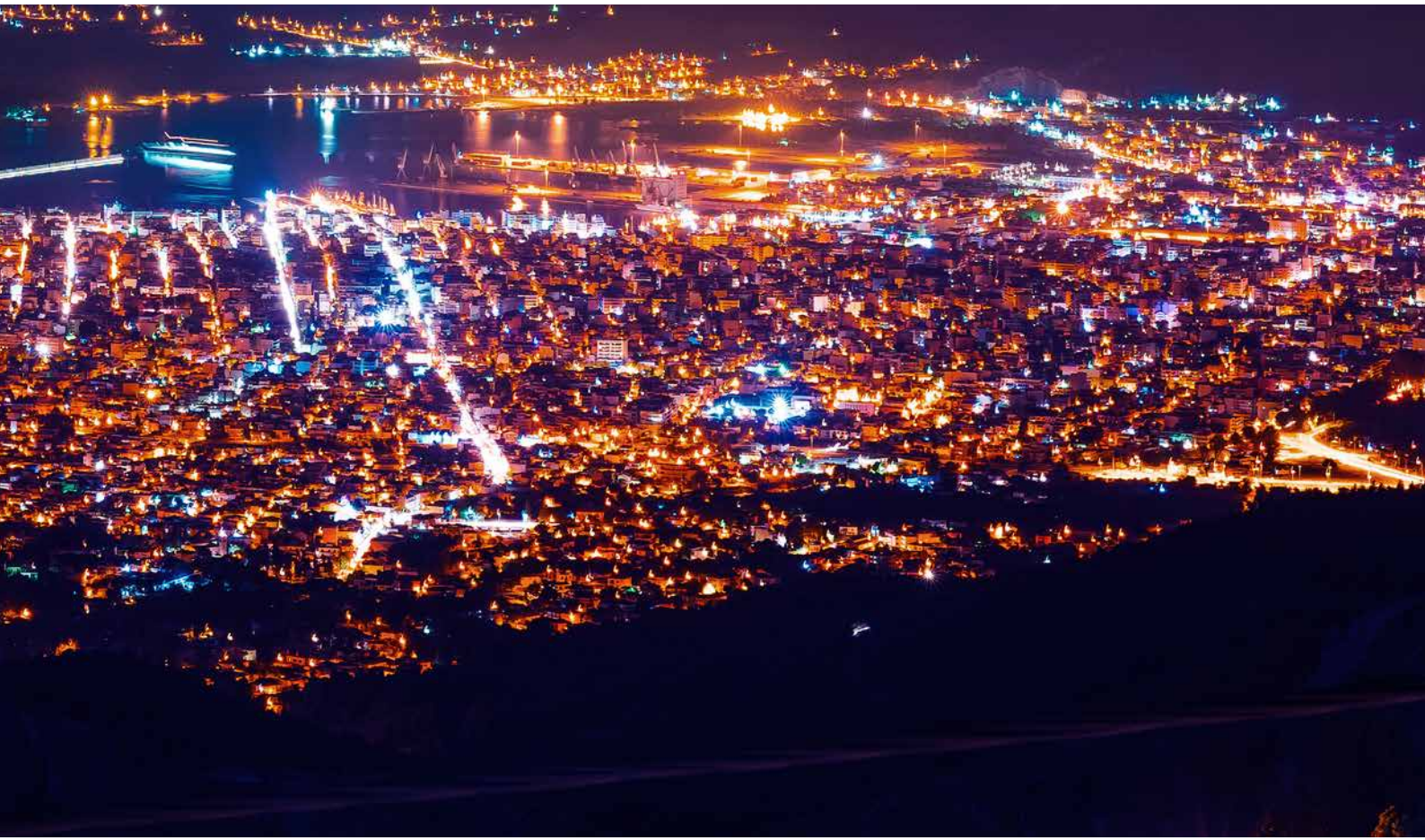


KEY TAKEAWAYS FROM 2024 FIGURES

Energy consumption keeps on increasing steadily.

Despite rising renewable capacity additions and renewable power generation, fossil fuels still account for most of the G20 energy mix and power mix, and thermal power generation continues to increase, **raising coal and gas consumption and fuelling CO₂ emissions.**

2024 confirmed the **return to historical economic growth trends**, which began in 2022 (around 3%/year). **Energy consumption**, on the other hand, continued to **rise faster than historical trends** (+2% in 2024 vs. +1.4% over 2010-2019), spurring CO₂ emissions (+1%), and **making the 2 °C pathway increasingly difficult to reach.**



Fossil fuels – coal, gas, and oil – remained dominant in the G20 energy mixes.

They still account for 80% of the G20's primary energy consumption and for nearly 60% of the G20's power mix. In spite of soaring renewable installations (+406 GW of solar, +105 GW of wind in 2024) and rising renewable power generation, renewables come on top of – and not instead of – thermal power generation, which continues to increase (+1% in 2024), pushing CO₂ emissions gain.

The weight of **China, India, and Indonesia** to a lesser extent, is increasing.

These **heavily coal-dependent countries** account for **nearly 50% of the G20's**

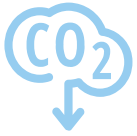
energy consumption, over 80% of its coal consumption, and 55% of its CO₂ emissions. Meanwhile, China accounts for 70% of new wind and solar capacity additions in the G20 in 2024, and for more than 40% of the G20's wind and solar power generation.



Chapter 2

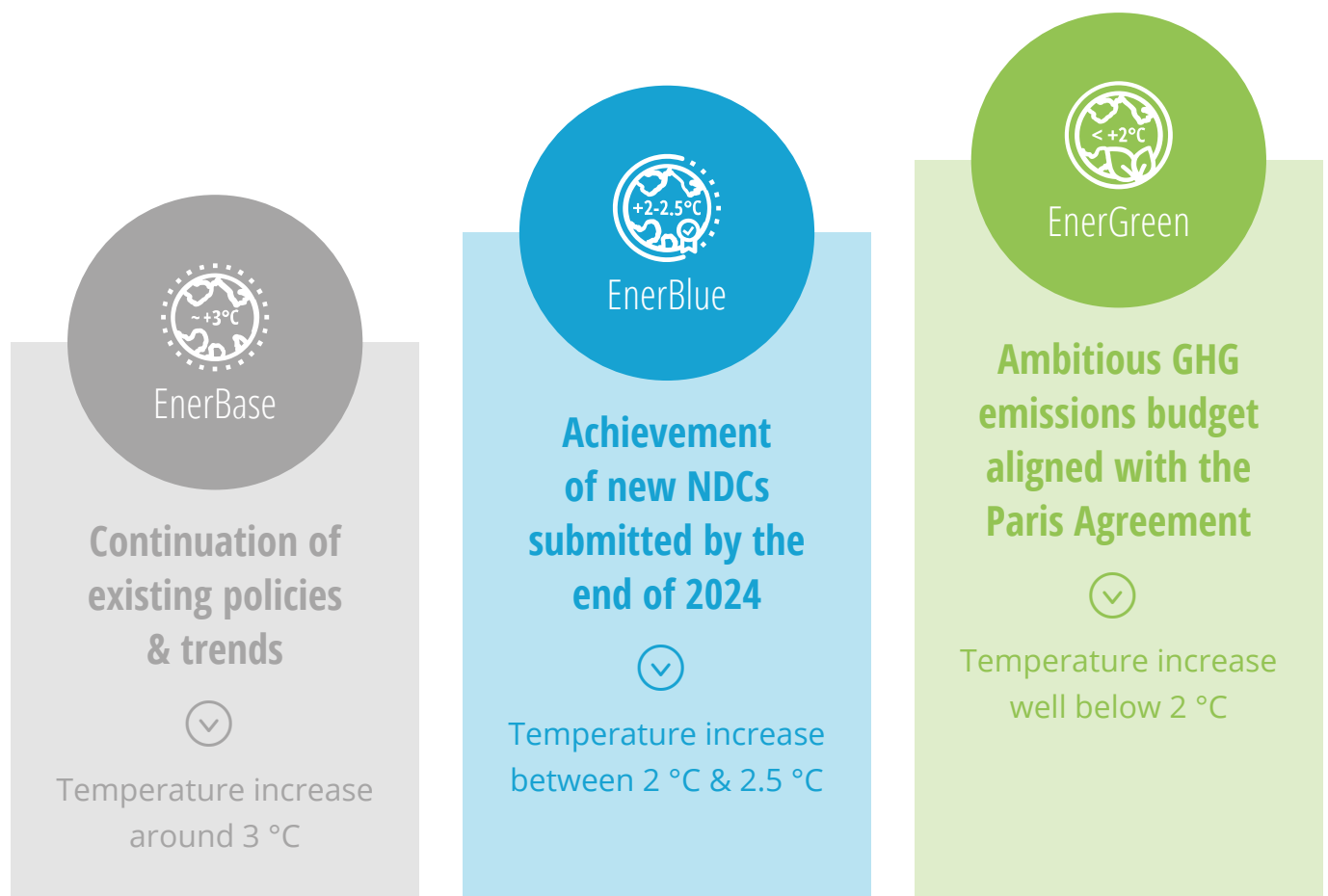
COMPARISON OF TRENDS & DECARBONISATION PATHWAYS





ENERFUTURE: THREE ENERGY-CLIMATE SCENARIOS TO 2050

Enerdata has prepared three contrasting energy-climate scenarios through 2050 to explore possible pathways for the global energy sector.



Source: Enerdata – www.enerdata.net



Enerdata contributes modestly by sharing our vision to **complement the official process** and **address its perceived limitations**. Notably, we are working on comparing historical trends with reference scenarios. Our goal is to provide a regional and sectoral assessment.

EnerFuture relies on the recognised POLES-Enerdata model* (standing for **P**rospective **O**utlook on **L**ong-term **E**nergy **S**ystems), **an energy-economy-environment model of the global energy system**, covering **66 countries and regions**. It includes dedicated modelling of **individual end-use sectors, energy supply, prices, and GHG emissions**.

* The POLES model was initially developed by IEPE (Institute for Economics and Energy Policy), now named GAEL lab (Grenoble Applied Economics Lab)



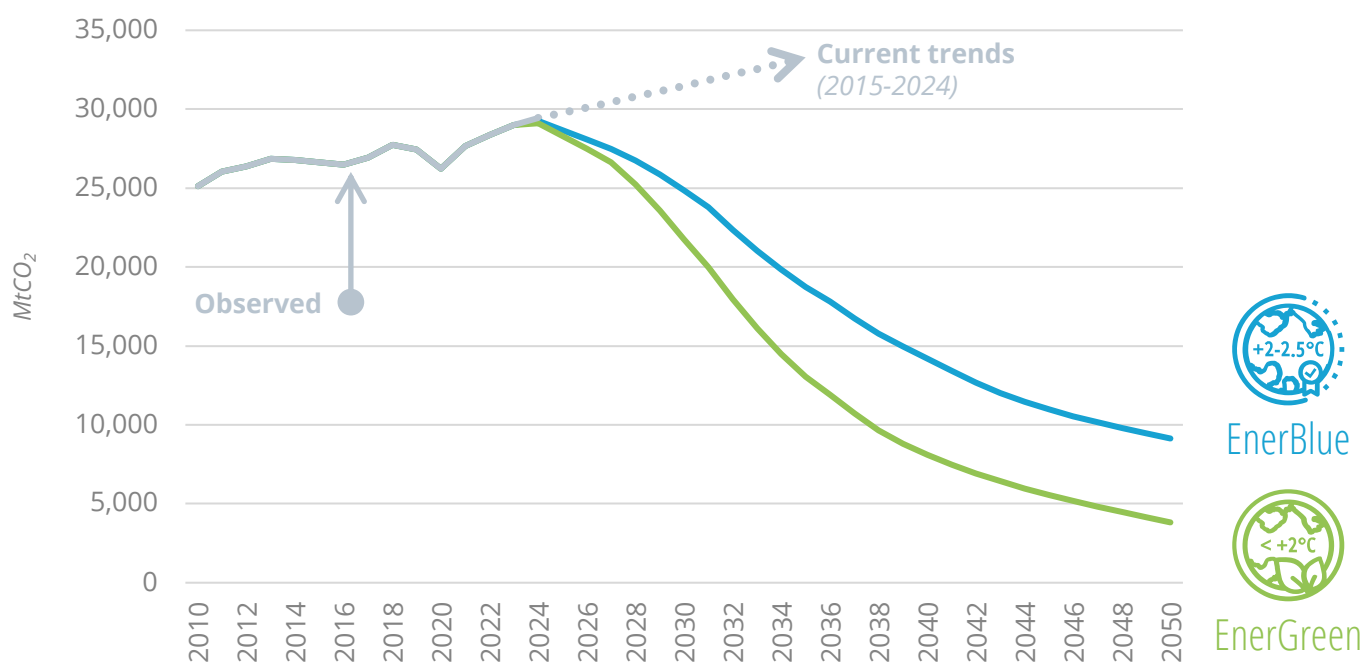
GLOBAL KEY INDICATORS OF ENERFUTURE SCENARIOS

A major shift required to meet climate pledges and targets.

Energy consumption and emissions need to drastically and quickly go down in order to realign with a trajectory that is compatible with our climate pledges and objectives. This would mean a significant shift compared to past trends, as both energy consumption and emissions have continued to increase.

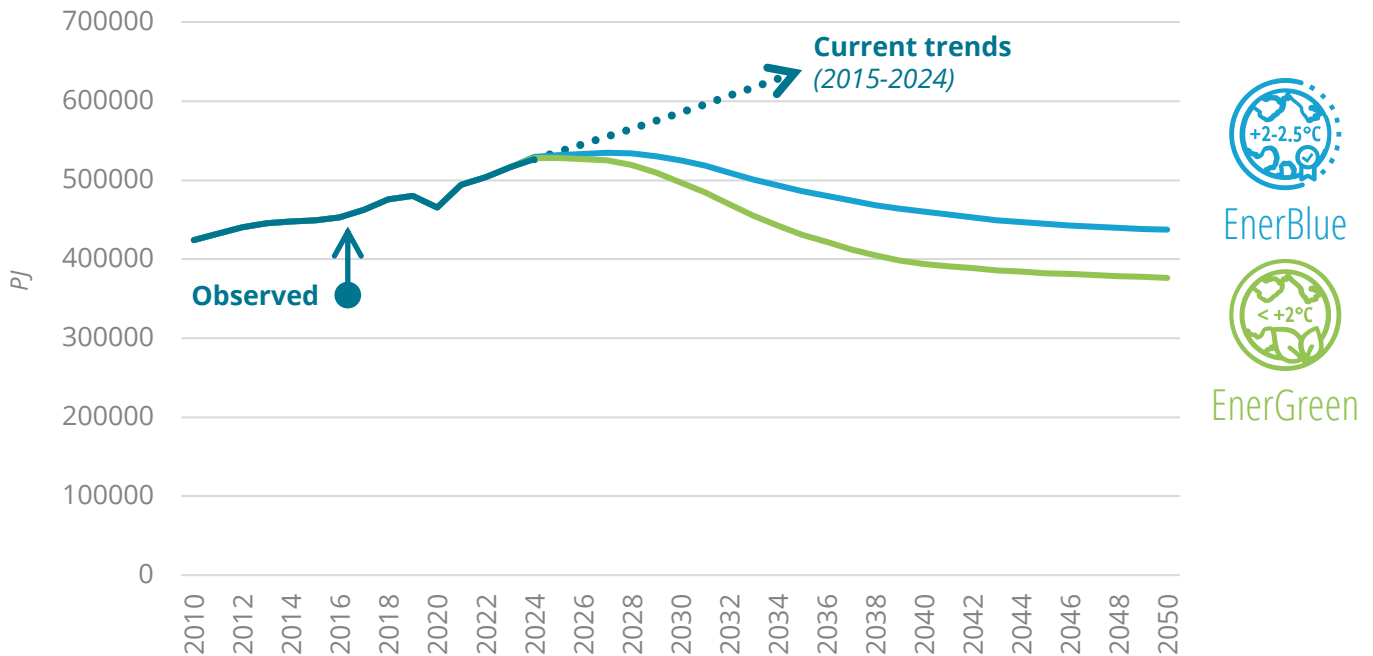
Fossil fuels have continued to rise in absolute terms while their share in the energy mix has barely reduced. **EnerBlue** and **EnerGreen** scenarios show **the extent at which they must be cut.**

CO₂ emissions from combustion in G20 countries

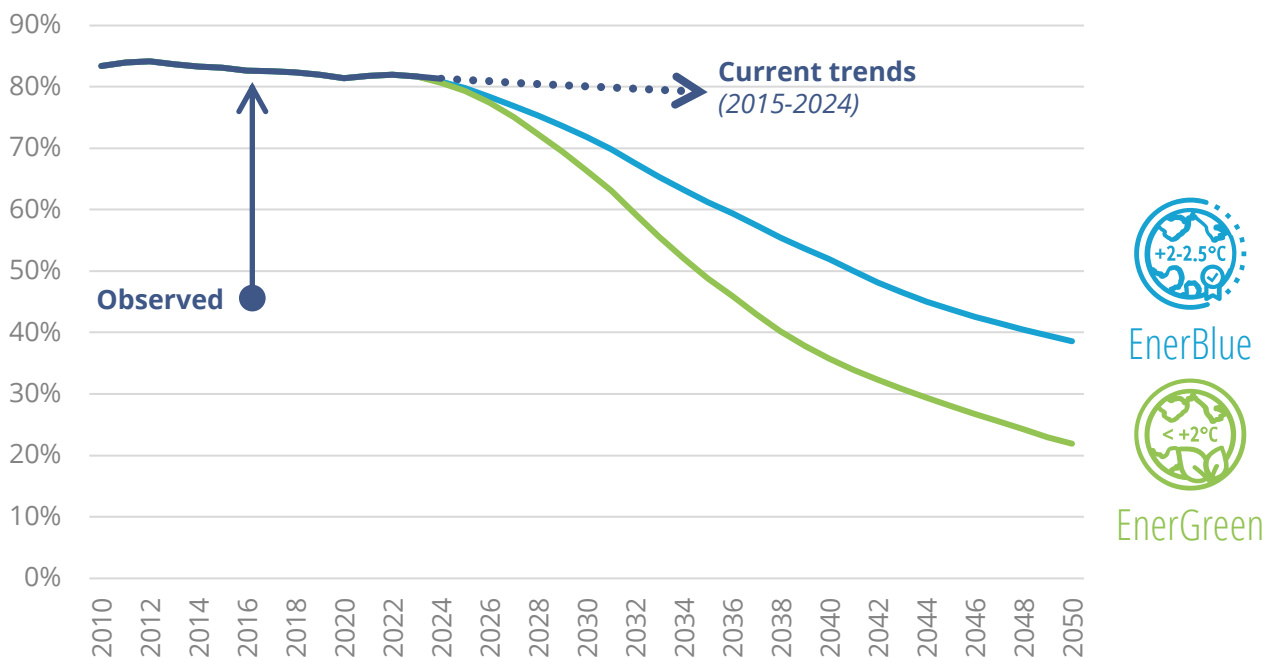


Source: EnerFuture – Enerdata – www.enerdata.net

Primary energy demand in G20 countries



Share of fossil fuels in G20 countries



Source: EnerFuture – Enerdata – www.enerdata.net



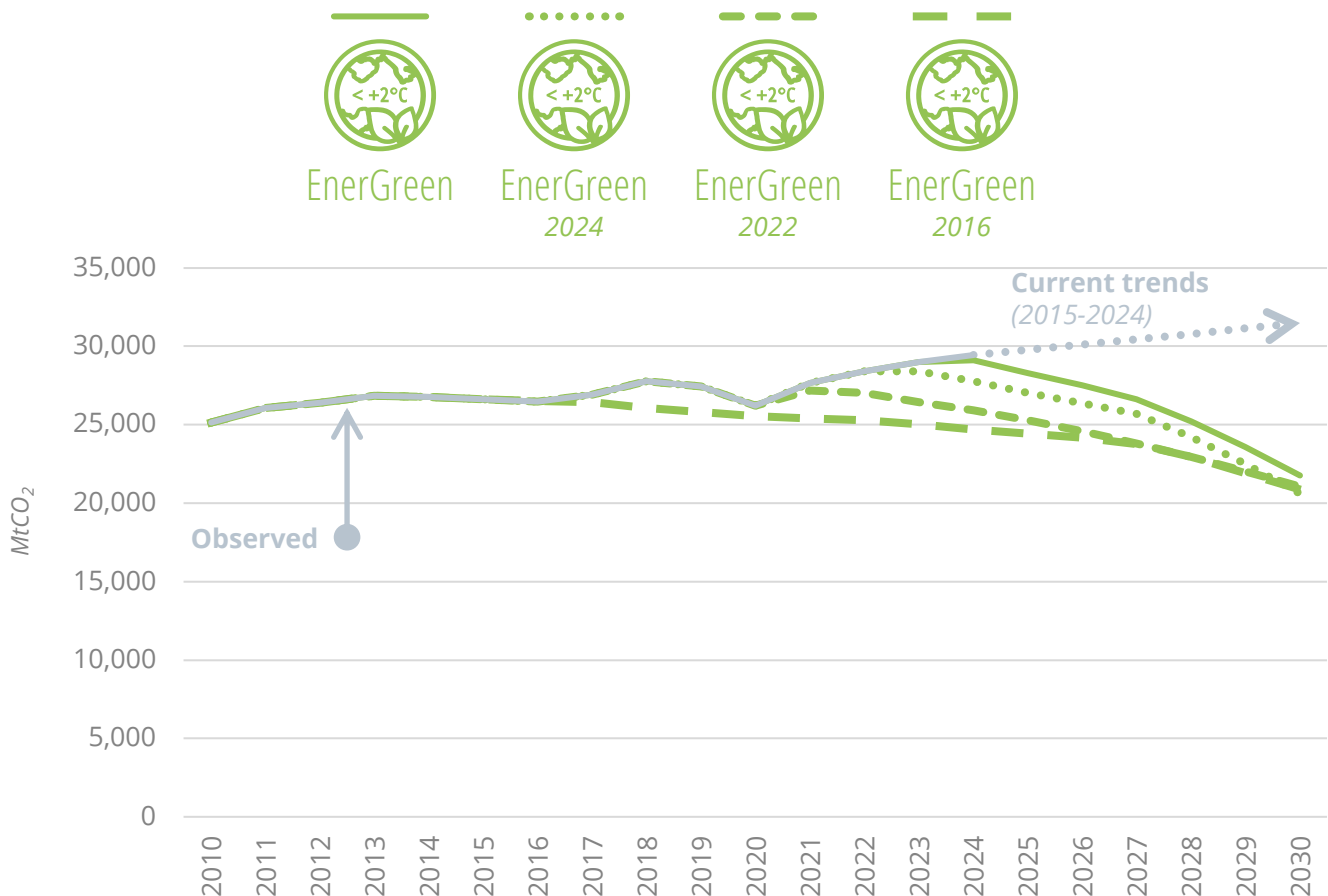
EMISSIONS KEEP RISING SINCE THE PARIS AGREEMENT

The path to staying below 2 °C is becoming increasingly unrealistic.

The critical shift needed to align with the Paris Agreement objective is continually being delayed. Indeed, this pathway requires an **average 5% annual CO₂ emissions drop between now and 2030**, which is becoming increasingly unrealistic.

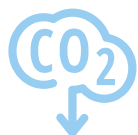
Furthermore, cumulative emissions have escalated, with **over 18 GtCO₂ that could have been avoided** if policies aligned with long-term climate goals had been implemented.

CO₂ emissions from combustion in G20 countries



Source: EnerFuture – Enerdata – www.enerdata.net





MAIN ENERGY TRANSITION INDICATORS FOR G20 COUNTRIES

Current trends need to be drastically accelerated.

Only minor progress is observed in decoupling energy consumption:

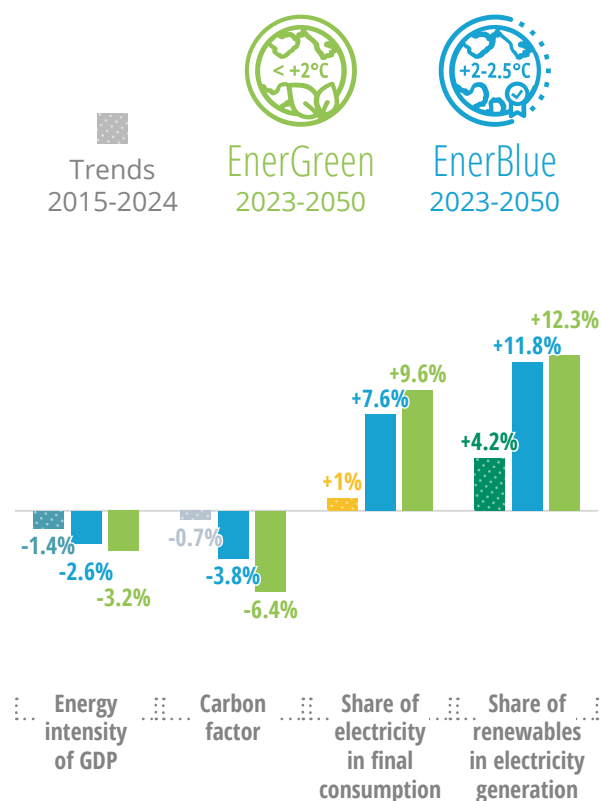
- ➔ from **economic growth** on the one hand;
- ➔ from **CO₂ emissions** on the other hand.

A critical step of deep decarbonisation – the widespread electrification **of end-uses – is not happening** as quickly as needed.

While the **growth of renewable energy sources** has been **noticeable**, its **expansion must accelerate** massively to yield substantial results.

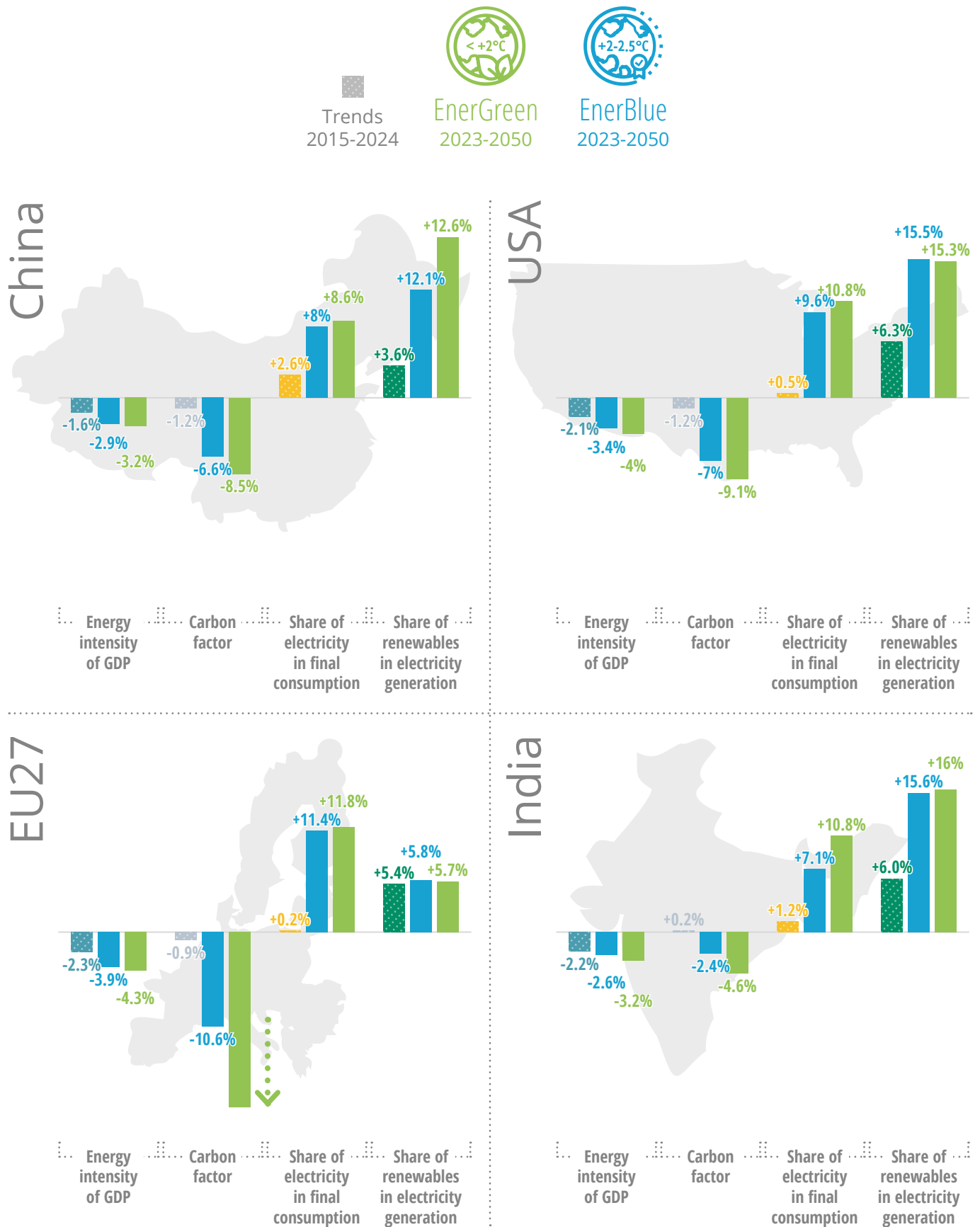
Looking at four specific regions of the G20 – China, India, the US and the EU – the observations are very similar. **Efforts will need to be drastically scaled up across regions.**

Main energy transition indicators for G20 countries

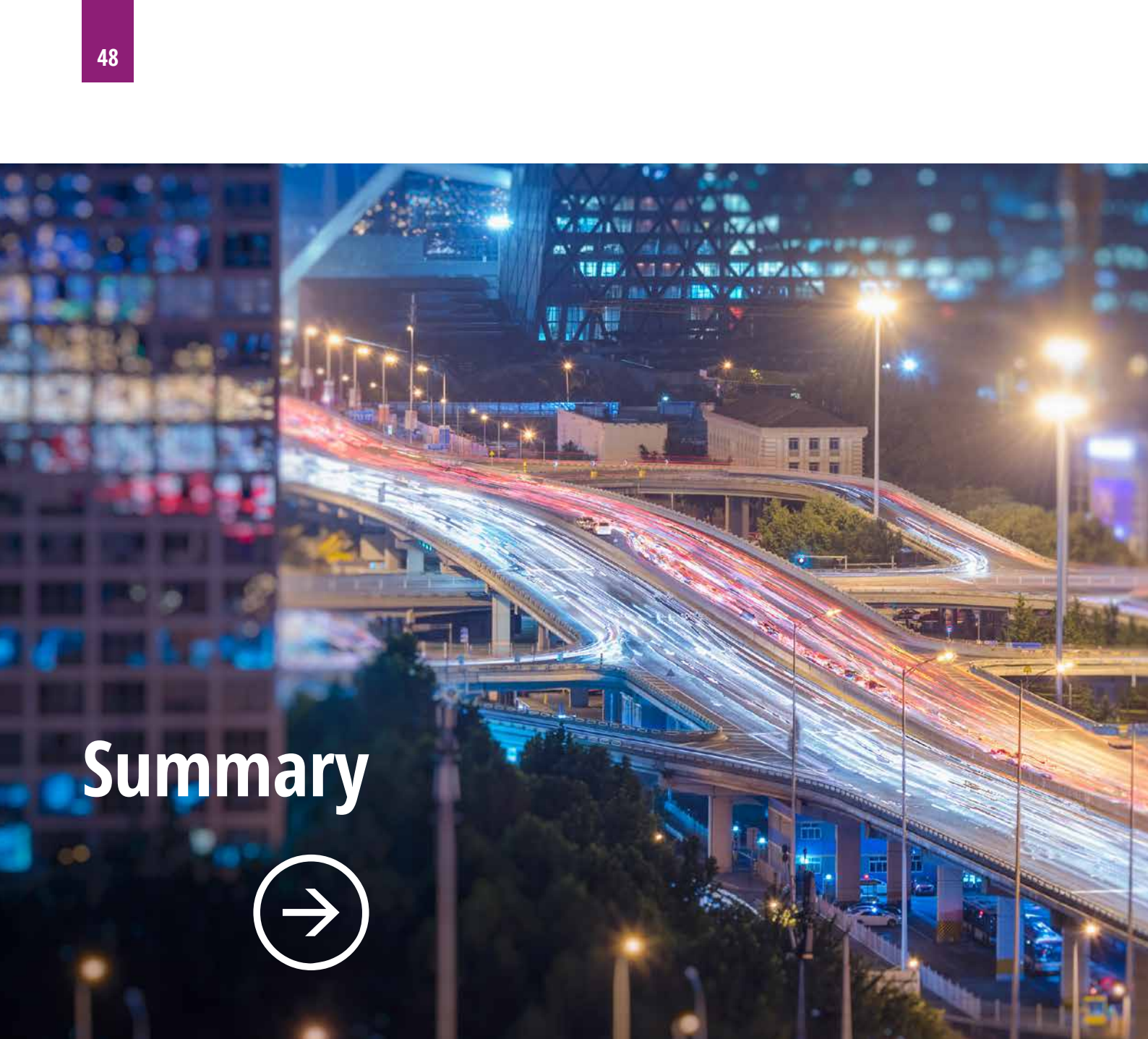


Source: EnerFuture, Global Energy & CO₂ Data – Enerdata
www.enerdata.net

Main energy transition indicators for four specific G20 countries



Source: EnerFuture, Global Energy & CO₂ Data – Enerdata – www.enerdata.net



Summary



KEY TAKEAWAYS

One step away from the Paris Agreement target.

Energy consumption is currently rising at a faster pace than before the energy crisis. There is a notable lack of significant decoupling between GDP and energy consumption, as well as between energy consumption and CO₂ emissions.

With each passing year, **the world moves further away from a pathway compatible with the objectives of the Paris Agreement.**



Dynamics vary considerably across G20 regions: energy consumption and CO₂ emissions are rising in emerging countries while remaining relatively stable in developed economies; however, this divergence is largely driven by economic and demographic factors.

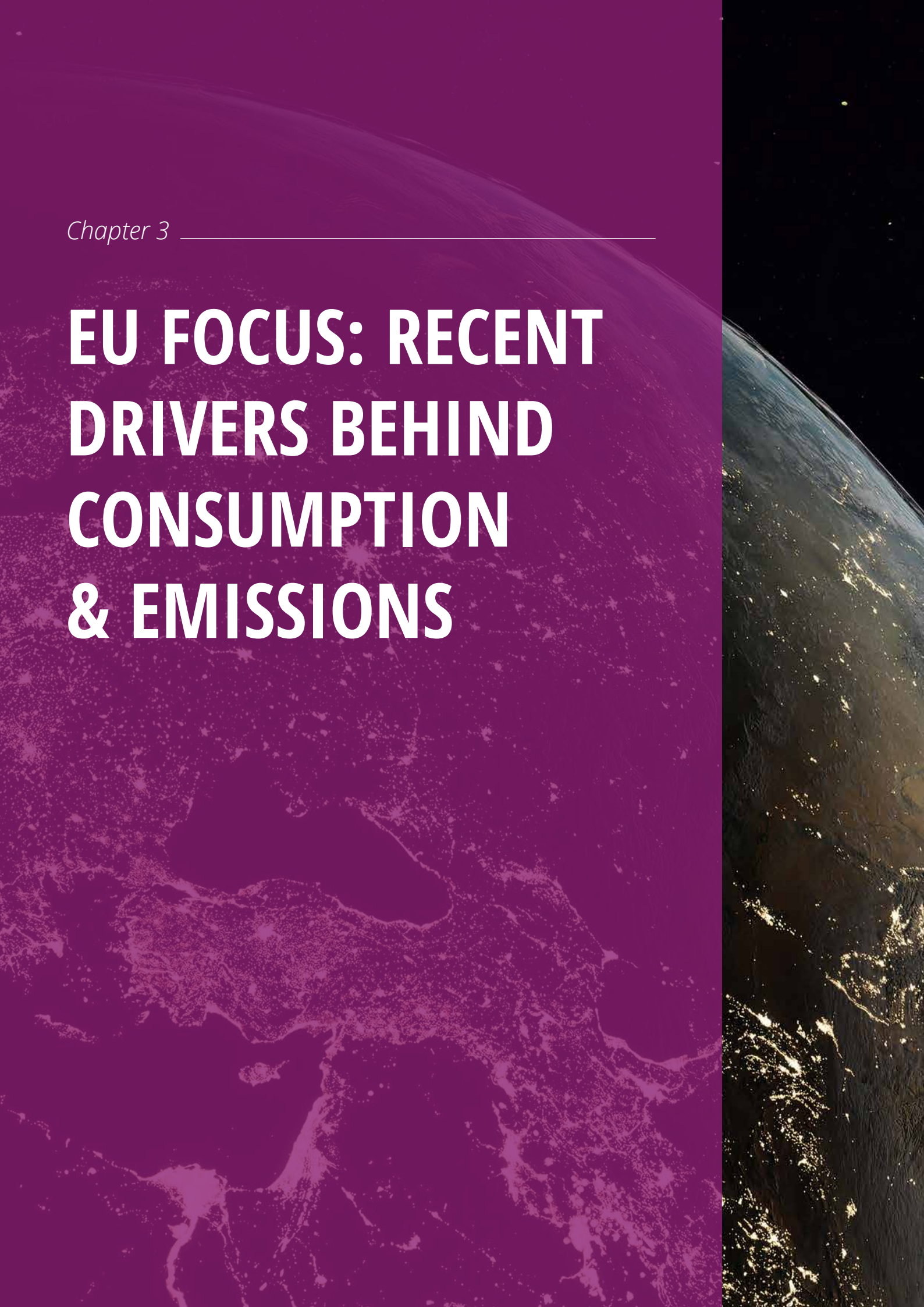
Although **renewable energy sources continue their expansion, their growth rate remains insufficient**, and

the electrification of end-uses is still minimal. Consequently, the consumption of fossil fuels continues to rise in volume.



Chapter 3

EU FOCUS: RECENT DRIVERS BEHIND CONSUMPTION & EMISSIONS



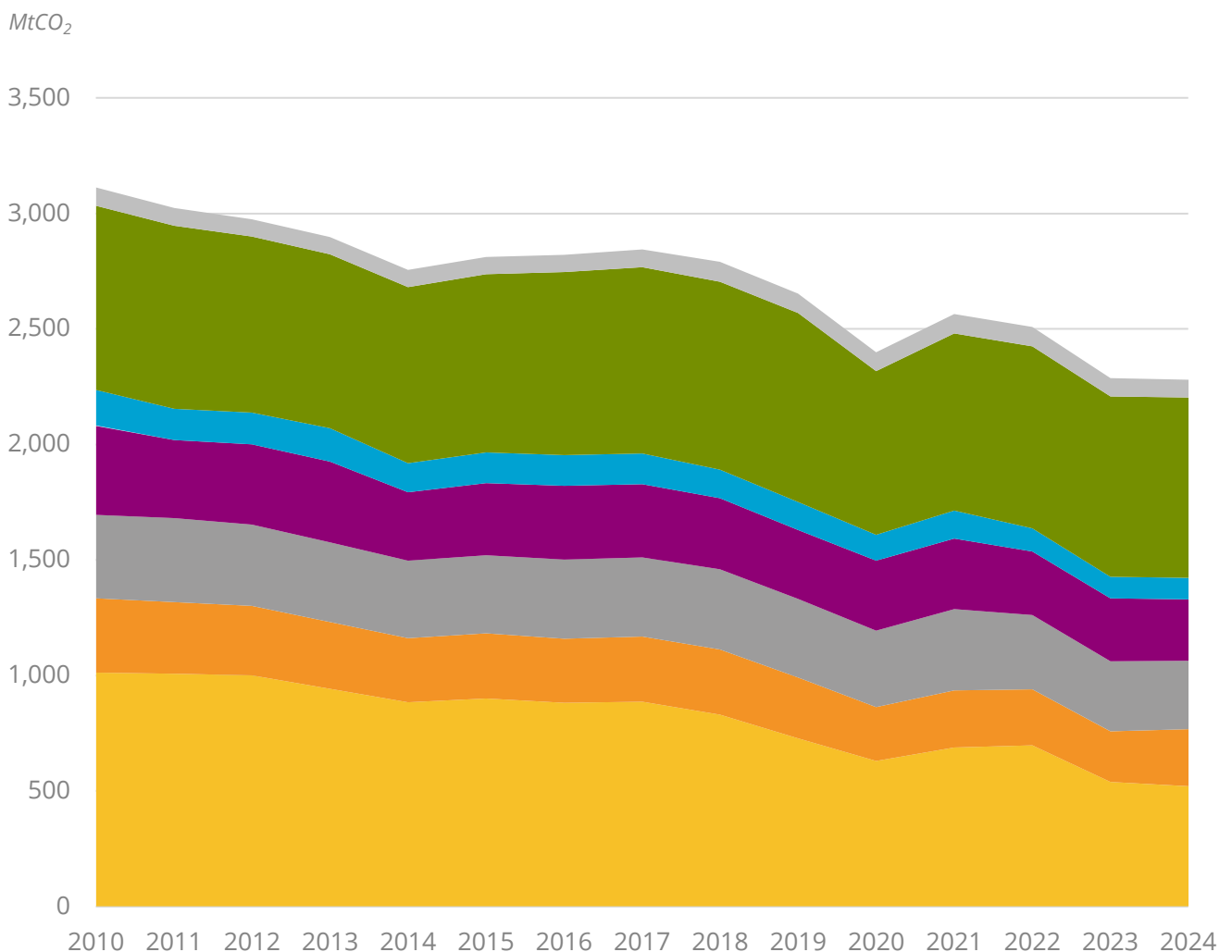


CO₂ EMISSIONS ARE DECREASING IN THE EU27

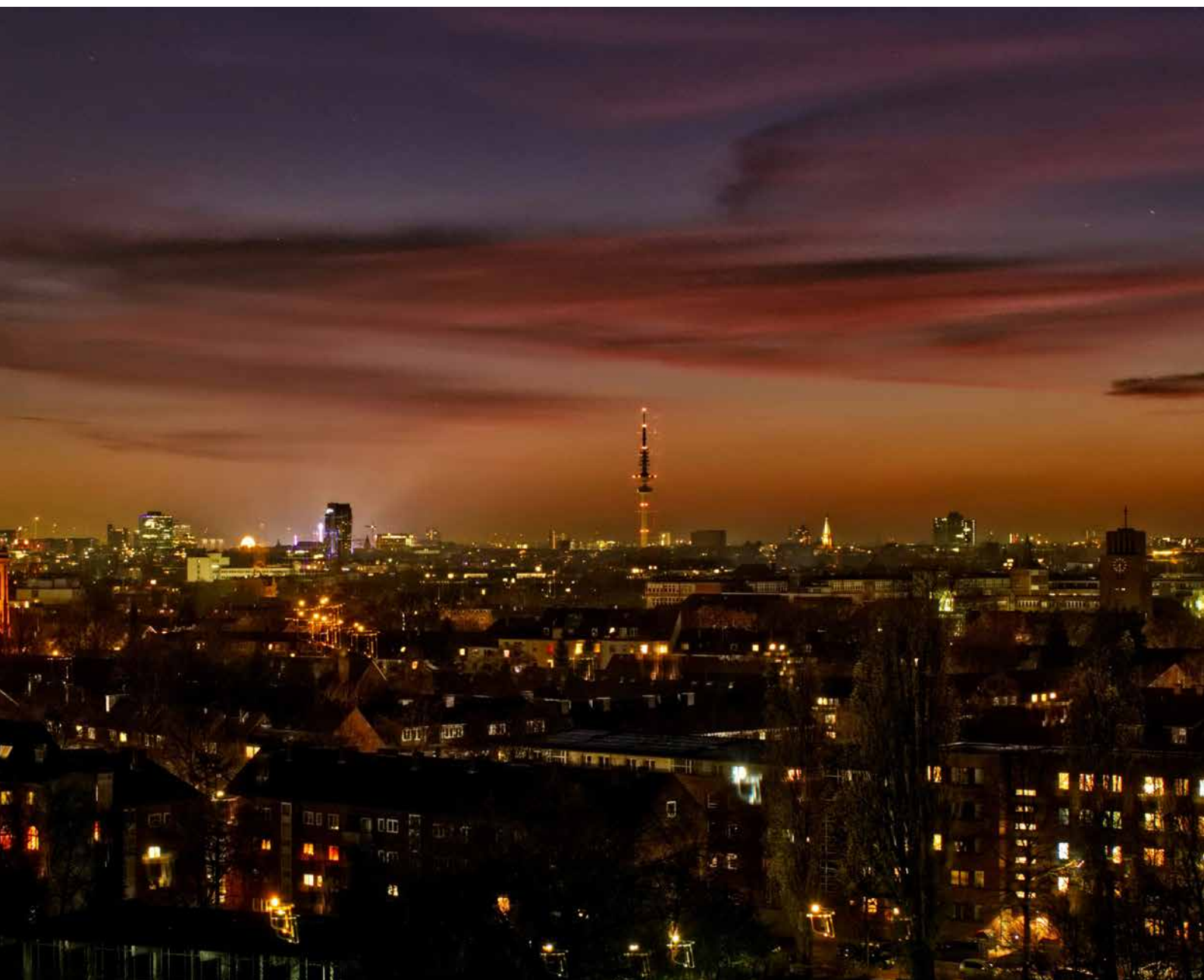
What are the sectoral trends and drivers behind the decrease?

CO₂ emissions from combustion by sector in the EU27

Power gen Other transformation Industry Residential Services Transport Others



Source: Enerdata, Eurostat



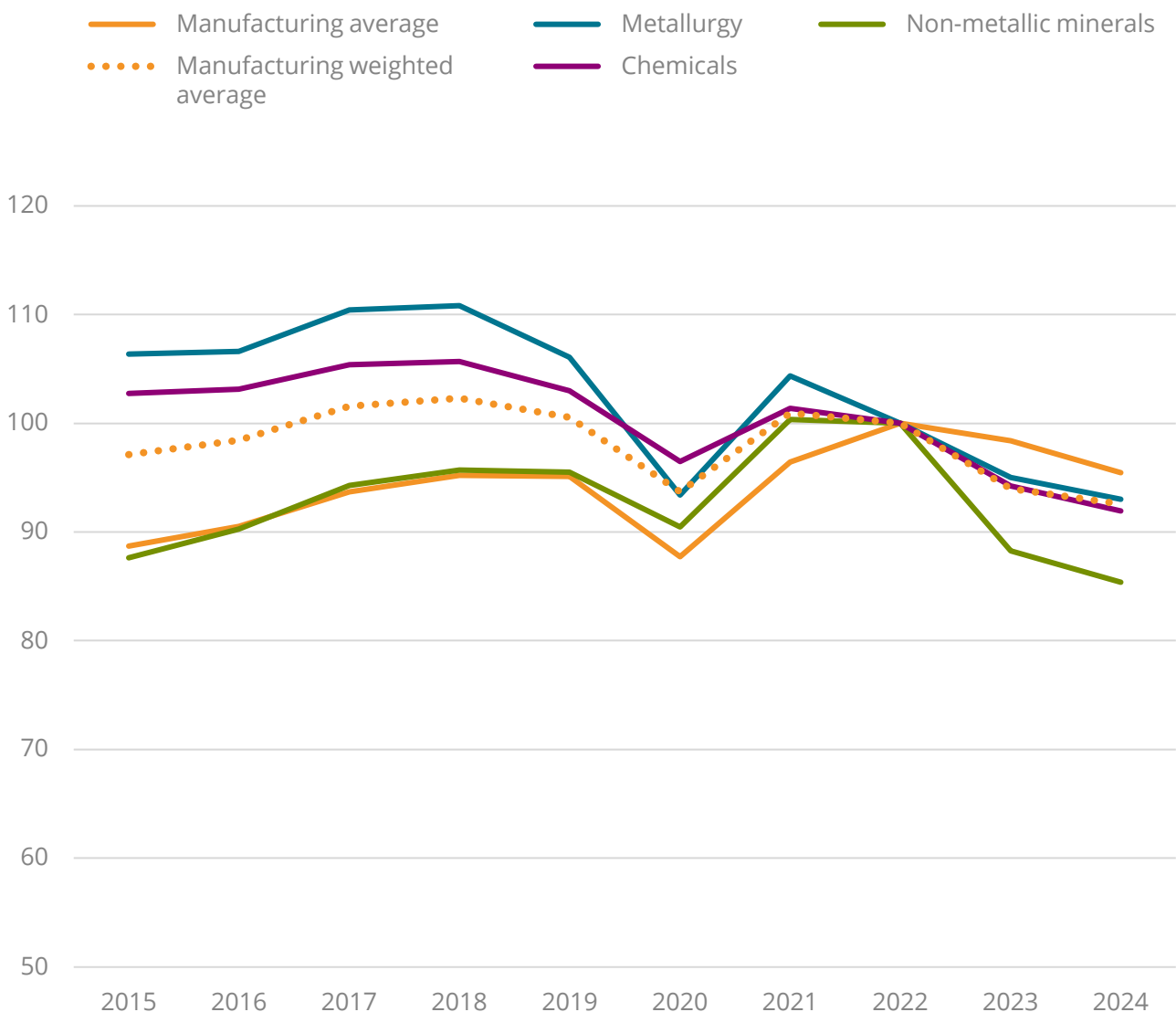
Since 2015, **emissions have decreased** by an average of 2% per year. This reduction is primarily driven by the power sector -6%/year – rather than by final consumption -1%/year. This trend occurs within a context of **low economic and demographic growth**, indicating that only marginal progress has been made in improving energy intensity and carbon factor.



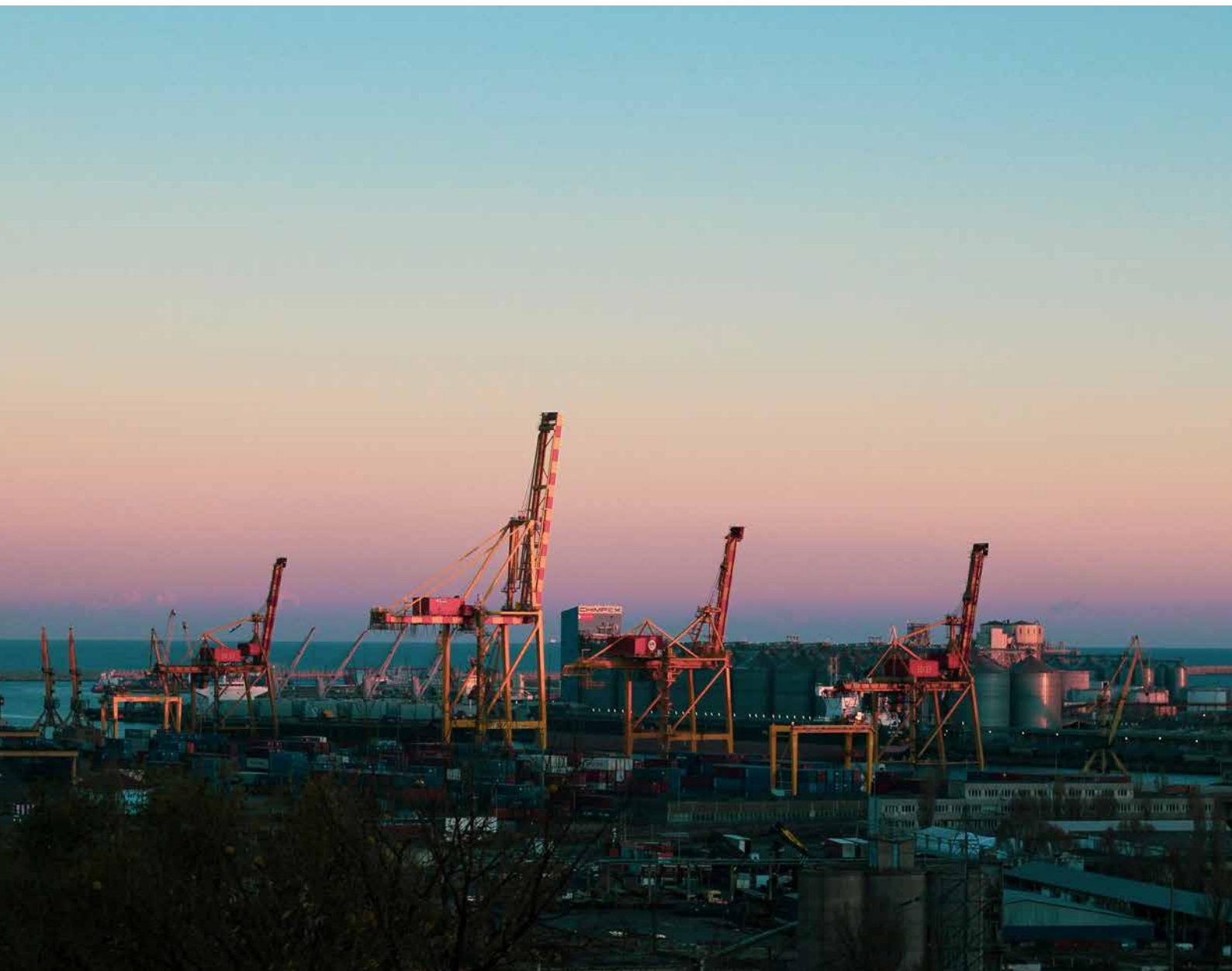
ENERGY-INTENSIVE INDUSTRIAL ACTIVITY IS DECLINING

Significant loss in competitiveness due to the energy crisis.

Activity indices of manufacturing industry in the EU27



Source: Enerdata, Eurostat



Industrial activity in the EU has declined by 5% since 2022. This trend is particularly pronounced in energy-intensive industries, which experienced a 7% reduction after adjusting for the energy consumption of different branches.

This decrease in activity largely **explains the reduction** in both energy consumption and CO₂ emissions within the industrial sector.

Additionally, overall **electricity consumption has decreased** since 2015, and electricity has only gained a marginal share in total energy consumption.



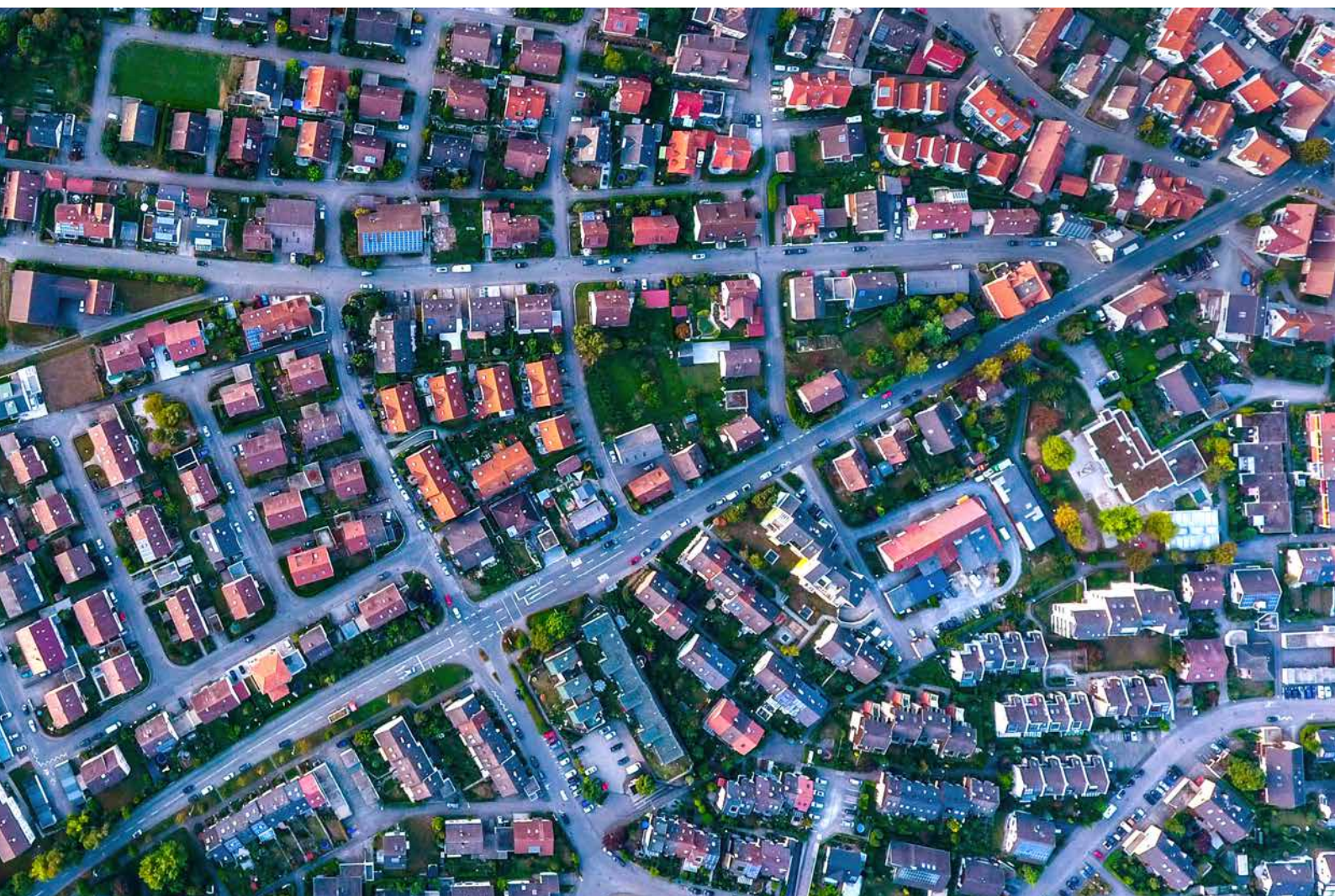
DECLINE IN CO₂ EMISSIONS FROM HOUSEHOLDS

Equipment renewal and behaviour barely compensated for activity.

Drivers behind reduction in CO₂ emissions from residential sector in the EU27



Source: Enerdata, Eurostat



Direct emissions from households have decreased by 11% since 2019.

This reduction has occurred despite increased activity (driven by factors such as demography, dwelling sizes, and household equipment), and has been offset by:

- ➔ Improvements in energy efficiency
- ➔ Fuel switching
- ➔ Milder temperatures
- ➔ **Changes in energy sufficiency and behaviours**

Electricity has only gained 1.5 percentage points since 2019.

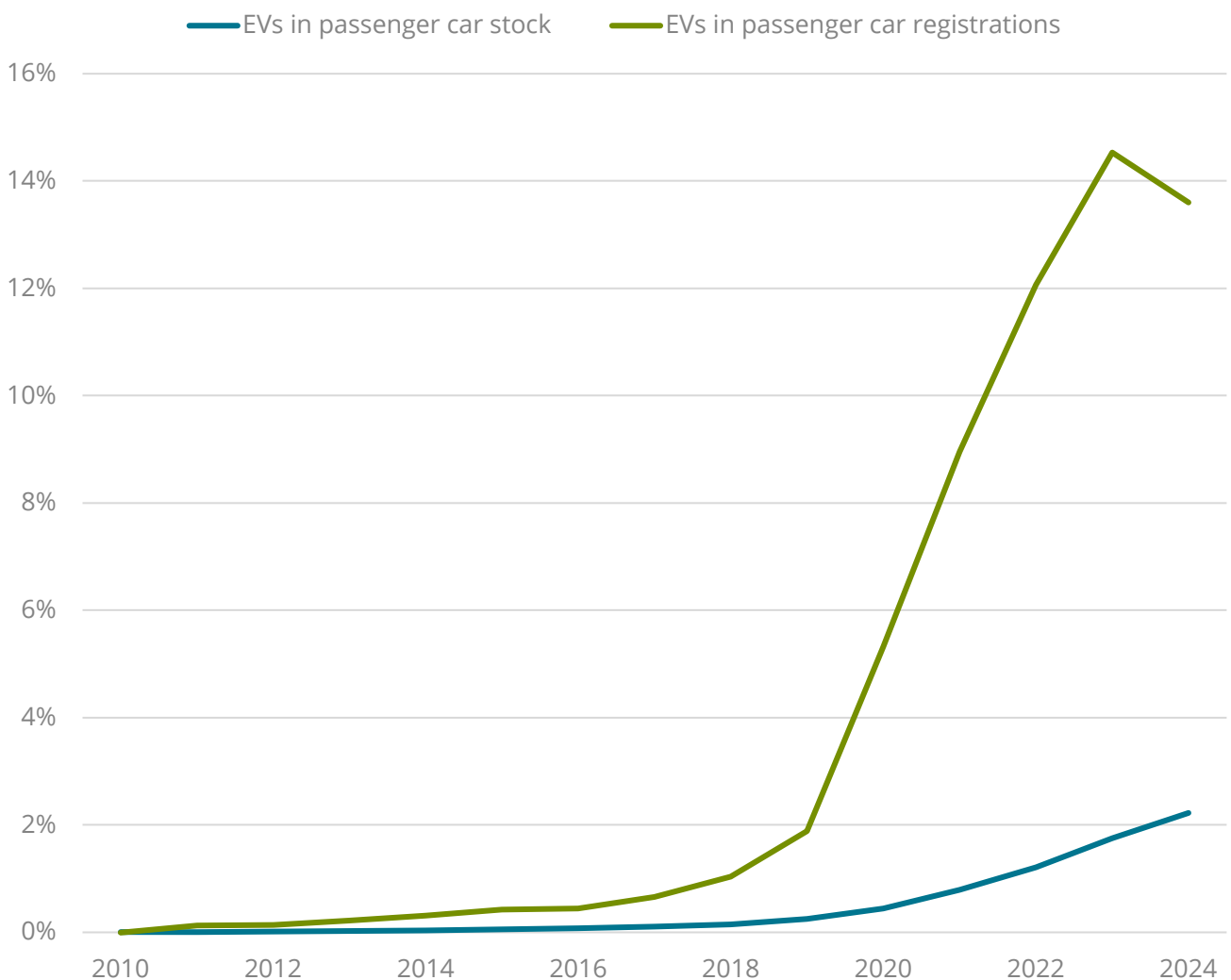
Although, **heat pumps have been emerging**, they currently account for **only about 8 %** of residential space heating, with sales declining in 2024.



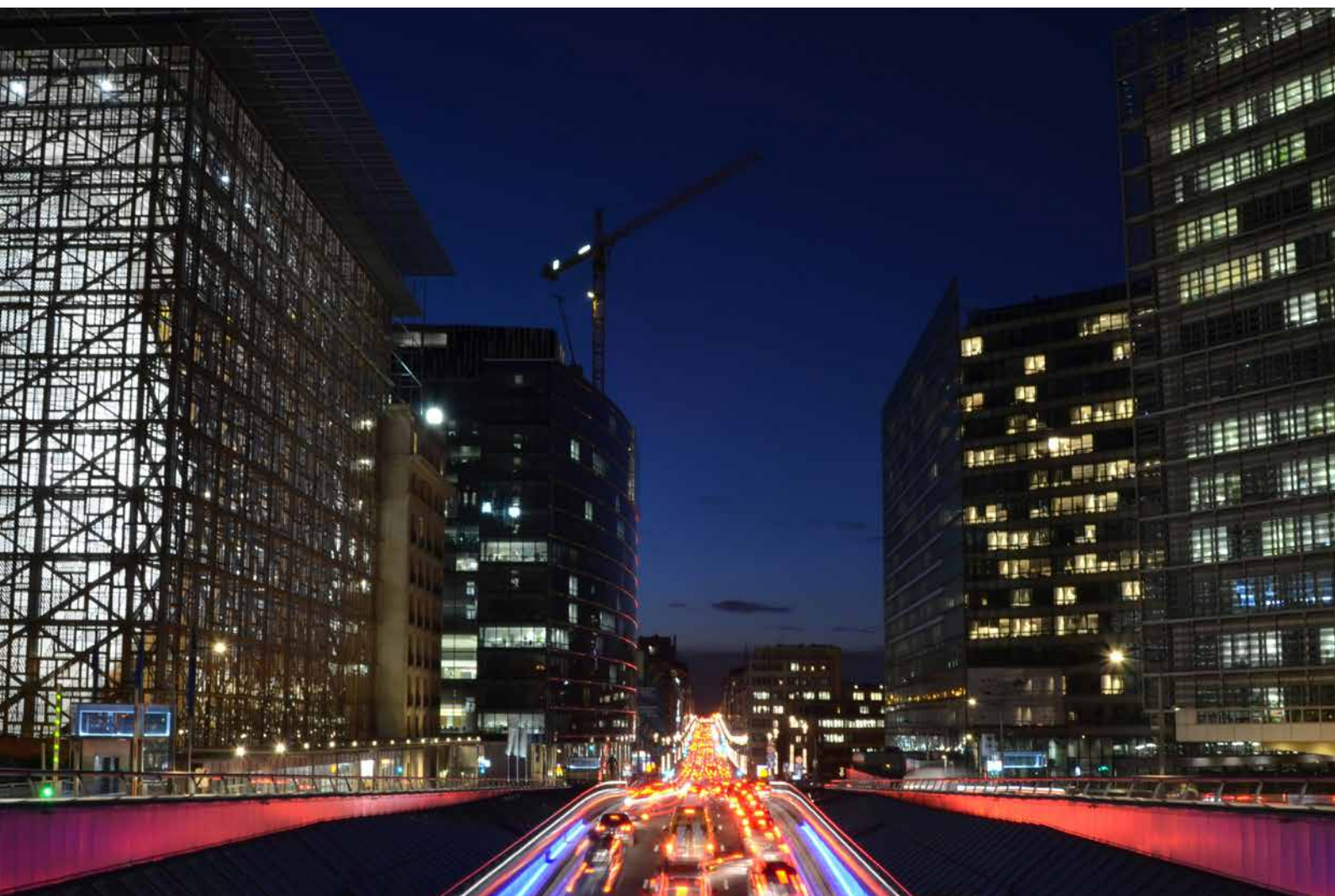
STABILISATION OF EMISSIONS IN TRANSPORT

EVs are not playing a significant role but traffic is starting to decline.

Share of electric vehicles in the EU



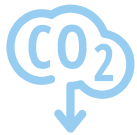
Source: Enerdata, Eurostat, ACEA



CO₂ emissions from transport have remained relatively stable since 2022, standing 4% lower than in 2019. **Passenger traffic has not recovered to pre-COVID levels**, and goods traffic remains relatively constant.

Furthermore, **the share of oil products has not decreased**, holding steady at 92% and remaining stable since 2010. **No significant modal shifts** have occurred, with road transport consistently accounting for 90% of passenger transport and 80% of goods transport.

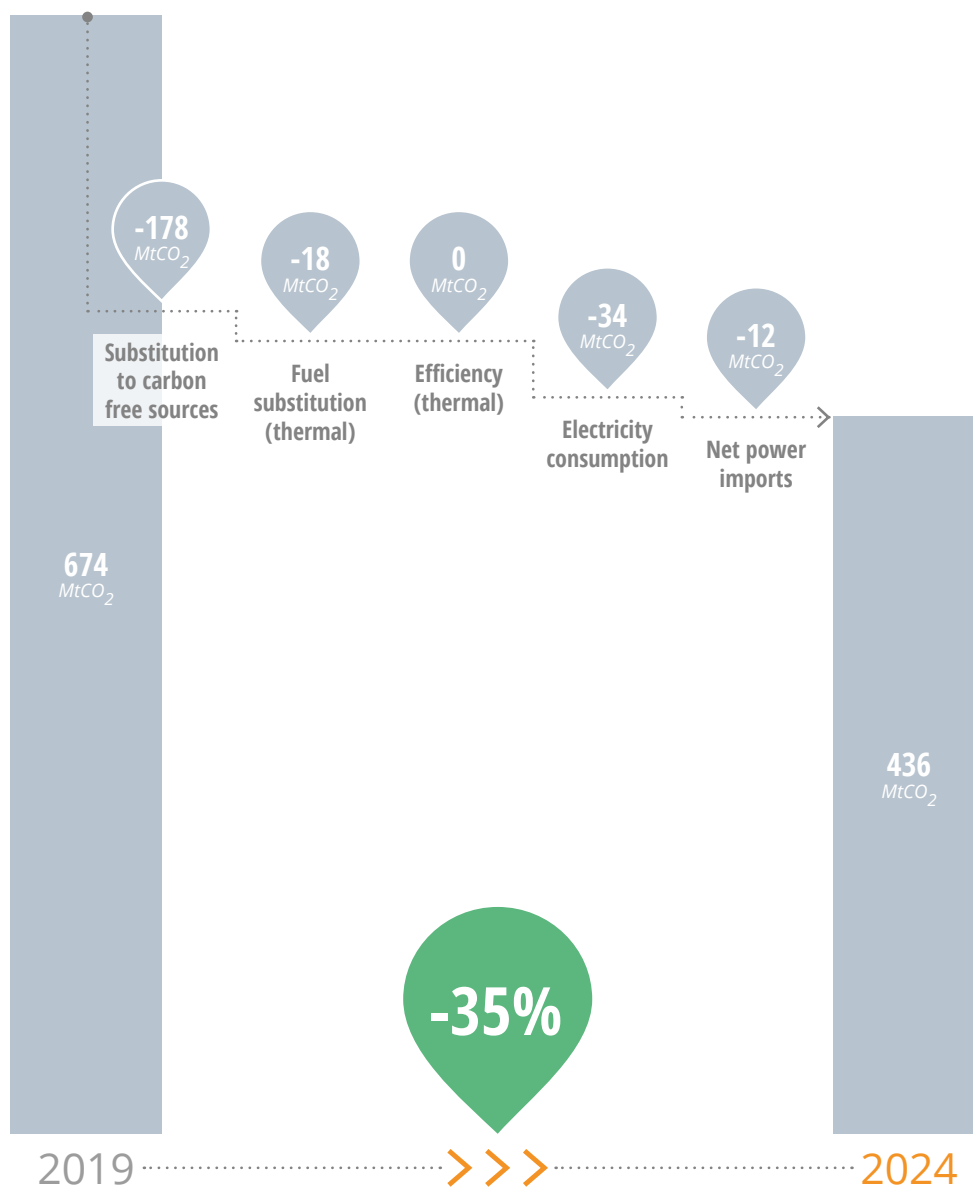
Electricity continues to play only a minor role in the transport sector. The share of electric vehicles in the private car stock is a mere 2%, with new registrations **expected to decline in 2024**. Moreover, electricity represents only 2% of total energy consumption from transport, primarily in rail transport.



THE EU POWER SECTOR IS MOVING IN THE RIGHT DIRECTION

Noticeable decarbonisation, but with limited impact.

Emission drivers in power generation* in the EU



* excl. auto-producers.

Source: Enerdata, Odyssee



The power sector now generates almost **50% of its electricity from renewable energy sources**, primarily reducing its reliance on fossil fuels.

Consequently, **the carbon factor has dropped by 40%** between 2015 and 2024.

However, this positive trend is somewhat offset by **a decrease in electricity consumption** itself, which also contributes to lower emissions. **The overall impact of decarbonising power generation remains limited without substantial electrification of end-uses across other sectors.**

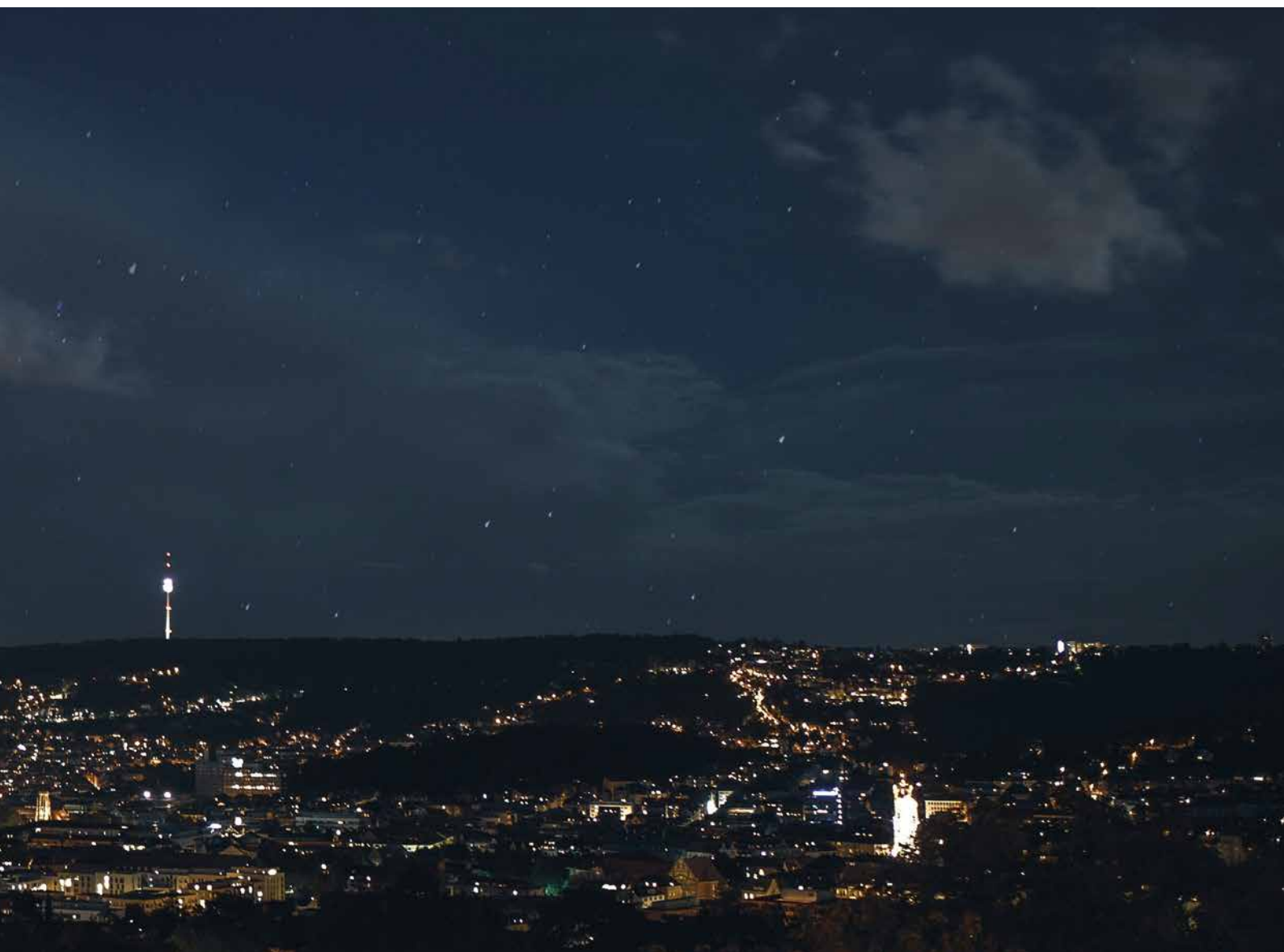
Summary



KEY TAKEAWAYS

EU emissions are down, but few structural shifts are underway.

The recent decrease in emissions within the EU is largely attributable to **modest economic and demographic growth**. This trend is underscored by a **decline in European industrial activity**, which has been particularly pronounced since 2022. Notably, increasing populations and improved access to energy are **not key drivers of energy consumption**, which contrasts with emerging economies.



While low-emission and energy-efficient technologies are emerging, **their adoption rate remains insufficient**; significant decarbonisation of power generation has occurred, but **its overall impact is limited** in the absence of broader electrification of end-uses. Electric vehicles and heat pumps, despite their potential, **remain niche technologies** and are beginning to show signs of slowing uptake.

Furthermore, some positive behavioural shifts are observed, such as household energy sufficiency, primarily as a response to high energy prices, and **passenger traffic that has not fully recovered to pre-COVID levels**.

HELPING YOU SHAPE THE ENERGY TRANSITION

Enerdata is an independent research company that specialises in the analysis and forecasting of energy and climate issues, at a variety of different geographic and business / sector levels. The company is headquartered in Grenoble, France, where it was founded in 1991, and has a subsidiary in Singapore.

Leveraging its globally recognised databases, business intelligence processes, and prospective models, Enerdata assists clients – which include companies, investors, and public authorities around the world – in designing their policies, strategies, and business plans.

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www.enerdata.net



research@enerdata.net

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