GLOBAL OBSERVATORY OF CLIMATE ACTION

KEY TAKEAWAYS 2023

GLOBAL SYNTHESIS REPORT ON CLIMATE ACTION

Overview of the progress made by non-State actors since the Paris Agreement

IN PARTNERSHIP WITH

Enerdata

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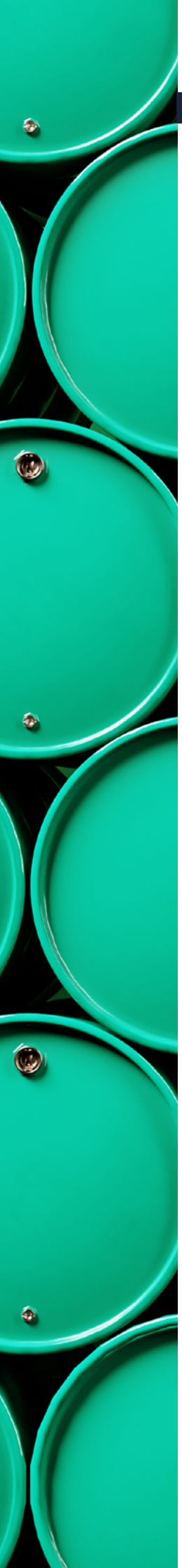


EDITORIALS

RONAN DANTEC

President of Climate Chance

This sixth edition of the Global Synthesis Report on Cliimate Action contributes to the first "Global Stocktake" of the Paris Agreement, the evaluation of collective progress made since 2015, which will be presented at COP28. This report is based on the work produced by the Observatory and associated researchers over the last five years, with the freedom of analysis of a fully independent association.

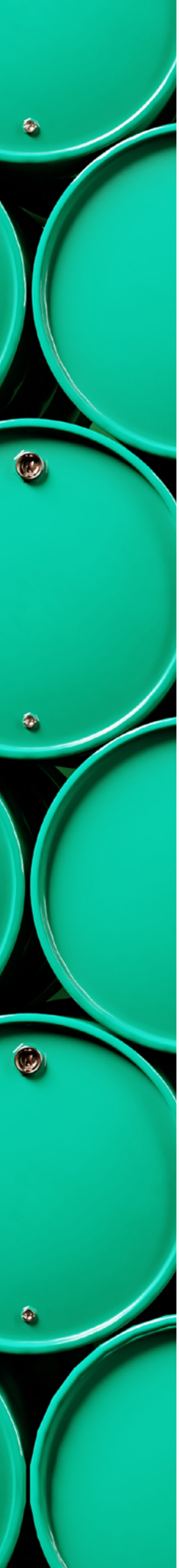
This report aims to be realistic about the situation. We will not achieve the objective of stabilising the climate below a 1.5 °C rise in temperature; the 2 °C objective, with its already more devastating consequences, is also getting more distant. But beyond these observations, Climate Chance is driven by the desire to mobilise and strengthen action. This Report shows the proliferation of initiatives, the success of ambitious actions, the real transformation of certain sectors and the key role played by local and regional authorities.

A number of global trends are keeping hopes alive that the climate will stabilise at levels below current trajectories. Firstly, the development of renewable energies, which now account for the majority of global energy investments. But the speed at which they are being deployed is still not enough to reduce the share of fossil fuels, while investment by the oil majors remains too low; oil money continues to go to oil. But European governments, local authorities, large companies and citizens' movements are showing that it is possible to speed things up.

The electrification of end-uses is a second reason for hope. From China to Europe, the impressive transformation of the automotive sector, with the prospect of the internal combustion engine being phased out in around fifteen years, shows that the synergy between government regulations and the proactive strategies of industrial groups can produce real results.

Thus, there are positive signs, even if this report does not ignore a very clear global trend: the convergence of lifestyles based on highly consumerist models. We can no longer see the world as being divided into a North that emits CO_2 and a South that suffers the consequences. We live on a planet where the rich and the urban middle classes emit unsustainable quantities of CO_2, be it in China or the United States, in Europe or even in large African cities. This trend stands in the way of a reduction in global emissions and of a just transition. The cultural battle for sufficiency is far from won.

An uncompromising report, major trends that cannot be masked, interesting dynamics, a flurry of initiatives... This sixth Global Synthesis Report on Climate Action is therefore intended to contribute to our knowledge of the reality of action. Without lucid analysis, it is impossible to define credible scenarios for stabilising the climate, which are necessary to mobilise and commit to the issues at stake.



PASCAL CHARRIAU

President of Enerdata

2023 marks the conclusion of the first "Global Stocktake" of the Paris Agreement, evaluating the progress accomplished since it was signed in 2015. This is an excellent opportunity to take a step back, to separate structural changes from cyclical factors and, ultimately, to assess our ability to achieve a satisfactory trajectory for the decarbonization of society.

What stands out when we compare the situation in 2022 with "where we should have been on a trajectory below 2 °C, as targeted at COP 21"?

- Global CO_2 emissions have continued to rise, when they should have started to fall.

- The global economy is the main factor driving up energy consumption and CO_2 emissions – but it has not grown as much as expected due to various crises.

- The decoupling of activity and energy consumption ("energy intensity") is very weak and far from the targeted trajectories; energy efficiency gains are therefore too limited.

- Energy consumption continues to grow and remains highly carbon-intensive. The "emissions factor" (CO_2 emissions per unit of energy) is barely falling. While the development of renewable energies is accelerating, fossil fuels are not yet on the decline.

- In short, we are not yet on the right trajectory (below 2 °C), or even on the trajectory that corresponds to the commitments made by countries (NDCs).

This report also shows that positive signals of a real transformation in specific sectors or geographical zones, such as:

- The electrification of end-uses, a major driver of efficiency gains and decarbonization potential, is continuing to develop (electric vehicles, buildings, industry, etc.),

- Electricity generation from renewable sources is increasing strongly throughout the world,

- Many countries and local governments are adopting increasingly ambitious targets and policies.

Beyond the facts and figures, there are other encouraging signs to be confirmed in the near future:

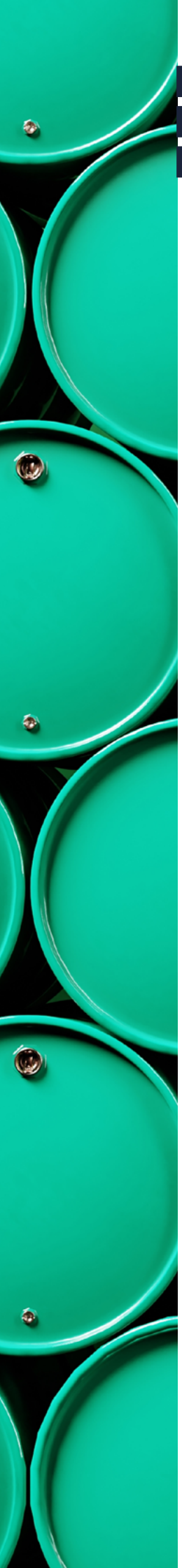
- Local and regional players are becoming leaders in transformation

- Companies are gradually incorporating climate objectives into their strategic priorities

- Reduced energy consumption and the development of energy sufficiency policies are (finally) taking on a significant role in public debate

- The collective awareness of the need for far-reaching change is helping to push for greater demands from decision-makers and confidence in their ability to mobilise the community. And prospecting studies show that the transformation that is about to take place can be a source of improvement in the quality of life, reduced inequalities, reasonable development...

The intuition underlying Climate Chance is becoming more important by the day: valuing and deploying the initiatives and successes of non-state actors is essential to accelerating change. This report is both a clear assessment of the current situation and a source of inspiration for action...



OVERVIEW OF GLOBAL EMISSIONS

SINCE THE PARIS AGREEMENT, EMISSIONS HAVE REACHED A RECORD HIGH DESPITE TRANSITIONS UNDERWAY IN SOME SECTORS

Global CO_2 emissions reached a new record in 2022. At a time when most of the negotiation items under the Paris Agreement are stumbling over the issue of financing and North-South solidarity, the intersecting emission trajectories of the industrialised countries and the major emerging economies are redrawing the divisions between past, present and future responsibilities. Nevertheless, territorial emissions, fruit of the international division of economic activities, mask major inequalities in carbon footprints between nations, reflecting the general level of consumption of their inhabitants. Carbon footprint inequalities are now widening as much between income levels within countries as between countries: the middle and affluent classes in the major emerging economies, especially in China, are adopting lifestyles that are just as carbon-intensive as those in industrialised countries. Public support for coal-fired power stations in the countries of the South and the inability of the countries of the North to embark on in-depth decarbonisation of their end-uses (transport, buildings, etc.) have led to the trends of transition identified in some industrial sectors.

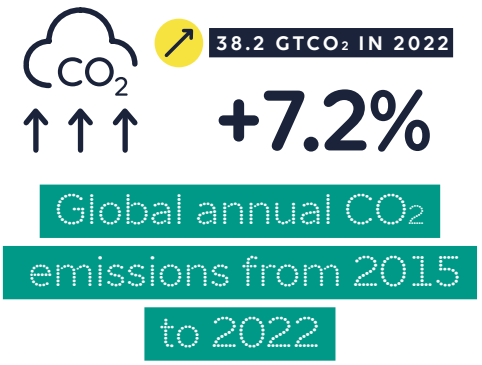
Record concentrations of greenhouse gases are accelerating the rise in temperatures

In 2022, global surface temperatures were 1.15 [1.02 to 1.28] °C higher than pre-industrial temperatures recorded between 1850 and 1900, according to observations by the World Meteorological Organisation (WMO).[1] This warming is the result of the increase in the concentration of greenhouse gases (GHGs) in the atmosphere from the pre-industrial period (1750) to the present day: +149% in carbon dioxide (CO_2), +262% in methane (CH_4) and +124% in nitrous oxide (N_2O). These levels of concentration had not been observed for hundreds of thousands of years. The concentration of CO_2, which had never exceeded 300 ppm for 800,000 years,[2] rose from 278.3 ppm in 1750 to 285.5 ppm in 1850, then to 400 ppm in 2015, peaking at 415.7 ppm in 2021, the last year for which consolidated figures are available.[3]

As early as 1896, the Swedish chemist and physicist Svante Arrehnius identified the link between CO_2 emissions linked to human activities and the possibility of global warming. Since it was set up in 1988, the Intergovernmental Panel on Climate Change (IPCC) has consistently confirmed the influence of human activities on the climate system in its publications, going so far as to state in its sixth assessment report that the human origin of global warming is now "unequivocal".[4] For the past six years, the Observatory has therefore been looking at anthropogenic emissions, in order to tell the complex story of on-the-ground action that underlies the changes in emissions.

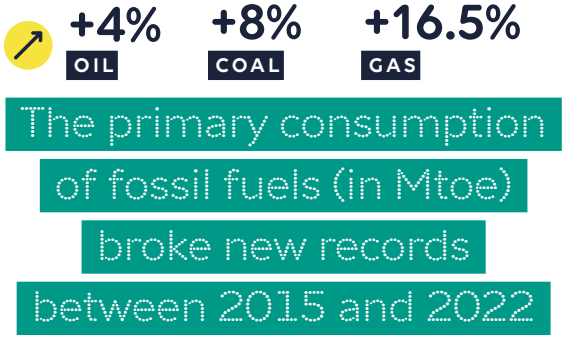
Since the Paris Agreement, global emissions continue to break records

Global greenhouse gas (GHG) emissions excluding land use, land-use change and forestry (LULUCF) amounted to 52.8 gigatonnes of CO_2-equivalent ($GtCO_2e$) in 2021, according to the 2022 edition of the United Nations Environment Programme's (UNEP) "Emissions Gap" report.[5] This is lower than the peak of 56.4 $GtCO_2e$ reached in 2019, due to the pandemic-driven fall in emissions in 2020, but already much higher than the 51 $GtCO_2e$ recorded in 2010 and the 42 $GtCO_2e$ measured in 2000. These figures include all greenhouse gases, the main ones being carbon dioxide (around 75%) and methane (around 16%), followed by other gases such as nitrous oxide, sulphur hexafluoride (SF_6) and fluorinated gases (F-gases).



Global CO_2 emissions excluding LULUCF rose from 35.6 $GtCO_2$ in 2015 to 38.2 $GtCO_2$ in 2022, according to Enerdata figures, a growth of 7.2%. The annual growth rate of CO_2 emissions between 2010 and 2022 (1%) is lower than that observed during the decades 2000-2010 (2.7%) and 1990-2000 (1.1%). **88% (33.9 $GtCO_2$) of these CO_2 emissions were attributable to the combustion of fossil fuels**: coal (46%), oil (29%) and gas (24%). The remaining 12% came from industrial processes. Emissions associated with forests, agriculture and land use change are examined later in this report (**CF. "LAND USE" TRENDS**).

The global energy mix is still heavily dependent on fossil fuels (**CF. "ELECTRICITY" TRENDS**). Between 2015 and 2022, the annual consumption of petrol, gas and coal in absolute terms has increased by 4%, 16.5% and 8% respectively. **While the use of fossil fuels to generate electricity has fallen slightly since 2015, their share of the global energy mix has remained stable at around 80% for decades.**[6] Investment in renewable energies has only partially offset the structural decline in coal, which has also increased the share of gas, though this has been hindered by geopolitical events since 2020. The Observatory has analysed this duality in the transition of power generation away from coal in a number of countries that have recently fully or partially phased out coal, such as the United Kingdom,[7] the United States[8] or Spain.[9]



The sectoral breakdown of emissions has stayed stable

CO_2 emissions from combustion originate from the consumption of hydrocarbon-based and mineral solid fuels used in the various energy production and consumption activities. Energy industries, such as power generation and refining, were responsible for almost half (48%) of global CO_2 emissions in 2022. Manufacturing and construction industries, such as iron and steel and chemicals, accounted for 23% of emissions, followed by transport (20%), residential and tertiary buildings (8%) and agriculture (1%). This breakdown has not changed much since the signing of the Paris Agreement, or since 1990, except that emissions linked to energy production are taking up a little more space, mainly due to efficiency gains in other sectors.

On the other hand, the sectoral composition of emissions can vary more significantly from country to country. In France, for example, where electricity production is relatively low-carbon due to the country's nuclear fleet, the share of emissions linked to energy production is much lower (14%), and that of transport much higher (43%). Thus, each country is in a position to determine its priorities for action according to the origin of its emissions.

Since the Paris Agreement, not a single sector has escaped the general trend of increasing CO_2 emissions. The only blip in this trend has been the Covid-19 pandemic and the lockdown decisions by countries, which slowed the economy to the point of generating the biggest drop in emissions (-4.8%) since the 2009 economic crisis (-1.1%), particularly affecting the transport sector (-11.4%). However, after a spectacular rebound in 2021 under the effect of economic stimulus policies when the lockdowns were gradually lifted, emissions have very quickly returned to their growth rate and are already above their pre-pandemic levels (2019), except for transport and tertiary buildings. The various sectoral "Trends" in this report take a more in-depth look at the trajectories of each emissions sector (**CF. "TRANSPORT" AND "BUILDINGS" TRENDS**).

While stagnating in the OECD, emissions growth is concentrated in emerging countries

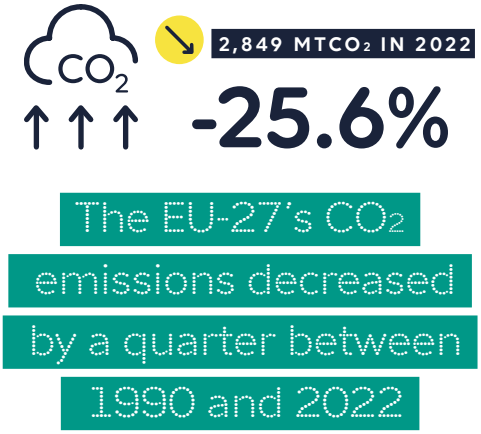
There are two approaches to measuring and tracking the greenhouse gas emissions of a country, city or region. The inventory approach accounts for emissions produced within the administrative and geographical boundaries of the jurisdiction studied, while the "footprint" approach, which incorporates emissions embodied in imports and exports, is more reflective of consumption behaviour in a globalized economy.

Going by the inventory approach, the emissions of G20 countries[a] accounted for 84% global CO_2 emissions. This ratio has remained virtually unchanged since 1990, but this group covers very different dynamics over the period. The share of the BRICS (Brazil, Russia, India, China, South Africa) in global CO_2 emissions was only 28% in 2000, but rose to 49% in 2022. China, which increased its territorial emissions fivefold between 1990 and 2022, now accounts for over a third (34%) of global CO_2 emissions, as against 11% thirty years earlier. Even India, now the world's most populous country, still only emits 7% of emissions, compared to 3% in 1990.

Conversely, the European Union (EU-27), whose territorial emissions fell by a quarter (-25.6%) over the period, now accounts for just 7% of global emissions, compared with 18% in 1990. The United States, which emitted 23% of CO_2 in 1990, accounts for just 13% by 2022, having reduced its emissions by only 1.9%. Downward trends can also be seen in Japan (-9.1%) and, above all, in the UK (-42.6%), which the Observatory's 2019 analysis showed to be almost entirely coal-free.[10] On the African continent, emissions rose by 122% between 1990 and 2022, but its share of global emissions only increased from 2.9% to 3.8%.

Since the Paris Agreement, territorial emissions from OECD countries have globally decreased by 6.5%, while they rose by 15% in non-OECD countries. The European Union (-9.6%), Japan (-11.7%) recorded a much deeper drop than in North America (-5.3%) or Australia (-5.8%). Conversely CO_2 emissions rose by 17% in China, 23% in India and more than 56% in Indonesia. Emission from the African continent grew by 8.7% over the period (**SEE TABLES IN ANNEX**).

a G20 countries include Argentina, Australia, Brazil, Canada, China including Hong Kong, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, the United Kingdom, the United States and the European Union.



The Covid-19 pandemic in early 2020, followed by the war in Ukraine in February 2022, were two exogenous factors that broke the trends of the past two decades. All regions of the world were affected, to varying degrees, by the economic impact of travel and activity restrictions imposed by governments during the pandemic. All continents saw an exceptional drop in CO_2 emissions that year: North America (-10.3% CO_2 emissions), Europe (-7.8%), Africa (-7.3%), the Pacific nations (-4.8%), the Middle East (-3.4%)... Only China saw a steady rise in CO_2 emissions (+1.5%) in 2020, mitigating the effect perceived on the Asian continent (-1.3%).

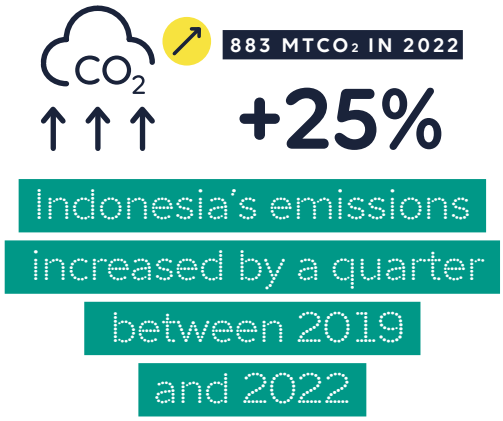
The effect was short-lived, although the pandemic had major economic and political implications, as we analysed in our 2020 and 2021 Global Synthesis Reports. **By 2021, global CO_2 emissions had exceeded their pre-pandemic level (2019) by 1.3%, and by 4.1% in 2022.** But trajectories diverge according to the economic areas observed. OECD countries[b], where CO_2 emissions fell by 8.9% in 2020, saw a rebound in 2021 as elsewhere, but returned to the downward trajectory observed since 2005: emissions in 2022 remained 3.4% lower than in 2019. Only Mexico, Sweden and Turkey overshot their pre-pandemic emission levels – with Turkey already having returned to a trajectory of falling emissions.

Outside the OECD, emissions fell by a smaller proportion during the lockdowns (-2.3%). The rebound observed was all the more spectacular in 2021 (+6.3%), as it considerably accelerated the annual growth rate of emissions in 2022 (+4%) compared to the 2010-2019 decade (+2% on average each year). This trend is particularly striking in the BRICS. There, the effect of the pandemic was even weaker (-1.2%), and the rebound was even more pronounced in 2021 (+7%), although the preponderance of Chinese emissions should not be overlooked. A singular case, South Africa's emissions peaked in 2019, due to the difficulties encountered by Eskom, the state-owned company that supplies 90% of the country's electricity. Dilapidated infrastructure and corruption-ridden governance have led to a drop in national electricity production of almost 10% since 2018. While coal still accounts for more than 85% of the electricity mix, this phenomenon has considerably reduced emissions from the sector, which is responsible for half of South Africa's CO_2 emissions.

Other major emerging countries are posting spectacular growth in emissions. Indonesia has become the world's sixth largest emitter, while its CO_2 emissions excluding LULUCF in 2022 (823 $MtCO_2$) were already more than a quarter higher than in 2019 (653 $MtCO_2$). The reason: coal and oil consumption growing by 33% and 12% respectively between 2021 and 2022, as analyzed by the Global Carbon Project.[11] Part of this record demand can be explained by efforts to restore post-pandemic industrial production, but it is not the only reason: the installed capacity of coal-fired power plants has risen from 25.4 GW in 2015 to 40.6 GW in 2022. The opening of new power plants is in line with Indonesian President Joko Widodo's plans to increase the country's capacity to extract and process nickel, a strategic metal that is crucial to the manufacture of lithium-ion batteries, which contribute to the electrification of road transport (**CF. "TRANSPORT" AND "INDUSTRIES" TRENDS**). Numerous nickel smelters opened in Indonesia in 2019, which explains the jump in emissions from the industrial sector of almost 66% in just three years. In January 2023, Indonesia introduced a new mandatory emissions trading scheme for coal-fired power plants over 25 MW.[12]

The effects of the war in Ukraine on gas demand have been more concentrated on the European continent and prolonged a trend that had already begun. In reality, the first tensions on the gas market appeared in the second half of 2021, due to a combination of economic and climatic effects. Against the backdrop of a cold winter in 2021 in the northern hemisphere and global economic recovery, strong demand from Asian markets for liquefied natural gas (LNG) competed with European demand, combined with a fall in European gas production and low gas stocks. A drought in Brazil during the summer also increased its demand for LNG to make up for shortfalls in hydroelectric power generation. At the end of 2021, tankers loaded with LNG initially destined for Asia were finally rerouted to Europe, where the shortage of gas had led to an explosion in the price of FFT-future contracts and where suppliers were prepared to pay a higher price. Throughout the year, the Chinese, Japanese and Korean markets outbid European demand, generating spectacular inflation from early spring 2021.[13]

b OECD countries here include the USA, Canada, South Korea, Australia, New Zealand, Mexico and the following European countries: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Iceland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom. The most recent members from Latin America (Chile, Colombia, Costa Rica) are not included.



Russia's invasion of Ukraine in February 2022 has prolonged and accentuated this tension on the European continent. Russia's share in EU gas imports fell from 39% in the second quarter of 2021 to 13% in 2023.[14] To make up for this, the European Union has resorted to other trading partners, with whom it has contracted long-term LNG imports (Qatar, the United States, etc.). The RePowerEU strategy adopted in May 2022 has strengthened the objectives set by the European Green Deal and the Fit-for-55 strategy, with the aim of reinforcing energy independence by focusing on electrification and the deployment of renewable energies. Energy sufficiency has also entered the public debate in France, Spain, Italy and many other European countries, in the form of calls for individual and collective responsibility to reduce energy consumption against a backdrop of tensions over gas supplies. While an effective drop in electricity consumption has been observed energy-intensive industries in France in 2022 for example, there are many explanatory factors, which will require in-depth monitoring over time.[15] As a result, gas consumption in the European Union fell by 16.5% between 2021 and 2022: while it had rebounded in 2021 above its pre-pandemic level, emissions linked to gas combustion fell by almost 13%, falling below their 2015 levels.

The carbon footprint, a marker of international as well as domestic inequalities

Global per capita emissions in 2022 (4.27 tCO_2 per capita) are down from 2015 levels (4.29 tCO_2/cap), and especially below the peak reached in 2013 (4.4 tCO_2/cap). On a per capita basis, territorial emissions remain more than twice as high in the OECD (8.17 tCO_2/cap) as in other countries (3.45). They are as high as 34.4 tCO_2 per capita in Qatar, 14.1 tCO_2/cap in the United States, 8 tCO_2/cap in Japan, 7.7 $MtCO_2$/cap in China and 5.88 tCO_2/cap in the European Union. Territorial per capita emissions are also following intersecting trajectories; they peaked in 2000 in OECD countries (10.71 tCO_2/cap), while they tripled in China over the same period, overtaking the European Union. Despite the impressive growth in its national emissions over the last two years, Indonesia's per capita emissions (2.8 tCO_2/cap) remain well below those of most industrialised economies.

While territorial accounting of national emissions does reflect the political choices and orientations of governments, it is biased against countries that host natural resources or industrial activities that benefit the global economy as a whole. This is true of oil-exporting countries: the Gulf States, of course, but also Trinidad and Tobago, which has the world's fourth-largest per capita territorial footprint due to its status as the world's fifth-largest oil producer and the largest supplier of liquefied natural gas (LNG) to the United States. This is also the case for the new industrial and manufacturing powers that have emerged since the early 2000s, such as China, where industries account for 40% of GDP – against about 20% in the US and the EU. China's trade surplus has increased 28-fold between 2000 and 2021.

The carbon footprint, which takes into account the emissions embodied in the goods and services consumed by a country's inhabitants, offers a more refined indicator for measuring the economic distribution of emissions. The French National Institute for Statistics recently published a comparative study on this subject, using the example of the European Union, the United States and China.[16] The EU appears first and foremost as a 'net importer' of emissions: its per capita carbon footprint (11 tCO_2e/cap) exceeds the per capita emissions calculated using the territorial approach (9.2 tCO_2e / cap). In the United States, an even greater gap separates the per capita carbon footprint (21.3 tCO_2e / cap) from per capita emissions measured by inventory (17.5 tCO_2e /cap). Conversely, in China, per capita GHG emissions calculated using the territorial inventory approach (8.5 tCO_2e /cap in 2018) are slightly higher than the carbon footprint per inhabitant (8.3 tCO_2e / cap). In absolute terms, these carbon footprint levels reflect differences in purchasing power, demographic dynamics and economic growth. But breaking down these footprints also reveals uneven progress in local efforts to decarbonise. In each of these three economic zones, 85% of final demand for goods and services is met by domestic production, and 15% by imports. Yet imports account for 33% of the carbon footprint in the EU, 26% in the US and 14% in China. This difference results from EU and US domestic production being both more tertiarised and more advanced in its decarbonisation than the production of its trading partners. The opposite is true in China, where domestic production, which is more industrial, is also highly carbon-intensive due to an electricity mix that is 62% coal-based.

It can be argued that the global distribution of industrial activities, and therefore emissions, has shifted in recent decades towards more carbon-intensive countries, as value chains have become more international. China's entry into the World Trade Organisation (WTO) in 2001 seems to have marked a real turning point in this respect. The average annual growth rate in global CO_2 emissions from industry rose from 0.6% between 1990 and 2000 to 4.5% over the following decade. However, 80% of this increase in industrial emissions between 2000 and 2010 took place in China, while they fell by 15% in the European Union and 22% in the United States over the same period. As a result, while China accounts for a larger share of global industrial emissions – going from around 20% between 1990 and 2000 to 40.3% in 2018 – it is also driving absolute growth in global production, driven by the growing purchasing power of its middle classes.

The transformation in the geographical distribution of global emissions also reflects the internal development trajectories of the major emerging countries, and not just the relocation of polluting activities away from industrialised countries, and cannot be summed up by the demographic growth of emerging countries alone. China's GDP per capita, measured in purchasing power parity, which was just $2.92 per capita in 2000 – compared with an OECD average of $24.6 per capita – increased sevenfold by 2022, and that of the BRICS as a whole by almost fivefold. This economic development is also reflected in infrastructure investment and the population's consumption. For example, while China is a net exporter of crude steel, accounting for 54% of global production, it is also by far the world's second largest consumer of finished steel, behind South Korea.[17] It has also become the world's leading car market, with the car ownership rate rising from 93 vehicles per 1,000 inhabitants in 2015[18] to 221 per 1,000 in 2022[19] (compared to 651 in Europe and 831 in the United States). Studies have shown that changes in consumption patterns by the middle and high-income classes are increasing the carbon footprint and emissions of Chinese households, as well as inequalities between urban and rural populations.[20,21]

Another change indicates that the differences in carbon footprints between income levels within countries are as important as the differences between countries. In a study published in Nature Sustainability at the end of 2022, the economist Lucas Chancel identifies two forces driving the increase in individual carbon footprint inequalities around the world: changes in average emission levels between countries, and changes in emission inequalities within countries. In 1990, 62% of carbon footprint inequalities were explained by differences in wealth between countries: the average citizen of a rich country almost invariably emitted more than the rest of the world. The situation has been completely reversed: it is now inequalities within countries themselves, between rich and poor, that explain almost two-thirds of global inequalities in emissions.[22]

63%

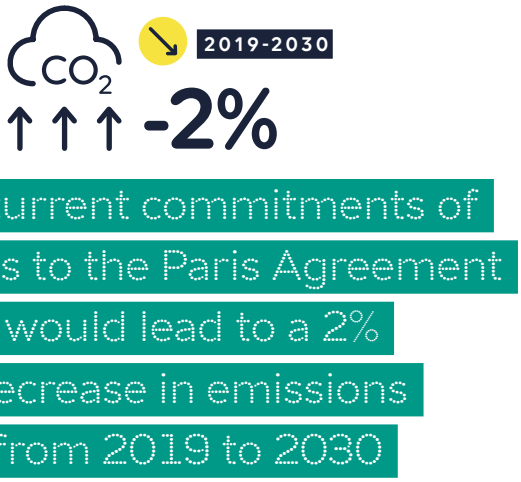
Two-thirds of carbon footprint inequalities arise from domestic economic inequalities, rather than international ones

On a global scale, the Interntional Energy Agency estimates that the richest 10% are responsible for almost half of the world's CO_2 emissions, while the poorest 10% emit just 0.2%.[23] These disparities can now be seen in both developed and emerging economies. In the United States and Europe, the top deciles emit three to five times more than the median level; in China and India, the ratio is five to eight. Inequalities persist between countries at all levels. In the United States, the 33 million people belonging to the richest 10% emit up to 55 tCO_2 per person per year, compared with just 7 tCO_2 per capita for the richest 10% in India. Similarly, says the IEA, the lowest deciles in the United States, Canada, Japan and South Korea always emit more than the global median. For example, the poorest 10% in the United States emit 3.5 tCO_2 per capita, compared with 0.2 tCO_2 per capita for the poorest 149 million in India. The gaps between the middle classes are narrower, particularly between the European Union and China.

The ambition level of commitments remains too low to bring about a real reduction in global emissions

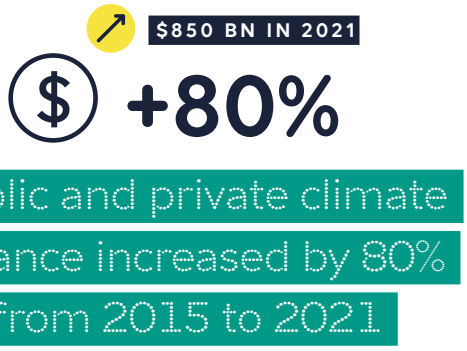
In 2015, the Parties to the Paris Agreement pledged to limit global warming to 2 °C or even 1.5 °C above pre-industrial averages. A veritable compass for climate action since the Paris Agreement and the publication of the IPCC's special report in 2019, the goal of "carbon neutrality" is now enshrined in many NDCs. According to the latest count by Net Zero Tracker, 151 countries covering 88% of emissions, 92% of GDP and 89% of the world's population have formulated a carbon neutrality objective.[24] **However, while global emissions need to fall by 43% between 2019 and 2030 to stay below the 1.5 °C threshold, according to the IPCC[25] the current plans of the 193 Parties to the Paris Agreement only commit to reducing emissions by 2% over the period,** according to a UNFCCC study.[26] UNEP, in its 2022 "Emissions Gap" report, concludes that full implementation of these so-called Nationally Determined Contributions (NDCs) would, at best, only limit global warming to 2.4~2.6 °C above pre-industrial averages. According to analyses by the Climate Action Tracker, out of 39 countries + the European Union covering 85% of global emissions,[c] no government action is compatible with a trajectory of limiting global warming to 1.5 °C. Only a handful of countries – Ethiopia, Kenya, Morocco, Nepal, Nigeria, Norway, Bhutan, Costa Rica and the Gambia – are considered "almost sufficient".

Climate finance is making progress, but flows are still insufficient to meet the needs of the transition. According to the latest findings of the Climate Policy Initiative (CPI), published in 2022, an average of $653 billion in climate finance flows was mobilised in 2019-20, 15% more than in the previous two years. Initial estimates put the figure at $850-940bn in 2021, an increase of 28-43%, which would be a new record. Renewable energies, which are seven times more profitable than fossil fuels, account for more than half of these flows. However, public subsidies for fossil fuels exceeded all the climate finance mobilised between 2011 and 2020 by 40%. CPI estimates that the annual growth in flows is not in line with a 1.5 °C trajectory, which would require $4,300 billion a year by 2030. CPI points in particular to the weakness of the mobilisation of private finance.[27]



To maintain a 50% chance of keeping global warming below 1.5 °C, the world cannot emit more than 380 $GtCO_2$ between 2022 and 2030; in the light of all the above analyses, the 1.5 °C objective now seems more doomed than ever.[28]

Eight years after the signing of the Paris Agreement, Climate Chance intends to contribute to the debates leading up to the first Global Stocktake of collective progress by governments, by offering an extensive analysis of trends in climate action around the world. The aim of this sixth edition of the Global Synthesis Report on Climate Action is to identify and analyse the public policies, private initiatives and civil society movements that, against this gloomy global backdrop, are showing signs of transition.



c Climate Action Tracker assesses government climate action in terms of the impact of policies implemented, commitments, NDCs and the fair share of each in the global effort to reduce emissions.

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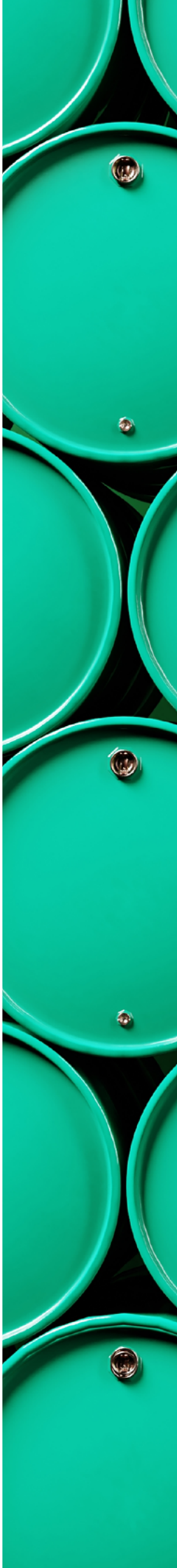

GLOBAL
OBSERVATORY
OF CLIMATE ACTION

KEY TAKEAWAYS 2023

The 10 Key Takeaways presented here sum up the analyses of the 2023 edition of the Global Synthesis Report on Climate Action. They provide an overview of the evolution of emissions and climate action at the global level from 2015 to 2022, based on available specialized publications.

N° 1

EMISSIONS

Despite the adoption of the Paris Agreement and the Covid-19 pandemic, global CO_2 emissions continue to grow

N° 2

ELECTRICITY

Renewable electricity generation continues to rise... but carbon-intense generation is not falling

N° 3

TRANSPORT

The transition from fossil-fuelled to electric engines is overtaken by growing demand for transport

N° 4

BUILDINGS

Decarbonization policies fall behind construction and renovation needs

Nº 5

INDUSTRY

Hydrogen, CCS... disruptive technologies remain marginal and dependent on fossil fuels

Nº 6

WASTE

The already small share of recycled materials is shrinking, but new circular industrial channels are developing

Nº 7

LAND USE

Deforestation is slowing...
but is not stopping the decline
of the carbon sink

Nº 8

COMPANIES

Distant and hard to measure, net zero commitments of companies lack credible transition plans and progress monitoring

Nº 9

LOCAL GOVERNMENTS

At the heart of innovation and climate action, local public policies seek to scale-up in order to reach 2030 targets

Nº 10

CIVIL SOCIETY

The multifaceted conflicts of civil action on climate feature both legal successes and difficult applications

N° 1 Despite the adoption of the Paris Agreement and the Covid-19 pandemic, global CO_2 emissions continue to grow

- Global CO_2 emissions hit a new record in 2022, despite the drop observed in 2020 during the Covid-19 pandemic.
- Emissions have plateaued in the OECD. The EU and the UK have embarked on a sustained reduction in their territorial emissions. The trend has been more erratic in the United States since 2000. Japan reached its peak in 2013, as did Australia in 2017 and South Korea in 2018, more as a result of weak GDP growth than a real shift in the energy mix.
- Emissions are growing mainly in non-OECD countries, which now account for 60% of global emissions. More than 70% of the growth in global emissions since 2000 has taken place in China, where per capita emissions even exceed those of the EU. Despite strong growth, per capita emissions in India and Indonesia remain well below those of the industrialised countries.
- Carbon inequalities are increasingly well measured, and can now be observed both between nations and between income levels within countries. For example, the carbon footprint of China's middle and upper classes is converging with that of industrialised countries, and increasing the gap with the lowest incomes.

KEY FIGURES

Global emissions have not dropped since the Paris Agreement

- **52.8 Gt** of greenhouse gases emissions (excluding land-use) in 2021, vs. 49.2 $GtCO_2e$ in 2016 (UNEP, 2022).
- **+7.2% CO_2 emitted** between 2015 (35.6 $GtCO_2$) and 2022 (38.2 $GtCO_2$), in cumulative annual growth. 88% of these emissions were from fossil fuel combustion (Enerdata, 2023).
- **48% of global CO_2 emissions** are linked to energy production, ahead of industry (23%), transport (20%), buildings (8%), and agriculture (1%) (*ibid.*).

The intersecting trajectories of territorial emissions in emerging and industrialised economies

- **84% of global emissions are from the G20**, a constant share since 2000. But 49% from BRICS in 2022, vs. 28% in 2000. China's, India's and Indonesia's emissions have grown fivefold (*ibid.*).
- **The European Union (-25,6%)**, the United Kingdom (-42.6%), Japan (-9.1%), the Unites States (-1,9%) have reduced their emissions from 1990 to 2022.
- **-0,13 tCO_2 per capita** between the peak in 2013 (4.4 tCO_2 per capita) and 2022 (4.27 tCO_2 per capita) at the global level (*ibid.*).

The carbon footprint of the middle and upper classes widens inequalities in emissions

- **The world's leading emitter**, China's carbon footprint (8.3 tCO_2 per capita) is still smaller than that of the EU (11 tCO_2 per capita) and the United States (21 tCO_2 per capita) (INSEE, 2023).
- **1/3 of the carbon footprint of the EU** stems from its imports, vs. 26% in case of the US and 14% in China (*ibid.*).
- **The richest 10% emit 48% of global emissions** (IEA, 2023). 2/3 of carbon footprint inequalities stem from within countries, rather than between them, as the upper-middle classes of emerging economies expand (Chancel, 2022).

FURTHER READING

- Global Synthesis Report on Climate Action by Sector – 2018, 2019, 2020, 2021, 2022
- Global Synthesis Report on Climate Finance – 2018, 2019, 2020, 2022
- Global Synthesis Report on Local Climate Action – 2018, 2019, 2021, 2022
- Global Energy Trends 2023 (Enerdata)

N° 2 Renewable electricity generation continues to rise… but carbon-intense generation is not falling

- Emissions from electricity generation have followed a constant upward trend since 2015, except for the fall triggered by the pandemic in 2020.
- Since 2015, renewable capacity additions have outstripped fossil capacity additions (respectively accounting for three quarters and one quarter of the capacity added between 2019 and 2022). But on average, three times as much renewable capacity is needed to replace one unit of fossil capacity.
- The average carbon intensity of electricity generation has therefore fallen overall since 2015, but the rise in global demand is outstripping the decarbonization of the mix. Where it is taking place, the transition away from coal is benefiting renewables as much as gas.
- Government subsidies are keeping coal alive in China, India and Indonesia, while oil companies are still investing far too little in renewables to begin a genuine transition away from oil.

KEY FIGURES

Increase in emissions, decrease in carbon intensity

- **+10.91% emissions from electricity generation** from 2015 to 2022 – 15.95 $GtCO_2$ (Enerdata, 2023).
- **+10.11% primary energy consumed** from 2015 to 2022 – 14,951 Mtoe (*ibid.*).
- **+21.7% final electricity consumption** from 2015 to 2022 – 24,598 TWh (*ibid.*).
- **-8.08% average carbon intensity of global electricity generation** from 2015 to 2022 – 439.78 gCO_2/kWh (*ibid.*).
- **20.5% share of electricity** in final energy consumption, vs. 18% in 2015 (*ibid.*).

Growth in renewables, fossils persist

- **+82% renewable capacities** from 2015 (1,853 GW) to 2022 (**3,372 GW**) (IRENA, 2023).
- **40.2% of global generation capacity** was renewable in 2022, vs. 29.5% in 2015 (*ibid.*).
- **63.2% of fossils** in the electricity mix in 2022, vs. 68% in 2015. From 2015-22, solar went from 1% to 4.5%, and wind from 3.4% to 7.3% (Enerdata, 2023).

Investments and transition plans are insufficient

- **1,241 mergers and acquisitions** in 2022 in the energy sector, **+117%** compared to 2015 (White & Case, 2023).
- **13/100**, average ACT score of oil companies' transition plans. **37/100** for electric utilities (WBA, 2023).
- **+680% power purchase agreements (PPAs)** from 2015 (4.7 GW) to 2022 (**36.7 GW**) (BNEF, 2023).
- **1.3%** of the investments of 9 Oil Majors are "low-carbon" (Energy Monitor, 2023).

FURTHER READING

TRENDS

- The growth of renewables is still not enough to feed the insatiable energy appetite of the economic recovery (2022)
- From Big Oil to Big Power? At the heart of the renewable energy boom, oil producers are dreaming of a low-carbon future (2021)
- With PPAs, businesses and cities are securing the production and supply of low-carbon electricity (2021)

CASE STUDIES

MALI • Access to "clean" energy thanks to decentralised solar-mini-grids (2022)

GEORGIA • Gender-sensitive energy cooperatives in rural areas (2022)

VIETNAM • A boom in solar energy (2021)

MELBOURNE • En route to 100% renewables thanks to Power Purchase Agreements (2021)

CADIZ • At the forefront of the municipalisation of energy (2021)

SPAIN • Spain's upswing in renewables defeats years of headwinds (2021)

UNITED KINGDOM • A decarbonization model involving all stakeholders (2019)

KENYA • Innovation at the service of low-carbon electrification (2018)

N°3 The transition from fossil-fuelled to electric engines is overtaken by growing demand for transport

- Since the Paris Agreement, global CO_2 emissions from transport have been rising, except in the OECD countries, where it is slightly contracting. Demand for mobility is growing in the Global South, while efforts to reduce demand are still in their early days.
- The success of electric car sales in Europe and China has not yet dented the hegemony of oil, which has been eroded by biofuels only in a handful of countries (Norway, Sweden, Brazil...).
- Carmakers, whose sales have been falling for the past five years, have resolutely embarked on their transition, but the "SUVization" of the market is wiping out efficiency gains made possible by electrification.
- The mitigation roadmaps for international air and sea transport promote alternative fuels which remain marginal and do not address the growth in demand.
- The supply and demand for high-speed rail is expanding, particularly in China. Europe is gradually rehabilitating night trains and short-distance rail, while India has electrified its lines on a massive scale.

KEY FIGURES

Demand for mobility and emissions still rising in the transport sector

- **+6%** CO_2 emissions related to transport from 2015 (6.39 $GtCO_2$) to 2022 (6.78 $GtCO_2$) (Enerdata, 2023).
- **Road: +6.1 %** from 2015 (5.75 $GtCO_2$) to 2022 (6.14 $GtCO_2$), with a slight drop observed in the OECD (-1.5%) and a strong increase elsewhere (+14.9%) (*ibid.*).
- **Rail: +4.2%** from 2015 (91.37 $MtCO_2$) to 2022 (95.24 $MtCO_2$) (*ibid.*).
- **Air: -9.1%** from 2015 (882.81 $MtCO_2$) to 2022 (789 $MtCO_2$) (*ibid.*).
- **Sea: +6.5%** from 2015 (663 $MtCO_2$) to 2022 (734 $MtCO_2$). +150% CH_4 from 2012 to 2018 (UNCTAD, 2022).
- **Road: +7%** energy consumption from 2015 and 2022 (Enerdata).
- **Rail: 4,100 billion passenger-kilometres** in 2019: record unequalled since the pandemic (UIC, 2023).
- **Air: 94.2%** of air traffic had picked up since the pandemic by June 2023. -8% air freight in 2022, dropping below its 2019 level (IATA, 2023).
- **Sea: +14%** transport of containerized cargo, +11.7% bulk cargo (UNCTAD, 2022).

Dependence on oil not yet contested

- **95% of road transport runs on petroleum** vs. 4.7% on biofuels and 0.3% on electricity (Enerdata).
- **42% of new vehicle sales are SUVs**, of which 84% have internal combustion engines (IEA, 2023).
- **98.2%** of ships in operation and 73.8% of ships on order run on conventional fuels (DNV, 2023).

Transition signals

- **23 countries and 17 sub-national jurisdictions** plan to phase out combustion vehicles (REN21, 2023).
- **14% of new vehicles sold were electric** in 2022, *i.e.* 20x more than in 2015. But EVs still only make up 2.1% of the global automobile fleet (IEA, 2023).
- **115 gCO_2/km average emissions for car manufacturers in Europe**, compared to 131 g/km in 2020 (12%) – the biggest drop observed since records began in 2010 (ICCT, 2022).

FURTHER READING

TRENDS

- Recycling Lithium-ion batteries, the new frontier in the electrification of mobility (2021)
- Metals, the precious fuel for the automotive market in the race to electrification (2022)

CASE STUDIES

ZIMBABWE • Mobility for Africa. Promoting access to sustainable electric mobility in rural areas to empower women (2022)

BARCELONA • Sant Antoni, the green street inspiring the city (2022)

COLOMBIA • Sustainable urban mobility, rural accessibility and interurban connectivity (2021)

JAPAN • At the cutting edge of technology and of the modal shift (2019)

NORWAY • The progressive electrification of land and maritime transport (2019)

SWEDEN • The automotive sector's transformation is taking shape (2018)

N° 4 Decarbonization policies fall behind construction and renovation needs

- The global built-up area has been faster than energy efficiency gains in buildings. As a result, emissions from the sector have been on the rise since 2015.
- Energy consumption from buildings in non-OECD countries, pushed by new constructions and demographic growth, is growing faster than in the OECD, where renovation isn't at the needed level.
- In the North, despite gradual electrification, the slow decarbonization of the electricity mix is holding back the sector's decline in emissions. In Germany and the United States, social movements are contesting the phase-out of gas in new buildings by states and municipalities.
- In light of its energy vulnerability revealed by the war in Ukraine, "energy sufficiency" is making a concrete entry into European policies; its impact remains to be seen over time.
- In the South, the need for air-conditioning is rapidly increasing. Isolated initiatives are seeking to scale-up, based on traditional materials and know-how.

KEY FIGURES

Property construction is outpacing energy savings

- **+8.5% emissions** and +12.8% energy consumption from 2015 to 2022. **30%** – share of the building sector in total final energy consumption (Enerdata, 2023).
- **+16.2% built-up area** from 2015 to 2022, compared to -5.5% energy intensity over the same period (IEA, 2023a).

Heating cools down while cooling heats up

- **54.5% of fossil energy** in building consumption in 2022 (mostly for heating), compared to 60.5% in 2015 (IEA, 2023b.)
- **+11% heat pumps** sold from 2021 to 2022, +40% in Europe. (IEA, 2023c).
- **+4%/year energy demand** for space cooling since 2000. Emissions generated by air conditioning systems increased by 16% from 2015 to 2022 (IEA, 2023d).

Sourcing, bans, certification – three popular action levers

- **920 municipal renewable energy targets** for 2022 – of which 793 concern supply, generation or consumption of electricity; 170 concern heating or cooling (REN21, 2022).
- **125+ local governments and 11 states in the United States, representing 36 million people,** have banned gas or encourage electrification of new buildings (RMI, 2023).
- **4.2 billion m² of built-up area certified** in 2021, compared to 1.05 in 2016 (WorldGBC, 2022).

FURTHER READING

TRENDS

- Real estate players are re-examining their foundations to adapt to climate change (2022)
- From efficiency to renewable energy generation: Commercial spaces in search of renewal favouring the low-carbon transition (2022)
- In the face of global warming, air-conditioning is locked in a market model that is costly for the climate (2021)
- US Cities embark on an anti-gas battle to electrify buildings (2021)

CASE STUDIES

ANGERS • EnergieSprong, an industrialized zero energy renovation project, a lever for mass uptake (2022)

INDONESIA • Betting on reflective roofs to avoid air condition (2022)

THE NETHERLANDS • Long-term strategies of local authorities to phase out fossil fuels in heating (2021)

BRAZIL • Buildings: Local authorities and businesses, pioneers in a still weak national set-up (2019)

CANADA • The energy intensity of the residential sector becomes more efficient (2018)

N° 5 Hydrogen, CCS... disruptive technologies remain marginal and dependent on fossil fuels

- Global CO_2 emissions from industry rose slightly between 2015 and 2022, driven mainly by energy combustion.
- Long ignored, CO_2 capture and storage is once again mobilizing investors – especially oil companies, who are extending the life of depleting wells. Installed and developing capture potential remains very low.
- Despite growing political and financial investment since the post-pandemic recovery plans, "green" hydrogen production processes and its decarbonized uses are still limited, and depend on the availability of a decarbonized electricity mix.
- The quest for industrial sovereignty over metals strategic to the transition is defining the contours of a new geopolitical map of raw materials between industrialized countries, China who dominates the value chains, and emerging countries rich in natural resources (Indonesia, DRC, Bolivia...).

KEY FIGURES

Industrial emissions concentrated in a few heavy industries

• **+1% direct emissions from industry** from 2015-2022; steel (+5%), chemicals (+1%) and cement (+11%) represent 71% of the sector's emissions (IEA, 2023a).

Green hydrogen still a long way from its own decarbonization

• **95 Mt hydrogen (H_2) produced** in 2022; <1% of low-carbon origin, and 0.04% from renewable electricity (IEA, 2022).

• **40.8%** of production is employed in oil refining; the remainder is used to produce methanol, ammonia and direct reduced iron ore. 0.04% is devoted to low-carbon uses (transport, storage, decarbonization of industry, etc.) (*ibid.*).

• **25 States** had adopted a hydrogen strategy in 2021, compared to 3 in 2019: the pandemic marked a turning point in investments (*ibid.*).

Carbon capture and storage driven by the petroleum sector

• **42.6 million tonnes per annum (Mtpa)** was the capacity for carbon capture in 2022 (+44% since 2015), *i.e.* the equivalent of Sweden's emissions, and 0.1% of global emissions (Global CCS Institute, 2022).

• **20/30 CCS sites** financed by enhanced oil recovery (*ibid.*).

• **1 single industrial site** equipped with CCS: a cement plant in the United Arab Emirates (*ibid.*).

Metals strategic to the transition become increasingly critical

• Lithium (+539%), cobalt (+124%), nickel (+118%), rare earths (+160%), copper (+60%)... **inflation** is impacting all transition metals (IMF, 2023).

• 74% of cobalt is extracted in the DRC, 68% of rare earths in China, 49% of nickel in Indonesia, 47% of lithium in Australia; 24% of copper in Chile. China controls 57% of refining for these metals (IEA, 2023b).

• **14% of energy needs** of the mining industry covered by renewable energy (REN21, 2023).

FURTHER READING

TRENDS

- CCUS reaches a turning point (2021)
- Boosted by the recovery, the "hydrogen economy" gains credibility (2021)
- "Yes, in my backyard!" Under pressure, international competition for strategic minerals required for the energy transition intensifies (2021)
- Carbon-free steel: a miracle solution and massive investment alloy (2020)

CASE STUDIES

ALSACE • Towards a Made-in-Europe production of low-carbon lithium with the EuGeLi project (2022)

NORWAY • The Longship Project: CCS to decarbonise heavy industries (2021)

TOKYO • Hydrogen fuels the flame of the Tokyo Olympics (2021)

CHILE • An emerging key actor in the renewable energy arena (2019)

N° 6 The already small share of recycled materials is shrinking, but new circular industrial channels are developing

- Since 2018, the share of circular processes (recycling, composting, etc.) in global consumption of raw materials has continued to shrink: the growth in demand for virgin raw materials has overtaken the progress made by global circularity.
- Monitoring of the evolution of global waste production suffers from a lack of aggregated data, making it hard to precisely follow its destination: numerous waste items drop off the grid, move into informal circuits, or disappear in landfills.
- The closure of Chinese and other Asian borders to imports of recyclable waste in 2018, followed by the amendment of the Basel Convention on hazardous waste, have slowed and redirected international waste trade towards new countries. Landfilling and incineration, emitting CH_4 and CO_2, have gained ground.
- In Europe, and increasingly in North America, Extended Producer Responsibility (EPR) and deposit-return schemes are demonstrating their ability to organize and finance collection and recycling channels.

KEY FIGURES

Consumption of materials overrides the progress of circularity

- **2.01 billion tonnes solid municipal waste produced in 2016**, according to latest available global figures (World Bank, 2018).
- **7.2% in 2022**: the rate of global circularity, which has been continuously dropping since 2018 (9.1%) (Circle Economy, 2023).
- **48.3% of waste recycled or composted in the EU** in 2021, compared to 44.9% in 2015 (Eurostat, 2023) and 32.1% in the United States in 2018 (EPA, n.d.), while Japan reduced its waste production by 7% from 2015 to 2021 (MOE, 2022).

China has shifted the status quo on international waste trade

- **0 tonnes of plastic waste** imported into China in 2022, compared to 8.8 million tonnes in 2017; -98% imports of paper and cardboard waste... the National Sword Policy has slashed international waste processing (UN Comtrade, 2023).
- **72% of the 300 biggest global companies** have a target to reduce plastic pollution (Diana et al., 2022).

Multifaceted reorganization of local processing capacities

- 352.9 million people in 50 jurisdictions around the world lived an area with a container deposit return system. **The average rate of return is 74.2%** in the world, 90% in Europe (Reloop, 2023).
- 180,000t of battery recycling capacities per year in the world. <1% of lithium used is currently recycled (IEA, 2021).
- **+11% biogas production** in the European Union from 2015-2022, *i.e.* 8% of its gas consumption, as much as +114% in France, where the move to methanation is strongest (Enerdata, 2023).

FURTHER READING

TRENDS

- In Europe, the circular economy in textiles is being reinvented (2022)
- Recycling Lithium-ion batteries, the new frontier in the electrification of mobility (2021)

CASE STUDIES

KAMIKATSU • A social project beyond the zero waste objective (2022)

MENDOZA • Promoting a socially inclusive model of comprehensive waste management (2021)

BRITISH COLUMBIA • Operation EPR at the heart of "Zero Waste" and the Circular Economy (2021)

FLANDERS • The development of a comprehensive strategy for the bioeconomy (2021)

MOROCCO • Moroccan society's uneven response to the proliferation of waste (2020)

N° 7 Deforestation is slowing… but is not stopping the decline of the carbon sink

- Annual global tree cover loss has slowed since peaking in 2016, but remains above the 2000-2015 average. The carbon stocking capacity of forests therefore continues to weaken.
- Indonesia has significantly slowed its rate of deforestation, which is accelerating in the Democratic Republic of Congo and Brazil.
- International targets for combating deforestation (New York Declaration), accelerating reforestation (Bonn Challenge) and promoting biodiversity (Aichi Targets) have generally not been met.
- Financing for biodiversity and forests is growing. "Nature-based" carbon credits are driving the development of voluntary carbon markets.

KEY FIGURES

Deforestation slowing down but still high

- **25 million hectares (Mha) of forest cover** lost on average each year since the 2016 peak of 29.6 Mha. Noteworthy slowdown in Indonesia from the 2016 peak (2.2 Mha) to 2022 (0.8 Mha) (GFW, 2023).
- **4 Mha** humid primary forests lost on average each year since the 2016 peak of 6 Mha (*ibid.*).
- **2/3 of the loss of primary forests** between 2013 and 2019 was due to conversion for commercial agriculture, and 3/4 of that conversion was illegal (Forest Trends, 2021).

The forest carbon sink continues to shrink

- **-7.72 $GtCO_2e$/year**: net sink for the period from 2001 to 2022, resulting from 8.84 $GtCO_2e$/year of emissions from forests and -16.6 $GtCO_2e$/year absorbed (GFW, 2023).
- **-5.8 GtC sequestration capacity** in tropical forests from the 1990s to the 2010s – the carbon equivalent of a decade of fossil energy emissions from the United Kingdom, Germany, France and Canada combined (CIRAD, 2020).
- **0.22 $GtCO_2e$/year** of net emissions from the Brazilian Amazon between 2001 and 2019, now a net source of emissions (Harris et al, 2021).

Despite increased commitments and funding

- **69% of companies with the highest forest risk** had a policy against deforestation in 2023 (41% in 2015), and 39% of financial institutions (0 in 2015) (Forest500, 2015; 2023).
- **$130 billion funding** to support biodiversity in 2020, compared to $52 billion in 2012 (Global Canopy, 2012; The Nature Conservancy, 2020)
- **$263 million/year**: average multilateral funding of REDD+ projects between 2015 and 2021 (CFU, 2022).
- **+321%** value of nature-based carbon credits sold on the voluntary market from 2020 to 2021 (Ecosystem Marketplace, 2022).

FURTHER READING

TRENDS

- Strengthening ecological connectivity to adapt ecosystems to climate change (2022)
- Rights of nature as a bastion against the destruction of natural ecosystems (2022)
- Community Forestry in Central Africa: Still a fragile sustainable forest mangement model (2021)
- A matter of trust: How palm oil supply chain actors respond to the evolving sustainability standards (2021)

CASE STUDIES

SUNDARBANS • Banking on mangroves for land, life and livelihood (2022)

CARDAMOMS • Involving local communities to protect the Cardamom range (2021)

RWANDA • "Visit Rwanda", from a soft power strategy to a profitable business for forest and wildlife conservation (2021)

RUSSIA • As Russia's climate policy comes under fire, burning forests risk depleting carbon sinks (2021)

COSTA RICA • After ending deforestation: strategies and actions for viable land use (2020)

CÔTE D'IVOIRE • Winning back its forests (2018)

FRANCE • The indispensable role of biomass and soils, concrete action still being discussed (2018)

N° 8 Distant and hard to measure, net zero commitments of companies lack credible transition plans and progress monitoring

- Since the Paris Agreement, "net zero emissions" has become the compass of corporate climate action and a driver for their growth strategies.
- Often unclear and limited to "operational" emissions (Scopes 1 & 2), these targets overlook value chain emissions (Scope 3), which represent 75% of companies' carbon footprint.
- Corporate transition plans, which should specify the means to reach carbon neutrality, are lacking precision on the required investments and changes in business models.
- Carbon offsets via voluntary markets, gaining popularity among companies, requires greater methodological credibility and transparency, at a time when "carbon neutrality" claims are beginning to be regulated in Europe.

KEY FIGURES

Measuring emissions, a prerequisite to commitments but not yet universal

- **8,307 companies have committed to the Race to Zero**. 929 of the 2,000 biggest companies have set net-zero targets, 4% of them aligned with RtZ requirements (Net Zero Tracker, 2023).
- **71% of companies disclose their operational emissions** (Scopes 1 & 2) out of the 4,000 biggest global firms, vs. 54% in 2015 (FTSE Russell).
- **22% disclose their Scope 3 emissions**, which represent 75% of their total emissions (CDP, 2023).

Transition plans lack precision

- **3,960 companies supported the TCFD in 2022**, seven times more than in 2018 (571) (TCFD, 2022).
- **2,079 "science-based" emissions reduction targets validated** by the STBi in 2022 (28 in 2015), out of 4,230 committed companies. 136 "net-zero" strategies validated (SBTi, 2023).
- **0.4% transition plans judged credible**. Financial planning, science-based targets, and net-zero strategies were lacking (CDP, 2023).
- **27.6/100** is the average score of company transition plans evaluated using the methodologies of the Assessing low-Carbon Transition® initiative set up by Ademe and the CDP (WBA).

Booming carbon markets shifting towards nature-based solutions

- **475 $MtCO_2e$ of carbon credits put on the market in 2022**, the equivalent of Brazil's CO_2 emissions. 55% financed renewable energy projects, and 17.6% financed the elimination of CO_2 in 2022 (World Bank, 2022).
- **$1.3 billion "nature-based" carbon credits exchanged in 2021**, 20 times more than in 2016, way ahead of renewable energy credits. This success comes up against questions concerning the integrity of emissions avoidance credits (Ecosystem Marketplace, 2022).

FURTHER READING

TRENDS

- The Net Zero Target: The Voluntary Carbon Market enters a new dimensions (2022)
- As it surges ahead, the ESG market seeks to standardise transparency norms (2022)
- Regulation: From China, to Europe, taxonomies are increasing the transparency of financial markets (2022)
- From Big Oil to Big Power? At the heart of the renewable energy boom, oil producers are dreaming of a low-carbon future (2021)
- With PPAs, businesses and cities are securing the production and supply of low-carbon electricity (2021)

CASE STUDIES

ALSACE • Towards a Made-in-Europe production of low-carbon lithium with the EuGeLi project (2022)

ANGERS • EnergieSprong, an industrialized zero energy renovation project, a lever for mass uptake (2022)

THE OBSERVATORY'S BLOG

- Non-financial reporting standards: What impact on corporate climate accountability? (2023)
- UNFCCC Secretariat Recognition and Accountability Framework for non-party stakeholder climate action: What's to be expected? (2023)

N° 9 At the heart of innovation and climate action, local public policies seek to scale-up in order to reach 2030 targets

- Cities signatory to the Covenant of Mayors in Europe have, according to reported data, reduced emissions beyond their average targets for 2005 to 2020, in line with EU targets.
- The mobilisation of cities is growing significantly in Latin America and Sub-Saharan Africa. In Europe, adaptation planning is improving in quality.
- Around the world, the analysis of real progress by local governments is met with a lack of data that is credible and coherent over time. In Europe, the average gap between two municipal inventories equals the length of a mayor's mandate in France – six years.
- Several cities are rendering permanent the resilience measures that were taken during the pandemic, like the roll-out of cycling infrastructure. Subnational regions play a central role in ensuring the just transition of coal-dependent areas.

KEY FIGURES

Local governments committing for the climate

- **12,800+ signatories** of the Global Covenant of Mayors for Climate and Energy, representing 1.1 billion+ people (GCoM, 2023).
- **1,136 cities and 52 regions** among signatories of the Race to Zero initiative (UNFCCC, 2022).
- **2,336 jurisdictions** in the world have declared a "climate emergency" (Cedamia, 2023).
- **1.3 billion people** in 1,500 cities covered by renewable energy targets and policies (REN21, 2022).

Reporting and monitoring in need of standardization

- **862 distinct jurisdictions** have published emissions figures at least once through CDP (CDP, 2022).
- **58% (503 out of 862)** of them disclosed their emissions at least twice, permitting their monitoring (*ibid.*).
- **2-3 years** is the average gap between accounting and reporting years of cities reporting to CDP (*ibid.*).
- **6 years** is the average gap between two inventories of CoM-EU cities (JRC, 2022)

Europe: A general downtrend in emissions

- **41% of the 10,800+ current signatories** have renewed their targets for 2030 or 2050 (JRC, 2022).
- **-25.3% emissions** from 1,851 cities between 2005 and 2020, above the average target of -22.7% (*ibid.*).
- **320 low-emission zones (LEZ)** in Europe in 2022, vs. 228 in 2019 (Azdad, 2023)
- **1,500 cities (1.3 bn people)** have set targets policies in favour of renewables globally (REN21, 2022)

FURTHER READING

REPORTS

GLOBAL SYNTHESIS REPORT ON LOCAL CLIMATE ACTION – 2018, 2019, 2021, 2022

CASE STUDIES

BOBO-DIOULASSO • The development of a SEACAP after signing up to CoM SSA (2022)

ATHENS • A whole department of the municipality dedicated to developing resilience (2022)

SCOTLAND • Linking climate action and the SDGs (2022)

DANNIEH • Using the SEACAP as a climate finance instrument (2022)

MANCHESTER • A local carbon budget for the city (2021)

MEXICO CITY • MERCI-CO2, an example of atmospheric accounting of emissions (2021)

NOUAKCHOTT • The AREDDUN project for resilience and adaptation (2019)

N° 10 The multifaceted conflicts of civil action on climate feature both legal successes and difficult applications

- Since 2015, civil society has diversified its repertoire of actions and radicalized its positions, multiplying conflicts and leading to contested major infrastructure projects being abandoned (Notre Dame des Landes, Yasuni…).
- Shareholder activism is on the increase, but shareholder-supported resolutions are less likely to win the confidence of general assembly meetings than those tabled by the company's board.
- Use of legal proceedings to challenge a government policy or a company strategy has a high success rate in the courts. On a case-by-case basis, the effectiveness of the implementation of decisions has yet to be assessed.
- The increasingly frequent use of law or legislation to confer rights on nature, ecosystems or animals is gaining in popularity.

KEY FIGURES

Double-edged conflicts for the most vulnerable

- **649 conflicts observed** from 1997 to 2019 on fossil energy projects (371) and low-carbon projects (278) (Temper et al, 2020).
- **15% of contested projects** have been cancelled, suspended, or seen investment withdrawn (*ibid.*).
- **10% of conflicts** have led to the assassination of an activist (*ibid.*), in particular among indigenous communities. 1,910 ecological activists were killed between 2012 and 2023 (Global Witness, 2023).

Shareholder activism pushes corporate ambitions

- **182 resolutions on climate** filed by shareholders at corporate AGMs in 2023 (Ademe, French SIF, 2023).
- **17.4% average approval** of shareholder resolutions at AGMs in 2023, compared to 90% average approval for "Say on climate" board resolutions (*ibid.*).
- **31% of shareholder resolutions** are withdrawn following an agreement with the company, with the formulation of an emissions or offset target, or a transition plan (*ibid.*).

Rise in legal action since 2015

- **2,341 climate litigation cases** observed from 1986 to 2023; 2/3 were filed 2015 onwards. 9 cases in 10 were pursued by NGOs last year, mostly in the Global North (LSE, 2023).
- **55% of decisions** made were favourable to the climate (*ibid.*).
- **457 "ecological jurisprudence" initiatives** listed in 44 countries in 2022 (since 1969); +130% compared to 2015 (198). 75% aim to grant rights of nature to an ecosystem or animals (Kauffman, 2023).
- **70% of ecological jurisprudence initiatives** are adopted; only 16% are rejected (*ibid.*).

FURTHER READING

TRENDS

- Rights of nature as a bastion against the destruction of natural ecosystems (2022)
- "Yes, in my backyard!" Under pressure, international competition for strategic minerals required for the energy transition intensifies (2021)
- Community forestry in Central Africa: Still a fragile sustainable forest management model (2021)

CASE STUDIES

GEORGIA • Gender-sensitive energy cooperatives in rural areas (2022)

ULAANBAATAR • An ecosystem for the thermal insulation of precarious housing (2021)

PARIS GOOD FASHION • Making Paris the capital of sustainable fashion (2021)

TERRITORIAL CO_2 EMISSIONS (EXCEPT LAND USE) OF MAJOR GLOBAL ECONOMIES, $MTCO_2$

Industrialized economies globally managed to cut their territorial emissions

	2015	2016	2017	2018	2019	2020	2021	2022	2015-2022 (%)	Global share in 2022
United States	5,252.4	5,146.0	5,088.7	5,212.6	5,122.8	4,578.0	4,896.7	4,957.6	-5.6%	13.0%
European Union	3,151.6	3,162.2	3,196.8	3,124.9	2,979.0	2,704.3	2,905.9	2,850.3	-9.6%	7.5%
Japan	1,231.9	1,217.6	1,202.4	1,163.7	1,124.3	1,065.1	1,088.9	1,086.8	-11.8%	2.8%
Germany	791.6	800.9	783.7	755.0	707.0	651.7	693.1	676.9	-14.5%	1.8%
South Korea	690.6	707.1	717.3	718.4	700.8	655.4	673.7	649.5	-6,0%	1.7%
Canada	622.0	617.6	627.0	639.6	624.2	576.5	599.2	616.6	-0.9%	1.6%
Australia	414.0	424.9	426.4	425.6	418.5	399.9	389.1	389.8	-5.9%	1.0%
United Kingdom	423.2	400.5	385.5	378.7	363.4	324.2	349.4	340.3	-19.6%	0.9%
France	344.4	345.0	351.1	340.4	332.2	295.3	326.0	311.9	-9.5%	0.8%
OECD	12,878.8	12,814.2	12,803.5	12,792.5	12,461.7	11,350.5	12,009.8	12,033.6	-6,6%	31.5%

Growth in emissions is ramping up in major developing countries

	2015	2016	2017	2018	2019	2020	2021	2022	2015-2022 (%)	Global share in 2022
China	11,094.3	11,129.0	11,238.0	11,497.3	11,647.9	11,820.6	12,524.3	12,974.7	16.9%	33.9%
India	2,256.4	2,301.5	2,433.5	2,569.8	2,528.2	2,307.1	2,545.2	2,768.3	22.7%	7.2%
Russia	1,778.9	1,759.0	1,810.9	1,896.9	1,949.2	1,859.8	2,049.3	2,055.9	15.6%	5.4%
Indonesia	526.4	518.2	551.8	607.2	653.6	608.7	642.4	823.4	56.4%	2.2%
Mexico	493.4	503.2	495.0	466.4	472.9	393.9	433.3	478.6	-3.0%	1.3%
Brazil	528.3	488.5	496.7	471.2	473.2	448.3	506.8	475.3	-10.0%	1.2%
Turkey	378.7	402.4	444.9	442.1	424.8	433.3	470.0	457.2	20.7%	1.2%
South Africa	430.5	431.0	441.5	445.1	453.2	402.9	396.8	378.3	-12.1%	1.0%
Non-OECD	22,762.6	22,891.0	23,384.8	23,973.0	24,245.8	23,712.4	25,226.5	26,195.7	15.1%	68.5%

Emissions in oil-producing economies rebounded after the pandemic, despite late signs of slowing down in some of them

	2015	2016	2017	2018	2019	2020	2021	2022	2015-2022 (%)	Global share in 2022
Iran	649.7	655.4	683.0	695.6	686.2	672.2	697.8	709.3	9.2%	1.9%
Saudi Arabia	587.1	586.0	577.1	551.2	553.4	538.3	551.7	609.0	3.7%	1.6%
Egypt	230.6	241.9	259.5	259.7	238.6	227.1	252.6	246.6	6.9%	0.6%
United Arab Emirates	199.6	204.9	197.3	180.0	192.5	191.1	197.4	208.7	4.5%	0.5%
Nigeria	112.9	115.0	115.4	120.3	126.3	116.8	129.9	131.6	16.6%	0.3%
Kuwait	91.3	92.8	92.2	94.0	94.9	93.2	107.3	116.1	27.2%	0.3%
Qatar	99.5	101.3	101.9	101.3	103.9	102.7	104.5	106.4	6.9%	0.3%
Algeria	151.9	148.7	149.5	160.5	165.5	156.0	169.6	173.1	13.9%	0.5%

AN OBSERVATORY TO UNDERSTAND THE COMPLEXITY OF THE EVOLUTION OF EMISSIONS AND CLIMATE ACTION

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In order to identify trends of actions delivering concrete local results, the **Global Observatory of Climate Action** builds on an international network of expertise to gather and analyse data and publications helping to understand the story of action behind emissions figures.

Every year, the Observatory releases the **Global Synthesis Report on Climate Action**: a unique report that provides an overview of the climate action implemented by non-state actors in order to identify the trends, signals and remarkable initiatives that are making a difference in the main emission sectors: energy, transport, buildings, industry, waste and land use.

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