ADF Quarterly Climate Review #5

LES ATELIERS DU FUTUR

lesateliersdufutur.org

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LES ATELIERS DU FUTUR

Climate:

Recent Developments & Outlook

2025: THIRD WARMEST YEAR DESPITE LA NIÑA'S COOLING EFFECT

+1.47°C

above pre-industrial levels in 2025 (Copernicus)
3rd warmest year on record, after 2024 (+1.60°C) and 2023 (+1.48°C)

Despite La Niña

Three consecutively hot years

2023–2025 average exceeds 1.5°C for the first time. Since 1980, each decade has become the warmest ever. The last 11 years are the 11 warmest on record.

Several combined drivers

Structural warming (dominant): long-term GHG rise. Short-term boost: record sea-surface heat amplified by El Niño (2023–H1 2024). Modulating factors: aerosols, La Niña in 2025.

Monthly records in 2025

January 2025: warmest January ever. March, April, May: 2nd warmest for their months. Every month except Feb. and Dec. warmer than any year before 2023.

Source: Copernicus, Berkeley Earth

RECORD OCEAN HEAT, RECORD SEA ICE LOSS

Oceans in persistent overheating

+0.38°C SST above 1991–2020 avg.

9th consecutive year of record ocean heat storage

2024–2025: +23 ± 8 zettajoules absorbed in upper 2,000 m ≈ 200× world's 2024 electricity production

Consequences: marine heatwaves, coral bleaching, ecosystem disruption, stronger tropical cyclones

Mediterranean: critical hotspot
H1 2025: 18.50°C avg. SST (record). June anomalies >+5°C in western basins. Fed severe storms in Spain (Valencia).

Polar regions & sea ice

Feb. 2025: lowest global sea ice extent ever recorded

Arctic & Antarctic intensified anomalies

Antarctic: began 2025 near typical levels, then plummeted by February to one of the lowest minima ever. Remained well below average all year.

Arctic: unusually low sea ice throughout 2025. Annual temperature records reached in Antarctica and nearly reached in the Arctic.

Warming patterns in 2025
Tropics relatively less warm; high latitudes experienced intensified anomalies. Record anomalies in NW/SW Pacific, NE Atlantic, Eastern/NW Europe, Central Asia.

Melting North: permafrost in danger
Rapid warming and thawing of far-northern permafrost. Release of metals such as iron, aluminum, and zinc into rivers, and release of greenhouse-gas emissions, from formerly trapped organic matters. A process amplifying global warming.

Source: Copernicus

$107 BILLION IN INSURED LOSSES — SIXTH YEAR ABOVE $100B

$107B

insured natural catastrophes losses in 2025 (Swiss Re)
6th consecutive year above $100B. Lower than anticipated: no US hurricane landfall for the first time in 10 years.

Heatwaves

Recurrent 40°C+ in S. Europe, extreme heat across S. Asia and US. 770M people experienced their warmest local year.

Droughts

Mediterranean basin, East Africa, South America. Soil shrink-swell cycles damaging buildings.

Floods & rainfall

Sudden floods, landslides in SE Asia, Central Europe, N. America. Glacier-outburst floods in Nepal, Afghanistan, Pakistan.

Wildfires & cyclones

Major destructive wildfire in Los Angeles. Cat. 5 Hurricanes Melissa, Erin, Humberto.

Sea-level rise: +20 cm since 1900, currently +3.7 mm/yr (2.5× faster than 20th century)

1.5°C THRESHOLD WITHIN REACH BY END OF THE DECADE

1.5°C

Long-term global mean temperatures projected to reach +1.5°C by end of this decade

Copernicus estimates the long-term warming trend will reach 1.5°C in 2029

2026 forecast

Expected among the hottest years ever: +1.35°C to +1.53°C above 1850–1900 (Canadian Centre). Met Office: 4th consecutive year above +1.4°C. Slightly cooler than 2024 but close to 2023/2025 levels.

WMO 2025–2029

86% chance at least one year exceeds +1.5°C. 70% chance the five-year mean will also exceed +1.5°C.

Paris Agreement context

One or two years above 1.5°C ≠ breach of Paris Agreement (refers to long-term trend). However, the latest three-year average is above 1.5°C for the first time, highlighting proximity to this threshold.

Climate modelling at risk

Need to invest in climate modelling for accurate predictions. Capacity threatened by proposed US budget cuts: >25% reduction to NOAA's budget, job redundancies, and elimination of major climate research offices. Though Congress has pushed back, partial implementation is already underway.

INVESTING IN MODELS TO AVOID INVESTING IN DISASTER

Current State of the Art	Key Limitations	Innovative Solutions
CMIP6 Models: coordinated climate model experiments providing the scientific database for IPCC reports.	Cloud-aerosol interactions: largest source of uncertainty, impacting climate sensitivity estimates.	New-gen satellites: EarthCARE (data since early 2025) — unprecedented cloud & aerosol data. AI for pattern recognition and emulators.
Standard resolution: 50–100 km for most global models.	Unresolved sub-grid processes: turbulence, individual cloud formation.	km-scale “storm-resolving” models (nextGEMS, TRACCS): explicitly simulate convection.
Coupled Earth System Models: atmosphere, ocean, sea-ice, land surface, carbon cycle.	High inter-model variability: significant differences in climate sensitivity projections.	Probabilistic ensembles (SMILEs): separate natural variability from forced climate change.
SSP scenarios (SSP1-2.6 to SSP5-8.5): projections based on Shared Socioeconomic Pathways to 2100.	High socio-economic uncertainty: demographics, behaviour, policy, technology pace.	Transdisciplinary co-production: interoperability between data, communication, governance.

Source: WCRP, ESA, Copernicus

GHG Emissions

Recent developments & Outlook

38.1 $GtCO_2$ IN 2025: FOSSIL EMISSIONS HIT ANOTHER RECORD HIGH

38.1

$GtCO_2$

Fossil emissions

+1.1% vs 2024

42.2

$GtCO_2$

Total anthropogenic

incl. LULUCF

425.7

ppm

Atmospheric CO_2

+53% vs pre-industrial

170

$GtCO_2$

1.5°C budget remaining

≈ 4 years at current rate

Temperatures

2025: +1.47°C (3rd warmest year on record)
2023–2025 average: 1.52°C (exceeds 1.5°C for the 1st time)
Sustained 1.5°C breach projected by 2029

Carbon sinks

Ocean: 29% absorbed (revised upward)
Land: 21% absorbed (revised downward)
Efficiency reduced by ~20% due to warming

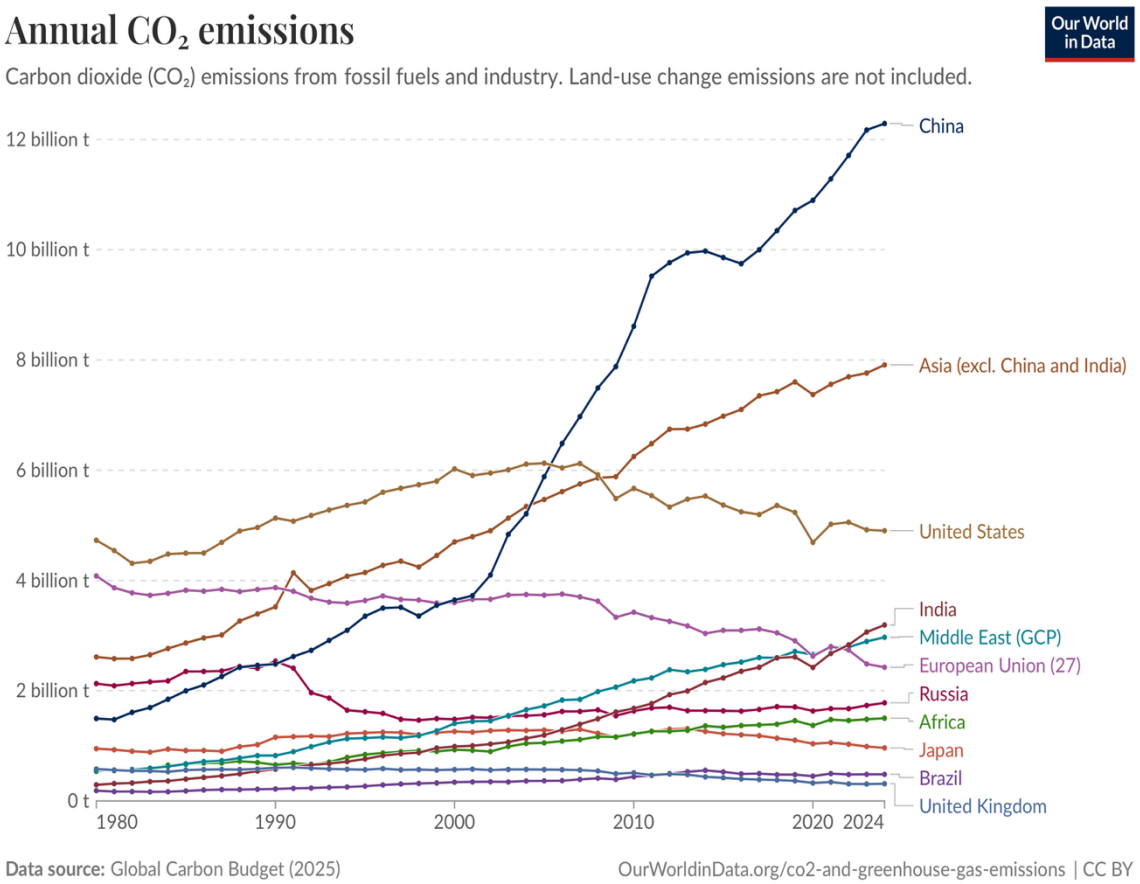
DIVERGING TRAJECTORIES: CHINA SLOWS, THE US REBOUNDS

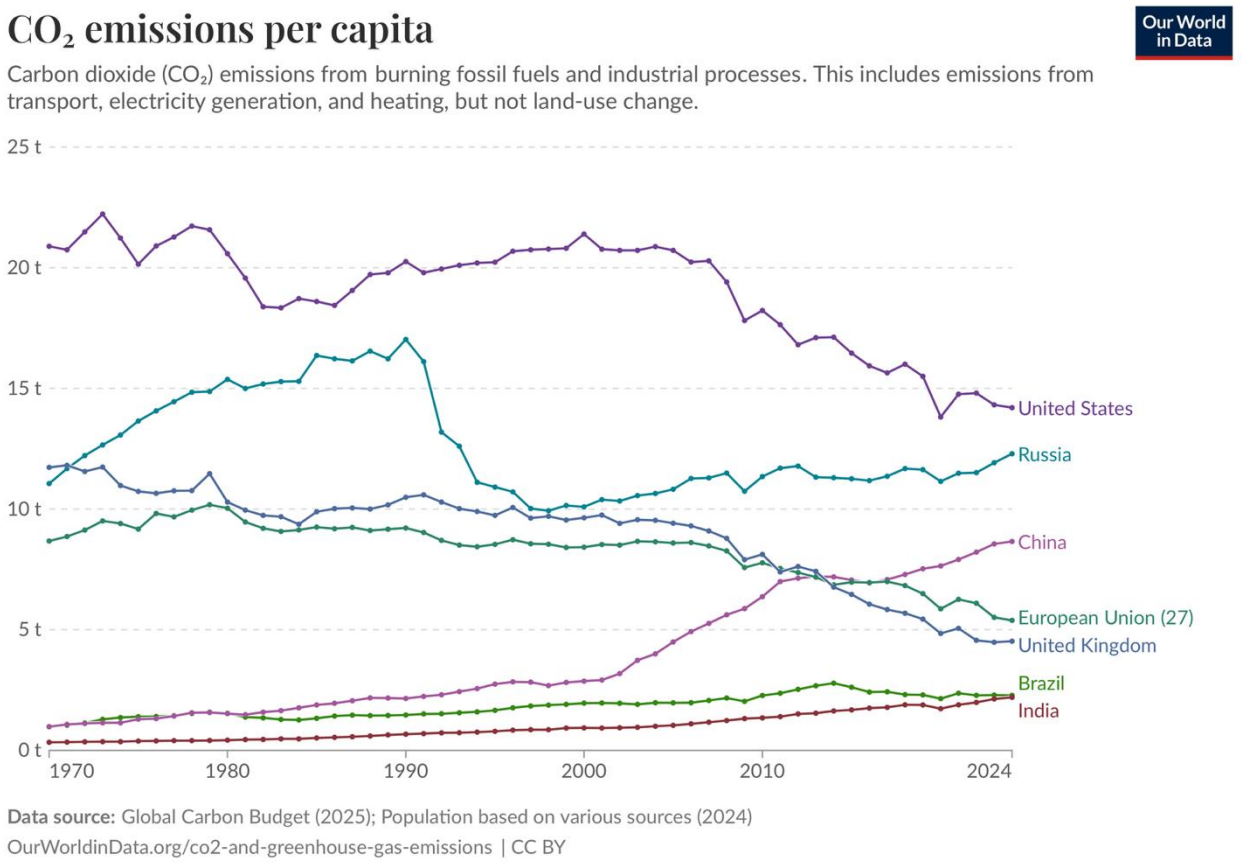
Region	$GtCO_2$	Share (%)	Δ 2025	Prior trend	tCO_2/cap.
China	12.3	32%	+0.4%	+2.5%/yr	8.6
United States	4.9	13%	+1.9%	Declining	14.2
India	3.2	8%	+1.4%	+3.6%/yr	2.2
EU-27	2.4	6%	+0.4%	−2.5%/yr	5.4
Japan	~1.0	2.5%	−2.2%	Declining	7.8
Rest of world	~14.3	38%	+1.1%	Growing	Var.
Int. aviation	—	—	+6.8%	Post-COVID recovery	—
World	38.1	100%	+1.1%	Record high	4.8

Source: Global Carbon Budget 2025 (Friedlingstein et al.) — 2025 projections

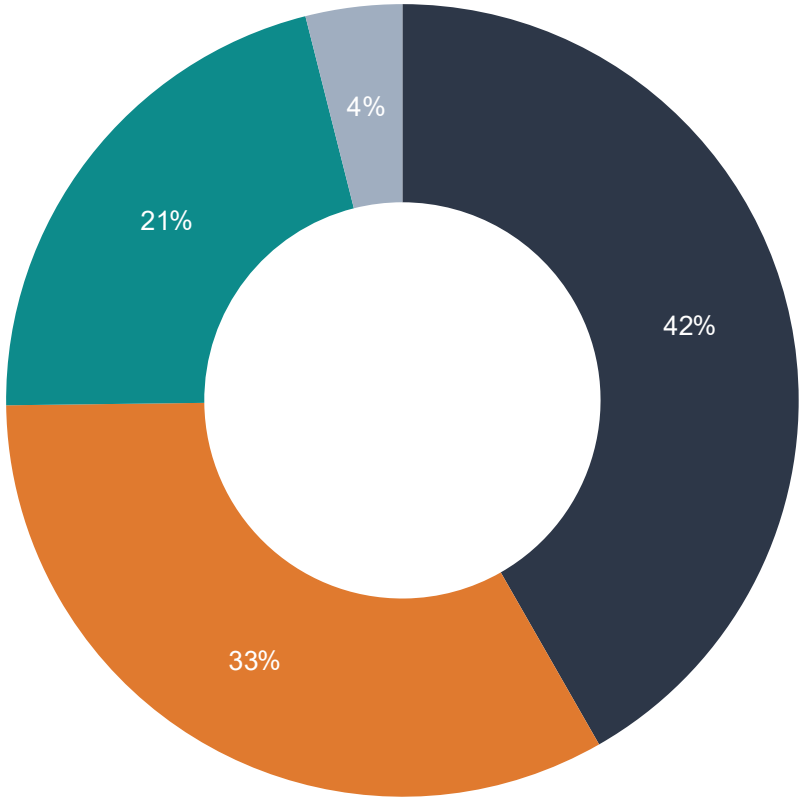
35 countries decoupled emissions from GDP (2015–2024), up from 18 in 2005–2014 → 27% of global emissions

DEVELOPED COUNTRIES DECARBONIZING TOO SLOWLY TO COUNTERBALANCE GLOBAL DEVELOPMENT





ALL FOSSIL FUELS STILL GROWING — GAS LEADS THE RISE



Coal — **15.9 $GtCO_2$** — **+0.8%**

USA +7.5% · India +1.7% · China stagnant · EU declining

Oil — **12.6 $GtCO_2$** — **+1.0%**

Aviation recovery (+6.8% int.) · All regions increasing

Natural gas — **8.1 $GtCO_2$** — **+1.3%**

Fastest relative growth · Up in China, USA, EU · Down in India

Cement — **1.5 $GtCO_2$** — **+0.5%**

India +9.9% · China −2.8% · USA −8.0% · EU −4.1%

NATURE ABSORBS HALF, BUT THE SINKS ARE STALLING

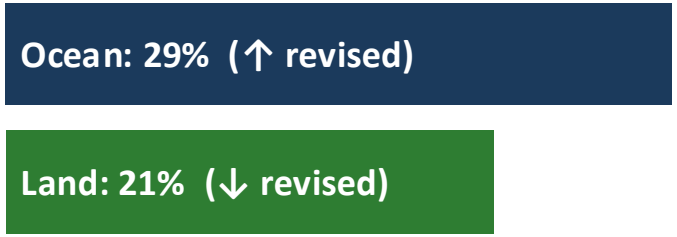
Land-use change emissions

5.0 $GtCO_2$/yr

average 2015–2024

2025 (prelim.): 4.1 $GtCO_2$
Permanent deforestation: ~3.9 $GtCO_2$/yr
Reforestation/regrowth: −2.2 $GtCO_2$/yr
Brazil + Indonesia + DRC = 57%
China + USA + EU = net sink (0.9 $GtCO_2$/yr)

Major carbon sink revision



Total absorbed ≈ 50% of anthropic emissions

Both sinks are stalling:
Ocean since 2016, land since 2000

Efficiency reduced ~20% by climate change
Tropical forests (SE Asia, S. America): shifting from sinks to net sources

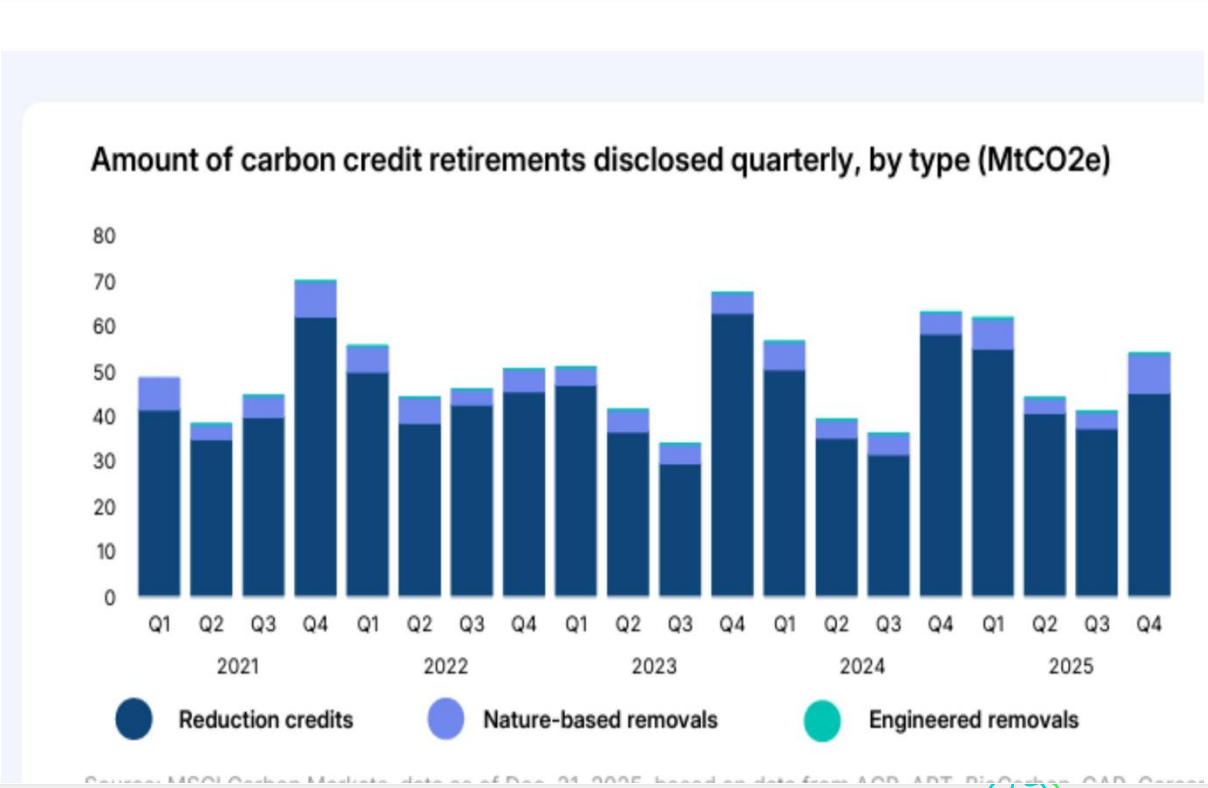
Source: Global Carbon Budget 2025 — Revised historical estimates

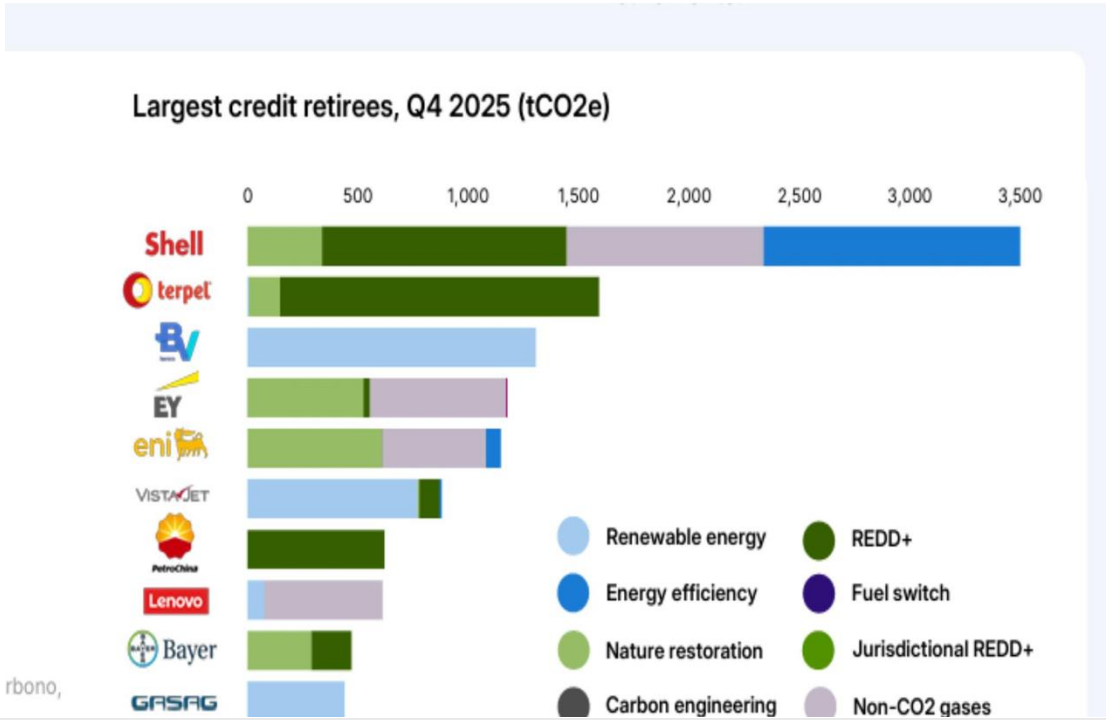
CARBON CREDITS: 202 $MtCO_2e$ RETIRED IN 2025 — LESS THAN 0.5% OF EMISSIONS

202 $MtCO_2e$

Highest total since 2021 | 4th consecutive year of growth

But only 0.5% of the 42.2 $GtCO_2$ emitted annually





Source: MSCI Carbon Markets, data as of Dec. 31, 2025 (ACR, ART, BioCarbon, CAR, Cercarbono, Climate Forward, CDM, GCC, GoldStandard, Plan Vivo, Puro Earth, Verra)

FOUR YEARS OF CARBON BUDGET LEFT AT CURRENT PACE

1.5°C carbon budget

170 $GtCO_2$ remaining ≈ 4 years at current rate. Could be exhausted by 2029.

Natural sinks

Stalling ocean (since 2016) and land (since 2000) sinks. Combined efficiency reduced by 20%.

1.5°C threshold

Sustained breach projected by 2029 if current warming rate (0.25°C/decade) persists.

Radically more ambitious NDCs required

Emissions reduction is technically feasible — the scale and speed must be unprecedented. 35 countries already decoupling prove it's feasible.

Green Techs:

Recent Developments

STILL 85% FOSSIL — BUT RENEWABLE CAPACITY ADDITIONS DOUBLED IN 3 YEARS

15%

share of carbon-free energies in the global primary energy mix (doubled in 10 years)

Renewable capacity additions ×2 between 2022 and 2024

Clean energy surge

Clean energy technology adoption surged at an unprecedented pace over the last three years. Total renewable capacity additions increased by a factor of 2 between 2022 and 2024, driven by record solar PV deployment globally.

But the gap remains immense

Fossil fuels (coal, oil, gas) still represent 85% of global primary energy consumption. The energy transition is accelerating in electricity, but heating, transport, and industry remain largely fossil-dependent.

Source: Our World in Data, IEA

2× MORE INVESTED IN CLEAN ENERGY THAN IN FOSSIL FUELS

$2,2T

Clean energy investment in 2025 (New high)

Total energy investment in 2025 (IEA) : $3,3T | **Fossil fuels: first decline since 2020**

Clean energy at record highs

Clean energy investment hits $2.2 trillion, with record additions of renewables, strong EV sales, and rapid battery deployment. Investment now running at 2× the fossil fuel level.

Fossil investment retreating

Upstream oil investment is set to fall for the first time since 2020. Oil spending revised down amid new economic outlook and cost pressures. Global refinery investment hits a 10-year low. Gas/LNG remains robust.

Source: IEA World Energy Investment 2025

RENEWABLES +9% IN ELECTRICITY — COAL FLAT FOR THE FIRST TIME

Low-emission sources surging

Renewables grew +9% in electricity production in 2025, slightly below +9.6% in 2024 (weather dampened wind/hydro). Still well above the 6.4% decade average.

Coal generation flat

Coal-fired generation remained flat in 2025 after +1.4% in 2024. Declines in China and India were offset by gains in the US and Eurasia. A historic inflection point: for the first time, additional demand is being fully met by clean sources.

Energy storage booming

2025 saw record growth in grid-scale battery storage. The increasing share of intermittent renewables creates price volatility in power markets, fostering massive investment in storage solutions. Negative electricity prices are increasingly frequent in key markets.

Source: IEA Electricity 2026

EVS EXCEED 20 MILLION SALES — BUT ENERGY INTENSITY STALLS

20.7M

electric vehicles sold globally in 2025 (+20%)

BEV: 13.6M (+24%) | **PHEV:** 7.0M (+13%)
Europe: 4.3M (+33%), best in class
China: 12.9M (+17%), but Q4 slowdown as incentives cut
North America: stagnating in USA (policy uncertainty) and collapsing in Canada (end of subsidies)

Energy efficiency improvement slowing

Only 1%/yr improvement in 2024, down from 2%/yr (2010–2019)

Key reasons for slowdown:
- Investment-intensive post-COVID growth in emerging economies (China, India)
- Higher energy demand from extreme temperatures
- Poor growth in hydropower output leading to more fossil fuel consumption

Heat pumps: sales declining

Global sales fell –1% in 2024. Sharp decline in Europe, stagnation in China. Japan and US partially recovered in H2. Cost remains the major barrier. Market collapsing in Canada after end of subsidies.

Energy innovation funding is slowing

Public energy R&D spending in 2024 dropped from its recent high point in 2023, and IEA's estimate for 2025 is down a further 2% to USD 55 billion.
Energy VC fundings is declining since 2022, initially due to higher interest rates and macroeconomic environment. In 2025 energy start-ups faced stiff competition for capital from AI start-ups.

Source: Benchmark Minerals, IEA

Green Techs:

Outlook

THE SHARE OF FOSSIL FUELS IN GLOBAL PRIMARY ENERGY CONSUMPTION IS EXPECTED TO FALL TO 71% BY 2035 (IEA)

71 %

Share of fossil fuels in primary energy demand in 2035 (According to STEPS scenario of IEA)
While Energy demand grows by 0,7%/y until 2035 assuming energy efficiency improves 2.2%/y.

Coal and oil demands peak by 2030

Coal demand remains broadly stable at its current level (6 090 million tons), but it peaks before 2030 and then declines to under 4 900 Mtce in 2035.

Oil demand rises slowly to around 102 mb/d by 2030 before beginning a slow decline, with reductions in oil demand for road transport broadly offset by increased oil use for petrochemicals.

Natural gas grows 1% / year

Natural gas demand rises by 1% per year to 2035, driven mainly by growth in industry and power and then remains stable.

Low-carbon energy demand steeply growing

Demand for renewables increases by an average of 5.5%/y to 2035: most of the additional demand comes from the power sector, but the direct use of renewables also increases, particularly in industry and biofuels in transport.
Renewable power capacity expands 2.6 times from 2022 to 2030, and 3.7-times by 2035.
Nuclear capacity increases by 3% on average to 2035

Source: IEA Electricity 2026

ELECTRICITY DEMAND SET TO ACCELERATE: +3.6%/YR TO 2030

33,600 TWh

global electricity consumption in 2030 (up from 28,200 TWh in 2025)
+1,100 TWh/yr added on average through 2030 (vs 700 TWh/yr over 2015–2025)

Buildings: 49% of the new demand

Largest absolute growth. Space cooling, data centres, and heat pumps make up almost half of buildings sector growth. Electricity share in total final consumption rises from 21% to 24%.

Industry accelerating

Industrial electricity consumption expected to accelerate vs past decade, especially from light industries. Electrification replacing fossil heating in selected processes.

AI likely to add a stress on top of previous consumption pathways.

Transport: share doubles

Fueled by rapid EV uptake, transport's share of demand growth rises to >10%, double from the past five years.

Source: IEA Electricity 2026

50% LOW-EMISSION ELECTRICITY BY 2030 — NUCLEAR RESTARTS

Renewables outlook to 2030

+1,050 TWh/yr

renewable electricity generation growth per year

Solar PV alone: +600 TWh/yr. Solar PV overtakes wind and nuclear by 2026, hydropower by 2029.

Low-emission share rises to 50% of global electricity by 2030 (from 42% in 2025). Coal falls to 27% (from 34%).

Gap to COP28 tripling target

Despite strong growth, a gap remains vs the global tripling target announced at COP28. Storage must increase ×6 to support ×3 renewables.

Nuclear restart announced

+2.8%/yr

nuclear generation growth (vs 1.3% in 2021–2025)

China: ~30 GW new nuclear capacity by 2030. Largest build programme globally.

Japan: Continued restarts supporting generation growth.

India & Korea: New reactors being commissioned.

France: Robust output from advancement of maintenance works.

US & EU: Output expected to remain relatively stable.

Source: IEA Electricity 2026

RENEWABLE HEAT, BIOGAS & STORAGE: ACCELERATING BUT INSUFFICIENT

Renewable heat: 18% by 2030

Heat demand rises +8% by 2030. Modern renewables expand +42% but still only 18% of total (from 14%). Industry becomes dominant consumer. China's renewable heat to double, 60% of growth from China+India.

Biogas & biomethane: +22% by 2030

Global production expands 22% by 2030. Growth mainly from biomethane (versatile, uses gas grids). Drivers: energy security post-Ukraine, hard-to-abate decarbonization, circular economy, rural development. EU, India, China setting ambitious 2030 targets.

Storage: ×6 needed for NZE

COP28's ×3 renewables target requires ×6 grid-scale storage. 2025 saw record battery deployments but far below the NZE trajectory. Negative electricity prices increasingly frequent, highlighting the urgency of storage build-out.

Source: IEA Renewables 2025, Rystad Energy

EV FLEET ×4 BY 2030 — BUT CRITICAL MINERALS REMAIN A BOTTLENECK

EV outlook to 2030

250 million EVs

global fleet by 2030 (STEPS) — ×4 vs end 2024

>90% electric cars, stock growing ~25%/yr (vs ~50%/yr in 2018–2024 as the base expands).

Warning signals:
Recent changes in trade policies, tariffs, and demand-side policies (fuel economy standards, tax incentives) may affect EV sales in several markets. US policy changes could have larger impact via demand-side incentives than tariffs alone.

Critical minerals: lithium highest risk

IEA warns of future lithium & copper shortages despite current oversupply and price collapse.

Concentration worsening:
Top 3 countries: 86% of refining (vs 82% in 2020), 77% of mining (vs 73%). China dominates. 55% of strategic metals subject to export restrictions.

Supply shock risk: 40–50% price increase for consumers or loss of competitiveness for manufacturers (IEA).

Solutions: geographic diversification, recycling, and technological innovation. But progress toward diversified supply chains expected to be slow.

Source: IEA Global EV Outlook 2025, IEA Critical Minerals 2025

HYDROGEN & CCUS: ESSENTIAL BUT STILL IN INFANCY

Low-carbon hydrogen

Use of low-carbon hydrogen grew ~10% in 2024 but remains <1% of total demand due to cost challenges and insufficient policy support.

Many projects cancelled or delayed in 2024–2025, but approved pipeline requires ~$8B investment in 2025 (2× 2024 level).

Production expected to reach 4% of total hydrogen by 2030 (IEA).

Policy initiatives in EU, Japan, Korea can accelerate ramp-up, but impact depends on implementation speed.

Carbon capture (CCUS)

Seen as essential for hard-to-abate industries (steel, cement, refining) that cannot be easily electrified.

Currently capturing only 0.1% of global CO_2 emissions per year — still in its infancy.

Strong pipeline of new projects: if successfully developed, CCUS investment would rise more than ×10 over the next 3 years.

Key challenge: scaling from demonstration to commercial deployment while reducing costs and ensuring permanent storage.

Source: IEA World Energy Outlook 2025

Public Policies:

Recent Developments & Outlook

NDC LANDSCAPE: EU SUBMITS AT COP30, USA EXITS, CHINA PEAKS?

China

• NDC 3.0: first absolute reduction target (−7 to −10% from peak by 2035). All GHGs covered.

• CO_2 flat or falling for 21 months. 2025: −0.3%. Peak "finely balanced."

• 430 GW wind+solar added in 2025 (+22%). Wind+solar = 22% of electricity. NEVs >50% of new car sales.

• ETS expanded: steel/cement/aluminum (≈60% of CO_2). Price: $8–14/t.

• But: 83 GW new coal started (record). CAT: "Highly Insufficient."

European Union

• NDC 3.0 at COP30: 66–72.5% reduction by 2035 vs. 1990. CAT: "Almost Sufficient."

• 2040 target: −90% net under EU Climate Law.

• On track for −55% by 2030. ETS reform operational. ETS II delayed to 2028.

• Open Coalition on Carbon Markets with Brazil (16 countries, 40% of emissions).

• Called Belém Package "insufficient." LNG deal with US signed.

United States

• Paris withdrawal effective. First UNFCCC exit attempt ever.

• OBBBA: EV credits ended; solar/wind phased out post-Jul 2026; $27B GHG fund repealed. Nuclear/CCUS preserved.

• EPA rescinded GHG Endangerment Finding — no legal basis for federal GHG regulation.

• Yet: record $378B clean investment; 42% zero-carbon electricity; 24 governors maintain Paris targets.

• GHG +2.4% in 2025. Rollbacks: +600–800 Mt/yr by 2040 vs. Biden path.

COP30 NDC SUBMISSIONS: 80% OF EMISSIONS COVERED, BUT STILL ON A 2.3°C- 2.5°C PATH

, **122 countries submitted NDCs (~80% of emissions)** including 29 around COP30 (Oct–Nov 2025). Implementation projects −12% vs 2019 by 2035. **Collective implementation still projects 2.3–2.5°C warming.**

Indonesia

First-ever absolute cap: 1.26–1.49 $GtCO_2e$ by 2035. Conditional on $20B JETP financing. 36 GW renewables by 2030. ETS operational since 2023. CAT: "Highly Insufficient."

Turkey

Target: 643 $MtCO_2e$ by 2035 (−7% vs 2030, but +32% vs 2022 actual). Peak brought to 2035. Net-zero 2053 in Climate Law. Still 36% coal. CAT: "Critically Insufficient." COP31 candidate.

South Africa

2035 targets below 2030 range (350–420 Mt). Ambition not increased. Coal phase-out facing major delays. Needs $8B/yr intl. finance (currently $2B). CAT: less compatible with 1.5°C.

G20 missing

India (~7%), Saudi Arabia (~2%), South Korea (~2%), Argentina (~1%) did not submit NDC 3.0. Together: ~12% of global emissions unaccounted. India under sustained pressure; no 2035 absolute target.

COP30 BELÉM: “IRREVERSIBLE” TRANSITION, BUT NO FOSSIL FUEL PHASE-OUT ROADMAP

Belém Package adopted by 195 Parties declaring the clean energy transition "irreversible”. **No fossil fuel phase-out roadmap but Belém Mission to 1.5°C and Global Implementation Accelerator launched.**

Finance

Tripling of adaptation finance by 2035 (Mutirão). $1T on clean grids for developing nations. NCQG $300B/yr confirmed; Baku-to-Belém Roadmap toward $1.3T/yr by 2035.

Carbon markets (Art. 6.4)

PACM adopted first methodology — Paris crediting mechanism operational after years of deadlock. EU-Brazil Open Coalition: 16 countries, ~40% of global emissions.

Just Transition

First Just Transition Mechanism under Paris Agreement. Belém Mission to 1.5°C and Global Implementation Accelerator launched — concrete results pending.

US absence

No official US delegation (first time in COP history). 24 states (57% of economy) pledged action. Bloomberg covered ~$7.4M UNFCCC funding gap (~21% of operating budget).

$ CARBON PRICING, RENEWABLES & EV MANDATES: MIXED SIGNALS

Carbon pricing

• 80 instruments globally (43 taxes + 37 ETSs) vs 5 in 2005. Cover 28% of GHG emissions.

• Mobilized >$100B for public budgets in 2024. Avg price doubled to ~$19/t.

• ⅔ of global GDP has direct carbon pricing. >50% of power sector covered.

• China ETS: ~60% of nat. emissions (~8 Gt). Absolute cap ~2030.

• Article 6.4 adopted first methodology at COP30 — Paris crediting operational.

Renewable energy

• Gap: 3.7 TW still needed by 2030 for COP28 tripling goal.

• China: 1,840 GW wind+solar — surpasses thermal capacity.

• USA: 42% zero-carbon electricity (record). OBBBA threatens 300+ GW pipeline.

• 54 GW commissioned in US in 2025 — rush to beat deadline.

• Grid challenge: solar curtailment rising; storage lagging.

Electric vehicles

• China: ~50% NEV in new sales. 10M+ chargers (+56% YoY).

• USA: 1.6M EV sales (record) with credits eliminated Sept 2025.

• CA + 14 states = ~40% of US auto market backstop.

• $34.8B clean energy cancelled in US — 3× new announcements.

• EU: ~15–18% share in new sales. 100% ZEV by 2035 under review; penalties deferred.

Source: World Bank, IEA, MSCI

WHAT SCIENCE SAYS: POLICY PORTFOLIOS WORK, COERCION BACKFIRES

Policy portfolios drive reductions

Analysis of 3,917 policies across 43 countries (2000–2022). Avoided 27.5 $GtCO_2$ cumulatively; 3.1 $GtCO_2$/yr in 2022.

Policy density and specialization in economic instruments (carbon pricing, trading) drive fastest reductions.

Long-term absolute targets + dedicated climate ministries amplify effectiveness.

Source: Arvanitopoulos et al., Nature Comms (2026)

Behavioral backlash risk

German survey (n=3,306): enforced climate mandates trigger control aversion 52% higher than COVID restrictions.

Pro-environment citizens most resistant when perceiving freedom loss.

Policy implication: design must cultivate green values rather than crowd them out.

Coercive instruments (bans, quotas) may undermine long-term support even in high-trust societies.

Corporate alignment gap

MSCI Tracker Q4 2025: only 19% of listed companies have SBTi-validated targets (up from 14%).

Aggregate corporate trajectory: 3°C warming — 62% of companies exceed 2°C threshold.

Climate funds AUM: $652B, median return 12.2% in 2025.

Gap between financial commitments and actual decarbonization remains structural.

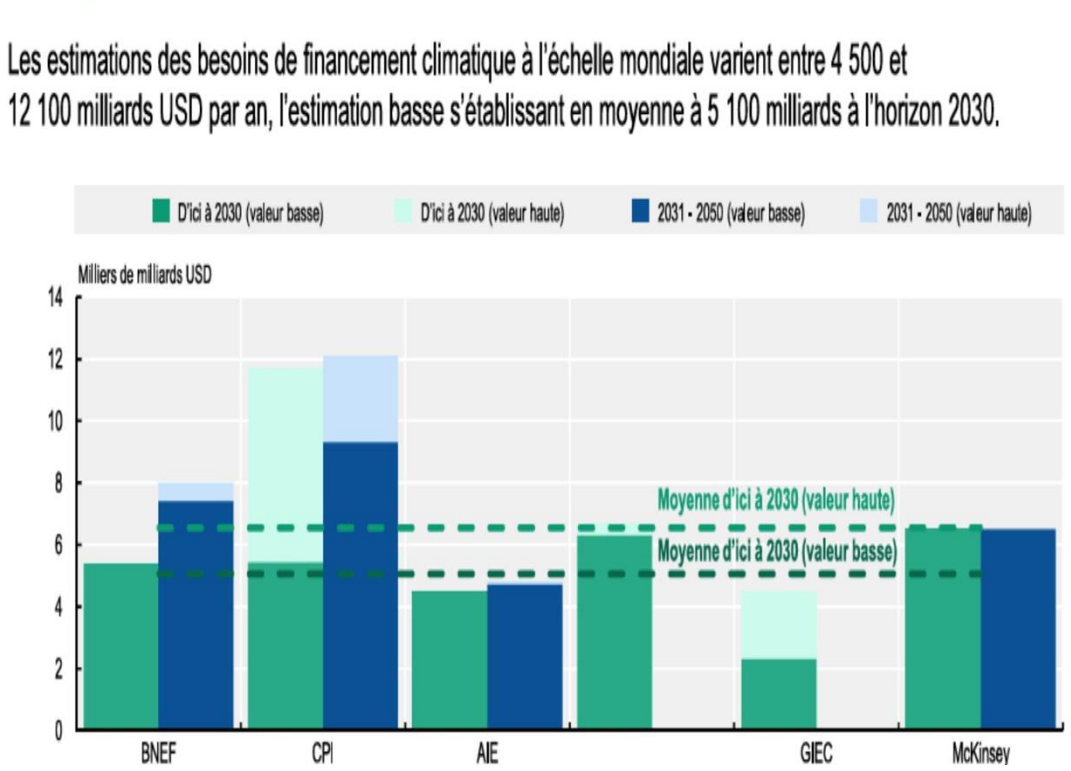
Finance :

Recent Developments & Outlook

$ CLIMATE FINANCE NEEDS: $5.1T+ BY 2030 VS $1.6T IN 2023

$5.1T **annual needs by 2030** | $1.6T in 2023

Estimated annual climate transition financing needs (Trillions USD)



Current climate investment by source

Source	Investment ($T)	Ref. year
BNEF	1.8	2023
CPI	1.5–1.6	2023
IEA	2.0	2024
McKinsey	2.0	2021

Key gap

Estimates range from $4.5T to $12.1T/yr.

Low estimate average:
$5.1T by 2030

Source: OECD Global Debt Report 2025, BNEF, CPI, IEA, McKinsey

ENERGY TRANSITION INVESTMENT GROWING BUT GAPS REMAIN

$2.3 TRILLION

in energy transition investment in 2025

+8%

vs 2024

$893B

Electrified transport

Largest segment

$690B

Renewable energy

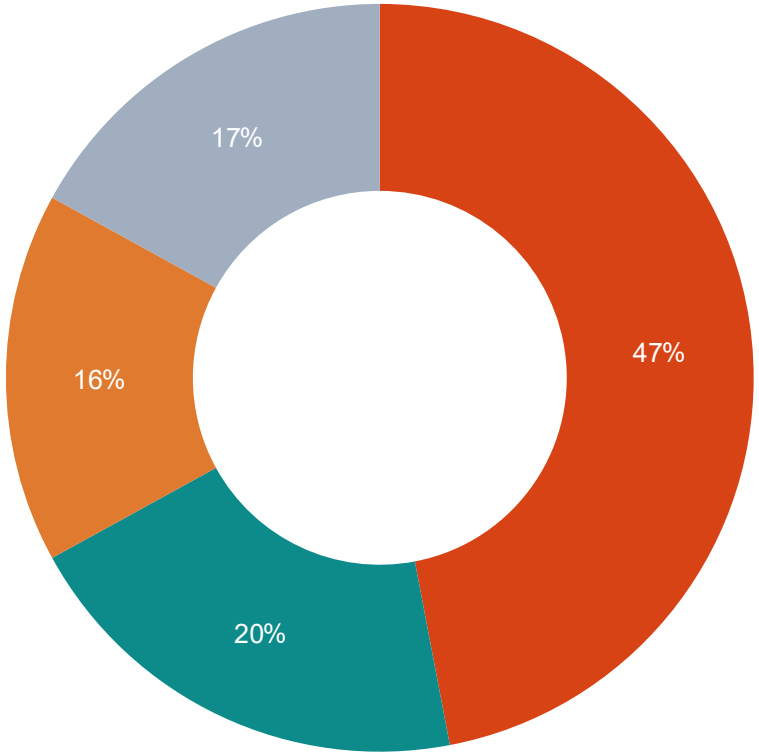
Solar, wind, hydro

$483B

Electricity grids

Infrastructure buildout

REGIONAL INVESTMENT FLOWS SLOWING IN CHINA AND THE US



Asia-Pacific: 47% of global total

China **$800B** **Declining RE financing**

Largest contributor globally. Power market reforms slowing renewable energy financing.

EU **$455B** **+18%**

Strong growth in clean energy investment across the bloc.

United States **$378B** **+3.5%**

Growth despite Trump administration measures to slow energy transition.

India **$68B** **+15%**

Fastest growth rate among major economies.

CLIMATE TECH & TRANSITION DEBT EXPERIENCE SOLID BUT INSUFFICIENT GROWTH

Climate tech capital raised

$77.3B

in private and public capital in 2025

+53% vs 2024

Key drivers:
Clean energy · Energy storage
Low-carbon transport · Data centres

Energy transition debt issuance

$1.2T

in green/transition bonds in 2025

+17% vs 2024

Sustained growth in green bond and sustainability-linked instruments supporting the energy transition.

CLIMATE FUNDS WEIGH LESS THAN 20% OF CLIMATE TRANSITION NEEDS

$652B

Listed climate-themed fund assets

+16.4% vs 2024

$143B

Private-capital climate funds (227 funds)

As of September 2025

Who we are

LES ATELIERS
DU FUTUR

WE ACT TO ENHANCE BUSINESS MOBILIZATION TOWARDS NET ZERO

Our purpose

In response to the interconnected challenges of climate change and biodiversity loss, our **mission** is to **act for the Climate**

Our members

A multidisciplinary group of business executives and senior managers
All volunteers, we are **experts in modeling** (trained in climatology), engineers focused on **energy** and **green technologies**, or **finance specialists**
Our experience facilitates their mastery of business climate strategies

Our strategy

A focus on the **Climate**
An international vocation, as key governance for the normative framework of businesses and citizens is at global and regional levels
An orientation towards corporations, as they alone meet the key conditions to successfully decarbonize our activities: Ability to do, know-how, and, to some extent, willingness to do

Our actions

Raising awareness - policy makers and governing bodies (public or private)
Challenging corporate strategies and public policies with a constructive, optimistic yet ambitious mindset.
Training future generations through Universities/Schools

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INDEPENDANT NGO
ACTING
FOR THE CLIMATE

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