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Climate & Environment

Climate Update Report

Q2 – April-July 2025

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The **MEDRC Climate Update** is a quarterly review of the latest news, trends, data, events and reports on the state of the climate and environment, covering decarbonization, climate security, diplomacy, technology, finance, and biodiversity. This update covers the period between April 1 to July 1, 2025.

Editorial Summary

The global climate remains on track to exceed the +1.5°C temperature threshold of the Paris Agreement for a second consecutive year. Entering summer in the northern hemisphere, regional extremes and heat records have dominated North America, Europe, and Asia, with anomalies of +1.5 to +3°C. Alaska issued its first-ever heat advisory, while heatwaves in Europe are estimated to have caused nearly 1,900 deaths. In addition, record flooding events were reported across Texas (USA), Nigeria, Australia, Indonesia, and Bolivia. The World Meteorological Organization (WMO) has confirmed 2024 to be the warmest on record, and Q1-Q2 data from 2025 indicates this trajectory is continuing.

For the April-June quarter, each month ranked among the hottest or second hottest on record, continuing a pattern in which 21 of the past 22 months have exceeded +1.5°C globally. The 12-month average from July 2024 to June 2025 reached +1.55°C above pre-industrial levels, despite a transition toward weak La Niña conditions—an event that would normally suppress global temperatures.

This year marks the 10th anniversary of the Paris Agreement, yet international climate diplomacy is showing signs of deep fracture. The United States has again withdrawn from the UN climate process and was absent from the Bonn Climate Conference (SB62). Meanwhile the UAE Dialogue on the Global Stocktake concluded without a formal agreement, setting the stage for what is likely to be a more contentious COP30 in Belém, Brazil. Financing remains the key fault line, particularly regarding the delivery of pledged resources from developed to developing countries. Negotiations around Nationally Determined Contributions (NDCs) and climate finance mobilization will dominate the COP agenda.

Diplomatic uncertainty has been compounded by domestic U.S. policy shifts. The decision to exit the Paris framework was accompanied by funding cuts to the UNFCCC, NOAA, and proposed cuts to critical monitoring infrastructure like the Mauna Loa Observatory, weakening the international climate science base. These reversals represent a significant step back for the world's largest economy and a major disruption to global climate leadership at a critical time.

The passage of the One Big Beautiful Bill Act (OBBBA) has also subdued U.S. climate policy. The bill repeals key renewable energy tax credits introduced under the 2022 Inflation Reduction Act (IRA), citing concerns of foreign control over clean energy supply chains. Industry leaders warn the rollback could be a "death blow" to the U.S. renewables sector, putting at risk billions in investments, particularly in Republican-led states that supported the bill. Expected consequences include increased emissions, job losses, and higher domestic energy prices. Global oil prices have dropped 11% in the past six months and upstream investment has begun to slow.

Globally, efforts to scale up adaptation and resilience financing continue to lag behind need, with recent record GCF disbursement figures still falling short of pledged targets. At the same time, regional cooperation is gaining momentum in some areas, including the African Union's new Climate Risk Facility and ASEAN's partnership with the Global Shield initiative. These frameworks aim to close protection gaps and strengthen financial safety nets for climate-vulnerable countries.

Progress on the renewables transition and financing adaptation will remain contentious multilateral issues but must continue with increasing pace if we are to avoid the worst climate outcomes in the coming decades.

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Key Events

- IEA Summit on the Future of Energy Security, London, U.K. 24-25 April
- Nature Finance Forum Europe 2025, Paris, France. 28 April
- Oman Sustainability Week, Muscat, Oman. 12-14 May
- 3rd UN Ocean Conference, Nice, France. 9-13 June
- Global NDC Conference, Berlin, Germany. 11-13 June
- Bonn Climate Change Conference (SB62), Bonn, Germany. 16-26 June
- Baku Dialogue on Water for Climate Action, Bonn, Germany. 21 June
- The International Maritime Organization (IMO) approves its net-zero regulation, IMO Net-Zero Framework, to introduce a global carbon levy on shipping emissions. This marks a pivotal step in decarbonizing the maritime sector, with a formal framework expected in October 2025 for implementation in 2027.

Key Reports

- IEA Energy & AI, April
- IEA State of Energy Innovation, April
- IEA World Energy Investment, June
- IEA Energy Progress Report SDG7, June
- IFPRI, 2025 Global Food Policy Report, May
- Sustainable Development Report 2025, May
- OECD, Global Drought Outlook, June
- WMO regional State of the Climate Reports, 28 March – 23 June

Carbon Emissions Data

- After trailing behind 2024 emissions levels in Q1, emissions for 2025 are now higher than in 2024 for April, and likely to continue on this trajectory, on pace to reach over 62 billion tons CO_2e in 2025.
    - **2021** - 60.03 bn
    - **2022** - 60.73 bn
    - **2023** - 61.59 bn
    - **2024** - 61.92 bn
    - **January 2025** - 5.28 bn
    - **February 2025** - 4.99 bn
    - **March 2025** - 5.29 bn
    - **April 2025** - 5.16 bn
        - YTD—20.70 bn >> *62.10 bn pace*

- **Record Monthly Highs (tCO_2e)**
    - October 2024, 5.31 bn
    - October 2023, 5.29 bn
    - ***March 2025, 5.29 bn***
    - March 2024, 5.28 bn
    - January 2024, 5.28 bn

- Among the top-emitting countries, China led the increase, adding 22.52 million tons of CO_2—a +1.55% rise. India's emissions grew by 4.96 million tons (+1.39%), followed by Russia with an increase of 1.45 million tons (+0.49%), and Brazil, which rose by 0.62 million tons (+0.42%). The European Union as a bloc saw a collective increase of 1.30 million tons (+0.41%). In contrast, the United States was the only major emitter to record a decline, cutting emissions by -2.79 million tons (-0.50%).
- By sector, power generation experienced the most significant growth, with emissions rising +2.71%, reaffirming its position as the largest contributor to global greenhouse gas emissions.

Total year-to-date emissions (April 2025) of 20.70 billion tons of CO_2e.

Temperature Records Q1-Q2

- January 2025 – Hottest January on record, 2nd in 2024.
- February 2025 – 3rd hottest February on record, 2nd in 2024, 3rd in 2025.
- March 2025 – Hottest March on record tied with 2016, 2nd in 2024.
- April 2025 – 2nd hottest April on record, 1st in 2024.
- May 2025 – Hottest May on record, 2nd in 2024.
- June 2025 – 3rd hottest June on record, 1st in 2023, 2nd in 2024. Hottest June in Europe.

World Resources Institute Explainer on the 1.5°C temperature threshold, one decade on – *June 18, 2025*

Decarbonization

- Nama Power and Water Procurement Company (Nama PWP) requests proposals for investigating the geothermal potential and feasibility of Oman's northern hot springs. Studies by Sultan Qaboos University notes that Oman has several geothermal low to medium reservoirs that have not been suitably explored.
- Oman's OQ Gan Networks announces $2bn investment in renewable energy projects in Oman, towards green hydrogen, green ammonia, and Vision 2040 renewable energy capacity targets. A 2030 target is set at 30% of its energy mix from renewables, which stands at about 5% today.
- The International Maritime Organization (IMO) reached a consensus to introduce a global carbon tax on shipping emissions. The framework, set for formal adoption in October 2025 and effective in 2027, will apply a universal levy on emissions from ships over 5,000 gross tons.
- In April, China reached a landmark record with a 25% share of its electricity mix from wind and solar for 951 terawatt hours (TWh), a 19% increase year over year, and a total renewables share of almost 40%.
- The U.S. Department of Energy cancelled $3.7bn USD in funding for 24 decarbonization projects, including carbon capture and sequestration, and clean energy projects, issued by the Office of Clean Energy Demonstrations, because they would not generate a positive return for taxpayers. The pilot projects include a first of its kind Net Zero cement, which accounts for 8% of global emissions.

Climate Security Nexus

- ***Water Security*** – an IAEA report on nuclear desalination for water security in the Arab region lists case studies on Jordan, Saudi Arabia, Egypt, and Kuwait, supported by the IAEA. Nuclear approaches to freshwater production can ensure water security in remote areas with the use of SMR technology and utilizing both Multi-effect Distillation (MED) and Reverse Osmosis (RO) processes. Nuclear integration also allows for more avenues to reduce, reuse, or dilute brine discharge to enhance its sustainability.
- ***Energy Security*** – IEA Summit on the Future of Energy Security held on 24-25 April in London. Solar plus battery storage can supply the sunniest cities around the world with around 90% of their power 24/365, and up to 99% in places like Muscat, Oman according to analysis from Ember. Energy efficiency remains the lowest hanging fruit to increase energy security and reduce emissions, with the G20 saving the equivalent of all of India's emissions through efficiency gains since 2000.
- ***Food Security*** – The Hunger Hotspots report from the UN-FAO and World Food Programme confirms that famine risks are rising in 13 global hotspots, from Gaza, Palestine due to insufficient aid access, to the impacts of armed conflicts in Sudan, South Sudan, Mali, or Haiti, which are further compounded by climate-related hazards such as flooding or drought. These 5 regions are at the highest risk of Phase 5 Catastrophe / Famine (>20%) levels of food insecurity, resulting in starvation, death, and severe malnutrition. Of the 13 hot spots, 12 are conflict driven first, as well as all of the 5 of highest concern.

Climate Diplomacy

- Through Q1 & Q2 the global momentum on climate diplomacy has continued to stall with major powers and multinational companies cutting climate-linked funding and / or backing away from previous climate commitments or pledges. Plans for rapid transitions and changes are being quietly exited.
- This includes the Loss & Damage Fund (FRLD), first proposed in 1991, officially created in 2022 at COP27 in Egypt, operationalized in 2023-24 at COP28 in the UAE, and which just began to accept contributions in 2025. The U.S. has resigned from FRLD's board, with its funding of $17.5m USD out of $786m in total pledges. More than ¾'s of funds are pledged by the E.U. and European states, led by Germany ($109m), France ($110m), Italy ($110m), the United Kingdom ($51m), Denmark ($25m), Spain ($20m), Sweden ($19m), the Netherlands ($15m), and Ireland ($10m). However, just $261m are reported as received in paid-in contributions, including all of the U.S. funds, and just $475m are confirmed in signed agreements. Italy's $110m pledge remains fully unpaid and unsigned, along with the UAE. Japan, Denmark, Spain, and the Netherlands have fully paid-in their pledge amounts, while most other countries have paid about half.
- The UN Ocean Conference in Nice, France looked to accelerate action on conservation and sustainable use of oceans, seas, and marine resources, tied to SDG-14. The role of the ocean in climate regulation, carbon sequestration, and biodiversity is receiving greater recognition, but remains a challenging multi-lateral environment for effective rules and regulations on pollution and degradation, which are further exacerbated by climate impacts.
- The lead up to COP30 begins with SB62 at the Bonn Climate Change Conference, which ended with the comment, "We need to go further, faster, and fairer" from the UN Climate Change Executive Secretary Simon Stiell. The threats to multilateralism coming out of COP29 in Baku have only increased, while the U.S. did not send any negotiators to Bonn, and agenda fights led to two days of delay, leading the COP30 president to call for reflections on the process itself. On adaptation, agreed indicators for tracking went from a list of 9,000, down to 490, with a goal of reaching 100 at COP30. Finance has been a source of contention at every phase, reflecting the lackluster outcomes of COP29 and the New Collective Quantified Goal (NCQG) on climate finance—$300bn. The transformational changes sought require funds, with challenges to fairness and sovereignty, and concerns about 'colonial' outlooks.
- The Fourth International Conference on Financing for Development (FfD4) in Seville, Spain, under the Global Partnership for Effective Development Cooperation (GPEDC), centered on enhancing the

effectiveness of development programming, international finance reforms, aligning finance and climate goals, in progress towards the SDGs.

- The Climate Action Coalition was formed in 2024 at London Climate Week, and in the lead up to COP30 in Brazil will host a series of events on Nature Finance in Paris, London Climate Week & Innovation, and New York Climate Week & Sustainable Investment. Such efforts are becoming more important and necessary as multilateral climate diplomacy between states appears to become stalled.

Climate Resilience

- The OECD's Global Drought Outlook analyzes the escalating frequency and severity of droughts worldwide, driven largely by climate change and unsustainable land and water management. Currently, around 40% of the world's land area is experiencing more frequent and intense droughts. Economic losses from these events are projected to rise by at least 35% by 2035. Given these trends, the report underscores the urgent need for countries to proactively integrate drought resilience into national policies and to adopt robust water demand management strategies. Strengthening institutional frameworks, investing in sustainable water infrastructure, and improving adaptive capacity are essential for mitigating the social, economic, and environmental impacts of a steadily drying global climate.
- A trifecta of crises between insurance rates, climate stress, and affordable housing threatens entire economies. Insurance premiums are rising much faster than inflation, while many insurers are simply leaving 'high-risk' markets, leaving owners with no alternatives. This leaves homeowners at risk and the financial system less able to absorb impacts, pushing burdens onto governments.
- Hundreds of contributors to the U.S. National Climate Assessment were told they were released from their roles and that the scope of the climate report would be re-evaluated. The report was set to be released in 2028, documenting climate change in the United States every 4-5 years. The report is congressionally mandated by the 1990 Globa Change Research Act.

Renewable Energy

- IRENA reports in *Renewable Capacity Statistics 2025* that a massive increase in renewable power capacity reached 4,448 gigawatts (GW), an addition of 585 GW, for 15% annual growth and a 92.5% share of total capacity expansion. Still, reaching 3x renewables capacity by 2030 requires a 16.6% growth rate.
- New U.S. legislation will eliminate the incentives and subsidies for wind and solar power in the U.S., established via the Inflation Reduction Act of 2022, with projects set to lose benefits if they haven't 'broken ground' in tightly controlled ways by mid-2026 or have fully come online by 2027. Wind and solar are particularly impacted, while hydro, geothermal, and nuclear fare better under the new law.
- The Middle East and the United States together accounted for half of all new natural gas-fired investments in 2024, per the IEA. While for the first time, there were no new orders of turbines for coal-fired power plants in advanced economies. However, China and India green-lit 115 GWs of new coal-fired plants due to growing electricity demand. Low-emission power investment doubled in the past 5 years, led by Photovoltaic (PV) solar, while nuclear investment increased 50%. Energy investments in Africa are a third lower than they were in 2015, with just 2% of global renewable energy investment.
- The world's highest PV solar park has been completed in China's Xizang plateau in Tibet, and the world's largest and highest solar thermal power plant (CSP) using mirrors and molten salts is under construction. The region boasts among the highest solar potential in the world with 2,800 hours of annual sunlight. These plants will make hundreds of GWh's of electricity per year and can replace tens of thousands of tons of coal, abating hundreds of thousands of tons of CO_2 emissions. Hundreds of sheep have been employed to maintain the panel areas with their appetites. Elsewhere in the Tibet, a new world's largest dam project is being kicked off in a biodiversity hotspot that could cause tensions with India and Bangladesh downstream.
- China's ~40% renewables mix was mostly driven by wind (13%) while solar (10%) is growing faster.

Carbon Capture & Removal

- The XPrize Foundation has awarded $100 million in prizes for innovative solutions in carbon removal, with the $50 million USD grand prize going to Mati Carbon for its enhanced rock weathering (ERW), plus another $50 million awarded to other winners. The process uses crushed basalt spread over agriculture land to absorb atmospheric CO_2, while also enhancing soil nutrients simultaneously.
- The outlook for Carbon Dioxide Removal (CDR) technologies are clouded globally by the shift in U.S. policies that have removed funds for pilot projects. Plans for CCUS, adding carbon capture technologies onto existing plants, are down 55% from last year, which is a cornerstone of the oil & gas industry to prolong the use of fossil fuels by limiting their carbon footprint. Layoffs at emerging CDR companies signal expectations for slower growth lay ahead.
- JPMorgan Chase bank has signed a CDR offtake agreement with $CO_2$80 for CO_2 captured and stored from the paper and pulp industry's boiler stack emissions. The provider is praised for its quality and monitoring standards, which align with Frontier's CDR principles.
- Direct Air Capture (DAC) startups have received 60% less funding than they did 1 year ago, although Aircapture was able to receive $50m USD in Series A funding for its modular DAC systems. Climeworks reported a 50% increase in energy efficiency with field tests of its Gen 3 process, while also capturing 2x as much carbon by using structured absorbents developed by Svante. Lowering costs to the benchmark of $100 per ton of CO_2 removed remains a critical target for the industry.

Green Hydrogen

- An update to the influential 'Hydrogen Ladder' covering the challenges and alternatives to using hydrogen to advance decarbonization and future its competitiveness is reviewed in a new paper in *Nature*.
- The recent collapse of the Dutch government threatens to slow progress on its National Hydrogen Strategy ambitions, after it was already behind schedule to meet its targets.
- Tokyo announced the results of its first-ever green hydrogen trial transaction for a market-based hydrogen trading framework, with city government funds filling the gap, revealing buyers were willing to pay up to $23/kg for small-scale deliveries, with wide gaps between suppliers and off-takers for large-scale orders.
- Even before the latest legislative setbacks to renewables in the U.S., the green hydrogen boom was facing years of headwinds and delays, from pandemics to unclear guidance on approved incentives.
- Pink H_2 plus desalination from NuScale's integrated small modular reactor (SMR) with brine reuse, developed in partnership with the U.S. Department of Energy and the Pacific Northwest National Laboratory. The nuclear-driven process creates desalinated water and H_2 through a non-electrolytic production method from the chemical conversion of brine-derived salts. A win-win-win for water scarcity, brine reuse, and hydrogen production.

Biodiversity

- McGill University released a study on the application of A.I. towards conservation efforts to rapidly analyze vast amounts of biodiversity data and improve decision-making efforts to effectively enhance protections in the most efficient way while filling knowledge gaps.
- Part of the Road to COP30 Nature and Finance Series, the Nature Finance Forum in Paris, France was held on 28 April 2025 to discuss sustainable finance, market transformation, regulatory frameworks, and how to catalyze transition towards a net-zero and a nature positive economy. The Climate Action Coalition hosts events in Paris, London, and New York ahead of COP30 in Brazil. The lack of finance for climate and nature remains a continuing theme throughout.
- The first World Restoration Flagship initiatives were announced by the UNEP and FAO in East Africa, Mexico, and Spain, aiming to restore 5 million hectares of marine ecosystems. The winning initiatives were announced at the UN Ocean Conference in Nice, France.

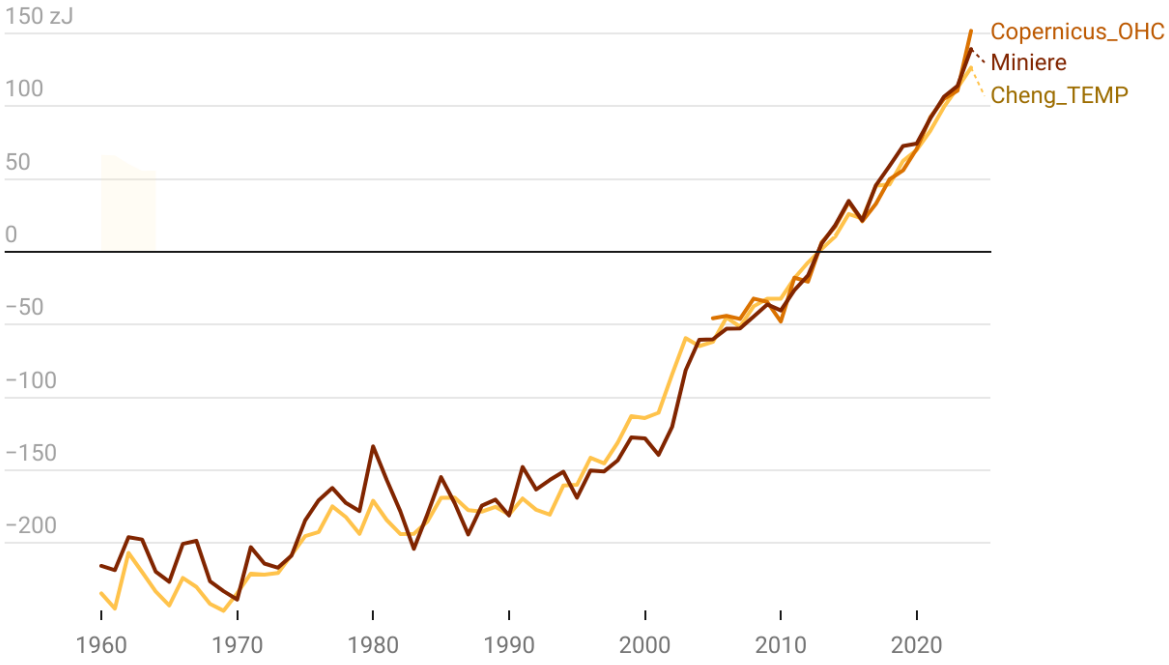
Climate Finance

- A key element of the IMO's agreement on shipping decarbonization is a proposed GHG levy. One specific proposal outlines a complex two-tiered carbon tax of $100 and $380 per metric ton of CO_2e emissions for ships over 5,000 gross tons.
- A joint OECD and UNDP report concluded that ambitious and investable NDCs are essential tools for countries to unlock and catalyze the necessary climate finance from both public and private sources to achieve their goals.
- Modeling from IFPRI's 2025 Global Food Policy Report estimated that offsetting the increased hunger caused by climate change could cost over $24.7 billion annually. This figure includes necessary investments in agricultural research, water infrastructure, and other adaptation measures.
- A central point of debate at the Bonn Climate Talks was the Means of Implementation for adaptation. Developing countries pushed for firm commitments from developed nations on finance, technology transfer, and capacity building to support their resilience efforts.
- Per the IEA report *World Energy Investment 2025*, energy investments are set to rise to $3.3 trillion in 2025, with $2.2 trillion going to clean energy technologies, double that directed towards fossil fuels. Private finance is leading the way for energy, while public funds remain insufficient.
- The Frankfurt School of Finance & Management convened a CEO Summit on disaster risk finance to strengthen collaboration of Regional Risk Pools to address loss and damage from climate change, backed by a €4.7 million grant to support joint solutions.
- The Green Climate Fund (GCF) has managed to release $1.2 billion USD on 17 projects for Asia and Africa amidst the tense international environment and cuts to aid funding. Its total portfolio is currently $18 billion USD across 133 countries, with $30bn in pledges and $21bn in funds paid in.

Interesting Climate Charts

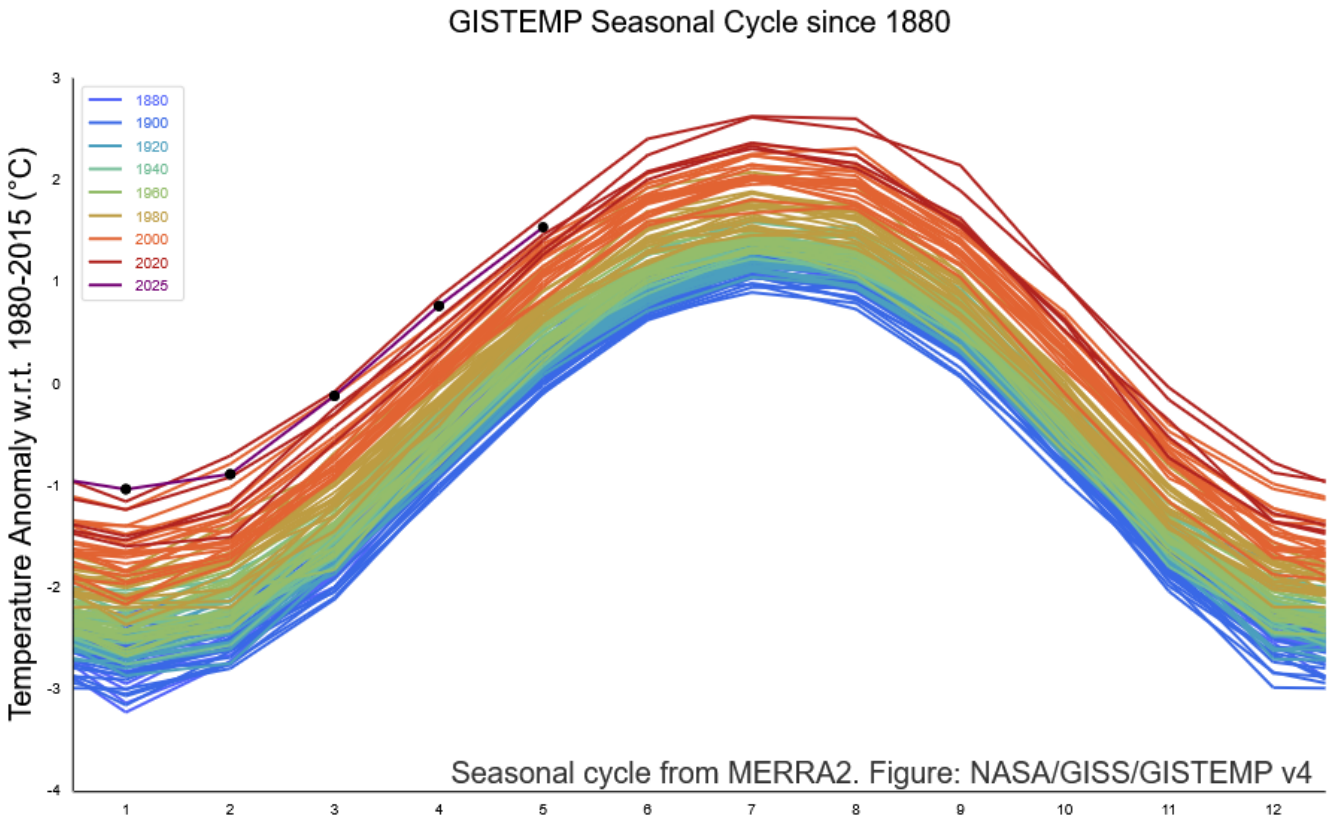
Ocean heat content 0-2000m 1960-2024

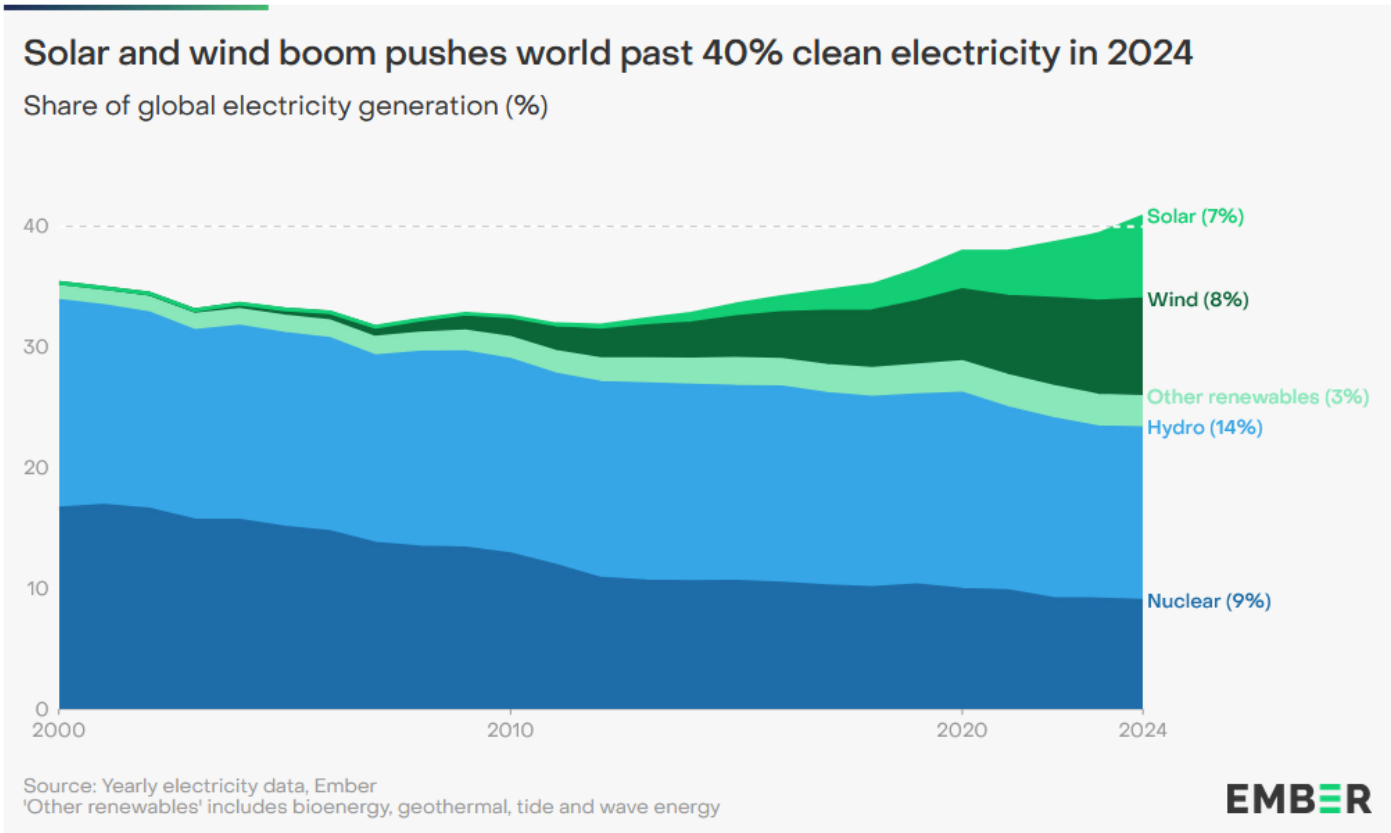
Difference from 2005-2020 average

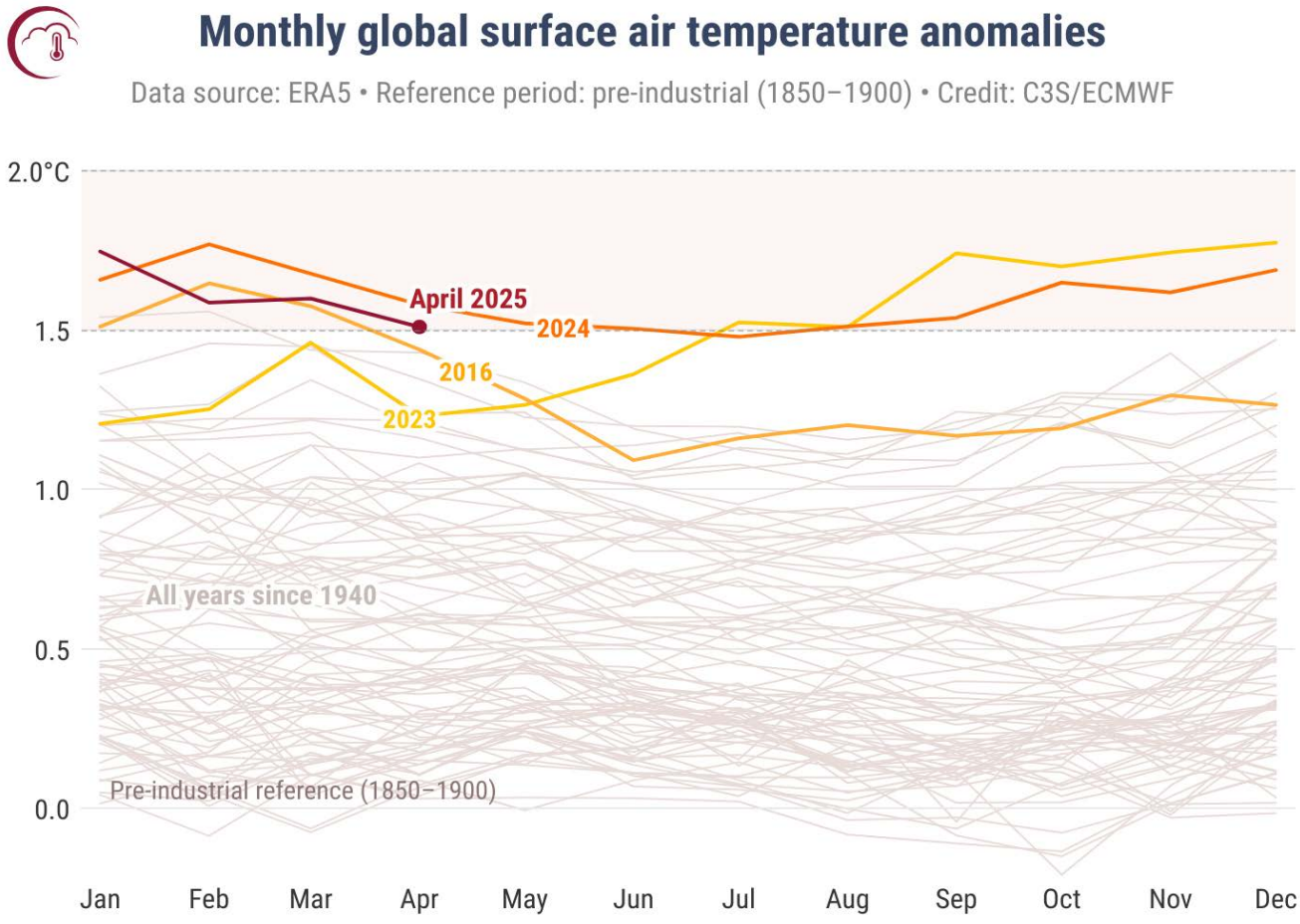


Annual Global ocean heat content (zJ, difference from the 2005-2020 average) from 1960-2024. Data are from the following three data sets: Cheng et al. 2024, Copernicus, Miniere et al. 2023. Values shown do not include uncertainty.

Chart: WMO • Created with Datawrapper




Solar and wind boom pushes world past 40% clean electricity in 2024
Share of global electricity generation (%)
40
30
20
10
0
2000
2010
2020
2024
Solar (7%)
Wind (8%)
Other renewables (3%)
Hydro (14%)
Nuclear (9%)
Source: Yearly electricity data, Ember
'Other renewables' includes bioenergy, geothermal, tide and wave energy
EMBER


Monthly global surface air temperature anomalies
Data source: ERA5 • Reference period: pre-industrial (1850–1900) • Credit: C3S/ECMWF
2.0°C
1.5
1.0
0.5
0.0
April 2025
2024
2016
2023
All years since 1940
Pre-industrial reference (1850–1900)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

Pledges to FRLD received at COP28 in Dubai				
Contributor	**Amount pledged (in million)**	**Amount pledged (in USD million eq*)**	**Signed amount delivered (in USDmillion eq****	**Signed unpaid contributions (in USD million eq**)**
Canada	CAD 16.00	11.13	--	11.19
Denmark	DKK 175.00	24.66	24.66	--
Estonia	EUR 0.05	0.05	0.05	--
European Union	EUR 25.00	27.18	--	--
Finland	EUR 3.00	3.26	--	--
France	EUR 100.00	107.74	53.16	--
Germany	EUR 92	98.63	44.28	53.91
Iceland	USD 0.6	0.60	0.60	--
Ireland	EUR 25.00	26.85	10.54	--
Italy	EUR 100.00	108.70	--	--
Japan***	USD 10.00	10.00	10.00	--
Netherlands	EUR 15.00	15.78	15.78	--
Norway	USD 25.00	25.00	25.00	--
Portugal	EUR 5.00	5.38	1.03	4.31
Slovenia	EUR 1.50	1.63	0.44	1.19
Spain	EUR 20.00	20.79	20.79	--
United Arab Emirates	USD 100.00	100.00	--	100.00
United Kingdom	GBP 40.00	51.83	25.87	25.87
United States	USD 17.50	17.50	17.56	--
COP28 TOTAL		**656.71**	**249.76**	**196.47**
Pledges to the FRLD received since COP28 in 2024 and up to March 2025				
Australia	AUD 50.00	31.45	--	--
Austria	EUR 25.00	26.77	15.90	10.78
Iceland	ISK 320.00	2.38	--	--
Japan	USD 5.00	5.00	5.00	--
Latvia	EUR 0.05	0.05	0.05	--
Luxembourg	EUR 8.00	8.70	--	--
New Zealand	NZD 10.00	5.70	--	5.74
South Korea	USD 7.00	7.00	--	--
Sweden	SEK 200.00	19.66	--	--
Walloon Region of Belgium	EUR 2.00	2.17	1.05	--
Additional pledges TOTAL		**108.88**	**22.00**	**16.52**
TOTAL		**765.59**	**271.76**	**212.99**