PERRY WORLD HOUSE
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2026 Global Climate Trends Report

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2026 Global Climate Trends Report: Executive Summary:

Purpose and context

The 2020s have shattered temperature records across land and sea, a signal of the accelerating consequences of anthropogenic climate change. Major policy reversals driven by geopolitics and the global economy are also rapidly reshaping annual public budgets and priorities, and the timing and rate at which countries and regions transition towards sustainable energy systems and resilience. The decisions made in the context of these trends in the next few years by governments, finance institutions, businesses, and communities will also shape the trajectory of global warming and its impacts. The Global Climate Trends Report addresses the question "In the coming 12 to 60 months, what decisions and strategies enable the transition to sustainable energy systems and societal and ecological resilience?". The answers to this question turn climate science and insights into actionable strategic foresight for governments, finance institutions, and business.

Outlook for 2026: Seven trends shaping sustainable energy systems and resilience

2026 will be a year of **hybrid transitions** with cooperation in some regions, fragmentation in others. Watch for climate shocks and possible insurance and home mortgage retreat, debt and interest rate dynamics, trade and industrial policy shifts, and AI-driven energy innovation**.** Mid-decade, seven trends are shaping the risks and potential for success of transition to sustainable energy systems and resilient societies and ecosystems.

Trend No.	Theme	Core Concept
1	Climate Limit & CO2 Emissions	Exceeding 1.5C likely; remaining carbon budget exhausted around 2026; high CO2 emissions despite electrification.
2	Climate Volatility & Damage	2026 is likely another year of temperature records and volatility; increased frequency of compound events like floods and fires, straining fiscal systems.
3	Food & Ecological Stress	Food price inflation linked to soil/forest degradation, La Niña-driven drought, and global crop yield declines; weakening natural carbon sinks.
4	Energy Transition & Market Shift	Rapid rise in renewables deployment (585 GW added in 2024); global energy investment in clean energy (e.g., Solar PV @$500b) nearly double fossil fuel investment; market shifting from monopolistic to competitive.
5	Geopolitics & Supply Chains	Security, trade tensions, and industrial policy are reshaping supply chains; critical minerals/clean-tech components are being weaponized for strategic autonomy.
6	Demography & Debt	Public debt exceeds 100 percent of GDP in over 80 countries; high interest rates create trade-offs between servicing debt and investing in climate resilience; ageing populations strain public finance.
7	Tech Energy Demand & Investment	Capital-intensive data centers and AI are driving up electricity demand; significant investment in digital infrastructure is crowding out other productive investments.

1. Exceeding **1.5C is likely** as the remaining carbon budget is exhausted around 2026

- Electrification and substitution effects (e.g., EVs) are **decreasing gasoline sales**, but demand from **industrial reshoring and AI infrastructure** is outpacing grid capacity.
- Some governments remain hesitant to regulate in ways that allow renewables to replace coal in electricity generation.
- Measurements confirmed **2024 as the hottest year in recorded history**, with global CO_2 emissions reaching **41.6 Gt** and atmospheric concentrations at **422.45 ppm**.
- Despite signs of emissions plateauing, **fossil fuels still supply over 80 percent of primary energy**.
- Renewables are scaling fast, adding **585 GW to the energy mix in 2024** and avoiding **9.8 $GtCO_2$**.

2. 2026 is likely to be another year of **climate volatility, temperature records, damage**

- Persistent **La Niña conditions** will bring colder, wetter weather to the Northern Hemisphere and drought to the south.
- Risks of compound events like **floods, fires, hurricanes** will strain infrastructure and fiscal systems already under pressure from rising debt and insurance retreat.
- Compound events like heatwaves, floods, drought, and wildfires are more frequent and destructive.
- U.S. climate-related losses exceeded $100 billion in 2024, with similar patterns globally.
- Rising insurance premiums and sovereign bond volatility linked to climate risk.
- Children born today may face two to seven times more extreme events than their grandparents.

3. Food price inflation is linked to forest and soil degradation, tariffs, and crop yield declines

- Soil and forest degradation, combined with La Niña-driven drought, may affect grain yields.
- Tariffs and disrupted supply chains could combine with climate impacts to increase food prices.
- These stressors may accelerate population redistribution and social instability, making resilience investments urgent yet harder to finance.
- Soil and forest carbon sinks are weakening; tropical forests and boreal regions shifting from sinks to sources.
- **Sea level rise accelerated in 2024** with record ocean heat.
- Groundwater depletion and glacier melt are major contributors to global water stress.
- Crop yields for staples (wheat, maize, rice) have declined globally; estimated **4–13 percent lower** than without recent climate trends.

4. Rise in renewable energy deployment **shifting market structure** from monopolistic to competitive

- Surging demand from digitalization, industrial reshoring, and electrification will keep policy focus on affordability and energy security.
- Societies will continue to have greater appetite for affordable, abundant energy.
- Battery storage and distributed energy scaling fast in advanced economies, but grid bottlenecks and capital constraints persist elsewhere.
- Global energy investment reached **$3 trillion in 2024**, with **$1.78 trillion directed toward clean energy,** almost twice that of fossil fuel investment.
- Solar PV attracted **$500 billion**, more than any other generation technology.
- Market structure shifting from monopolistic to competitive; diversification accelerating substitution and electrification.

5. Security, trade tensions, and industrial policy will **reshape supply chains** and regional strategic autonomy

- Security, trade tensions, and industrial policy will reshape supply chains and regional strategic autonomy.
- Some governments will prioritize **energy sovereignty, defence, and weaponize trade in critical minerals and clean-tech components**.
- Policies facilitating low-cost renewables are reshaping trade and domestic grids.
- Conflicts and attacks on energy infrastructure incentivize diversification and energy autonomy.

6. Demography and **debt**

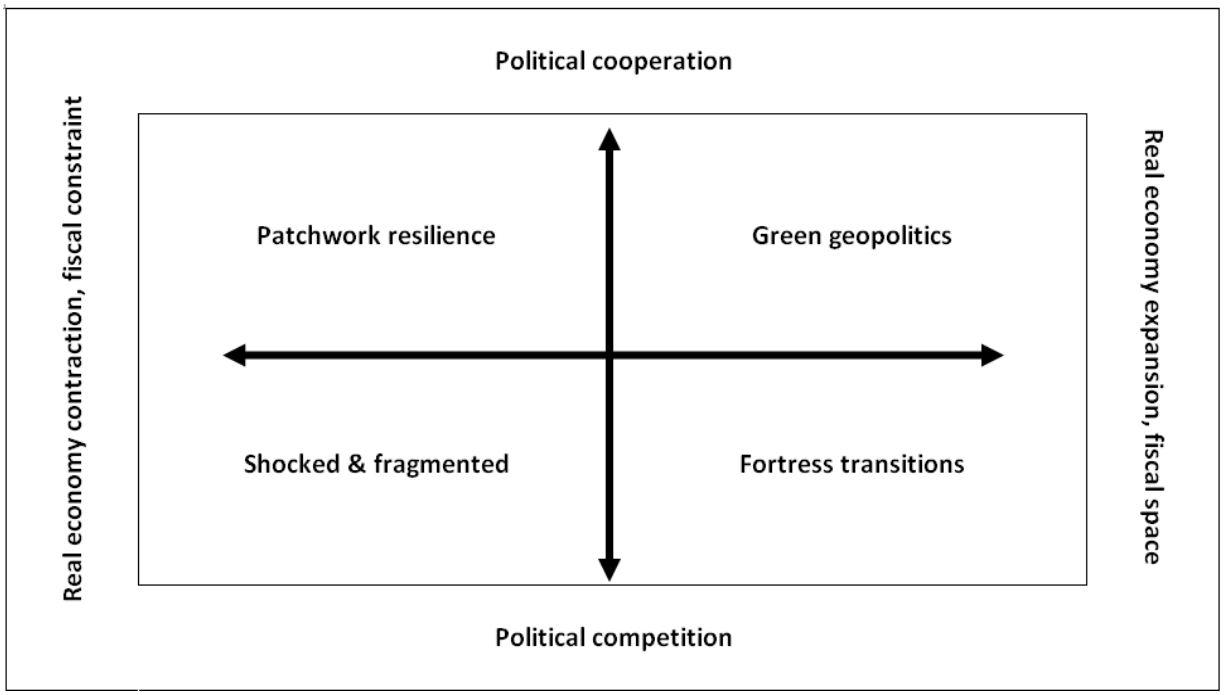
- Public debt will exceed 100 percent of GDP in more than 80 countries.
- Interest rates remain above 3 percent for six consecutive quarters.
- Governments face trade-offs: servicing debt vs. investing in resilience and energy infrastructure.
- Ageing populations strain public finance and reshape labor markets.
- Fiscal sustainability under pressure as healthcare and pensions rise while tax bases shrink.
- Intergenerational equity debates intensify.

7. Technology is absorbing large scale finance and driving up **energy demand.**

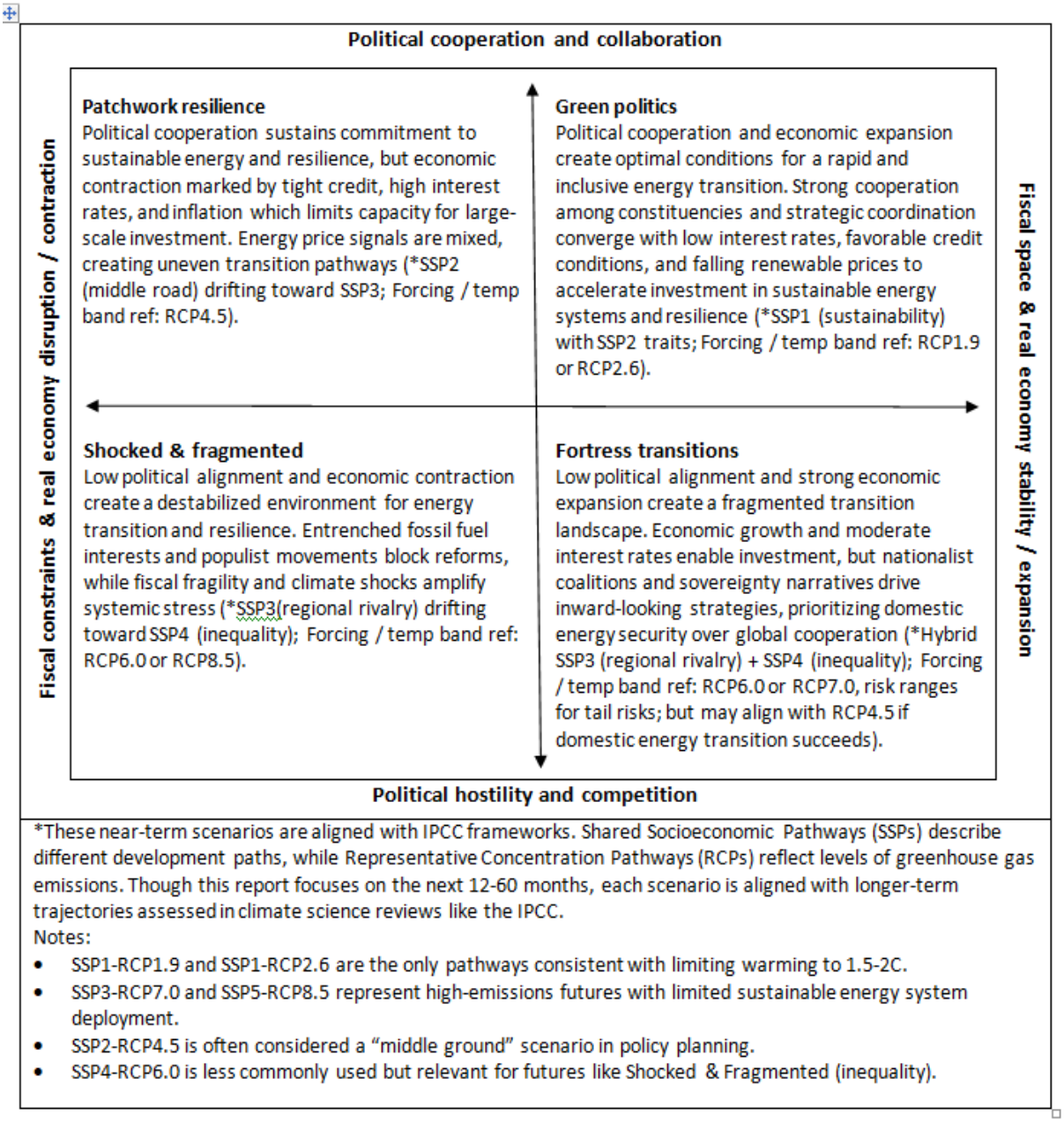
- Capital-intensive data centres will drive up electricity demand, surpassing power used by all energy-intensive manufacturing sectors combined.
- AI could optimize grids and accelerate innovation in battery and solar PV—but benefits require rapid investment in electricity infrastructure and collaboration between governments and the tech sector.
- Gargantuan investment in digital infrastructure and AI is crowding out other productive investments.
- AI infrastructure concentrated in advanced economies; tech stocks account for **up to 40 percent of S&P500**.
- Electricity consumption from data centres is expected to **double by 2030**.

Four scenarios for strategic planning

Politics, finance, and societal constraints will affect the degree of stability in the face of accelerating climate change in coming years. To navigate this volatile landscape, the report introduces four plausible scenarios for planning purposes. These scenarios are structured along two primary axes: political alignment (cooperation vs. competition) and economic momentum (expansion vs. contraction).



These dynamics vary by region and are similarly shaped by the relationships between countries and their domestic political, economic, and social contexts. Policy ambition related to sustainable energy systems and resilience are also shaped by the degree to how the interaction of countries on the global stage plays out, the state of the global economy, and factors shaping society like demographic trends, technology, and fairness.



*These near-term scenarios are aligned with IPCC frameworks. Shared Socioeconomic Pathways (SSPs) describe different development paths, while Representative Concentration Pathways (RCPs) reflect levels of greenhouse gas emissions. Though this report focuses on the next 12-60 months, each scenario is aligned with longer-term trajectories assessed in climate science reviews like the IPCC.

Notes:

- SSP1-RCP1.9 and SSP1-RCP2.6 are the only pathways consistent with limiting warming to 1.5-2C.
- SSP3-RCP7.0 and SSP5-RCP8.5 represent high-emissions futures with limited sustainable energy system deployment.
- SSP2-RCP4.5 is often considered a "middle ground" scenario in policy planning.
- SSP4-RCP6.0 is less commonly used but relevant for futures like Shocked & Fragmented (inequality).

The scenarios are structured foresight tools intended to help decision-makers anticipate risks, stress-test strategies, and identify leverage points for action.

Decision-making context 2026

While global temperatures may be relatively fixed in the near term, the crucial aspect that determines outcomes from now on is the way that decision makers navigate the challenges and opportunities embedded in the political and economic, as well as social, fairness, demographic and technological realities in which they find themselves at present. Each scenario contains threats and opportunities that help frame strategy and near-term decisions. By understanding the context, strategists can help decision makers advance sustainable energy systems and resilience relative to political alignment and economic momentum.

Scenario-Specific Opportunities

While global temperatures may be relatively fixed in the near term, the crucial aspect that determines outcomes from now on is the way that decision makers navigate the challenges and opportunities embedded in the political and economic, as well as social, fairness, demographic and technological realities in which they find themselves at present. Politics, finance, and societal constraints will affect the degree of stability in the face of accelerating climate change in coming years. Each scenario contains situations decision makers can use to advance sustainable energy systems and resilience relative to political alignment and economic momentum.

Scenario 1: Green Geopolitics *(High Political Alignment + Economic Expansion)*

- Recommendation: Decision-makers can capitalize on favorable credit conditions and low interest rates to scale renewable deployment and resilience infrastructure. Invest in AI and smart grid technologies to optimize energy flows and electrify industry. Ensuring fairness mechanisms such as job guarantees and retraining can help energy transitions and investments in resilience maintain public support.

Scenario 2: Patchwork resilience *(High Political Alignment + Economic Contraction)*

- Recommendation: Enable harmonisation of utility grids alongside decentralized solutions and modular technologies like rooftop solar and community energy solutions. Maintain targeted incentives and support to maintain social legitimacy, while deploying AI for efficiency gains in constrained fiscal environments. Communicate economic benefits clearly to sustain public support.

Scenario 3: Fortress Transitions *(Low Political Alignment + Economic Expansion)*

- Recommendation: Safeguard against industrial dependency that can accompany protection through sunset clauses and performance targets that buoy strategic market strengthening (productivity gains, debt reduction, fostering innovation and research and development). Invest in AI-driven productivity gains to offset geopolitical fragmentation and maintain competitiveness. Introduce fairness provisions for communities disadvantaged by inward-focused strategies to reduce instability.

Scenario 4: Shocked & Fragmented *(Low Political Alignment + Economic Contraction)*

- Recommendation: Focus on adaptive, low-cost solutions such as off-grid renewables for households facing high fossil fuel costs. Strengthen local resilience through community-based energy systems and disaster preparedness. Address fairness gaps to prevent social unrest and maintain minimal cohesion. Enhance cybersecurity and diversify critical infrastructure to reduce vulnerability.

While climate outcomes may be path-insensitive in the near term, the direction of energy and resilience will depend not only on climate impacts but on political and economic choices made now.

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About Penn International Climate Observatory. Global climate policy was shaped decades ago, but today's world looks very different. Uneven energy transitions, strategic competition, and cascading risks demand a recalibration in approach. To inform decision makers, in 2025 the University of Pennsylvania's International Climate Observatory (PICO) launched a new initiative anchored at Perry World House that connects cutting-edge academic research with global policy and practice. The Observatory convenes scholars, practitioners, and decisionmakers to generate near-term foresight on challenges and opportunities, translate emerging evidence into actionable insights, and stress-test strategies for resilience and the sustainable energy transition. The Penn International Climate Observatory brings geopolitical and security, finance and real economy, and social analysis to global climate diplomacy and action. This consultation draft, created in consultation with experts by the Penn International Climate Observatory (PICO), analyses these critical trends and conveys recommendations for the coming period to inform decision making on energy and resilience in the context of shifting geopolitics, finance and the real economy, and societal pressures.

About this consultation draft. This consultation draft of the *Global Climate Trends Report* helps leaders navigate in the near-term, in the context of geopolitical dynamics, the real economy and finance, and societal and demographic forces that enable or constrain decisions. The report's biannual foresight cycle aligns with key global decision points such as UN General Assembly, annual meetings of the IMF and World Bank, and COP, enabling adaptive planning and scenario tracking. It empowers decision-makers to anticipate transition risks and climate impacts, stress-test strategies, and shape informed responses.