POLICY NOTE

DIFFERENTIATED DIVERSIFICATION AS A SCIENCE-ALIGNED PATHWAY FOR DE-RISKING THE GLOBAL ENERGY SYSTEM

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Differentiated Diversification as a Science-Aligned Pathway for De-risking the Global Energy System

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Abstract

The 2026 Iran-U.S. conflict and the disruption of energy flows through the Strait of Hormuz and Bab el-Mandeb have heightened the urgency of de-risking global energy supply chains. Energy diversification across nuclear, renewables, and other sources strengthens near-term resilience and helps manage longer-term climate risks. Even as the energy transition is underway in most countries, many of them retain an "all of the above" strategy of diversification for maximizing energy resilience.

This note proposes three interconnected recommendations for G20 action in this area: (1) strengthen grid resilience through modernization and regional grid integration; (2) establish a G20 Energy Diversification Framework with differentiated national roadmaps; and (3) enable differentiated pathways for fossil fuel subsidy phase-out that reflect national circumstances and protect vulnerable households. These approaches build on priorities of current and past G20 meetings, including the 2025 Critical Minerals Framework, the 2025 Voluntary Energy Security Toolkit, 2023 summit proposals for reform of the multilateral development banks, and the outcomes of the 2026 Houston Permitting and Regulatory Efficiency Symposium. Together, the recommendations in this note offer a practical agenda for G20 leadership to make progress on greater diversification of the global energy system.

The Imperative of Energy Diversification

The recent disruption to energy flows through key chokepoints in the Middle East in the wake of the Iran-U.S. conflict has further increased the urgency of de-risking global energy supply chains.

The conflict, which began on February 28, 2026, is still ongoing after many months, with the Strait of Hormuz significantly blocked to oil supplies coming out of most Gulf states.[1] In addition, the Ansar Allah seizure of the second chokepoint of Bab el-Mandeb and attacks on the East-West pipeline have endangered the oil supplies from Saudi Arabia that were able to bypass

[1] "Trump Says the Strait of Hormuz Is Open. But How Much Oil Is Really Going Through?" *Washington Post*, September 14, 2026, https://www.washingtonpost.com/national-security/2026/09/14/trump-claims-strait-hormuz-is-open-how-much-oil-is-really-going-through/.

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the Strait of Hormuz.[2] A total of approximately 7 million barrels per day (mbpd) of oil remains blocked from the Gulf.[3] This represents about 7% of the global oil supply.

The disruption is greater for oil products, such as diesel, which are crucial to current long-distance road transport of food and other consumer goods. Oil refining capacity is unevenly spread across the world, and refineries are often designed to handle only a specific grade of crude oil. This only magnifies the supply shock.

Apart from the Middle East itself, Asia is most affected by these disruptions, being heavily dependent on energy supplies from the Gulf. The crisis is also contributing to inflation pressures in several regions.[4]

The shock goes beyond oil.[5] The Gulf is also a vital source of liquefied natural gas (LNG) supplies, used for power generation and fertilizer manufacturing, among other applications. Again, Asia is especially affected, with spot prices tripling due to the ongoing conflict.[6]

The G20, as a global grouping focused primarily on economic governance, could play a major role in coordinating policies to de-risk the global energy system. Its members are collectively responsible for the lion's share of energy investment and include the world's biggest nodes of technology, manufacturing, and consumer demand. Energy diversification is a major means of achieving such resilience, both because it de-risks supply chains in the near term and is a key policy component in managing novel environmental and climate risks, which, in turn, unless effectively addressed, have serious ongoing and future economic implications across regions and across human timescales.[7] Climate impacts are already costly: for example, the May 2024 floods in Rio Grande do Sul, Brazil, alone caused an estimated R$88.9 billion (about US$15 billion) in damage, losses, and additional costs.[8] This will require a shift toward increasing shares of

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[2] "What the Closure of Saudi Arabia's East-West Pipeline Could Mean for Oil Flows," *Washington Post*, September 14, 2026, https://www.washingtonpost.com/business/2026/09/14/saudi-pipeline-oil-iran-war/6223e42a-b081-11f1-92c2-5c918f4a6127_story.html.

[3] "S&P Global: Middle East Crude Flows to Stay below Prewar Levels through 2027," *Oil & Gas Journal*, September 11, 2026, https://www.ogj.com/general-interest/economics-markets/news/55404460/sp-global-middle-east-crude-flows-to-stay-below-prewar-levels-through-2027.

[4] Lutz Kilian, Michael D. Plante, Alexander W. Richter, and Xiaoqing Zhou, "The Impact of the 2026 Iran War on U.S. Inflation: A Scenario Analysis," Working Paper 2609 (Dallas: Federal Reserve Bank of Dallas, 2026).

[5] Beyond energy, the manufacturing of plastics and other vital goods depends heavily on oil and gas supplies. The crunch on key ingredients for the making of fertilizers affects food security. And the Gulf is a key source of helium, crucial for semiconductor manufacturing.

[6] "LNG Demand in China, India Expected to Recover When Mideast War Ends," Reuters, September 15, 2026, https://www.reuters.com/business/energy/lng-demand-china-india-expected-recover-when-mideast-war-ends-2026-09-15/.

[7] Boston Consulting Group, *The Cost of Inaction: A CEO Guide to Navigating Climate Risk* (Geneva: World Economic Forum, 2024), https://www.weforum.org/publications/the-cost-of-inaction-a-ceo-guide-to-navigating-climate-risk/.

[8] See, e.g., Ginés Suarez, Omar Bello, and Jack Campbell, *Assessment of the Effects and Impacts of Floods in Rio Grande do Sul* (Washington, DC: Inter-American Development Bank, 2024), https://doi.org/10.18235/0013254, for

alternative energy sources, prominently including, for example, renewables and nuclear energy. Clearly, countries with greater shares of alternative energy in their portfolio have weathered the energy shocks of the current Gulf conflict better, indicating enhanced resilience.[9] This should not be surprising, as many alternative sources rely on zero or more limited streams of legacy fuel and also provide opportunities for localization and decentralization of energy generation, at cheaper or competitive prices.

However, cost is not the only consideration for the design of resilient, fit-for-purpose energy policies. Employment, energy sovereignty, legacy industry pressure, ability to earn export revenues from various types of domestic energy production, and lagging grid innovation and upgrades/modernization in order to ensure stable energy supply with a diversified energy mix can drive an "all of the above" energy strategy in many countries across the Global North and South. Current barriers to strategic and resilient energy diversification need to be accounted for in any coordinated G20 approach on energy diversification.

Additionally, there are also geographic concentrations in renewable and nuclear energy supply chains. The mining and refining of some of the key constituents of these energy technologies suffer from a high degree of geographic concentration.[10] Therefore, geographic de-risking is another factor driving "all of the above"-type energy policies in many countries. Furthermore, as costs of renewables have fallen and a range of countries show renewed interest in nuclear energy, there remains plenty of scope to increase the fraction of renewable and nuclear energy in the current global mix.[11]

Analysis and Recommendations

We propose three interconnected recommendations for vital G20 action on energy diversification, with its unique potential to drive crucial transformations within the global economy. The recommendations are presented below along with their associated analysis.

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an example of the costs of a single climate-related disaster in a G20 state. These costs are also likely to increase as risks become non-linear see e.g., Rockstrom et al, *Planetary Health Check* (2026).

[9] Centre for Research on Energy and Clean Air (CREA), *What the Hormuz Crisis Has Cost Fossil Fuel Importers: March to August 2026* (Helsinki: CREA, August 2026), https://energyandcleanair.org/what-the-hormuz-crisis-has-cost-fossil-fuel-importers-march-to-august-2026/.

[10] United Nations Conference on Trade and Development (UNCTAD), "Global Trade Update (June 2026): Shifting Dynamics in Critical Minerals Trade," June 2026, https://unctad.org/publication/global-trade-update-june-2026-shifting-dynamics-critical-minerals-trade; International Energy Agency (IEA), "Clean Energy Supply Chains Vulnerabilities," in *Energy Technology Perspectives 2023* (Paris: IEA, 2023), https://www.iea.org/reports/energy-technology-perspectives-2023/clean-energy-supply-chains-vulnerabilities.

[11] There are concerns among environmentalists on nuclear waste and also about the environmental impacts of mining and other activities in the renewable energy supply chain. Noura Y. Mansouri, Fateh Belaid, Adnan Shihab-Eldin, Charles McCombie, Holger Rogner, Robert Budnitz, Robert Schock, and Anita Nilsson, "The Role of Nuclear Power in Clean Energy and Green Transitions," T20 Policy Note, 2022.

Recommendation 1: Enhance Efforts on Grid Resilience – Specifically in Grid Modernization and Regional Integration

An electricity system with diversified sources will fail or at least perform poorly if the associated grid is not resilient and fit for purpose. The IEA has raised concerns that investments and buildout of resilient grids are severely lagging future requirements.[12] Less attention has been paid in multilateral fora such as the G20 to coordinated action on grid resilience. Grid resilience actions include two key components, namely, grid modernization and regional grid integration.

The U.S. presidency of the G20 has set out three priorities on energy security: limiting regulatory burdens, unlocking affordable and secure energy supply chains, and pioneering new technologies and innovation.[13] The Energy Abundance Ministerial of G20 energy ministers, held in Houston in September 2026 and attended by all G20 ministers, identified three pillars of action, namely energy security and affordable baseload, permitting and regulatory efficiency, and critical minerals and resilient supply chains.[14] These reflect the priorities of the United States as chair this year.

They also align significantly with the priorities of G20 2025. The Johannesburg Declaration (2025) lists the Voluntary Energy Security Toolkit, which includes mention of "regional interconnectivity" and "infrastructure resilience."[15] There is also mention of "transmission expansion and modernization efforts" and "advancing cross-border infrastructure for regional development," making these ripe candidates for advancing a consensus G20 agenda this year.

There is also the distributional question. For example, most clean energy investments flow into China, Europe, and the United States; only 20% reach developing countries, and of these, Africa gets a disproportionately low fraction.[16] Almost 600 million Africans also lack energy access.[17]

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[12] IEA, *Electricity Grids and Secure Energy Transitions: Enhancing the Foundations of Resilient, Sustainable and Affordable Power Systems* (Paris: IEA, 2023), Executive Summary, https://www.iea.org/reports/electricity-grids-and-secure-energy-transitions/executive-summary.

[13] "G20 United States," G20, https://g20.org/g20-united-states/.

[14] The White House, "G20 Energy Abundance Ministerial Concludes with Four Consensus Outcomes," September 2026, https://www.whitehouse.gov/releases/2026/09/g20-energy-abundance-ministerial-concludes-with-four-consensus-outcomes/; "G20 Energy Abundance Ministerial in Houston Spotlights Permitting, Infrastructure and Supply Chain Issues for Oilfield Services," IndexBox, https://www.indexbox.io/blog/g20-energy-abundance-ministerial-in-houston-spotlights-permitting-infrastructure-and-supply-chain-issues-for-oilfield-services/; "India Calls for Secure, Affordable, Reliable Energy at G20 Energy Abundance Ministerial Meeting in US," ANI, September 17, 2026, https://aninews.in/news/national/general-news/india-calls-for-secure-affordable-reliable-energy-at-g20-energy-abundance-ministerial-meeting-in-us20260917134255/.

[15] G20, "G20 Leaders' Declaration," Johannesburg, November 22, 2025, G20 Information Centre, University of Toronto, https://www.g20.utoronto.ca/2025/251122-declaration.html.

[16] World Economic Forum, "Rethinking Clean Energy Investment in EMDEs," January 15, 2025, https://www.weforum.org/stories/energy-transition/rethinking-clean-energy-investment-in-emdes/.

[17] IEA, *Financing Electricity Access in Africa* (Paris: IEA, 2025), https://www.iea.org/reports/financing-electricity-access-in-africa.

The Johannesburg and Miami summit agendas will both be served if the G20 utilizes the output of the Houston Permitting and Regulatory Efficiency Symposium, held as part of the G20 energy ministerial in Houston, as the basis for a voluntary principles document on enhancing permitting actions for faster grid modernization and buildouts.[18] Such a document can serve as a guide for global action in this space. Grid buildouts are currently plagued by equipment supply shortages, with delivery lead times as high as five years.[19] A centralized registry that consolidates data for relevant electrical equipment orders across major economies can improve visibility of the supply-demand balance and enable better planning for grid construction projects.[20] Commercial sensitivities are an issue in the generation of such a database, but taking a cue from the semiconductor industry, any sensitive data can be masked before it is consolidated and made available to third parties.[21]

There is also a need to advance skills in the electrical transmission sector, which is facing acute shortages of trained personnel.[22] This has the additional benefit of being aligned with the workforce development agenda that the Johannesburg summit outlined. If G20 states can agree to prioritize sectoral skills, for example, through mutual recognition of engineering and vocational qualifications across its states (or a subset of them), it would aid the supply-demand balance of such labor. Leader-level championing of such skilling on the domestic front would also enhance the supply of such labor.

A promising approach for enhancing grid resilience is regional integration of electricity grids across sovereign jurisdictions. Southeast Asia is a leader in such efforts with its ASEAN Power Grid initiative.[23] Although the effort is showing success, it is still not a fully integrated approach, limited by the separateness in buildouts, financing, and regulation.[24] Currently, cross-border power trading takes years to set up because countries have to resolve legal debates over pricing,

[18] U.S. Environmental Protection Agency, "EPA Hosts Global G20 Forum on Regulatory Efficiency in Houston," news release, September 14, 2026, https://www.epa.gov/newsreleases/epa-hosts-global-g20-forum-regulatory-efficiency-houston.
[19] Asian Development Bank, *Asia-Pacific High-Voltage Transmission Supply Chain Project* (Manila: Asian Development Bank, 2026), https://asiacleanenergyforum.adb.org/wp-content/uploads/2026/06/Asia-Pacific-High-Voltage-Transmission-Supply-Chain-Project.pdf; RMI, "Solving the Gridlock: America's Electric Supply Chain Opportunity," May 8, 2026, https://rmi.org/resources/solving-the-gridlock-americas-electric-supply-chain-opportunity/.
[20] IEA, *Building the Future Transmission Grid* (Paris: IEA, 2025), https://www.iea.org/reports/building-the-future-transmission-grid.
[21] SEMI, "Data Collection Methodology," SEMI Data Collection Program, https://www.semi.org/en/products-services/market-data/data-collection-program/data-collection-methodology.
[22] United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), "Driving the Skills Transition for a Clean Energy Future That Leaves No One Behind," ESCAP blog, June 3, 2026, https://www.unescap.org/blog/driving-skills-transition-clean-energy-future-leaves-no-one-behind.
[23] ASEAN Centre for Energy, "ASEAN Power Grid (APG)," https://aseanenergy.org/apaec/asean-power-grid-apg.
[24] IEA, *Financing the ASEAN Power Grid* (Paris: IEA, 2026), Executive Summary, https://www.iea.org/reports/financing-the-asean-power-grid/executive-summary.

liability, and local laws in each country.[25] Standardizing all or some of these elements will shorten project delivery timelines. A template would cover how power is bought, sold, and tracked across borders, addressing elements such as transmission fee structures across third countries, harmonizing technical standards to mitigate sudden demand spikes, and setting out dispute-settlement mechanisms. The G20 could generate a template for a standardized cross-border trading agreement that can be adopted voluntarily by member states, as well as states beyond the G20, for encouraging and speeding up regional power integration initiatives.

Finally, regional grid integration can also be coupled with the development of regional hubs for industrialization. This will also aid supply chain diversification. The voluntary G20 Critical Minerals Framework, established in 2025 under the South African Presidency, can serve as a guide.[26] A similar document could be developed for regional manufacturing of grid equipment and batteries, sited close to locations where minerals are produced.

Recommendation 2: Establish a G20 Energy Diversification Framework with Self-Determined and Differentiated National Roadmaps

The G20 is well positioned to serve as an enhanced coordination entity for energy diversification, leveraging its collective weight as an institution. Since at least 2022, G20 communiqués have referenced energy supply chain diversification. But these commitments have generally lacked specificity and accountability mechanisms. The G20 could now agree on a common Energy Diversification Framework setting out shared principles, including security, affordability, sustainability, and equity, while accommodating differentiated national pathways.

Within this framework, those G20 members willing and able would commit to furnishing a national energy diversification roadmap, covering a portfolio of sources (renewables, nuclear, storage, efficiency, and where applicable, managed legacy fossil fuel use in transition contexts), alongside measurable targets and timelines. Such roadmaps can build on existing national energy strategies and link with the COP30 Presidency's international roadmap.[27] As the G20 is a highly diverse and informal grouping, the best approach would be to have states defining such roadmaps to conduct annual self-reviews with assessments of successes and failures. The Science Panel for the Global Energy Transition (SPGET), launched at Santa Marta in April 2026,

[25] IEA, *Financing the ASEAN Power Grid*; Economic Research Institute for ASEAN and East Asia (ERIA), *Layered Market Approach to ASEAN Power Grid Development* (Jakarta: ERIA, 2026), https://www.eria.org/uploads/Layered-Market-Approach-to-ASEAN-Power-Grid-Development.pdf.
[26] G20, "G20 Critical Minerals Framework" (Johannesburg: G20 South Africa Presidency, 2025), G20 Information Centre, University of Toronto, https://www.g20.utoronto.ca/2025/251201-critical-minerals-framework.html.
[27] COP30 Presidency, "Transitioning Away from Fossil Fuels Roadmap," COP30 Brazil, July 1, 2026, https://cop30.br/en/2026-priorities/transitioning-away-from-fossil-fuels-roadmap; Government of Germany, *Germany's Roadmap for Transitioning Away from Fossil Fuels* (2026). https://www.bundesumweltministerium.de/fileadmin/Daten_BMU/Download_PDF/Klimaschutz/taff_roadmap_en_bf.pdf

could provide science-based guidance for developing these roadmaps to those G20 states that request such assistance.[28]

Importantly, such a framework would enable collective signaling to private capital markets. Policy uncertainty is among the most significant factors driving inflated risk premiums on clean energy investment across many G20 members and partner countries. Common, publicly committed roadmaps verified through a shared G20 process would reduce this systemic uncertainty.

Supply chain concentration represents a further dimension requiring collective G20 attention. The IEA's World Energy Outlook 2025 identifies one country as currently dominating the refining of 19 out of 20 key energy-related minerals, and warns that geographic concentration in mineral refining has deepened rather than eased since 2020.[29] The G20 is an appropriate venue to further consolidate and strengthen a critical minerals cooperation platform that could build on existing initiatives such as the Critical Minerals Framework, advanced by the South African G20 presidency.[30] The framework is a blueprint to unlock investment in exploration, promote local beneficiation at source, and strengthen governance. It is structured around the finding that producer countries face "underinvestment, limited value addition and beneficiation, lack of technologies as well as socio-economic and environmental issues," explicitly preserves the sovereign right of mineral-endowed countries to harness their endowments, and supports spreading mining, transport, processing, and sales across different countries. The challenge now is to convert these goals into an implementation program.

Accordingly, the G20 can take up the task of preparing an implementation roadmap for diversifying supply chains. For example, the multilateral development bank (MDB) reform agenda, already an outcome of the 2023 G20 Summit in New Delhi,[31] can be updated to include a push for concessional and guaranteed finance for refining, separation, and precursor capacity sited in producer countries.[32] Another specific action could be the creation of a dedicated fund for exploration and beefing up national geological survey capacity in under-mapped and resource-rich countries.

Recommendation 3: Enable Pathways for Fossil Fuel Subsidy Phase-Out Accounting for National Circumstances and Transition Protections

The G20's 2009 commitment to phase out inefficient fossil fuel subsidies remains substantially undelivered. Historically, the grouping has had many differences and internal debates on fossil

[28] Science Panel for the Global Energy Transition (SPGET), Santa Marta Process, https://santamartaprocess.org/#spget.
[29] IEA, *World Energy Outlook 2025* (Paris: IEA, November 2025), Executive Summary (section on critical minerals supply chains), https://www.iea.org/reports/world-energy-outlook-2025.
[30] G20, "G20 Critical Minerals Framework."
[31] G20, "G20 New Delhi Leaders' Declaration," New Delhi, India, September 9–10, 2023.
[32] G20, *Roadmap towards Better, Bigger and More Effective MDBs* (2024), Global Development Policy Center, Boston University, https://www.bu.edu/gdp/files/2024/12/G20_MDB_Roadmap.pdf.

fuel subsidies, with some states questioning the need for this commitment in the first place. Though the subsidies commitment was dropped from the 2025 Johannesburg summit statement, its frequent presence in the summits prior to 2025 indicates its importance to many G20 states.

IRENA and CPI's Global Landscape of Energy Transition Finance 2025 reports that G20 governments provided approximately US$168 billion in public financial support for renewable power in 2023, which is less than one-third of the subsidies those same governments directed toward fossil fuels in the same year.[33] The Energy Policy Tracker has documented that by 2022–2023, G20 fossil fuel subsidies had reached record levels, driven in part by government responses to energy price shocks that expanded general consumer support rather than addressing underlying structural dependence.[34] This imbalance constitutes one of the most significant market distortions in the global energy system.

Those G20 states willing and able could move from open-ended commitments to nationally specific phase-out plans, differentiated by level of development and recognizing the need to take into account different national circumstances, noting, for example, that G20 states from the Global South and those with major dependence on fossil fuels for their national revenues should be given more time and support to pursue phase-out plans than developed G20 states. IISD analysis published in November 2025 proposes a practical three-tier approach: subsidies suitable for rapid elimination; subsidies requiring managed phase-out strategies with measures ensuring transition support; and time-limited exemptions justified by energy access or just transition considerations.[35] This framework enables participating governments to navigate distributional concerns without deferring reform indefinitely.

For participating advanced G20 economies, accelerated timelines are fiscally and technically feasible. For participating Global South states, which face more daunting challenges in ensuring protections for lower-income citizens, the priority could be eliminating the most environmentally and economically distorting subsidies first (particularly those benefiting fossil fuel producers rather than low-income households) while redirecting revenues toward targeted social protection and clean energy investment.

These efforts can also provide long-term savings — with an Oxford study estimating that a swift transition to a more diverse energy system could save between US$5 and US$12 trillion globally by 2050, compared with continuing current levels of fossil fuel use.[36] Country experience

[33] International Renewable Energy Agency (IRENA) and Climate Policy Initiative (CPI), *Global Landscape of Energy Transition Finance 2025* (Abu Dhabi: IRENA, November 2025), https://www.irena.org/Publications/2025/Nov/Global-landscape-of-energy-transition-finance-2025.
[34] Energy Policy Tracker, *Fanning the Flames: G20 Provides Record Financial Support for Fossil Fuels* (2023), https://www.energypolicytracker.org/g20-fossil-fuel-support/.
[35] Jonas Kuehl, Paula Osorio Figueredo, and Mario Cavolo, *Making It Happen: National Fossil Fuel Subsidy Phase-Out Plans for the G20* (Winnipeg: International Institute for Sustainable Development (IISD), November 2025), https://www.iisd.org/publications/report/g20-fossil-fuel-subsidies.
[36] Assuming discount rates of 1.4% and 5%, respectively, when calculating net present costs. See Rupert Way, Matthew C. Ives, Penny Mealy, and J. Doyne Farmer, "Empirically Grounded Technology Forecasts and the Energy Transition," *Joule* 6, no. 9 (2022): 2057–82.

illustrates both the necessity and the political awareness and skill required for this path. For example, India reduced its oil and gas subsidies by approximately 85% between 2013 and 2023 through a combination of retail price reform, incremental tax increases, and targeted support, redirecting fiscal savings toward renewable energy and electricity infrastructure: this transition is reflected in India's renewable capacity exceeding 50% of total installed power ahead of schedule.[37] In contrast, the Nigerian experience demonstrates the political costs of abrupt and poorly communicated reform: when consumer fuel subsidies were eliminated without adequate transition measures in 2023, inflationary impact fell disproportionately on lower-income households and businesses.[38] The lesson across both cases is that reform must be graduated, transparent, and clearly linked to benefits for the public; sound planning and the sharing of expertise across jurisdictions are crucial.

Consistent, comparable reporting across participating G20 members would be a driver for new and genuine progress. The G20 could commit to periodic disclosure of fossil fuel subsidy inventories, using the OECD/IEA reporting framework as a common baseline. This would provide factual foundations for future G20 action.

Conclusion

Together, these three recommendations constitute a coherent, evidence-based agenda for G20 leadership on energy diversification: one that addresses the technical, financial, and governance dimensions of the challenge at once, and that is calibrated to both scientific necessity and the differentiated realities and levels of participation of diverse G20 states. The case for acting collectively and now is further reinforced by the current geopolitical context, which has laid bare the systemic risks of concentrated energy supply chains, especially in fossil-fuel spaces. Further, and as the IPCC has already documented, there are major economic and social costs (e.g., causing direct economic damage in climate-exposed sectors such as agriculture, forestry, fisheries, energy, and tourism,[39] in addition to multiple studies pointing to more generalized economic damage)[40] of not moving to diversified global energy portfolios.

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[37] IISD, *Fossil Fuel Subsidy Reform: India* (Winnipeg: IISD, 2024), https://www.iisd.org/fossil-fuels/subsidy-reform/india/; see also Planetary Guardians, The B Team, and Project Dandelion, *Renewable Freedom* (April 2026), 12–13, https://www.planetaryguardians.org/renewablefreedom.

[38] International Monetary Fund (IMF), *Nigeria Article IV Consultation Report 2024* (Washington, DC: IMF, 2024); see also Planetary Guardians, The B Team, and Project Dandelion, *Renewable Freedom*, 13–14.

[39] IPCC, *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, ed. Hans-Otto Pörtner et al. (Cambridge: Cambridge University Press, 2022), Summary for Policymakers, https://doi.org/10.1017/9781009325844.

[40] For example, unmitigated climate change is projected to reduce global economic output by up to 18% of GDP by 2050, driven by escalating systemic stresses on agricultural yields, labor productivity, and infrastructure stability. Swiss Re Institute. (2021). *The Economics of Climate Change: No Action Not an Option*. Swiss Re Management Ltd. Available at: Swiss Re Climate Economics Index.