POLICY SOLUTION

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STRESS-TESTING STRATEGIC SUPPLY CHAINS: A G20 APPROACH TO ENERGY AND CRITICAL-MINERAL DISRUPTIONS



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Stress-Testing Strategic Supply Chains: A G20 Approach to Energy and Critical-Mineral Disruptions

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A Common Risk, Different Interests

Over the past five years, the G20 has spent increasingly more time on energy security and critical minerals, but the scope for collective action remains narrow. More than a lack of interest, this seems to stem from the fact that G20 members occupy very different positions in global supply chains and therefore face different risks and pursue different national interests. Indeed, the G20 brings together major, import-dependent economies across energy, critical raw materials, and manufactured goods. As a result, collective measures that improve security for one group can shift costs or risks to another.

These differences are especially visible in critical minerals. Producer countries often want investment to keep processing local and to enlarge their own share of value added. Many also seek to diversify export destinations, which are often concentrated in a handful of buyers, and to reduce the dependence of export and fiscal revenues on volatile international prices. On the other hand, importers worry precisely about concentrated supply and how this may affect access during a crisis. A disruption is therefore not only a supply problem for importers: for producers, it can also become a demand and price shock.

The G20 State of Play

This helps explain why recent G20 outcomes have relied heavily on voluntary principles and frameworks. The Rome Leaders' Declaration in 2021 broadened the definition of energy security to include critical minerals, semiconductors, and related technologies.[1] The Bali Roadmap in 2022 addressed resilient clean-energy supply chains and proposed an annual stocktake.[2] India followed in 2023 with voluntary high-level principles on critical minerals,[3] Brazil in 2024 again backed diversified and responsible supply chains,[4] and South Africa in 2025 produced both a Critical Minerals Framework[5] and a Voluntary Energy Security Toolkit. However, while these documents cover much of the policy space, from diversification to emergency preparedness, from processing to recycling, they do not create a recurring exercise through which G20 members test how a common disruption affects different parts of the same supply chain.

In this context, the U.S. Presidency has kept supply-chain security near the center of the 2026 agenda. The September Energy Abundance Ministerial focused on secure energy flows, diversification, critical infrastructure, and emergency preparedness, and Pillar III on "Critical Minerals" highlighted information sharing and capacity building, noting that G20 governments

[1] G20 Rome Leaders' Declaration
[2] Decade of Actions: Bali Energy Transitions Roadmap
[3] New Delhi Leaders' Declaration and Voluntary High-Level Principles on Critical Minerals
[4] Rio de Janeiro Leaders' Declaration
[5] G20 Critical Minerals Framework

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"may strive to leverage voluntary information exchange across government, industry, and research institutions."[6] These priorities leave room for a diagnostic exercise without requiring members to settle the harder questions of common targets, financing mechanisms, strategic stocks, or trade rules.

Proposal: A Voluntary G20 Supply-Chain Stress Test

The proposal is a voluntary stress test for a small number of energy and critical-mineral supply chains. It would use a common disruption scenario and a common set of questions, while allowing each member to assess the consequences from its own position in the chain.

Given the diversity of exposure and interests among G20 members, the goal is not to produce a single "resilience score." Instead, a stress test should make differences among members visible, while also producing common metrics that could be shared and harmonized.

Each exercise could cover one or two supply chains and begin with a specific shock. The scenarios should be severe enough to reveal bottlenecks but easy to understand and compare. Examples include a maritime chokepoint that remains closed for several weeks; a major supplier that restricts exports of a mineral or processed material; a large refining or processing hub that becomes unavailable; or a physical or cyber incident affecting critical infrastructure.

The same scenario does not mean the same shock for every member. For an importer, a closed chokepoint or an unavailable processing hub is above all a supply problem. For a producer, it can mean stranded exports, falling prices, and lost fiscal revenue, especially where sales depend on a few destinations or on a single processing partner. The stress test should capture both sides of the chain.

The analysis would cover three areas, with differentiated questions for importing and producing economies:

- **Exposure.** Which supplies, routes, facilities, or processing stages are affected? How concentrated are they, and how much of the global, regional, or national value chain depends on the disrupted node? For producing economies: how concentrated are export destinations and processing partners, and what share of export earnings and fiscal revenues depends on the disrupted node?
- **Buffers.** What can absorb the first phase of the shock? This includes commercial inventories, strategic stocks where they exist, spare production or processing capacity, alternative routes, and contractual flexibility. The relevant buffer will differ by commodity and by the role of each economy in the chain. For producing economies: what can cushion a sudden fall in demand or prices, such as storage capacity, fiscal stabilization funds, flexible offtake contracts, or the ability to redirect sales?
- **Adjustment capacity.** Which alternatives exist, and how quickly can they be deployed at the national or supply-chain level? Possible responses include switching suppliers or routes, increasing production or processing elsewhere, drawing on recycling, or substituting the unavailable material with another material or technology. For producing economies: how quickly can exports be redirected to new markets, or processing expanded domestically, so that a disruption becomes an opportunity to diversify buyers and retain more value added rather than only a loss of revenue?

[6] G20 Energy Abundance Ministerial Statement. Pillar III: Critical Minerals.

How the Exercise Could Work

The G20 has already used stress-testing approaches in its work on interconnected critical infrastructure, and these experiences may inform the methodology. As a general principle, the stress test could combine national self-assessments with a global market picture based on existing data. Sensitive information on stocks, contracts, or individual firms need not be published, and discussions at the G20 level could work with aggregated findings: where the main bottlenecks lie, which assumptions differ across members, and which vulnerabilities are shared by countries that otherwise have very different interests.

The exercise would rely on existing international organizations and agencies. These bodies already produce much of the relevant data and have experience with scenario analysis: the Organisation for Economic Co-operation and Development (OECD) has developed product-level supply-chain stress tests, while the International Energy Agency (IEA) already conducts stress tests on strategic raw-material supply chains.

Data collection. National self-assessments could be gathered through a standardized online questionnaire, designed with the IEA and the OECD and circulated by the G20 Presidency through the relevant working group, rather than through ad hoc email exchanges. A common form makes answers comparable and easier to aggregate, while still allowing confidential attachments. Each member would designate a national focal point, typically in the Ministry or Department responsible for energy and mining, to coordinate inputs from trade, economy, infrastructure, and geological agencies. Producing economies may also involve export-promotion agencies, which hold data on destinations and prices.

Timing and results. All members would respond within the same window, for example, eight to ten weeks, using the same reference year and scenario parameters. This is methodologically desirable because the shock is assessed under the same market conditions, results are not distorted by different timing, and differences among members reflect their position in the chain rather than the moment they answered. A short pre-test with a few volunteer members could refine the questionnaire. Results would take two forms: a confidential profile returned to each member, and an aggregated synthesis for G20 discussion, including a matrix of bottlenecks by chain stage and by importer or producer profile, with no country ranking. A brief public summary could present the main shared vulnerabilities.

If G20 members initially considered a full stress test too demanding, a pilot could start small, focusing on a single energy supply chain or a single critical-mineral chain. The exercise could then be repeated under successive presidencies, with scenarios changing as risks evolve.

From Diagnosis to Cooperation

Repeated exercises could build a shared evidence base without requiring agreement on common responses. They could also build confidence among members by making assumptions and vulnerabilities more transparent. Over time, this may create room for practical cooperation where interests overlap, for example on information-sharing, emergency contacts or contingency planning. Any further step would remain for members to decide.

Annex: How a G20 Supply-Chain Stress Test Could Work

