Chokepoint risks are unavoidable in fossil fuel-based energy systems

EXECUTIVE SUMMARY

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The central paradox of today's energy system is that plenty has not delivered security. The inescapable geographical reality is that importers accounting for over two-thirds of seaborne oil and gas demand are dependent on supplies transiting a small number of maritime and domestic chokepoints. Disruptions at these chokepoints cause price shocks, shipping disruptions, insurance withdrawal and physical supply constraints that can cascade rapidly across the system. More supply does not remove this systemic vulnerability. The most durable route to resilience for importers is to reduce dependence on oil and LNG through electrification, efficiency, grids, storage and domestic clean energy.

Download our full report, *Beyond Securing Supply: Chokepoint risk for oil and gas importers*, from **https://www.e3g.org/publications/chokepoints-systemic-threat-energy-security-oil-gas-importers/**

Recommendations

- **Deploy immediate crisis stabilisation:** Coordinate oil and gas stock releases, implement emergency demand cuts, and fast-track grid connections for new renewable generation.
- **Fast-track short-term measures:** Use fossil fuel supplier diversification as a short-term bridge, but avoid new long-term contracts: these lock in chokepoint risk for a generation.
- **Reduce long-term structural exposure to chokepoints:** Fossil fuel demand reduction is the only way to reduce chokepoint risk, primarily through clean energy rollout and energy efficiency measures, which provide long-lived, locally generated resilience.
- **Use defence capabilities to buy time but accept they don't boost resilience:** Military operations can limit short-term disruptions, but they are costly and resource intensive.
- **Strengthen energy systems resilience:** Future-proof clean energy by diversifying critical mineral and cleantech supply chains, while also boosting cyber and subsea security.

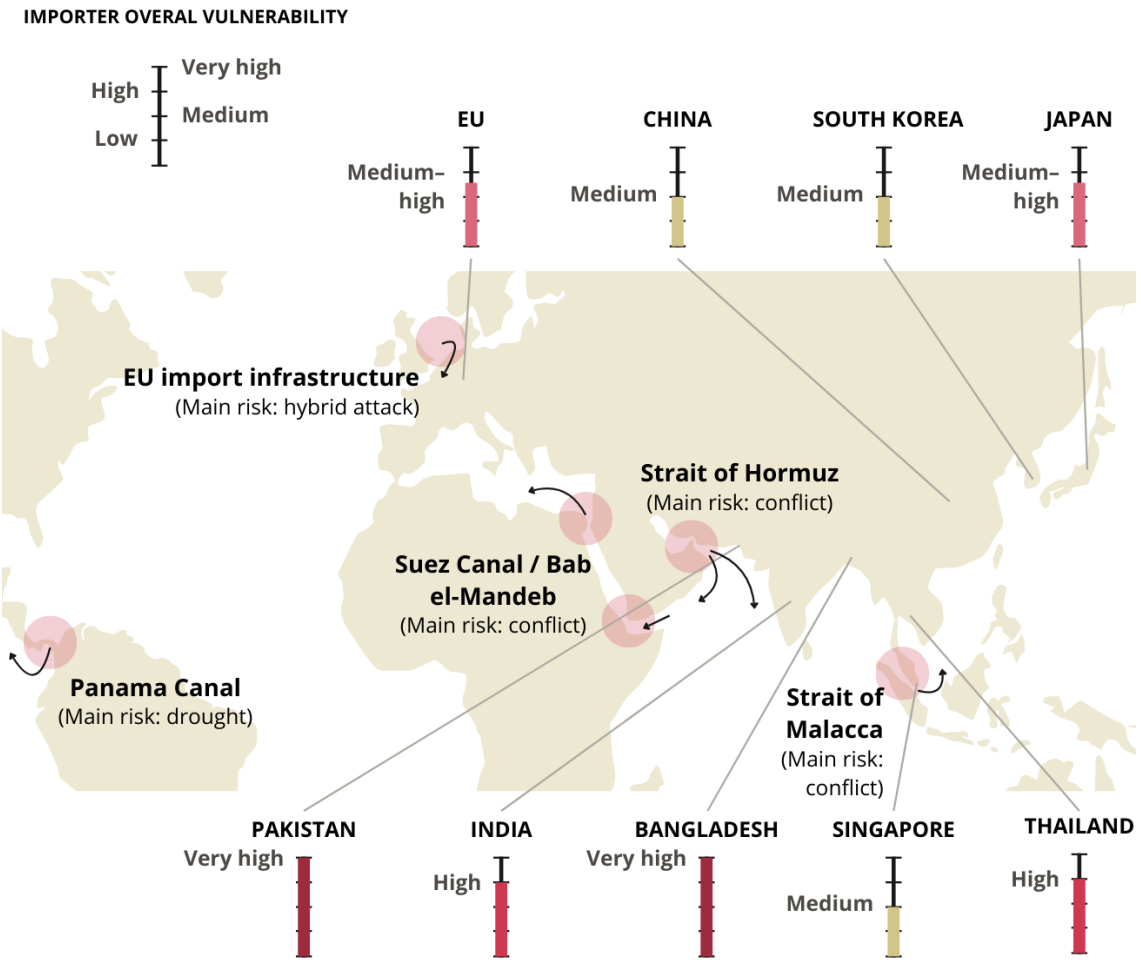
The global fossil fuel system contains several chokepoints

Disruption comes not just from **physical chokepoints** (conflict, blockades, accidents), but also "**paper chokepoints**" (insurance withdrawal, sanctions, inflexible contracts, freight constraints) and, increasingly, **climate impacts** (drought-strained Panama Canal, extreme weather hitting ports/infrastructure). These risks increasingly compound each other, reducing system slack and making even temporary disruptions cascade through global markets.

Vulnerability to chokepoint risk varies across importers

No importer is insulated. Global price transmission binds all importers into system vulnerability, but the level of exposure and resilience against chokepoint shocks determines the overall vulnerability of each importer. Our vulnerability assessments therefore consider:

- **Oil exposure:** chokepoint reliance; price exposure; oil intensity of the economy.
- **Gas exposure:** chokepoint reliance and availability risk; availability of alternatives.
- **Resilience:** fiscal space; foreign reserves; fuel reserves; supply contract flexibility.



For example, the EU is a major oil and gas importer so has high exposure, but also has high resilience, so has medium–high vulnerability overall. Meanwhile Japan's exposure is even higher but so is its resilience, so it has the same vulnerability overall.

Short-term fixes have a role to play, but not all of them reduce structural chokepoint disruption

Fossil fuel supplier diversification may appear to be a good short-term fix, but in the long term it risks locking in structural exposure to chokepoint risks. Similarly, **enhanced maritime security** can have a very high short-term impact, but is unsustainably resource-intensive in the long term. Meanwhile, while **clean energy rollout and energy efficiency** can take longer to implement, they are the most durable route to energy security in the long term, as they address the main way to reduce chokepoint exposure: reduced fossil fuel demand. **Infrastructure protection and system resilience** – including cyber security and supply chain diversification – also play an important role in reducing structural vulnerability.

▶ Fossil fuels are more vulnerable to chokepoints than clean energy.

Clean energy supply chains also face chokepoint risks, but they are different. Fossil fuel systems depend on constant, high-volume fuel shipments, so disruptions trigger immediate, global supply and price shocks. Clean energy trade instead moves equipment and materials that, once installed, generate power domestically for decades; disruptions slow future deployment rather than cutting current supply. While clean energy minerals and manufacturing are concentrated, these risks are more manageable because materials can be stockpiled, substituted, recycled and shipped flexibly – and each delivery reduces long-term fossil fuel dependence rather than adding new exposure.

▶ Domestic oil and gas production does not enhance structural resilience.

Expanding domestic oil and gas production reduces reliance on specific import routes but cannot eliminate fossil fuels' structural vulnerabilities. Because oil and LNG are globally priced, even major producers face price shocks during crises. Domestic output also shifts chokepoint exposure onto concentrated infrastructure like pipelines that act as single points of failure. It offers little short-term resilience, since new production takes years. Domestic systems still depend on specialised, geographically concentrated equipment supply chains with long lead times.

▶ Coal is not a dependable fallback when oil and gas supplies are disrupted.

Coal cannot meaningfully reduce chokepoint vulnerability because it shares many of the same weaknesses as oil and gas. About 90% of coal trade is seaborne, exposing it to the same maritime chokepoints and price shocks. Increasing coal dependence therefore heightens, rather than reduces, exposure to crisis-driven volatility.

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