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# Why Strategic Autonomy and Decarbonisation Must Reinforce Each Other

Geopolitical instability has returned energy security to the centre of European economic policy. The ongoing disruption of shipping through the Strait of Hormuz is confronting the European Union with renewed exposure to global fossil fuel supply and price shocks, especially in oil and liquefied natural gas markets. The crisis shows once again that fossil fuel dependence is not a source of security, but a strategic vulnerability. The central lesson is not that Europe must slow down the green transition in order to secure energy supply. On the contrary: the faster Europe reduces its dependence on imported fossil fuels, the less vulnerable it becomes to geopolitical blackmail, military escalation, price volatility and infrastructure disruptions. Strategic autonomy and decarbonisation are mutually reinforcing pillars of a modern European energy strategy. The key policy challenge is to bridge short-term crisis management with long-term structural redesign. Rather than responding to fossil fuel insecurity with new fossil lock-ins, Europe should use the current crisis to accelerate the clean energy transition.

The ongoing disruption of shipping through the Strait of Hormuz is a severe geopolitical and economic stress test. The strait is one of the world's most important energy chokepoints. A substantial share of global seaborne oil trade and liquefied natural gas exports passes through this narrow corridor. According to the International Energy Agency (2026a, 2026b), the Strait of Hormuz remains one of the most critical global oil and gas chokepoints. Even a partial or de facto closure therefore affects not only regional security, but also global energy prices, shipping costs, insurance premiums and inflation expectations.

For the European Union, the crisis is a reminder of a central weakness in its economic model. Europe has reduced its dependence on Russian fossil fuels since 2022, but it remains structurally exposed to global fossil fuel markets. Even where direct physical import dependence on one route or one supplier is limited, Europe is

affected through global oil prices, liquefied natural gas (LNG) competition, financial markets and industrial supply chains. Higher fossil fuel prices feed into transport, chemicals, heating, electricity markets and consumer prices. The current crisis therefore forces Europe to confront a dual challenge: ensuring immediate energy security while accelerating the transition towards sustainable, low-carbon systems.

The crucial question is whether this crisis requires Europe to choose between immediate energy security and long-term decarbonisation. This is a false choice. The European experience since Russia's invasion of Ukraine has already shown that fossil fuel dependence is itself a major security risk. The disruption of traffic through the Strait of Hormuz confirms this lesson. Dependence on imported oil and gas exposes economies to geopolitical coercion, volatile prices, infrastructure vulnerability and strategic uncertainty. Clean energy technologies, by contrast, rely primarily on domestic and European renewable resources. They reduce exposure to fuel imports and can strengthen economic resilience when combined with modern grids, storage, flexibility and efficiency.

This is particularly relevant because the EU remains structurally dependent on imported energy. Although Europe has sharply reduced its dependence on Russian gas, oil and coal, it has not overcome its fossil fuel dependence. This is also reflected in Eurostat (2026) data on the EU's

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continued energy import dependency. Replacing one fossil supplier with another can reduce a specific political risk, but it does not remove the systemic vulnerability created by high fossil fuel demand.

Energy security in the 21st century can therefore no longer be understood as the permanent availability of fossil fuels at acceptable prices. That definition belongs to the old energy system. A modern understanding of energy security must include resilience, affordability, climate stability, infrastructure robustness and strategic autonomy. The green transition is not a luxury to be pursued after crises have passed. It is the most important structural answer to the crises themselves.

This article argues that the European Union should treat strategic autonomy and decarbonisation as mutually reinforcing goals. The immediate response to the Strait of Hormuz disruption must be to protect citizens and firms from excessive price spikes and supply risks. But short-term measures must be designed in a way that accelerates rather than delays the transition to a low-carbon energy system. Europe should avoid repeating the mistakes of past crises, when emergency fossil infrastructure became permanent, subsidies weakened efficiency incentives, and climate policy was presented as a burden rather than a security strategy.

### **Fossil fuel dependence as a strategic vulnerability**

Europe's energy vulnerability is rooted less in a physical shortage of energy resources than in the structure of its fossil fuel dependence. Oil and gas are traded on global markets where regional conflicts, production decisions and transport bottlenecks can have immediate price effects. Even diversified import portfolios do not eliminate exposure to global price volatility. Diversification can reduce dependence on one supplier, but it cannot remove the systemic insecurity of fossil fuel dependence.

The Russian gas crisis made this reality visible. Europe managed to reduce Russian gas imports substantially, diversify supply routes, fill gas storage facilities and reduce demand. This was a remarkable political and logistical achievement. Yet the economic cost of the crisis was high: households faced rising bills, firms faced competitiveness pressures, and governments had to mobilise substantial fiscal support. The Hormuz crisis now demonstrates that this vulnerability is not limited to Russia, but it is embedded in the fossil fuel system itself.

Oil markets are affected first. Transport fuels remain heavily dependent on oil, and this dependence is a direct channel through which geopolitical shocks affect

households and firms. Gas markets are also exposed through LNG flows, risk premiums and competition for cargoes. In an integrated global energy economy, Europe cannot insulate itself from such shocks by simply changing suppliers.

Strategic autonomy therefore cannot mean replacing one fossil dependency with another. True autonomy requires reducing fossil fuel demand structurally. This is where decarbonisation becomes an energy security strategy: electrification of transport reduces oil dependence, heat pumps reduce gas dependence, renewable electricity reduces exposure to imported fossil fuels in power generation, and energy efficiency reduces the total volume of energy exposed to geopolitical risk. Circular economy policies reduce dependence on energy-intensive primary materials. The green transition is therefore not merely compatible with security policy; it is the foundation of a more secure economic model.

This point is sometimes underestimated in public debate. Fossil fuels are often described as “secure” because they can be stored and transported. But storage does not eliminate geopolitical vulnerability if the fuel itself is imported, price volatile and exposed to conflict. Renewable energy, by contrast, changes the underlying risk profile. Wind and solar power are variable, but they are not subject to fuel embargoes. Their variability can be managed through smart grids, storage, digital flexibility and demand-side response. Fossil fuel dependence imports geopolitical volatility, whereas renewable systems require technical flexibility. The latter is the more manageable challenge.

### **Short-term crisis management without fossil lock-in**

The ongoing disruption in the Strait of Hormuz requires immediate policy action. Governments must prevent panic, protect vulnerable households, stabilise critical infrastructure and coordinate internationally. Strategic petroleum reserves can be released in coordination with international partners. Temporary demand management measures can reduce pressure on markets. Targeted support can protect low-income households and particularly exposed firms.

However, the design of emergency measures matters. Broad fossil fuel subsidies, fuel tax cuts or general price caps that encourage consumption are economically inefficient and strategically counterproductive. They weaken the incentive to save energy, increase fiscal costs and transfer public money to fossil fuel consumption. If support is necessary, it should be targeted, temporary and income-based rather than linked to higher fossil fuel use.

Demand reduction is often the fastest and cheapest crisis response. Speed limits, public transport incentives, working-from-home options, efficient logistics and modal shifts can reduce oil demand quickly. In buildings and industry, efficiency measures and fuel switching can reduce gas demand. These measures are sometimes politically underestimated because they are less visible than new supply contracts. Yet in a crisis, avoided demand is equivalent to additional supply, which is often faster, cheaper and cleaner.

Europe should also strengthen joint procurement, storage coordination and solidarity mechanisms. But these should be understood as bridges, not destinations. Emergency diversification may be necessary in the short term, but it must not become a justification for new long-lived fossil infrastructure that risks becoming stranded or locking in emissions. The risk of fossil lock-in through expanded gas infrastructure has been highlighted in recent energy transition research (Kemfert et al., 2022). LNG terminals, pipelines or gas contracts must be assessed against declining demand pathways consistent with climate neutrality.

The same applies to nuclear energy. It is sometimes presented as a security solution, but new nuclear power is too slow and too expensive to respond to the current crisis. It also creates its own dependencies, including uranium supply chains, cooling water constraints, waste management and security risks. The most effective medium-term response remains the faster deployment of renewables, modernised grids, storage and flexibility.

The key principle should be clear: crisis policy must reduce vulnerability, not preserve it. Europe should support citizens and firms through the shock, but it should not subsidise the fossil fuel demand that makes such shocks economically damaging in the first place.

### The green transition as economic security policy

Europe's competitiveness debate is often framed around energy costs. High fossil fuel prices have weakened energy-intensive industries and intensified concerns about relocation. But the answer cannot be to preserve dependence on volatile fossil fuels. The answer must be to build an energy system in which clean electricity becomes the backbone of industrial competitiveness.

Renewable energy has two major economic advantages. First, wind and solar have no fuel costs. Once built, they reduce exposure to global commodity price shocks. Second, they can be deployed domestically and regionally, creating value chains, jobs and tax revenues. Combined

with storage, demand response and efficient grids, renewable electricity can provide a more stable basis for industrial planning than imported fossil fuels.

The EU has already made significant progress. Renewable electricity is no longer a marginal component of the European power system. Wind and solar have become central pillars of electricity generation, and their expansion has helped reduce fossil fuel use in the power sector. Recent data show the growing role of wind and solar in the European electricity mix (Rosslowe & Petrovich, 2025). The task now is to turn this progress into a broader transformation of transport, heating and industry.

The European Green Deal, REPowerEU and the Clean Industrial Deal should therefore be seen as elements of one strategic project: reducing geopolitical vulnerability while modernising Europe's industrial base. These policy frameworks define the EU's attempt to link decarbonisation, energy security and industrial competitiveness (European Commission, 2019, 2022, 2025). Decarbonisation can support competitiveness if it is implemented with sufficient speed, coordination and investment. Model-based analyses for Germany and Europe show that fully renewable electricity systems are technically feasible if renewable deployment, storage, grids and demand-side flexibility are coordinated (Göke et al., 2021; Kendziorowski et al., 2022). Delays increase costs, however; slow grid expansion, uncertain permitting, insufficient storage and fragmented national policies all make the transition more expensive than necessary.

A credible European economic policy should focus on the system costs of the transition, not only on individual generation costs. The cheapest kilowatt-hour is not always the most valuable if it is produced far from demand, cannot be transported due to grid congestion or increases balancing costs. Energy policy must therefore integrate renewable deployment with grid planning, storage, flexibility, industrial location policy and regional development.

This is particularly important for electricity-intensive industries. Green hydrogen, direct electrification, power purchase agreements and Contracts for Difference can help industry move away from fossil fuels. But these instruments will only work if clean electricity is abundant, affordable and reliable. The industrial transition must therefore be linked directly to renewable acceleration and infrastructure planning.

Strategic autonomy is also an industrial opportunity. Europe can strengthen its competitiveness by scaling up clean technology value chains: decentralised grids, batteries, heat pumps, power electronics, electrolyzers, re-

cycling, digital energy management and energy efficiency technologies. A fossil-based competitiveness strategy ties Europe to volatile import markets. A clean competitiveness strategy builds domestic capabilities and reduces exposure to geopolitical shocks.

### Strategic autonomy requires European coordination

Energy security remains partly national, but the relevant markets and infrastructures are European. The disruption in the Strait of Hormuz does not affect all member states equally, but its consequences spread across the internal market. Fragmented national responses can undermine solidarity, distort competition and increase costs.

The EU therefore needs stronger coordination in three areas.

First, Europe needs a more integrated approach to emergency preparedness. Strategic reserves, demand reduction plans, gas storage, electricity adequacy assessments and critical infrastructure protection should be coordinated across borders. The aim should be to avoid beggar-thy-neighbour policies in times of stress.

Second, Europe needs faster infrastructure integration. Electricity interconnectors, offshore grids, storage facilities, digital flexibility platforms and hydrogen infrastructure should be planned from a European system perspective where truly needed. However, infrastructure expansion must not mean building excessive fossil capacity. The priority should be clean electricity integration.

Third, Europe needs a common industrial strategy for clean technologies. The green transition reduces fossil dependencies but creates new dependencies in raw materials, batteries, solar components, electrolyzers and digital technologies. These dependencies must be managed through recycling, diversification, domestic production, strategic partnerships, substitution and innovation. The answer is not to slow the transition but to make clean technology supply chains more resilient.

Strategic autonomy should not be misunderstood as autarky. Europe will continue to trade energy, materials and technologies. But it should reduce critical vulnerabilities and avoid one-sided dependencies. A decarbonised energy system based on domestic renewables offers a much stronger foundation for autonomy than a fossil system dependent on unstable global supply routes.

This also requires a stronger fiscal and regulatory framework. Public investment should prioritise infrastructure

that reduces fossil dependence: electricity grids, rail, public transport, building renovation, heat networks, storage, renewable energy and industrial transformation. Fossil fuel subsidies should be phased out. Carbon pricing should remain credible, but revenues should be used to support social fairness and investment. Strategic autonomy will not be achieved through rhetoric; it requires a redirection of capital.

### The role of planning, electricity grids and flexibility

The transition from fossil fuels to renewables is not only a technological shift. It is a spatial and institutional transformation. Fossil energy systems are built around fuel extraction, ports, pipelines, refineries and large power plants. Renewable systems are more decentralised, weather-dependent and land-intensive. They require planning systems capable of coordinating generation, decentralised grids, storage, demand and public acceptance.

This is a major challenge for Europe. Permitting delays, local conflicts and grid bottlenecks can slow down renewable deployment even when technologies are mature and cost-effective. Acceleration areas and simplified permitting can help, but speed alone is not enough. Renewable expansion must be spatially intelligent. Transmission planning studies underline that the spatial distribution of renewables and storage has major implications for grid needs and system costs (Göke et al., 2022). Wind and solar should be deployed where they provide high system value, not only where individual project costs are lowest.

A resilient energy system also needs flexibility. The economics of electrical storage show that storage becomes increasingly important as variable renewable energy sources expand (Schill et al., 2018). Batteries, pumped hydro, demand response, smart charging, thermal storage, interconnectors and green hydrogen for specific applications can balance variable renewable generation. Electric vehicles can become flexibility assets if charging is smart and bidirectional technologies develop. Heat pumps combined with thermal storage can shift demand. Industrial processes can provide flexibility when market rules reward it.

This flexibility reduces the need for fossil backup and makes the system more resilient to external shocks. It also reduces price volatility. A fossil-based system imports volatility from global markets. A renewable-based system must manage variability, but that variability is domestic, predictable and increasingly manageable with digital technologies and storage.

Planning should therefore include resilience criteria. Critical infrastructure, hospitals, water systems, communication networks and emergency services need a secure electricity supply during crises. Local renewable generation, storage and microgrids can strengthen emergency resilience. Full regional energy autonomy is neither realistic nor economically necessary, but partial resilience for critical functions should become a planning objective.

The current crisis also underlines the importance of decentralisation. Large centralised infrastructures can be efficient, but they can also become vulnerable nodes. A resilient system combines European integration with regional robustness. It should not depend excessively on a few import routes, a few fossil suppliers or a few critical infrastructure corridors. Redundancy is not wasteful if it prevents systemic failure.

### **Avoiding the political trap: Crisis narratives against climate policy**

Every energy crisis creates political narratives. Fossil fuel interests often use crises to argue for slower climate policy, more drilling, longer fossil infrastructure lifetimes or weaker regulation. This narrative is powerful because it promises immediate security. But it ignores the structural cause of vulnerability: dependence on fuels that Europe does not control.

The EU must communicate clearly that the green transition is not the cause of energy insecurity. This argument is also developed in Kemfert (2026), which emphasises the economic and political risks of delaying the energy transition. Delayed transition is the cause. The more slowly Europe electrifies transport and heating, the longer households remain exposed to oil and gas shocks. The more slowly decentralised grids are expanded, the more expensive renewable integration becomes. The more slowly industry decarbonises, the greater the exposure to fossil price volatility and carbon costs.

Public acceptance depends on fairness. The transition must protect vulnerable households, support workers and regions affected by structural change and ensure that the benefits of clean energy are widely shared. Energy communities, municipal utilities, citizen participation and local value creation can strengthen support for renewable deployment. Social policy and climate policy must be designed together.

The same applies to fiscal policy. Public budgets should not subsidise fossil consumption, but rather invest in efficiency, public transport, decentralised grids, renew-

able energy, building renovation, storage, industrial transformation and climate-neutral infrastructure. Fossil subsidies weaken strategic autonomy; clean investment strengthens it.

A fair transition is also more resilient politically. If citizens experience climate policy as socially unjust, support will erode. If they experience it as protection against volatile fossil prices, as a source of local value creation and as an investment in security, public support can grow. Energy security and social justice must therefore be part of the same transition strategy.

### **Policy recommendations**

A European strategy that bridges crisis management and long-term redesign should rest on six priorities.

First, emergency support must be targeted and temporary. Relief should protect vulnerable households and firms without encouraging higher fossil fuel consumption. Broad fuel subsidies should be avoided.

Second, demand reduction should be treated as a security instrument. Efficiency, modal shift, speed management, public transport, digital substitution and flexible work can reduce oil and gas exposure quickly.

Third, renewable deployment must be accelerated and spatially coordinated. Permitting reforms should be combined with grid planning, storage strategies and regional value creation.

Fourth, electrification must become the central pillar of energy security. Electric mobility, heat pumps and industrial electrification reduce fossil import dependence and improve resilience.

Fifth, clean industrial policy must scale up European value chains. Batteries, decentralised grids, heat pumps, electrolyzers, power electronics, recycling and critical raw materials strategies are essential for strategic autonomy.

Sixth, resilience must become a formal criterion in energy planning. Infrastructure policy should assess vulnerability to geopolitical shocks, cyberattacks, extreme weather and physical disruption.

These priorities show that short-term security and long-term decarbonisation do not have to conflict. They conflict only if crisis policy is designed around preserving fossil fuel consumption. If crisis policy is designed around reducing vulnerability, it naturally accelerates the green transition.

## Conclusion

The ongoing disruption of shipping through the Strait of Hormuz is a serious stress test for Europe. It exposes once again the vulnerability of an economic model still too dependent on imported fossil fuels. But it should not lead to a retreat from the green transition – just the opposite.

Strategic autonomy and decarbonisation are not rival objectives. They are mutually reinforcing. The less fossil energy Europe imports, the less it is exposed to geopolitical coercion, price shocks and supply disruptions. The more Europe invests in renewables, efficiency, electrification, decentralised grids, storage and flexibility, the stronger its economic resilience becomes.

The European Green Deal should therefore be understood not only as climate policy but as a security and competitiveness strategy. Europe's answer to geopolitical instability should not be a return to fossil thinking. It should be a faster, fairer and more coordinated transition to a clean energy system. The goal is not only to reduce emissions. It is to build an energy system that is affordable, resilient, democratic and independent from the instabilities of the fossil age.

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## References

- European Commission. (2019). *The European Green Deal* (COM(2019) 640 final). European Commission.
- European Commission. (2022). *REPowerEU plan* (COM(2022) 230 final). European Commission.
- European Commission. (2025). *The Clean Industrial Deal: A joint roadmap for competitiveness and decarbonisation* (COM(2025) 85 final). European Commission.
- Eurostat. (2026). *Energy in Europe – 2026 edition*. Eurostat.
- Göke, L., Kemfert, C., Kendzierski, M., & von Hirschhausen, C. (2021). 100% renewable energy for Germany: Coordinated expansion planning needed. *DIW Weekly Report*, 11(29/30), 209–215.
- Göke, L., Kendzierski, M., Kemfert, C., & von Hirschhausen, C. (2022). Accounting for spatiality of renewables and storage in transmission planning. *Energy Economics*, 113, 106190.
- International Energy Agency. (2026a). *Oil market report*. IEA.
- International Energy Agency. (2026b). *Strait of Hormuz: Oil security and emergency response*. IEA.
- Kempf, C. (2026). *Kurzschluss: Wie wir unsere Energiezukunft verspielen*. Campus Verlag.
- Kempf, C., Braunger, I., Hoffart, F. M., Brauers, H., & Oei, P.-Y. (2022). The expansion of natural gas infrastructure puts energy transitions at risk. *Nature Energy*, 7, 582–587.
- Kendzierski, M., Göke, L., von Hirschhausen, C., Kempf, C., & Zozmann, E. (2022). Centralized and decentral approaches to succeed the 100% Energiewende in Germany in the European context: A model-based analysis of generation, network, and storage investments. *Energy Policy*, 167, 113039.
- Rosslowe, C., & Petrovich, B. (2025). *European electricity review 2025*. Ember.
- Schill, W.-P., Zerrahn, A., & Kempf, C. (2018). On the economics of electrical storage for variable renewable energy sources. *European Economic Review*, 108, 259–279.