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# HARDWIRING THE ENERGY TRANSITION INTO ENERGY SECURITY

## THE 2025 ENERGY SECURITY OPPORTUNITY

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This year presents a pivotal opportunity for governments, industries, and civil society organisations to embed the energy transition at the core of European and global energy security cooperation. This briefing outlines the key reasons why integrating the energy transition into energy security strategies is essential.

### Headlines

1. **The energy transition offers hard security benefits over a fossil-based system:** supply and demand-side actions are essential.
2. **Fossil fuel dependency has repeatedly failed to deliver energy security;** we cannot continue to rely on a 'business as usual' approach.
3. **Many countries are already choosing the energy transition as an energy security strategy** by investing in clean and domestic production and infrastructure to match variable renewable production and storage with more efficient and flexible demand.
4. **A new energy security framework needs to recognise the economy wide and geopolitical ramifications of energy system choices.** It should focus on realising the hard security benefits offered by the energy transition.



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## The energy transition offers hard security benefits over a fossil-based system

**Hard security benefits of the energy transition include:** building resilience against potential constraints on energy supplies in complex geopolitical contexts by strengthening domestic capacity; and greater resilience against single shocks including extreme weather and external attacks by moving to a more decentralised system. Additionally, supply chains can build up stock rather than needing constant renewal and materials can be largely recycled. Finally, the energy transition reduces reliance on fossil supply chains and leverages adaptive technologies.

**Delivering on the COP28 consensus is key to energy security** as tripling renewables and doubling efficiency will deliver 85% of the cuts in fossil fuels required by 2030.<sup>1</sup>

### Doubling efficiency

1. Simply reducing the amount of energy used is a sure-fire way to bolster energy security. However, today's energy economy is extremely inefficient. We waste almost two thirds of energy going into our energy system (or 400 exajoules) with the main driver being the energy losses associated with producing, transporting and using fossil fuels.<sup>2</sup> Energy efficiency is also the most effective instrument to neutralise new pressures on demand from Artificial Intelligence, to relieve short term power grid constraints, and to hedge against rising cooling needs.
2. In the EU, for example, a fast roll-out of heat pumps could reduce EU gas demand in buildings by 40% by 2030, while renewables-based district heating and cooling could further reduce EU gas demand by 12% in 2030.<sup>3,4</sup>

### Tripling renewables

1. Renewable power capacity is a dependable and regenerative asset with extremely low operating costs, once built. If policy design is right, renewables offer access to much more affordable energy supply and, when deployed in tandem with efficiency, grid modernisation, electrification, storage and

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<sup>1</sup> EMBER, November 2023, **Tripling renewables and doubling efficiency will accelerate a fossil phaseout**

<sup>2</sup> RMI, June 2024, **The Incredible Inefficiency of the Fossil Energy System**

<sup>3</sup> Cool Heating Coalition, February 2025, **Energy security begins at home**

<sup>4</sup> Cool Heating Coalition, February 2025, **Energy security begins at home**

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flexibility, increase a country's domestic capacity to satisfy demand, rather than relying on fossil imports. This whole-system domestic approach reduces exposure to fossil fuel price shocks, geopolitical forces and therefore leads to a much more energy productive economy.

## Fossil fuels have repeatedly failed to deliver energy security

We cannot continue to rely on a 'business as usual' approach where the assurance of fossil energy supply is equated with 'security'. Energy price-driven inflation has a wide range of economic and societal impacts:

1. Russia's illegal invasion of Ukraine triggered a global shock to energy markets:
  - a. Canada, one of the largest oil and gas producers in the world, saw record high gasoline and gas prices in May 2022 after Russia's invasion.<sup>5</sup>
  - b. European dependence on fossil imports has been weaponised by Russia, both during the build-up to the war in Ukraine and during the conflict. This dependency has proved extremely costly due to price volatility, supply chain disruptions and a cost-of-living crisis. EU governments spent €651 billion between September 2021 and June 2023 to shield citizens, businesses and its industries most dependent on fossil fuels.<sup>6</sup> This has exacerbated economic and debt crises in many countries beyond Europe.<sup>7</sup>
  - c. The failure of the Texas power grid in 2021 was one of the most severe energy crises in US history.<sup>8</sup> Under cold weather conditions, gas pipelines froze, and coal-fired power plants faltered. Grid interconnection and battery storage have since then made the Texan system more resilient.
  - d. In the UK, an extra £90 billion has been spent on gas between the start of 2021 and the end of 2024 after gas prices started to rise in 2021 ahead of the Russian invasion of Ukraine. Spread across the population, this

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<sup>5</sup> International Institute for Sustainable Development, October 2022, **Why Canada's Energy Security Hinges**

<sup>6</sup> Bruegel, June 2023, **National fiscal policy responses to the energy crisis**

<sup>7</sup> E3G, April 2022, **Gas imports: urgently rethinking the economic development agenda**

<sup>8</sup> The Texas Tribune, July 2024, **Why Texas' mass power outages continue to happen**

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amounts to about £2,000 per person—£1,300 more than what it would have cost without the gas crisis.<sup>9</sup>

- e. In Mozambique, exploitation of gas reserves has yet to deliver the promised development benefits.<sup>10</sup> Instead, it is linked with an outbreak of violence in the region, as grievances over the distribution of wealth stoked an Islamic insurgency.<sup>11</sup>
- 2. Additional fossil fuels coming onto the system will not alleviate energy security pressures: the world is already producing enough fossil fuels. The IEA predicts that the world will be producing more than 8mb of oil per day than needed by 2030, resulting in spare capacity that has never been seen before.<sup>12,13</sup> As a result, more exposed fossil fuel producers, such as Colombia and Kenya, are now exploring alternative and more secure pathways that move their economies beyond fossil fuel revenue.

## Many countries are already choosing the energy transition as an energy security and affordability strategy

Fossil fuel importers such as Europe, India, Türkiye, and China are already reducing their energy import bills and enhancing their economic options by hastening the clean energy transition.

- 1. **Europe:** In the last 5 years, additional wind and solar capacity in the EU has saved €59bn that would have spent on fossil fuel imports for power generation.<sup>14,15</sup>
- 2. **Türkiye:** Wind and solar power generation lowered Turkey's import bills by preventing US\$7 billion fossil fuel imports in 12 months.<sup>16</sup>

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<sup>9</sup> Energy& Climate Intelligence Unit, February 2025, **Russian invasion anniversary: £140bn gas bill for UK since crisis began**

<sup>10</sup> International Institute for Sustainable Development, December 2023, **Navigating Decisions: The risks to Mozambique from liquified natural gas export projects**

<sup>11</sup> Politico, September 2024, **Revelations of atrocities at French energy giant's African stronghold**

<sup>12</sup> International Energy Agency, June 2024, **Oil 2024 – Analysis and forecasts to 2030**

<sup>13</sup> Outside of the initial energy supply surge during Covid.

<sup>14</sup> EMBER, January 2025, **European Electricity Review 2025**

<sup>15</sup> Since the launch of the European Green Deal in 2019.

<sup>16</sup> EMBER, May 2022, **Turkey: Wind and solar saved \$7 bn in 12 months**

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3. **Asia:** The contribution of solar generation in seven key Asian countries – China, India, Japan, South Korea, Vietnam, the Philippines and Thailand – avoided potential fossil fuel costs of approximately US\$34 billion from January to June 2022. This is equal to 9% of total fossil fuel costs these countries incurred over the same period in 2022.<sup>17</sup>

## A new energy security cooperation architecture is needed

As we are already rapidly moving towards a transformed energy system, **a fossil fuel supply-driven framework to manage energy security is no longer sufficient to protect citizens or keep economies competitive.** Energy security needs to ensure the uninterrupted availability of energy services at an affordable price while ensuring resilience against service disruption, geopolitical risks, and market volatility. It encompasses long-term, sustainable energy system balance and short-term crisis preparedness to maintain economic stability and national security.<sup>18</sup>

To reflect this evolving context, **a new energy security framework to support the system is critical and includes the following characteristics:**

1. **Taking a system-wide approach** to prioritise energy security, including increasing renewables capacity, system flexibility, grid modernisation and interconnectivity, long duration storage solutions, energy efficiency solutions and demand-side responses.
2. **Supply chain strategies and cooperations:** including for critical raw materials, scaling manufacturing capabilities and skilled jobs.
3. **Mechanisms to deal with increased fossil fuel price volatility** in the transition.
4. **Ensure affordable and inclusive access:** Expand clean energy access to underserved and energy-poor regions, unlocking productivity, economic opportunity, and social resilience for all.
5. **Develop institutions** that monitor the timely delivery of the above and anticipate crunch points.

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<sup>17</sup> Institute for Energy Economics and Financial Analysis, November 2022, **The sunny side of Asia**

<sup>18</sup> Adapted from the IEA definition: International Energy Agency, October 2022, **World Energy Outlook 2022**

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## About E3G

E3G is an independent think tank working to deliver a safe climate for all.

We drive systemic action on climate by identifying barriers and constructing coalitions to advance the solutions needed. We create spaces for honest dialogue, and help guide governments, businesses and the public on how to deliver change at the pace the planet demands.

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