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Letting Europe's Energy Crisis Go to Waste: The Ukraine War's Massive Fossil Fuel Costs Fail to Accelerate Renewables

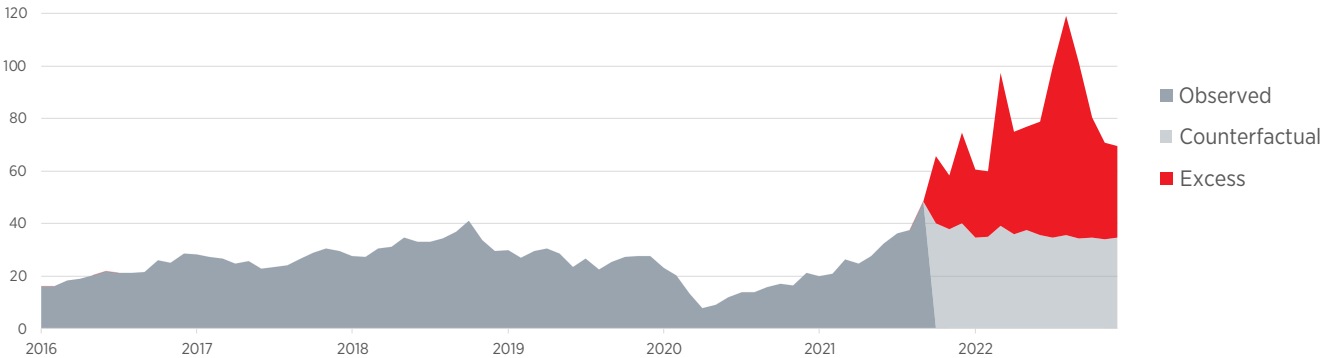
Jeff D. Colgan, Alexander S. Gard-Murray, and Miriam Hinthorn

Russia’s invasion of Ukraine in February 2022 created an energy crisis that Europe’s policymakers are letting go to waste by failing to accelerate the clean energy transition. New peer-reviewed research by the Climate Solutions Lab (CSL) at Brown University estimates that by the end of 2022, **Europe incurred over €1 trillion in extra fossil fuel costs, including both market costs from high prices and related government spending or announcements**, such as infrastructure costs, utility bailouts, and other expenditures.¹ At the same time, new investment in wind farms actually fell by more than 40 percent in 2022 compared to 2021, as did new wind turbine orders. Despite announcing moves to transition rapidly to clean energy, Europe’s leaders are not doing enough to escape fossil fuel dependence.



The new peer-reviewed research quantifies the value of energy security, as it relates to a recurring problem in fossil fuel markets: geopolitical price swings or interruptions from wars or other incidents. CSL estimates that Europe spent an extra **€517 - 831 billion in excess market costs due to higher prices** in the period October 1, 2021, to December 31, 2022, with a best estimate of €643 billion, counting only the fuel costs beyond the expected regular fuel costs in the absence of a war. In addition, European governments committed to **a further €908 billion of fiscal spending on energy-related infrastructure and policies**. These two categories of costs are not fully commensurable, but the total costs are over €1 trillion.

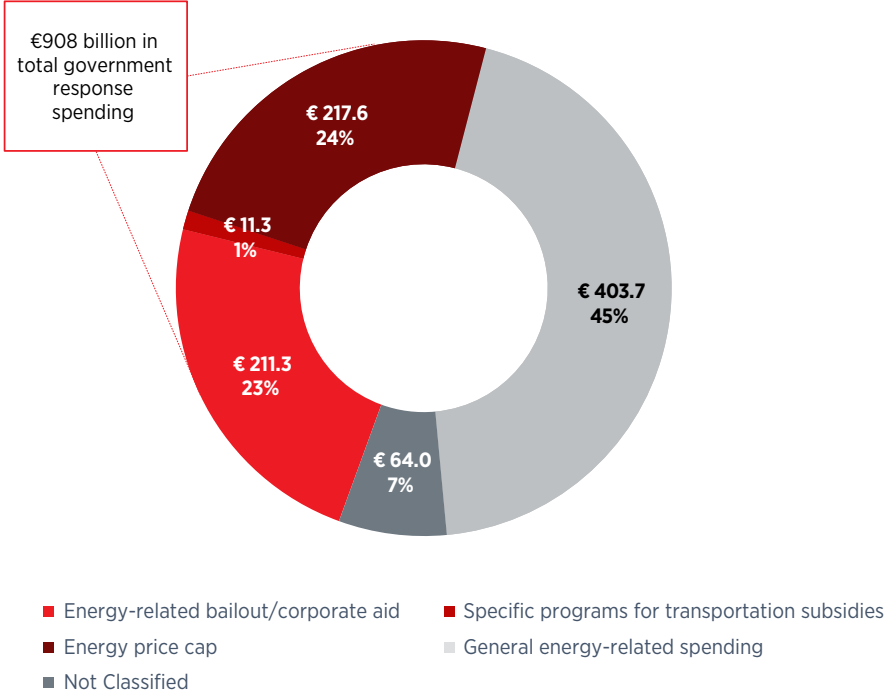
Europe’s Excess Market Fossil Fuel Costs due to High Prices, Oct 2021 to Dec 2022



¹Colgan, Gard-Murray, and Hinthorn, “Quantifying the Value of Energy Security: How Russia’s Invasion of Ukraine Exploded Europe’s Fossil Fuel Costs,” *Energy Research and Social Science* 103 (Sept 2023), <https://doi.org/10.1016/j.erss.2023.103201>.

The **costs will rise over time** due to ongoing market effects and policy responses. Notably, fossil fuel scarcity caused by the war drives up prices not only for Russian imports, but *all* fossil fuels in Europe (and in certain places elsewhere in the world). CSL cost estimates begin in October 2021, almost five months before the invasion of Ukraine, because Russia began to manipulate European markets and withhold energy exports in advance of the war. “Europe” is defined as the European Union’s 27 members plus the United Kingdom.

Europe’s Emergency Government Spending on Energy, by Type (€ Billions)



Emergency government spending includes costs for newly required infrastructure, energy price caps, utility bailouts, business rescue packages, transportation subsidies, and other expenses. Broader costs like economy-wide inflation or non-energy-related welfare programs are not included in cost estimates.

Policymakers, energy utilities, and companies sometimes fail to fully incorporate the risks associated with fossil fuels into cost estimates

Quantifying these energy security costs is important because policymakers, energy utilities, and companies sometimes fail to fully incorporate the risks associated with fossil fuels into cost estimates, investment decisions, or energy planning. While previous research has identified energy security risks for fossil fuels, the magnitude has been uncertain and not quantified. This new research takes the first step towards allowing analysts to incorporate the expected costs of geopolitical volatility into “levelized costs of energy” (LCOE) estimates or other tools for energy policy decisions. Unlike private sector analyses of

geopolitical risks that focus on the costs for individual firms, national energy policies should be informed by the full social costs of geopolitical disruptions, which includes government spending designed to cushion the impact of such disruptions.

Too often, decisionmakers are blind to the energy security advantage of renewables. For instance, when Germany was forced to bail out one of its major energy utilities (Uniper), at a cost of €25 billion because of the sudden spike in fossil fuel prices, German economy minister Robert Habeck claimed the bailout was needed because of the “energy scarcity that Russia has artificially created,” and that it was “not the kind of ordinary fluctuation that the market can digest.”² The problem with this viewpoint is that it treats geopolitical shocks to fossil fuel prices as extraordinary, and thus, not factored into policy or investment decisions. In reality, geopolitical shocks to oil and gas prices occur unpredictably but regularly (for example, the 1973 oil crisis; the Iranian Revolution of 1978-79; the Iran-Iraq War in the 1980s; the Gulf War of 1990-91, the ISIS insurgency 2011-2014; and Russia-Ukraine gas disputes in 2006, 2008-2009, 2014-15). Not only do these events create price volatility, they also impose public costs as governments suddenly need to fill reserves, build infrastructure, or provide subsidies and rescue packages to economic interests affected by the disruptions. By contrast, renewable energy, unlike fossil fuels like oil and gas, is safe and secure from political disruption because nature provides the basic “fuel” of wind and sunshine.



Blind to the energy security advantage of renewables



Could have covered

57%

of rapid clean energy transition cost

Europe’s electricity generation sector is transitioning away from fossil fuels, but its total primary energy consumption still relies heavily on oil, gas, and coal. Some of Europe’s fossil fuel dependence was caused by short-sighted decisions by policymakers and utility companies, such as building the Nord Stream pipelines.³ The Climate Solutions Lab’s new research **highlights the economic waste** generated by policymakers’ past decisions to allow energy markets to rely so heavily on fossil fuels and **underlines the value of investing in low-carbon energy** that is far less subject to geopolitical volatility.

True, wind and solar energy do face a different kind of geopolitical vulnerability: possible restrictions to critical minerals and components. However, these minerals and materials are not fuels, which completely changes the geopolitical dynamics. Instead, critical minerals are needed for capital equipment and long-lived infrastructure that produces and stores electricity. Thus, stakeholders

² J. Miller, G. Chazan, D. Sheppard, “Germany ploughs €15bn into struggling energy group Uniper,” Financial Times (2022).

³ J. Colgan, “Putin Has a Big Piece of Leverage Over Europe. Here’s How to Take It Away,” Politico (2022).

would have significantly more time to respond to a trade embargo or other access restriction than they would to a comparable fossil fuel shortage. Previous supply disruptions show the limits of trying to manipulate markets in this way. For example, in 2010 when the Chinese government imposed a two-month halt on exports of rare earth metals to Japan, prices spiked briefly, then returned to near-normal levels even before China lifted the embargo, in part due to the launch of new production in Canada, South Africa, and Kazakhstan.

Prominent industrialists and agencies within Europe have begun to publicly question the energy policy choices of various governments. For instance, Dimitri Papalexopoulos, chair of Titan Cement and vice-chair of the European Round Table for Industry, described the energy subsidies in 2022 as unsustainable, arguing that “the focus should be on accelerating the transition to renewable energy.” Benoit d’Iribarne, head of manufacturing at the major firm Saint-Gobain, agreed. “General subsidies are not the best way to spend money. If we could spend half or one-third of that to accelerate the transition, that would be much better for Europe and its industries.”⁴ Similarly, the EU’s energy regulator Acer warned that continued use of broad subsidies like those used in 2022 could trigger “overall energy inefficiency.”⁵

CSL’s research shows that Europe’s emergency government spending related to the energy crisis (€908 billion) represents 57% of the estimated investment cost needed to rapidly transition all of Europe to a clean energy power system, which itself would save 530 billion euros in lower fuel costs by 2035. The investment cost and fuel savings estimates come from Ember, an independent European think tank unaffiliated with the Climate Solutions Lab or Brown University.⁶

Though Europe could be moving to nearly 100% clean power by 2035, many countries are still locking in dependence through long-term fossil fuel contracts, especially for natural gas imports. In the United Kingdom, for instance, Centrica signed an \$8 billion contract for liquified natural gas (LNG) imports from the United States.^[7] Similarly, Germany, Belgium, and other countries have been arranging long-term LNG contracts. With many families and businesses still reliant on fossil fuels, it makes sense for leaders to secure supplies for the next few years. But contracts and investments should be consistent with a rapid transition away from fossil fuels over the next decade. Instead, new investment in wind farms and new wind turbine orders both fell in Europe by more than 40 percent in 2022 compared to 2021.⁷ Moreover, many of Europe’s major wind companies, including Vestas and Siemens, reported financial losses. Some of the obstacles



⁴ P. Hollinger, “European industrialists question focus of energy subsidies,” Financial Times (2023).

⁵ A. Hancock, “EU regulator warns against repeat of emergency energy measures,” Financial Times (2023).

⁶ C. Rosslowe, “New Generation: Building a clean European electricity system by 2035,” Ember (2022).

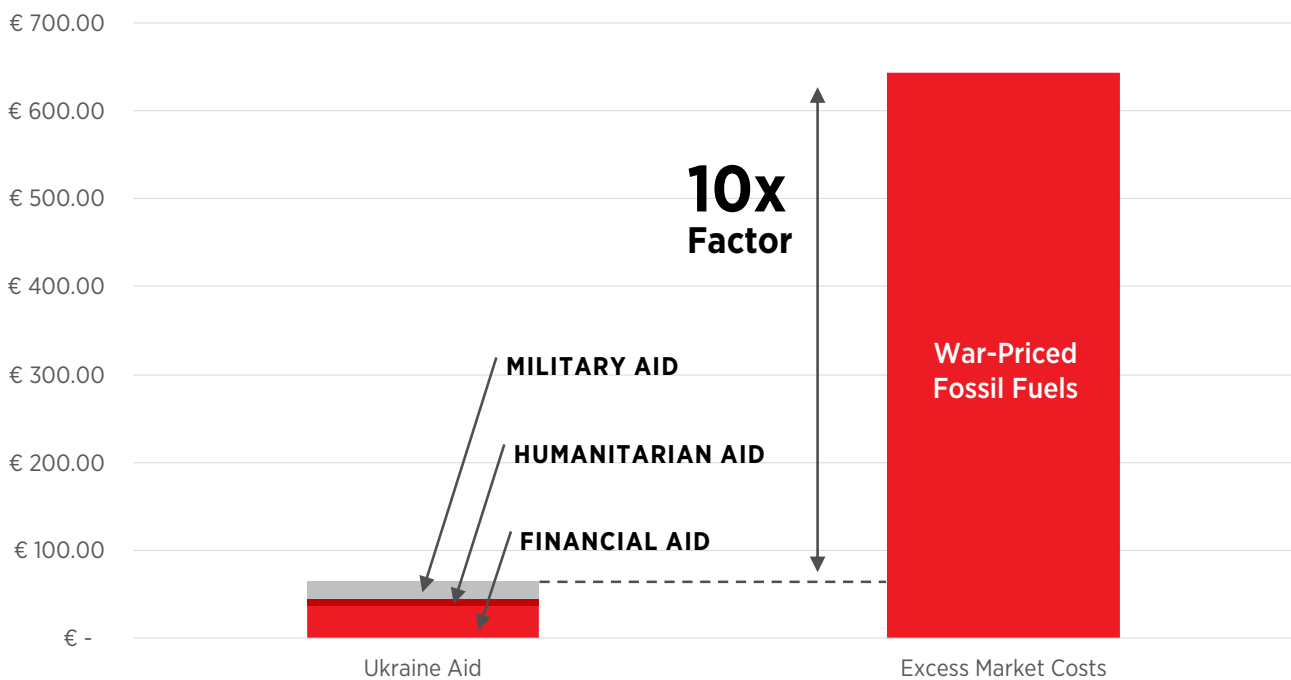
⁷ REVE News, “The EU built only 16 GW new wind in 2022,” (2023).

Many European countries are locking in long-term fossil fuel contracts

to renewables are supply chain problems related to the COVID-19 pandemic, but European energy policy – including higher taxes on electrical generators – have played a role, too.

More broadly, the fossil fuel costs of the war put a strain on public finances. Europe’s excess fossil fuel costs due to high prices alone are more than 10 times larger than Europe’s aid to Ukraine, including military, humanitarian, and financial assistance, that are sometimes reported as the “costs of the war.” This comparison focuses only on the excess market costs (due to high-priced fuel, €643 billion) and does not include the fiscal policy costs.

Europe’s Excess Fossil Fuel Market Costs Are Far Higher than Europe’s Aid to Ukraine



Policy Recommendations

European policymakers should act by accelerating the clean energy transition and by taking a long-term approach to prevent another crisis of this sort in the future. The European Union's REPowerEU Plan is insufficient to drive a more rapid clean energy transition. Policymakers could take steps that include: investing more money in the clean energy transition in the residential sector, electricity generation sector, and industrial sector; making regulatory changes and reforming the permitting process to allow for faster clean energy investments; and requiring corporate planning for the future obsolescence of existing fossil fuel infrastructure like pipelines, refineries, and certain shipping terminals. **Electrical grid upgrades**, especially, should be prioritized. The International Energy Agency reports that capital investments in Europe's electrical grid were stagnant between 2015 and 2020 at about \$50 billion per year, and barely rose in the years 2021 and 2022 (compared to almost \$83 billion in China in 2022).⁸

Worldwide, policymakers should learn from Europe's painful experience. While the war in Ukraine has disrupted European energy markets first and foremost, the war has also raised fossil fuel costs around the world. In Asia, buyers of LNG have competed against European purchasers, leading to a dramatic increase in prices. Even in North America, which is relatively isolated from the ripple effects, high oil prices increased gasoline costs for consumers and contributed to inflation across the economy. Investing in renewables creates a long-term shield from price spikes in fossil fuel markets.

In the United States, the federal government should speed the clean energy transition and create incentives or requirements for businesses to plan for a low-carbon future. This requires additional steps beyond the 2022 Inflation Reduction Act. Concretely, this means taking steps that could include: investing in electrical grid resilience and modernization, which would facilitate the adoption of renewable energy; making regulatory changes and reforming the permitting process to allow for faster clean energy investments; increasing efforts to restrict methane leakage; reducing routine gas flaring through greater monitoring and enforcement; and requiring corporate planning for the future obsolescence of existing fossil fuel infrastructure like pipelines.

Overall, the lesson from 2022 is clear: **fossil fuel dependence creates national vulnerabilities**. Wars and geopolitics create fossil fuel price volatility and other costs. These vulnerabilities are primarily economic, and in the long run they affect the prosperity that underpins national security. Fossil fuel crises can also cause huge disruptions to daily life and potentially even endanger lives by exposing them to heating shortages and power outages. By contrast, low carbon energy is considerably less exposed to geopolitical volatility. Investing in the clean energy transition is not only good for the environment, it is good for energy security.



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⁸ A. Mooney, "Gridlock: how a lack of power lines will delay the age of renewables," Financial Times (2023).

The Climate Solutions Lab is housed at the Watson Institute of International and Public Affairs at Brown University, dedicated to *creating, learning, and distributing* solution-oriented climate knowledge, at Brown and across the world. The Watson Institute is a community of scholars, practitioners, and students whose work aims to help us understand and address these critical challenges. It is dedicated to meaningful social science research and teaching, and animated by the conviction that informed policy can change systems and societies for the better.

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