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POLICY BRIEF SERIES

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The Energy and Climate Crisis Facing Europe: How to Strike the Right Balance

Policymakers in Europe are currently faced with the difficult task of reducing our reliance on Russian oil and gas without worsening the situation for firms and households that are struggling with high energy prices. The two options available are either to substitute fossil fuel imports from Russia with imports from other countries and cut energy tax rates to reduce the impacts on firms and household budgets, or to reduce our reliance on fossil fuels entirely by investing heavily in low-carbon energy production. In this policy brief, we argue that policymakers need to also take the climate crisis into account, and avoid making short-term decisions that risk making the low-carbon transition more challenging. The current energy crisis and the climate crisis cannot be treated as two separate issues, as the decisions made today will impact future energy and climate policies. To exemplify how large-scale energy policy reforms may have long-term consequences, we look at historical examples from France, the UK, and Germany, and the lessons we can learn to help guide us in the current situation.

The war in Ukraine and the subsequent sanctions against Russia have led to a sharp increase in energy prices in the EU since the end of February 2022. This price increase came after a year when global energy prices had already surged. For instance, import prices for energy more than doubled in the EU during 2021 due to an unusually cold winter and hot summer, as well as the global economic recovery following the pandemic and multiple supply chain issues. Figure 1 shows that the price of natural gas traded in the European Union has increased steadily since the summer of 2021, with a strong hike in March 2022 following the beginning of the war.

Figure 1. *Evolution of EU gas prices, July 2021-May 2022*

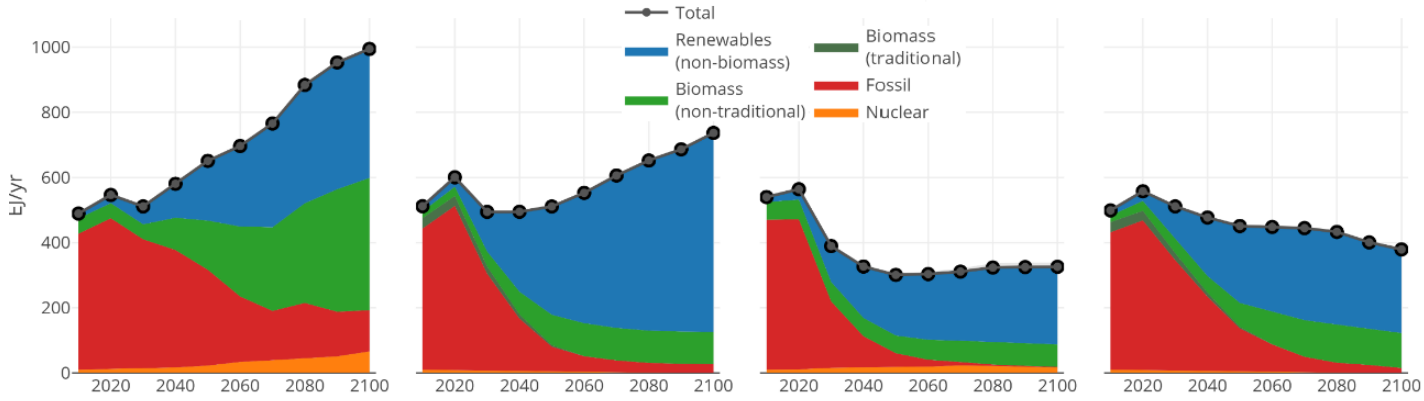
Source: https://tradingeconomics.com/commodity/eu-natural-gas

Concerns about energy dependency, towards Russian gas in particular, are now high on national and EU political agendas. An embargo on imports of Russian oil and gas into the EU is currently discussed, but European governments are worried about the effects on domestic energy prices, and the economic impact and social unrest that could follow. Multiple economic analyses argue, however, that the economic effect in the EU of an embargo on Russian oil and gas would be far from catastrophic, with estimated reductions in GDP ranging from 1.2-2.2 percent. But a reduction in the supply of fossil fuels from Russia would need to be compensated with energy from other sources, and possibly supplemented with demand reductions.

In parallel, on April 4th, the Intergovernmental Panel on Climate Change (IPCC) released a new report on climate change. One chapter analyses different energy scenarios, and finds that all scenarios that tare compatible with keeping the global temperature increase below 2°C involve a strong decrease in the use of all fossil fuels (Dhakal et al, 2022). This reduction in fossil fuel usage over the coming decades is illustrated in red in Figure 2.

It is thus important that, while EU countries try to decrease their dependency on Russian fossil fuels and cushion the effect of energy-related price increases, they also accelerate the transition to a low-carbon economy. And how they manage to balance these short- and long-run objectives will depend on the energy policy decisions they make. For instance, if policymakers substitute Russian oil and gas with increased coal usage and new import terminals for LNG, this can lead to a "carbon lock in" and make the low-carbon transition more challenging. In this policy brief, we analyze what lessons can be drawn from past historical events that lead to large-scale structural changes in energy policy. Events that all shaped our current energy systems and conditions for climate policy.

Figure 2. *Four energy scenarios compatible with a 2°C temperature increase by 2100.*



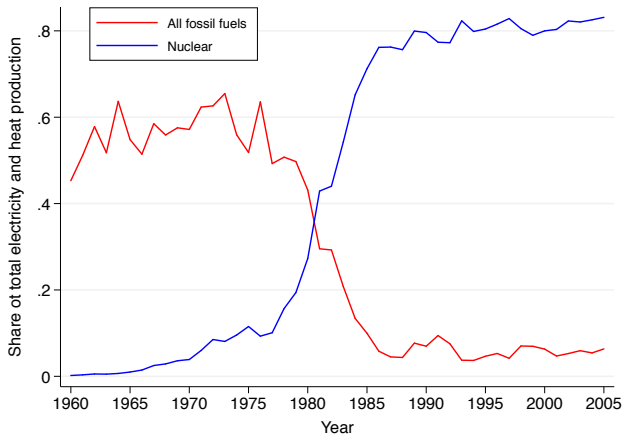
Source: IPCC sixth assessment report on Mitigation of Climate Change, chapter 3, p23

Structural Changes in Energy Policy in France, the UK, and Germany

We focus on three "energy policy turning points" triggered by three geopolitical, political or environmental crises: the French nuclear plan triggered by the 1973 oil crisis; the UK early closure of coal mines and the subsequent dash for gas in the 1990s, influenced by the election of Margaret Thatcher in 1979; and the German nuclear phase-out triggered by the 2011 Fukushima catastrophe.

In response to the global oil price shock of 1973, France adopted the "Messmer plan". The aim was to rapidly transition the country away from dependence on imported oil by building enough nuclear capacity to meet all the country's electricity needs. Two slogans summarised its goals: "all electric, all nuclear", and "in France, we may not have oil, but we have ideas" (Hecht 2009). The first commissioned plants came online in 1980, and between 1979-1988 the number of reactors in operation in France increased from 16 to 55. As a consequence, the share of nuclear power in the total electricity production rose from 8 to 80 percent, while the share of fossil fuels fell from 65 to 8 percent.

Figure 3. *French electricity mix*



Source: Data on electricity and heat production in France is provided by the IEA (2022).

In the UK, the election of Margaret Thatcher in 1979 opened the way for large market-based reform of the energy sector. Thatcher's plan to close dozens of coal pits triggered a year-long coal miners' strike in 1984-85. The ruling Conservative party eventually won against the miners' unions and the coal industry was deeply restructured, with a decrease in domestic employment – not without social costs (Aragon et al, 2018) - and an increase in coal imports. At the same time, the electricity market's liberalization in the 1990s facilitated the development of gas infrastructure. As an indirect and unintended consequence, when climate change became a prominent issue at the global level in the 2000s, there was no strong pro-coal coalition left in the UK (Rentier et al, 2019). Aided by a portfolio of policies making coal-fired electricity more expensive – a carbon tax in

particular - the coal phase-out was relatively easy and fast (Wilson and Staffel, 2018, Leroutier 2022): between 2012 and 2020, the share of coal in the electricity production dropped from 40 to 2 percent.

In 2011, the Fukushima nuclear catastrophe in Japan triggered an early and unexpected phase-out of nuclear energy in Germany. The 2011 "Energiewende" (energy transition) mandated a phase-out of nuclear power plants by 2022, while including provisions to reduce the share of fossil fuel from over 80 percent in 2011 to 20 percent in 2050. The share of nuclear energy in the electricity production in Germany was halved in a decade, from 22 percent in 2010 to 11 percent in 2020. At the same time, the share of renewable energy increased from 13 to 36 percent, and that of natural gas from 14 to 17 percent.

In these three examples, climate objectives were never the main driver of the decision. Nevertheless, in the case of France and the UK, the crisis resulted in an energy sector that is arguably more low-carbon than it would have been without the crisis. Although the German nuclear phase-out was accompanied by large subsidies to renewable energies, its effect on the energy transition is ambiguous: some argue that the reduction in nuclear electricity production was primarily offset by an increase in coal-fired production (Jarvis et al, 2022).

The three crises also had different consequences in terms of dependence on fossil fuel imports. The French nuclear plan resulted in an arguably lower energy dependency on imported fossil fuels. The closure of coal mines in the UK had ambiguous effects on energy security, with an increase in coal imports and the use of domestic gas from the North Sea. Finally, Germany's nuclear phase-out, combined with the objective of phasing out coal, has been associated with an increase in the use of fossil fuels from Russia: gas imports remained stable between 2011 and 2020, but the share coming from Russia increased by 60 percent over the period. In 2020, Russia stood for 66 percent of German gas imports (Source: Eurostat). Which brings us back to the current war in Ukraine.

The Current Crisis is Different

The context in which the current energy crisis is unfolding is different from the three above-mentioned events in two important ways.

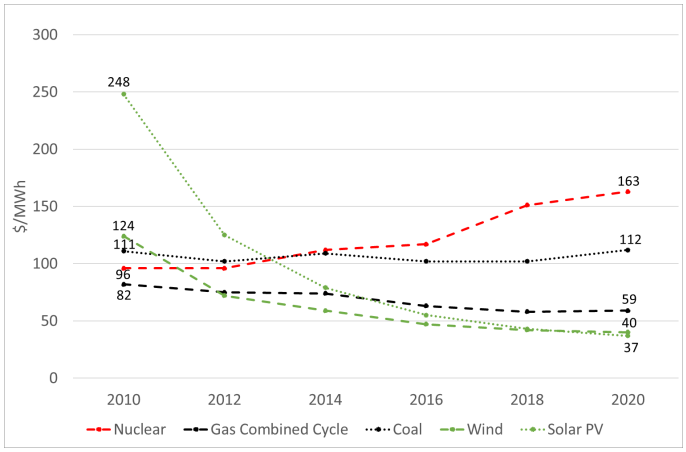
First, scientific evidence on the relationship between fossil fuel use, CO_2 emissions and climate damages has never been clearer: we know quite precisely where the planet is heading if we do not drastically reduce fossil fuel use in the coming decade. From recent research in economics, we also know that price signals work and that increased prices on fossil fuels result in lower demand and emission reductions (Andersson 2019; Colmer et al. 2020; Leroutier 2022). High fuel prices can also have long-term impacts on consumption patterns: US commuters that came of driving age during the oil prices of the 70s, when gasoline prices were high, still drive less today (Severen and van Benthem, 2022). The other way around, low fossil fuel prices have the potential to lock in energy-intensive production: plants that open when electricity and fossil fuel prices are low have been found to consume more energy throughout their lifetime, regardless of current prices (Hawkins-Pierot and Wagner, 2022).

Second, alternatives to fossil fuels have never been cheaper. It is most obvious in the case of electricity production, where technological progress and economies of scale have led to a sharp decrease in the cost of renewable compared to fossil fuel technologies. As shown in Figure 4, between 2010 and 2020 the cost of producing electricity from solar PV has decreased by 85 percent and that of producing electricity from wind by 68 percent. From being the most expensive technologies in 2010, solar PV and wind are now the cheapest. Given the intermittency of these technologies, managing the transition to renewables requires developing electricity storage technologies. Here too, prices are expected to decrease: total installed costs for battery electricity storage systems could decrease by 50 to 60 percent by 2030 according to the International Renewable Agency.

Finding alternatives to fossil fuels has historically been more challenging in the transport sector. However, recent reductions in battery costs, and an increase in the variety of electric vehicles

available to customers, have led to EVs taking market share away from gasoline and diesel-powered cars in Europe and elsewhere. The costs of the battery packs that go into electric vehicles have fallen, on average, by 89 percent in real terms from 2010 to 2021.

Figure 4. *Evolution of the Mean Levelised Cost of Energy by Technology in the US*



Source: Lazard

Options for Policy-Makers

Faced with a strong increase in fossil fuel prices and an incentive to reduce our reliance on oil and gas from Russia, policy-makers have two options: increase the availability and decrease the price of low-carbon substitutes – by, for example, building more renewable energy capacity and subsidizing electric vehicles – or cut taxes on fossil fuels and increase their supply, both domestically and from other countries.

Governments have pursued both options so far. On the one hand, the Netherlands, the UK, and Italy announced an expansion of wind capacities compared to what was planned, in an attempt to reduce their dependence on Russian gas, and France ended gas heaters subsidies. On the other hand, half of EU member states have cut fuel taxes for a total cost of €9 billion by the end of March 2022, the UK plans to expand oil and gas drilling in the North Sea, and Italy might re-open coal-fired plants.

To guide policymakers faced with the current energy crisis, there are valuable lessons to draw from the experiences of energy policy reform in France, the UK and Germany. France's push for nuclear energy in the 1970s shows that large-scale structural reform of electricity and heat production is possible and may lead to large drops in CO2 emissions and an economy less dependent on domestic or foreign supplies of fossil fuels. A similar "Messmer plan" could be implemented in the EU today, with the goal of replacing power plants using coal and natural gas with large-scale solar PV parks, wind farms and batteries for storage. Similarly, the German experience shows the potential danger of implementing a policy to alleviate one concern – the risk of nuclear accidents – with the consequence of facing a different concern later on – the dependence on fossil fuel imports.

One additional challenge is that the current energy crisis calls for a short-term response, while investments in low-carbon technologies made today will only deliver in a few years. Short-term energy demand reduction policies can help, on top of long-term energy efficiency measures. For example, a 1°C decrease in the temperature of buildings heated with gas would decrease gas use by 10 billion cubic meters a year in Europe, that is, 7 percent of imports from Russia. Similarly, demand-side policies could reduce oil demand by 6 percent in four months, according to the International Energy Agency.

Ending the reliance on Russian fossil fuels and alleviating energy costs for firms and households is clearly an important objective for policymakers. However, by signing new long-term supply agreements for natural gas and cutting energy taxes, policymakers in the EU may create a carbon lock-in and increase fossil fuel usage by households, thereby making the inevitable low-carbon transition even more difficult. The solutions thus need to take the looming climate crisis into account. For example, any tax relief or increased domestic fossil fuel generation should have a clear time limit; more generally, all policies decided today should be evaluated in terms of their contribution to domestic and European climate objectives. In this way, the current energy crisis is not only a challenge but also a historic opportunity to accelerate the low-carbon transition.

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