

Gonand, Frédéric et al.

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Frédéric Gonand, Pedro Linares, Andreas Löschel, David Newbery, Karen Pittel, Julio Saavedra and Georg Zachmann

Key Post-Crisis Challenges and Lessons for EU Energy Policy*

KEY MESSAGES

- **Only by decarbonizing its economy and reducing energy and raw-material dependencies can the EU safeguard its competitiveness in the global markets**
- **Postponing policies to decarbonize the energy system will increase long-run welfare losses**
- **Decarbonization offers great potential for improving energy security, if pursued systematically**
- **EU energy policy must be better coordinated and provide long-run price signals**
- **To strengthen resilience, systematic risk assessments and improved data infrastructure are essential**

Putin's invasion of Ukraine forced the EU into a profound reality check regarding its energy procurement and consumption habits – and into giving a renewed impulse to speedy decarbonization. Both endeavors are now deeply intertwined: the EU seeks to make its energy supply both greener and as independent as possible of autocrats' whims. But political, economic, and societal support for the energy transition will require striking a balance between economic efficiency on the one hand – i.e., keeping the costs of meeting the climate targets as low as possible – and, on the other, distributing the unavoidable costs in a way that is perceived as fair. Given the potential shift of the EU's political landscape after the upcoming European Parliament election, upholding these two commitments seems more important than ever.

Although much has been done to shift away from Russian energy, while at the same time managing to stick to the Green Deal's decarbonization efforts during and after the energy crisis, there are still several challenges that the European Commission will face in the coming years, even as it pays heed to the lessons learned out of the EU response to the crisis itself. These include the physical transformation of the energy system, for example by ramping up the share of renewables, adapting the power grid to the new energy mix, and securing the raw materials needed for the technologies underpinning the green transition, as well as balancing cost-efficiency and system resilience. This article will lay out some of these lessons and key chal-

lenges moving forward. Let us start with a short review of the lessons learned.

EU REACTION TO THE CRISIS

Russia's invasion of Ukraine in February 2022 led to gas supply in Europe dropping dramatically, which posed three interacting challenges at the EU level: how to balance gas supply and demand; how to dampen the impact on the economy and citizens; and how to preserve the internal market.

To balance supply and demand, gas-saving mandates, increases in import capacity, and enhanced reverse-flow capabilities were quickly addressed and implemented. The storage mandates introduced, while effective, may have been implemented in such a way that they ended up pushing up prices more than necessary – to a peak exceeding EUR 350/MWh in the summer of 2022.

Gas supply in Europe fell by 15.5 percent and demand by 13 percent over the first eleven months of 2022 compared with the same period in 2021. On the supply side, the drop in Russian pipeline imports was largely offset by a sharp rise in liquefied natural gas (LNG) imports. Thanks to the drop in demand, gas supplies turned out to be sufficient to devote a significant proportion to replenishing gas storage. In the end, thanks in part also to a mild winter, Europe managed to cope much better than originally expected. In the wake of the crisis, however, Europe's dependence on Russian gas has been partly replaced by a growing dependence on the world LNG market in general and on US LNG in particular.

To cushion the effects of higher energy prices, member states were given wide latitude to prop up consumers. Measures included income support, deferrals of bill payments, temporary tax exemptions, and reduced tax rates. Other schemes included attempts at raising windfall revenues from the energy sector through an inframarginal price cap (which was never reached), as well as through a fossil-fuel windfall tax. The results were mixed: while this may have been important politically (by avoiding more distorting measures), the EU's Agency for the Cooperation of Energy Regulators (ACER 2023a) was rather unimpressed by the effectiveness of the measures chosen by the member states, while a study for the European Parliament was slightly more optimistic regarding windfall taxes (Nicolay et al. 2023).

All in all, most of the new policies and funding happened at the member-state level, with ACER (2023b)

* This article is based on *Watts Next: Securing Europe's Energy and Competitiveness – Where the EU's Energy Policy Should Go Now* (Gonand et al. 2024).

listing more than 400 national measures (see Figure 1), half of which were support to consumers. Altogether, since September 2021, EUR 758 billion has been allocated and earmarked across European countries to shield consumers from rising energy costs.

In terms of reforming the electricity market, calls for decoupling electricity prices from gas prices became loud. Spain, for example, devised a system, which came to be dubbed the “Iberian Exception”, under which the gas price for use in power plants was subsidized by electricity consumers. This mechanism, according to most estimations, proved to be effective in lowering prices in the wholesale market, although the extent of this decrease depends on whatever counterfactual one employs (Linares and San Román 2023). On the negative side, the mechanism resulted, among other things, in a very significant increase in gas use, as well as cross-border subsidies to French consumers.

However, the leeway granted to member states to support private and industrial consumers raised concerns about the effects on the EU’s internal electricity market. Foremost was avoiding a subsidy race between member states and upholding marginal pricing in the internal market, as well as setting national gas saving and storage targets in order to avoid border closures prompted by fears of potentially free-riding neighbors.

Now, two years after Russia’s invasion of Ukraine, the energy crisis seems to be largely behind us. Energy prices have fallen – albeit not to pre-crisis levels – and we have made it through the winter 2023/2024 without any alarming news. It is time to think about the lessons learned from the crisis and the reactions to it. It is, however, also time to look beyond the crisis, toward the challenges for the years to come.

POLICY CONCLUSIONS AND RECOMMENDATIONS FOR THE NEXT ELECTION CYCLE

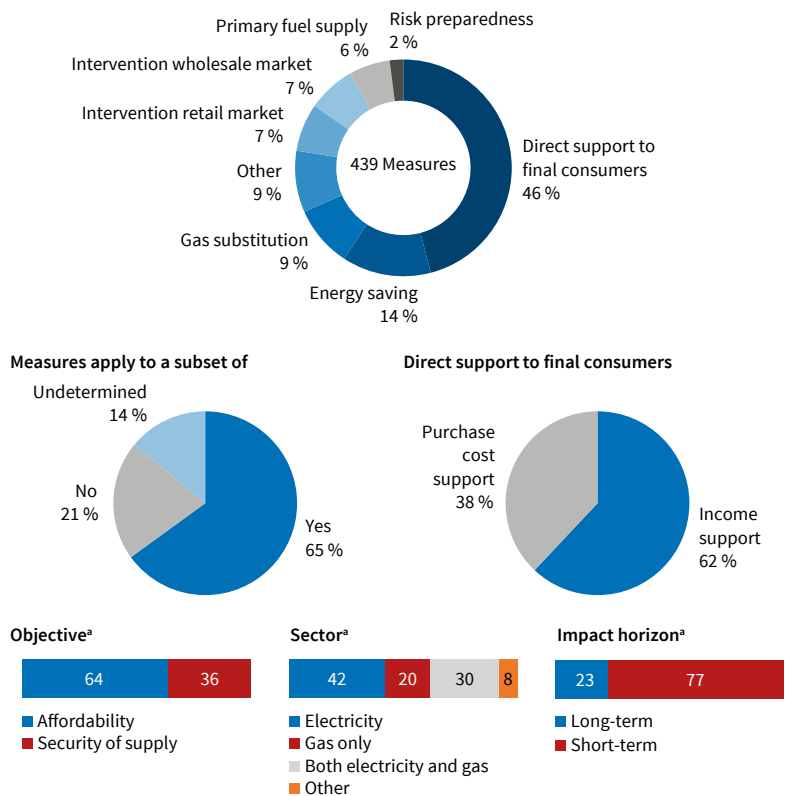
Lessons Learned from the Crisis

As discussed, the energy crisis prompted a flurry of reactive and widely varying measures by the EU and its member states. As in most emergency responses, some measures worked out well, others less so. Some lessons learned:

First, facilitating the shift to non-fossil energy sources can not only lessen strategic dependence, but also reduce electricity prices and help the EU attain its climate goals. This makes it imperative to *further integrate European electricity markets and gas networks* to better balance regional scarcities, for example by removing connector limitations. Equally important is to avoid any other strategic dependencies, such as for green metals or hydrogen. This calls for flexibility within Europe, global diversity of supply, and, for hydrogen and gas, an adequate design of pipeline systems. Likewise, incentives

Figure 1

National Measures to Ameliorate the Energy Crisis Impact



* Percentage of the total number of filtered measures. Source: ACER (2023c).

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are needed to improve efficiency across industry, buildings, and transport to reduce energy demand.

Second, *avoid distortionary policies* that can act as a short-term palliative at the cost of longer-term damage. Capping energy prices can dampen signals to reduce energy demand. Market signals as a rule manage to allocate scarce energy resources better across uses and users than mandates. Striking a balance between supporting households and firms is also crucial, keeping in mind that all measures should be *temporary* and designed in such a way as to not relieve the pres-



Frédéric Gonand

is Professor of Economics at University Paris Dauphine-PSL. He was Economic Advisor to the French Minister of the Economy (C. Lagarde) from 2007 to 2011 and Commissioner of the French Energy Regulation Authority from 2011 to 2013.

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Pedro Linares

is Professor of Industrial Engineering at the ICAI School of Engineering, Director of the BP Chair on Energy and Sustainability. He is also a Researcher at the Institute for Technology Research (IIT), Affiliate Researcher at the MIT CEEPR and the University Cambridge EPRG, and Senior Fellow at Esade EcPol.

sure for undertaking the structural change required to remain competitive in a decarbonized world, as well as to keep market-distorting signals to a minimum.

Governments must create the necessary *fiscal space* to support actors in times of crisis, which comes on top of the public support needed to foster the transition to a low-carbon economy. This does not call for an increase in public debt, but rather for slashing outlays through the abolition of fossil-fuel subsidies, as well as raising revenue through the systematic use of CO₂ prices.

Third, start planning now for the *repurposing or decommissioning of gas grids*, as the UK is already doing. To reach the net-zero greenhouse-gas emissions target by 2050, households will eventually have to give up their gas boilers in favor of heat pumps and their gas cookers in favor of electric options, while firms will have to switch to other energy carriers. The gas grid will need to be safely phased down, or possibly partially repurposed to transport hydrogen.

Fourth, on a more strategic level, a *Foresight Office* should be set up, tasked with thinking ahead to potential future crises, monitoring global trends, and anticipating risks. Crucially, such an office would also devise emergency response mechanisms that take the interconnectedness of the European economies into account. This applies not only to future energy supply shocks but also to supply chain disruptions, raw material shortages, or large-scale cyberattacks.

Fifth, *communication* must be improved significantly. The most sensible and best-intentioned policies will flounder if the key stakeholders – governments, firms, and households – fail to grasp their meaning and intent. Carefully crafted communication and education campaigns must always accompany the proposal of every policy intervention crucial to safeguarding our economies, well-being, and social cohesion.

Most of all, policymakers need to make clear that switching to renewables will cost money upfront, that the energy transition will involve pain and disruption to secure prosperity in the long run – and they need to reassure the public that the policies have been devised

in such a way as to minimize both pain and disruption. Crucially, the message must be clearly communicated that the alternative, namely doing nothing, will quickly become much more disruptive, expensive, and painful.

Energy and Infrastructure

Decarbonization of electricity requires a *suitably sized and properly located network*, which calls for timely network planning and construction combined with a better method of signaling where new generators can best locate, taking account not just of local resources (wind, sunshine) but also of current and expected network constraints. When it comes to getting the most out of renewables, the UK offers a very useful example of the infrastructure considerations that ought to accompany the planning of any renewable electricity project – in particular, a good method of signaling where new power generators can best locate.

Policy Coordination

Long-term contracts and hedging could have protected European consumers against the exceptional spike in energy prices after February 2022 – and would now also help accelerate the deployment of renewables or storage needed to reduce dependence on imported fossil fuels at volatile prices. Asymmetric information, growing uncertainty, and unhelpful regulation are among the many reasons for the sluggish development of long-term markets, despite their recognized advantages (Rodilla 2012; Daskalakis et al. 2015; Lucia and Schwarz 2002; Vehvilainen 2002). One way to improve this is to strengthen the role of instruments such as power purchase agreements (PPAs) or contracts for difference (CfDs), i.e., long-term contracts between electricity producers and consumers in which they agree on strike prices. In this regard, the agreement reached in December 2023 on EU electricity market reform is a step in the right direction.

But using all these instruments nationally in an uncoordinated manner may distort short-term markets, create sizable differences among European consumers, and result in an overall loss of efficiency in the deployment of renewables, storage, or backup capacity. Europe already has a somewhat-integrated short-term electricity market; if the benefits of a single energy market are to be enjoyed by European consumers, this integrated approach should also be extended to the long-term market. In our opinion, we need Europe-wide standardized products and trading platforms for long-term markets.

In this regard, CfDs may prove to be a suitable instrument for creating long-term certainty for investors and consumers. But they should not be mandatory, nor should they be exclusively bought by governments, to avoid



Andreas Löschel

holds the Chair of Environmental/Resource Economics and Sustainability at the Ruhr University Bochum. He also heads the Expert Commission of the German government to monitor the energy transformation and is a Chairman of the Board of Directors of the Energy Initiative ESYS of the German Academies of Science.



David Newbery

is the Director of the Cambridge Energy Policy Research Group and Emeritus Professor of Applied Economics at the University of Cambridge. He has been President of the European Economic Association, 1996 and President of the International Association for Energy Economics, 2013.

crowding-out and other undesirable effects (Chaves et al. 2023). A correct design of the CfD is also essential to avoid distortions (Newbery 2023).

However, developing these products, platforms, and infrastructure will take time, as was the case with the existing European energy markets. This might get in the way of the fast response needed to achieve energy security and boost the decarbonization drive. The key, then, is to set up temporary coordination arrangements (such as common instruments or coordinated targets) among member states to allow for a quick deployment of renewables, as well as of hydrogen and storage, while ensuring an efficient operation of the European energy market.

Strengthening Resilience

While the European markets worked well in reshaping energy flow patterns during the 2022 crisis, governments found it hard to come up with efficient answers for four reasons. First, the lack of access to timely and suitable *data* on energy storage, flows, value chains, prices, vulnerability of consumers, and the like made an efficient answer hard to design. Second, *assessments of systemic risk* were not carried out before the crisis, or not duly discussed at the appropriate political level. Third, most administrations failed to mobilize sufficient in-house and external *expertise* to work on such technically complex and politically sensitive issues in a quick and reliable manner. Fourth, the European Commission suffered from insufficient *trust* in its independence. This hindered the adoption of Europe-wide solutions, especially to the most politically sensitive questions.

This calls for developing a *European knowledge infrastructure for data and expertise* to support policy-making in such a technically challenging field.

Since no one knows where or when the next crisis will hit, we should refrain from sinking undue amounts of capital into overbuilding storage infrastructure, domestic production capacity, and so on for the past crisis, but rather keep in mind that our systems can evolve and that being *fiscally solvent* and *economically pro-*

ductive provide some of the best long-term insurance against any crisis.

Metals and Raw Materials

But energy is not the EU's only worrisome dependence. Metals, in particular those needed to beef up grids, multiply fleets of electric vehicles, and build renewable energy facilities, show high concentration on a small number of suppliers.

Decarbonization efforts have fueled vigorous worldwide growth in demand for several metals needed for the green transition, such as lithium, cobalt, graphite, rare earths, and others, as well as aluminum and copper. Europe will be heavily dependent on imports for many of these metals. In addition to the implementation of the Critical Raw Materials Act, the EU should encourage the recycling of metals whenever economically viable (He et al. 2020), and encourage the *production of critical metals in Europe*, in order to diversify sources and reduce risks of supply disruptions.

Industrial Decarbonization

The costs of going green on top of more expensive energy post-crisis are putting a strain on European competitiveness, with higher energy prices hitting the chemical, steel, and metal processing industries in countries like Germany, Spain, and Poland particularly hard. The situation for small and medium-sized enterprises, which are less energy intensive, is also difficult, albeit not to the same degree.

There are three main challenges for the industrial transition: First, financing the large investments required for new production processes. Second, creating markets for green products in a circular economy, with incentives for efficient and smart use of basic materials. Third, avoiding carbon leakage and safeguarding industrial competitiveness with mechanisms that do not hinder free trade.

Temporary proposals that may help include *production premiums* given to the producer for each unit produced, independent of the final cost of selling the



Karen Pittel

is Professor of Economics at the University of Munich and Director of the ifo Center for Energy, Climate, and Resources. She is also Co-Chair of the German Advisory Council on Global Change (WBGU) and a Member of acadtech, the National Academy of Science and Engineering.



Julio Saavedra

is Senior Economic Policy Advisor to several Gulf countries, particularly at the Royal Court of the Sultanate of Oman, focusing on energy transformation among other fields. In addition, he is Fellow at Oman's Royal Academy and Editor-at-Large at CESifo and other institutions.



Georg Zachmann

is a Senior Fellow at Bruegel. Prior to Bruegel he worked at the German Ministry of Finance, the German Institute for Economic Research in Berlin, and the Energy Think Tank LARSEN in Paris, and as a Consultant.

product. *Carbon contracts for difference*, which hedge industrial producers against volatile carbon prices, and other indexation options could help reduce risks for the most heavily emitting industries, such as steel, cement, aluminum, and metals. However, the use of these instruments should also be coordinated to prevent more affluent countries from subsidizing industrial production and creating an uneven playing field for industrial products in Europe. To lessen this risk, the integrated approach of Europe's short-term electricity market should be extended to the long-term market, with Europe-wide standardized products and trading platforms for long-term markets.

Instituting a *circular economy* will require well-tailored policies to help *create markets for such recycled products*. Two areas stand out in this regard: public procurement; and measures targeting business models in the manufacturing and recycling value chain. Furthermore, instituting a well-designed Green Public Procurement obligation for public tenders can help reduce the emissions associated with each procurement proposal.

A *charge based on the final consumption* of materials, independent of their production process, would not only incentivize more efficient use of materials, but also raise funds to finance the necessary investments for a circular industry.

Finally, the Carbon Border Adjustment Mechanism (CBAM) must operate in such a way as to not end up reshuffling production to third countries, sending the “clean” products to Europe and the “dirtier” ones elsewhere, while overall emissions remain unchanged. The best solution for these shortcomings would be to create a “Climate Club” (Nordhaus 2015) among the G7 or G20 countries, which would help harmonize and coordinate climate policies for industries, in particular for the high-emitting sort.

SMEs and SMIs

Small and medium-sized enterprises (SMEs) and small and medium-sized industries (SMIs) could benefit from the emergence of *aggregators* who operate as brokers of industrial access to electricity, enabling such companies to optimize their electricity supply through new PPAs for *groups of companies*. This type of arrangement can also mitigate the risks associated with price volatility, regulation, market events, operations, and financing.

As to specific electricity supply contracts for SMIs and, more generally, for manufacturers that are low energy consumers exposed to international competition, simple contracts *with prices largely uncorrelated with future markets* would be useful. Promising formulas include PPAs, or contracts over three to five years, covering all supply needs and whose prices are not – or only slightly – indexed to future contracts, adding stability to producers' costs over the multi-year duration of investment cycles.

Digitalizing procurement processes, finally, would clearly promote more sustainable sourcing, eliminate inefficiencies, standardize contractual processes, and ensure that supplier emissions data is tracked and reported.

OUTLOOK

The shifting political landscape and looming electoral cycles across the EU and elsewhere should not distract policymakers from the task at hand: the policies they put in place today, or fail to put in place, will have an impact on how the crucial decades to come will play out.

Lack of foresight led to the tight spot the EU found itself in after Russia's invasion of Ukraine. While the outlines of the major challenges on the intertwined energy/climate front are clear, a great deal of science-supported and policy-driven forward thinking still needs to be done. If we wait until the need is urgent and only painful measures are left as a last resort, we will have waited too long.

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