Europe's Energy Crisis:

A Journey from Oil to Hydrogen

KAGENCY

Introduction & Overview

The most significant increase in energy costs since the 1973 oil crisis has occurred during the last two years. The highest price rises since 2008 have been seen in fertilizers, which rely on natural gas as a production input, and food commodities, of which Russia and Ukraine are significant producers.

Energy is now contributing almost 3% to annual inflation in the Eurozone. Therefore, it would be naive to assume that energy costs have no bearing on the cost of many necessary goods and services. Almost all of the goods and services we use require energy in one way or another. For governments worldwide, it is highly challenging to execute a robust strategy for price controls because some of them are necessary and heavily dependent on energy.

In essence, governments simply have a few options to consider:

- Bearing the increasing costs by implementing internal policies (e.g., subsidies).
- Bearing the increasing costs by implementing external policies (e.g., political actions against aggressor agents).
- Reconsidering alternative hybrid options.

You can find an answer to these policy suggestions in this research file. Focusing on Europe, this document will examine the connection between energy costs and inflation. The impact of the Russian invasion of Ukraine will then be discussed. Although it is impossible to distinguish between these effects in the intricate system of the commodity and financial markets, their effects on the energy markets can be examined independently (contrary to what large governments seem to argue).[1]

As the energy situation is not going away anytime soon, we will later offer you the two primary options for policymakers to go forward: sustainable options and green options. We shall present as much support for these alternatives' claims as we can because they frequently rely substantially on sizable insurance policies. Finally, we will conclude our research effort with a few policy recommendations for those interested in policy, including both public and private agents. These should be simple to put into practice.

> *The explosion of energy prices in Europe constitutes the most significant strain on consumer purchasing power in decades. As a primary driver of inflation, European nations ponder the costs of implementing momentous and exclusionary foreign and energy policy decisions. In the long run, those decisions will shape Europe's industrial and geopolitical future.*

1 Biden blames Russia for gas prices as he presses Congress, states and oil companies. https://www.politico.com/news/2022/06/22/biden-russia-gas-prices-tax-00041486

In its efforts to boost energy independence, the EU should incentivize regional cooperation through infrastructural integration. That said, interconnectedness does not mean centralized decision-making. The principle of subsidiarity is essential for member states to strive for the same goals while individualizing their energy policy approach. This avoids bloated malinvestments.

If Europe wants to make strategic energy autonomy the driver of a low-carbon transition, it must learn from its past mistakes and overcome current taboos. A sovereign European energy market is possible, yet much remains to be done to unlock this potential.

Nazlıcan Kanmaz
Research Director at B&K Agency

Inflation Drives Energy Prices

In the past 50 years, there have been three significant price spikes in the global oil market. The 1973 oil embargo placed by many Gulf OPEC members on shipments to the US is now referred to as the first oil price shock. From September 1973 to January 1975, OPEC producers reduced oil production and increased oil prices by roughly five times (in nominal terms).

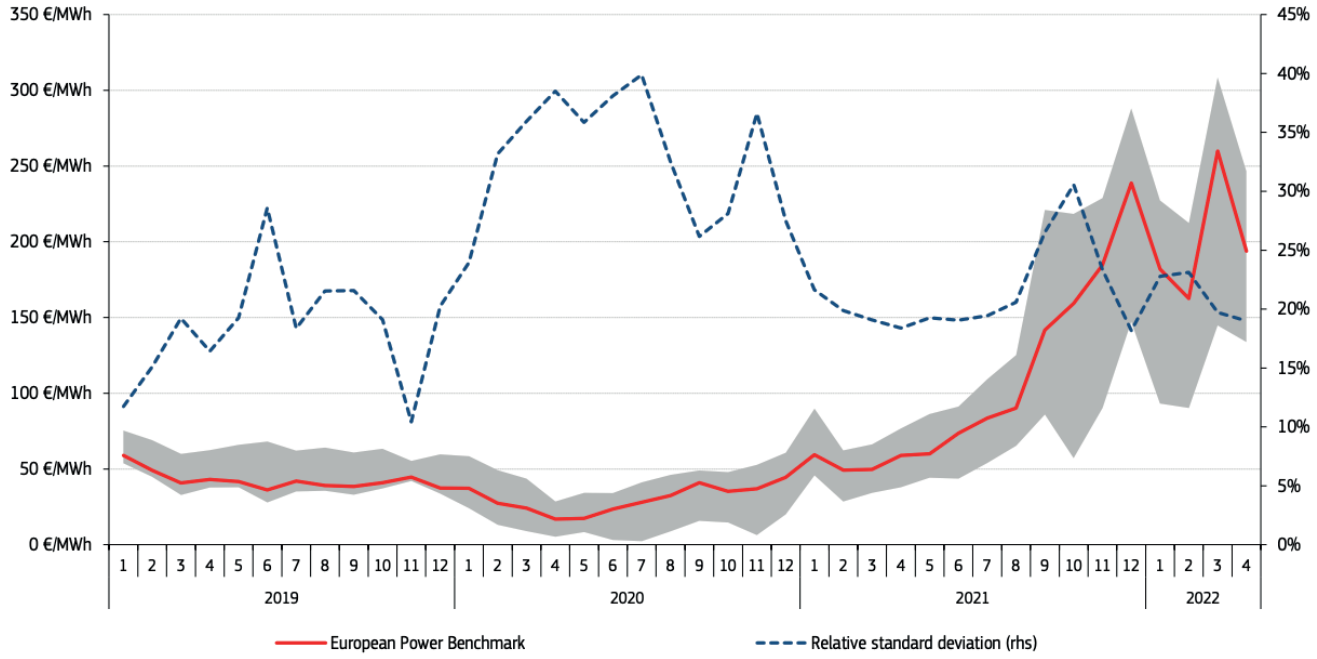
The Iran-Iraq conflict, which started in September 1980, aggravated the second oil price shock in 1979 due to the Iranian revolution and caused oil prices to triple within a year. Many countries implemented energy conservation policies in response to the oil price shock. For example, the United States introduced gasoline rationing, and Japan implemented an energy conservation law in 1979.

Right now, we are experiencing the third shock. More pressure is being put on the Federal Reserve to raise interest rates as inflation continues to soar at its most robust rate since the early 1980s. Additionally, before declining in 2023 and 2024, energy prices are predicted to increase by more than 50% in 2022. Experts believe that prices could be even higher and more unpredictable than currently predicted in the event of a protracted war or increased sanctions against Russia.[2]

Supply chain issues brought on by the pandemic were the main reason inflation started picking up speed in early 2021. The Ukraine conflict has primarily agitated energy markets, jeopardized supply, and increased oil prices.

2 Think Tank reports on the invasion of Ukraine. https://www.consilium.europa.eu/en/documents-publications/library/library-blog/posts/think-tank-reports-on-the-invasion-of-ukraine/

US energy costs increased by 32% in March 2022 compared to the previous month. Compared to the same quarter in 2021 and Q4 2021, the price of electricity for industrial customers in the EU increased by 40% and 14%, respectively, in Q1 2022. Because almost everything we purchase or eat takes energy, this is a huge economic issue.



Source: Platts, European power exchanges. The shaded area delineates the spectrum of prices across European regions.

To emphasize this point, Federal Reserve Chair Jerome Powell stated that every $10 increase in the price of crude oil raises inflation by 0.2 percent and slows economic growth by 0.1 percent in his semiannual testimony before the US Senate Banking Committee in March 2022.[3]

One of the most damaging consequences of increasing energy prices is that the costs of necessary goods and services are significantly impacted. They are essential, as their name implies. Thus, neither low-income nor high-income households can reduce their consumption. However, one is more negatively affected by the new price tag since low-income households get more for their money because they spend more than half of their discretionary income on energy and necessities. Thus, this new pattern of inflation and energy prices is essentially a tax on the underprivileged.

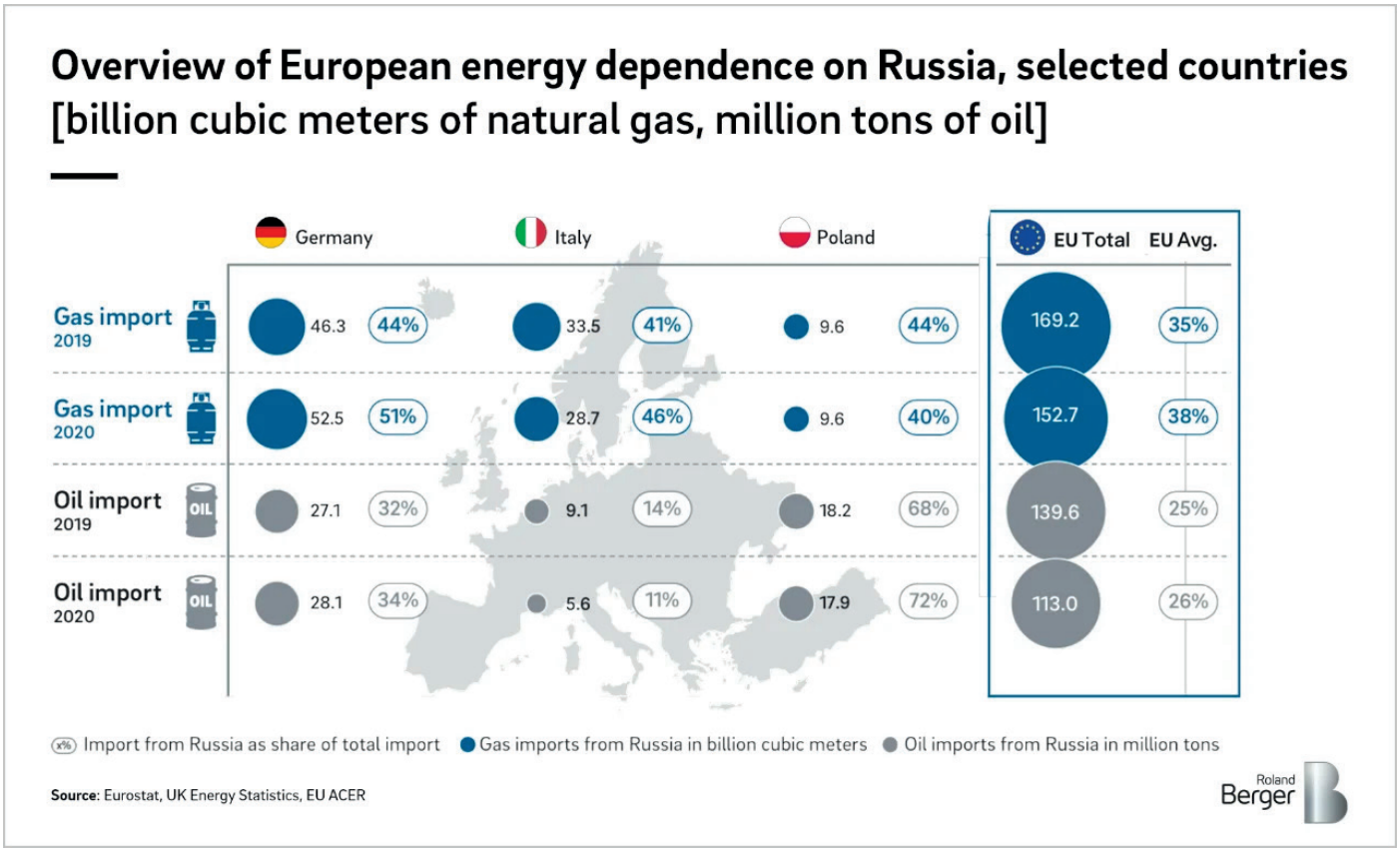
Commodity Prices, Energy, and War

According to Ayhan Kose, Director of the World Bank's Prospects Group,

3 Semiannual Monetary Policy Report to the Congress. https://www.federalreserve.gov/newsevents/testimony/powell20220622a.htm

"the war in Ukraine is causing one of the worst supply shocks in decades for commodity markets."[4]

Russia and Ukraine are significant suppliers of commodities to several nations. Russia is the primary source of energy imports for Europe, providing natural gas (35%), crude oil (20%), and coal (40%). With over 40% of its crude oil and natural gas sent to the EU, Russia similarly relies on the EU for exports. Regarding food supplies, advanced economies (e.g., Australia, Canada, the EU, and the US) are not dependent on Russia and Ukraine, being themselves necessary providers of grains and oilseeds.



The European Commission presented the REPowerEU Plan in response to the hardships and global energy market disruption caused by Russia's invasion of Ukraine. The Commission plans to make Europe independent from Russian fossil fuels well before 2030.

The proposal increases the energy efficiency target in the Energy Efficiency Directive from 9% of EU energy consumption to 13% by 2030 compared to the reference scenario. According to the proposal, the Energy Efficiency Directive's target for energy efficiency will rise from 9% of EU energy consumption in 2030 to 13% by 2030 when compared to the reference scenario.

Along with raising the goals for renewable energy and energy efficiency, RE-

4 Stagflation Risk Rises Amid Sharp Slowdown in Growth. https://www.worldbank.org/en/news/press-release/2022/06/07/stagflation-risk-rises-amid-sharp-slowdown-in-growth-energy-markets

PowerEU suggests significant increases in green hydrogen and biomethane production, highlighting these fuels as essential alternatives to fossil fuels.

To fit within the recipe for a clean energy transition, these elements must be produced with renewable fuels and used only to augment the other ingredients. Otherwise, REPowerEU would be off-course.

The Commission suggests importing an additional 10 million tonnes of renewable hydrogen annually and speeding up the deployment of renewable hydrogen within Europe. To compare, less than 1 million tonnes of green hydrogen are produced annually globally. So it is a seriously significant increase for an energy source that is neither renewable nor "green".[5]

It is generally worrying that the Commission's recently released delegated act defining renewable hydrogen allows for significant hydrogen development that is rather old and inefficient. There is also a possibility of producing hydrogen through the current electricity system within Europe, but that would only mean more use of natural gas since most of Europe's electricity is also dependent on gas.

Market Influence

There are two main ways the conflict in Ukraine could affect commodity markets: 1) physically, through blockades and the loss of producing capacity, and 2) economically, through the effects of sanctions on trade and production.

Physical Harm. The movement of goods has been severely hampered by the war. As of April 2012, nearly all Ukraine's grain exports were routed through defunct Black Sea ports. During the current season, which ends in July 2022, Ukraine was predicted to export up to 20 million tons of wheat, or nearly 10% of the world's total exports. Although some wheat may be moved by road and rail corridors to Hungary, Poland, Romania, and Slovakia, their capacity is constrained, particularly in light of infrastructure damage and security issues. The cost of shipping outside the blockades has also grown due to elevated insurance prices reflecting the risks posed by the war.

Additionally, the conflict will probably interfere with Ukraine's next harvest. Winter wheat is sown from September to mid-November, whereas spring planting for crops including maize, barley, and sunflowers usually takes place between April and May. The production of agricultural goods, particularly wheat, in Ukraine in 2022–2023 will be severely impacted by labor and input

5 Is REPowerEU the right energy policy recipe to move away from Russian gas? https://www.euractiv.com/section/energy/opinion/is-repowereu-the-right-energy-policy-recipe-to-move-away-from-russian-gas/

shortages (such as fuel and fertilizers), destruction of farming machinery, and producers' safety concerns. Between 25 and 50 percent is the range of predictions for the upcoming season's drop in Ukraine's agricultural output (FEWS NET 2022).

Impact on Commerce. Numerous sanctions have been put in place against Russia as retaliation for the invasion of Ukraine. Although energy was not included in the initial sanctions, some nations later forbade or announced a gradual end to imports of Russian energy items. Russian coal imports will be prohibited by the EU (beginning in August 2022) and will be reduced by two-thirds by the end of 2022. The EU is also thinking about expanding these oil regulations to eliminate imports of Russian fossil fuels by 2027.

Although this only accounts for a minor portion of Russia's energy exports, the United States has banned the purchase of Russian coal, gas, and oil. By 2022, the UK intends to stop importing Russian oil gradually. While many traders decided to boycott Russian oil, some major oil corporations said they would stop doing business there. This decision was partly motivated by the challenges and hazards involved in conducting business or obtaining insurance for their shipments. As a result, after the invasion began, the price of Urals (the Russian oil price benchmark) dropped to more than $30/bbl below Brent oil prices.

Due to the suspension of Russian bookings by various shipping lines and the difficulty in getting insurance, Russian commodity shipments by sea may also experience problems. Since rerouting results in lengthier flights, the reciprocal restrictions on airspace have hampered trade through air freight and driven up transportation costs for particular commodities typically transported by air.

Market Reactions

Demand reduction, substitution, and new sources of supply are the three ways market mechanisms react to price shocks and related policies. The use of these channels for energy is covered in this section.

Decrease in Demand. Oil demand decreased by 11%, or 6 mb/d, between 1979 and 1983, with advanced economies experiencing a demand decline of approximately 20%. Although the 1982 worldwide recession contributed to the decline in oil demand, energy efficiency and substitute policy initiatives by oil-importing nations resulted in a long-term slowdown in underlying demand growth. A factor was also played by shifts in customer choices brought on by increasing pricing. For instance, in the US, consumers began to choose Japanese-made cars over domestically built ones that were less fuel-efficient — the percentage of Japanese cars purchased in the country increased from 9 percent in 1976 to 21 percent in 1980. (Cole, 1981).

As a result of rising oil prices and policy changes in the 2000s, oil use became more efficient, and less oil was substituted for other fuels since less crude oil was required to produce power. Oil consumption in advanced economies reached its high in 2005 and then progressively fell after that, falling by 14% by 2014 from the peak. Consumer preferences were important once more. For instance, in the US, there was a move away from sports utility vehicles and toward fuel-efficient hybrid cars (aided by government policy) (SUVs). SUV sales started declining in 2008, and by the end of the year, they were down more than 25% from the same time the previous year (Hamilton, 2009). In EMDEs, oil demand slowed down in the 2010s as well.

Substitution. The percentage of crude oil in the energy mix of advanced economies decreased by more than 7% in the five years following the shock to the oil price in 1979. This change was primarily caused by the ban on building oil-fueled electricity power plants, which nuclear and coal-fueled plants replaced. The switch to nuclear power began in the late 1960s and was particularly pronounced in France and Japan, where their share of total energy consumption reached 23 and 8 percent, respectively, by 1984.

Oil's market share among EMDEs decreased by 4%, while natural gas mostly took its place. The US shale boom for natural gas and mandates and technological advancements for renewables contributed to the share of natural gas and renewables. in the energy mix in the years after the 2008 oil price surge. The reduction in oil's proportion was of minor significance, though, as oil is no longer a significant source of electricity. Additionally, it is significantly more difficult to replace oil with other energy resources for its two primary current uses — transportation and petrochemicals. The share of biofuels — ethanol and biodiesel — rose due to mandates from roughly 0.15 percent of total oil consumption in 2005 to 1.7 percent in 2019. This is still a very tiny share of total oil consumption.

New Sources of Supply. Non-OPEC nations invested in oil production due to high oil prices in the 1970s, especially for reserves with higher production costs. These include the oil sands in Canada, the North Sea offshore areas of the UK and Norway, Mexico's Cantarell, and Prudhoe Bay in Alaska. Alternative sources of crude oil were made easier to develop during the 2000s thanks to high and steady pricing. The most notable was the development of American shale oil resources, whose output increased from 5 mb/d in 2008 to 9 mb/d in 2014. Brazilian deep-water output and Canadian oil sands production also increased quickly.

Clean and Renewable Energy

With the rise and fall of oil prices, the world was thrust into a harsh reality at the start of the pandemic. As our economies resumed operations follow-

ing the closures enforced in response to the coronavirus pandemic, prices increased for oil, gas, and electricity. Later, we began to experience the consequences of Russia's invasion of Ukraine, and the EU became increasingly wary of threats from significant actors in the energy industry.

As a result, political pressure on decision-makers to devise fresh approaches to the future of energy began to increase. There are mainly two options: clean energy and renewable energy.

The terms "clean" and "renewable" are frequently used interchangeably, especially in heated public discussions, while other times, policymakers just use them without giving them a definition. However, what seems like a small wording issue can have wide-ranging consequences for the policies and financing that support decarbonization — and ultimately, the success of our decarbonization efforts.

Energy type	**Energy source**
Clean and renewable	Solar power Wind power Geothermal energy
Clean but not renewable	Nuclear power
Not clean but renewable	Hydropower Biomass

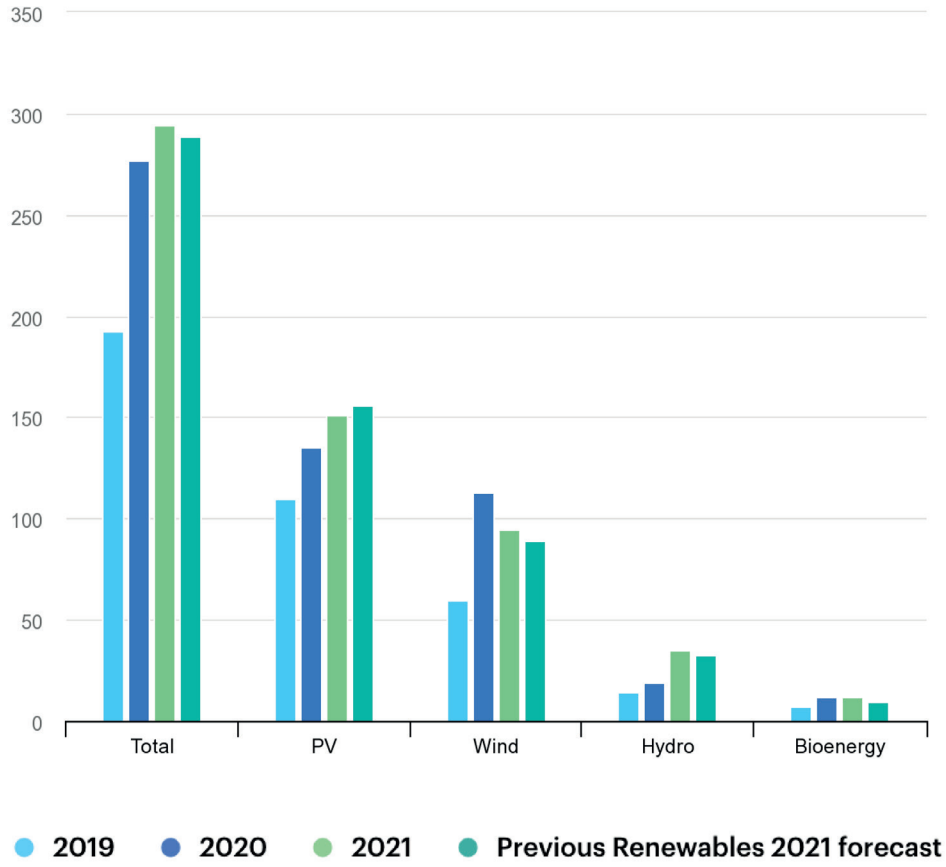
Renewable energy is the generation of energy from sources that can be replenished naturally over time. The clean energy or zero-carbon energy tent is more comprehensive; it not only leaves the door open to 100% renewables but also includes nuclear energy and the carbon-neutralizing impact of technologies like carbon capture and sequestration (CCS).

Carbon capture is a group of technologies used to decarbonize emissions-producing sources of energy as well as industrial processes like steel production, where electrification has its limits. This, in turn, can lower the life-cycle carbon footprint of solar and wind power.

Hydrogen can be renewable if it is produced through electrolysis using renewables and water, or it can be produced from natural gas, coal, biomass, and oil; in the latter cases, hydrogen becomes a zero-carbon energy source.

At the EU level, the share of renewable energy in energy consumption increased steadily from 9.6% in 2004 to 22.1% in 2020, thus exceeding the EU target of 20% renewables by 2020. The increased share of renewables in 2020 was partly prompted by the decrease in the consumption of fossil fuels brought about by the COVID-19 pandemic. The new EU target for 2030 is 32% (the target is under revision).

Within the EU, the growth in electricity generated from renewable energy sources from 2010 to 2020 primarily reflects an expansion in three renewable energy sources across the EU: wind power, solar power, and solid biofuels (including renewable wastes). In 2020, renewable energy sources made up 37.5% of gross electricity consumption in the EU, up from 34.1% in 2019.[6]



The European Union was the second largest market in terms of increased capacity for renewable energy, with the region surpassing for the first time the all-time record in 2011. Solar PV alone accounted for most of the European Union's expansion last year due to project acceleration in Spain, France, Poland, and Germany, which was driven by a combination of government-led auctions and distributed solar PV incentives.

Recommendations for Energy Policies

The food and energy commodity markets have been severely shaken by the conflict in Ukraine. This shock follows supply chain interruptions brought on by the epidemic and a stronger-than-expected recovery in demand.

Due to the damage to agricultural assets, workforce losses from relocating refugees and military operations, and loss of income from employment, Ukraine will have localized issues with food sufficiency. Rapidly rising energy and food prices will harm growth and considerably raise inflation in ad-

6 Renewable energy statistics. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Renewable_energy_statistics#Share_of_renewable_energy_more_than_doubled_between_2004_and_2020

vanced countries, further complicating the policy choices that central banks must make.

There are two main problems at hand. First, because price increases have been widespread across all fuels, there is less room now than in the past to switch away from the energy commodities that have been most negatively impacted — gas and coal. The cost of producing other commodities has also increased due to higher energy prices. Second, with fewer measures to address the underlying supply and demand mismatch, many countries' policy responses have prioritized energy subsidies and tax breaks, worsening the situation.

(In fact, we see this effect already in place. The UK has announced a rebate on household utility bills; Spain has cut taxes on energy bills and introduced a windfall tax on energy companies; France introduced a cap on energy bills that stayed in effect until the presidential election in April 2022 — conveniently.)

In order to offer a long-term solution to the current price increase, policy actions will be crucial. When policies are compared to previous shocks, it becomes clear that some have been very successful and advantageous, while others have only offered temporary solutions at the expense of market distortions or new issues. Long-term advantages have been produced through increased auto efficiency standards, incentives for energy-efficient home appliances, and renewable energy laws (apart from biofuels). Established organizations have had similar benefits in enhancing market transparency, coordinating policy responses, enhancing data quality, and encouraging policy discussion.

The introduction of biofuels offered an alternative to crude oil and may have increased the share of renewable energy, but its overall effectiveness has been questioned because producing biofuels uses a lot of energy and fertilizers and puts pressure on food prices. While temporarily lessening the impact of food price inflation on poorer households, export restrictions on food commodities during the price hikes in 2007–08 and 2010–11 also caused high volatility in world prices and common policy reactions by other countries. No matter how well-intended, energy subsidies may hinder the transition to a zero-carbon economy at this time.

To alleviate the effects of the energy crisis mentioned above, the European Union should:

1. Boost energy sector action for Europe's short-term recovery with large-scale programs for renovation and by lifting barriers for investment in energy projects and promoting the clean energy industries and infrastructure of the future.
2. Ensure cost-effective implementation of the 2030 energy and climate

framework and review EU policies to scale up EU energy sector action to achieve short and long-term benefits from a sustainable, secure, and just recovery of the European economy.
3. Leverage public- and private-sector financing for a wide range of technology solutions needed for clean energy transitions by boosting EU financial instruments while ensuring transparency and a level playing field.
4. Work with member states to ensure consistency and compatibility of NECPs, national long-term strategies, and the EGD objectives.
5. Strengthen strategic foresight and quantitative analysis and projections across all policies and sectors of the economy to identify the potential contributions of the energy sector in Europe's transition in the medium and long term.
6. Allow, facilitate and promote further practical, bottom-up approaches to regional energy cooperation.
7. Invite the existing regional forums to come forward with a short-term agenda for meeting the challenges of system capacity and adequacy of generation and their related supply security concerns.
8. Regional energy cooperation approaches should be further studied, both in the legal context and in their pragmatic applications, as a basis for further consideration and discussion.[7]

Closing Remarks

It is acceptable for nations to implement emergency measures, such as temporary exemptions from some taxes or fees, to lessen the burden on consumers — particularly the most vulnerable — during transient market unrest. However, these measures should be put into place in a way that does not worsen the investment climate for low-carbon energy sources and technologies, which are essential for the shift to cleaner and more resilient energy systems and include renewable energy, energy efficiency, electricity grids, nuclear power, and sustainable biofuels.

The Commission's strategy to implement a one-size-fits-all policy is not only shortsighted but also wasteful. Individual member states of the EU will quickly revise their allegiance to the master plan when it becomes clear that every country has a unique set of problems and solutions to the energy game. So, instead of dictating a central plan to each member state, the Commission should invest its time and resources into developing the connectedness between neighboring countries regarding energy grids and powerhouses.

7 Exploring a Regional Approach to EU Energy Policies. https://www.ceps.eu/wp-content/uploads/2014/08/SR%20No%2084%20Energy%20Schengen_0.pdf

AGENCY

347 Fifth Ave, Suite 1402
New York, NY
10016

+1 (434) 264-1485
hello@bkagency.co
www.bkagency.co