



# HOW SHOULD GOVERNMENTS TACKLE ENERGY PRICE

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## **Abstract**

Recent developments leading to energy price increases have highlighted the need for countermeasures by European governments. Tax reductions are commonly used but fail to address the problem as companies often keep prices high and take excess profits. Differentiated payments to low-income households are more effective in reducing the burden. Nuclear power is a cheaper alternative to gas and coal, but research shows alternative materials can be used to reduce waste. This paper argues governments should invest in R&D of renewable energy and promote grant schemes for large projects to gain independence and address climate change. Further, governments should switch to nuclear power until a renewable infrastructure is in place and stable.

## Contents

1.	Introduction .....	3
2.	Short Run Measures.....	4
	2.1 <i>Traditional Measures To Fight Price Increase</i> .....	4
	2.2 <i>Non-Traditional Measures To Fight Price Increase</i> .....	5
3.	Long Run Measures.....	8
	3.1 <i>Nuclear Energy</i> .....	8
	3.2 <i>Renewable and Sustainable Energies</i> .....	9
4.	Conclusion.....	11
5.	References .....	12

## 1. Introduction

In the wake of the COVID-19 pandemic and throughout 2021, energy prices have been skyrocketing in the EU as a consequence of the increase in gas prices globally. Demand for natural gas surged worldwide, particularly in Asia, limiting the import of the resource to Europe (European Commission, 2022). According to the Dutch Title Transfer Facility (Liboreiro & de Filippis, 2021), prices for natural gas surged from €16 megawatt per hour in January 2021 to €88 megawatt per hour in October 2021, creating a jump in electricity prices. Other reasons for rising energy prices include a colder winter causing an increase in the use of electricity to warm up buildings, stimulating a fall in gas reserves. Moreover, during the spring, business activity started to intensify after the pandemic, with venues such as offices and restaurants starting to reopen, leading to a wave of consumers wanting to spend their money. This resulted in significantly high energy demand. Aside from that, the scorching summer caused many people to overuse air conditioning and cooling systems (Liboreiro & de Filippis, 2021). In Sicily, the temperature rose to 48.8C degrees, breaking the record of Europe's highest temperature by 0.8C degrees (Rannard, 2022). Other contributing factors include poor weather conditions for producing renewable energy, and the Russian invasion of Ukraine caused the EU to restrict gas imports from Russia (European Commission, 2022). Overall, energy resources such as natural gas and coal play a vital role for everyone in the EU as the two resources combined supply more than 35% of the EU's total production. Having a significant excess demand disrupts the economy as citizens in countries such as Spain, Italy, France and Poland are encountering alltime-high energy costs adding to the economic problems of the pandemic (Liboreiro & de Filippis, 2021). This paper investigates how the government should tackle energy prices to ensure prosperity in Europe.

Firstly, this paper is structured into two sections: short-run and long-run energy policies. The paper starts by distinguishing between traditional and non-traditional short-run measures undertaken by governments across Europe. This is followed by discussing long-term alternatives such as nuclear power plants and renewable energy resources. In the end, the paper evaluates the efficiency of the discussed short and long-run policies.

## 2. Short Run Measures

### 2.1 Traditional Measures To Fight Price Increase

This research starts by focusing on the traditional short-run solutions to the energy crisis Europe is currently facing. These traditional short-term solutions are the most common measures the European countries studied have taken. Namely, most countries have decided to reduce taxes on energy and provide a lump sum or benefit to assist the most vulnerable groups suffering the most from this energy crisis.

Firstly, we dive into tax reductions. Almost all countries in Europe have decided to support consumers' electricity bills by reducing the taxes –only Bulgaria, Denmark, Greece, Hungary, Lithuania, Luxemburg, and the United Kingdom have not reduced the energy tax (*Bruegel, 2022*). For instance, in Belgium, taxes on electricity have gone from 21% to 6% (*Sudinfo, 2022*), similar to what the Dutch government has done in the Netherlands, reducing the VAT (Valued Added Tax) from 21% to 9% (*Government of the Netherlands, 2022*); while in Spain, there has been a reduction of 10% in the VAT on electricity bills (*La Moncloa, 2021*). In Austria, on the other hand, the tax on renewable energies has been completely suppressed.

In general, as it has already been criticized in several countries, this measure is not the most appropriate one. Firstly, tax reductions do not necessarily imply a price deduction because energy companies usually keep prices at the initial levels. Secondly, because it treats all consumers the same, while the situation varies among different groups – wealthier groups are not as affected as poorer sectors of the population. Therefore, this measure can be considered very inefficient. Of the ten countries on which we focused our analysis, eight embraced this measure: Portugal, Germany, Latvia, and Poland, apart from those already mentioned.

Regarding taxes, few countries, such as Spain, Germany, or Italy, have also imposed a windfall tax. This tax attempts to reduce the enrichment of energy companies at the expense of consumers due to the energy crisis Europe is experiencing (*Bruegel, 2022*). In Spain, for instance, this measure has caused an uproar among electricity producers, and the government has been criticized for a wrong approach to the problem (*The New York Times, 2021*).

Secondly, regarding the benefits or lump sums, these are the most common measures in Europe, with only two countries not adopting them, Bulgaria and Hungary (*Bruegel, 2022*). We can observe many examples of this measure throughout Europe. Portugal has social tariffs for electricity and natural gas that provide discounts on parts of the distribution tariffs to reduce the electricity and gas bills of households that meet certain

socio-economic criteria (*International Energy Agency, 2021*). In the Netherlands, 150 million euros have been dedicated to helping low-income households to take energy-saving measures. In addition, the Dutch government *has raised a one-off energy allowance for people on incomes around the level of social assistance benefit to 800 euros (Government of the Netherlands, 2022)*. On the other hand, in Austria, the government has paid 150 euros to every household –which again fails to differentiate between richer and poorer sectors– and is planning on additional payments to low-income households.

Moreover, Germany has adopted an extensive plan of payments providing working citizens with 300€, 100€ for families with children, and 100€ for people with unemployment benefits (*).* In Latvia, 150,000 of the most vulnerable households will receive from November 2021 until the end of 2022 between 15 to 20 euros per month (*Elektrum, 2021*). Additionally, vulnerable groups such as retirees, people with disabilities, and surviving spouses will receive an €80 compensation for the surge in gas prices (*Lv Portals, 2021*). Furthermore, in Poland, the most deprived families will be granted an allowance of between 400 and 1,150 zlotys (85 to 245€) (*International Trade Administration, 2021*). Lastly, in Belgium, the government has implemented a social benefit with a check of 100€ for all the population (*Sudinfo, 2022*).

In general terms, social benefits and aids to vulnerable groups seem to be a better shortterm solution to the problem of increasing energy prices. It is true that they aim at relieving tensions among the most hurt by the crisis, low income households –although the problem is that not all countries make that differentiation between richer and poorer when providing the population with economic help. Nevertheless, lump sums are still a short-run solution, which makes them, in the end, a patch to the problem and not a valid solution. If the crisis continues to worsen, these solutions are to become unsustainable for public finances (*Bruegel, 2021*). In the end, European Governments must rely on a different energy supply, cleaner energies, and consistent long-run solutions (European Commission, 2021).

However, before diving into long-term measures, there are other "non-traditional" shortrun measures that certain European governments have taken.

## **2.2 Non-Traditional Measures To Fight Price Increase**

Non-traditional measures that countries within our sample took to protect their citizens from sharp energy price increases were selected as the least often used by these countries. One approach that only Poland chose is the reduction of VAT on some categories, namely food items, fertilizers, and plant protection products (The Chancellery of the Prime Minister, 2022). One of the direct implications of such a step is the reduction of budgetary

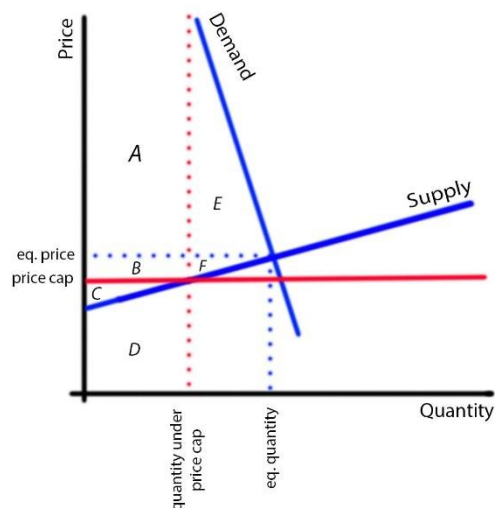
revenues. At the same time, to continue financing all current government projects, it should borrow from external sources, thus increasing the debt burden to future generations.

One of the positive sides of tax cuts in this specific case is that local producers of fertilizers and, consequently, agricultural goods are now freed from a significant tax burden, which encourages them to produce more. However, according to the World Bank (2022), Poland produced only 67.8 percent of fertilizers consumed in 2018, meaning that it heavily relies on fertilizers imports, especially from Russia, from which Poland imports 22.8 percent of the whole imported amount of fertilizers (The World Bank, 2022). Considering that foreign trade with Russia is canceled due to the Russia-Ukraine conflict, it will be challenging for Poland to fully substitute vast amounts of previously imported goods. Another positive consequence of VAT reduction might seem to be the increased food consumption, but it is not. Food prices experience an unswerving increase compared with price change over the same months in the previous year. Particularly, food inflation in Poland reached 9.1 percent in March 2022, and a 5 percent cut of VAT on food products does not fully compensate alone for food inflation, and other measures are necessary. It should be noted that this is a rather indirect measure to fight a surge in energy prices: consumers are provided with higher disposable income from lower VAT to redirect this saved money to cover higher energy costs.

Another least popular measure is an introduction of a price ceiling which is the maximum price the end consumer will be charged for the good or service. Three countries from our sample introduced a ceiling on energy prices – Germany, Latvia, and Hungary. The effect of a binding price ceiling is determined by elasticities of demand and supply, i.e., how responsive are suppliers and consumers to changes in energy prices. Since energy products such as heating and fuel are essential for our daily life, consumers' elasticity is very low: they will accept virtually any price the seller offers. On the other hand, supplier price elasticity is far more elastic because, for countries with massive oil deposits, this resource is treated as never ceasing. Hence, the country has wider room for dictating a price. When the actual market price is higher than the price ceiling under assumptions about elasticities mentioned above, consumers suffer from a greater surplus loss due to price surges than suppliers. This specific case is illustrated in Figure 1, where the downward-sloping demand curve is steep, so little price changes lead to relatively little change in the quantity demanded. In turn, suppliers feel more unconstrained in defining how much to supply for a given price: small price changes lead to significant changes in the quantity supplied. As a result, a binding price ceiling leads to greater surplus loss for consumers (area *E*) than for suppliers (areas *B* and *F*). The deadweight loss is, therefore, the sum of areas *E* and *F*. It also can be seen from the graph that the more elastic supply is (i.e., the flatter is the supply curve), the larger is the drop in quantity supplied caused

by little change in price ceiling. The theory also backs this: the largest burden of price change is borne by the less responsive side of the market (i.e., less sensitive in response to price change).

Figure 1. Welfare Effect of Price Ceiling



*Note: Produced by the authors*

Additionally, it creates a fiscal burden for the government, which has to use budget sources in order to cover extra expenses. Another classic theory prediction is that the total amount of imported energy under the effective price ceiling will decrease (Perloff, 2014, p. 316). The more binding the price ceiling is in a specific country, the more substantial the cut in the supply of energy is going to be and the more budget sources the government will be forced to spend to cover additional expenses.

Finally, in times of ascending inflation, Belgium increased wages for workers in both private and public sectors by the amount of price increase (measured by the Price Consumption Index). This might effectively support consumers facing higher prices but not directly aims to fight energy price upsurges. In this case, however, the effect on the budget is somewhat unambiguous because increased wages from budget services lead to increased budget revenues from income tax collection. This might create a vicious cycle if consumers do not pay serious attention to their spending structure and thus tightening the inflationary environment.



### **3. Long Run Measures**

#### ***3.1 Nuclear Energy***

Nuclear energy is a debated solution as a long-term source of renewable and sustainable energy. There is long-lasting support from the European Union toward energy through the Euratom agreement. This treaty, signed in 1957, aims to promote research and development in the nuclear industry (European Parliament, 2021). As a result, nuclear energy is part of the EU's green finance taxonomy (Kurmayer, 2021). Currently, 13 EU members (BE, BG, CR, DE, ES, FI, FR, HU, NL, RO, SE, SI, SK) out of 27 have nuclear power plants, for a total of 104 plants and a net capacity of around 100,000 Mwe (European nuclear society, 2022). France alone accounts for 56 of them. Certain countries (BG, CR, FI, FR, HU, LT, PL, RO, SI, SK) are in the process of building or planning to build new plants, 26 in total (World Nuclear Association, 2022). At the same time, countries (AT, DE, DK, PT, LU) have been fighting against the EU's nuclear support and getting nuclear energy out of the green taxonomy. Belgium, Germany, and the Netherlands are even actively trying to close their plants (Balkan Green Energy News, 2022). The reason for these contradicting views comes from the economic and political problems arising from the main disadvantages of nuclear energy production: cost and radioactive waste.

Building and maintaining nuclear power plants require enormous fixed costs. Disposing of radioactive waste is expensive as most of the waste from reactors is long-term waste which means they need to be stored underground in highly secured facilities until they lose their radioactivity which can take centuries. The level of complexity, space, and risks that these facilities require explains the high cost linked to nuclear plants (World Nuclear Association, 2022). It is, therefore, understandable that some countries struggle to find financial and political support for such projects. However, when looking at the Levelized cost of electricity and external costs, nuclear energy is, on average, cheaper than non-renewable resources such as coal or gas. However, existing plants incur, on average higher costs than the "cleaner" source of energy such as hydro, wind, or solar energy (World Nuclear Association, 2022). Nevertheless, it must be noted that existing plants are the oldest, and predictions indicate that new plants using new technologies would be the cheapest energy source. It, therefore, seems cost-efficient to invest in new nuclear plants (IEA, 2020).

Independent of the costs linked to their destruction, nuclear waste brings a political problem. Firstly, as for all public construction requiring on-land space, people are happy to have new plants as long as they are in someone else's garden. Also, past accidents with nuclear power plants have frightened the population, making them unwilling to accept a new plant or nuclear waste storage near their living space (Leman, 2022). As most EU

countries do not have largely deserted areas, it becomes politically difficult to find support. Secondly, the current material used in the reactors creates long-lasting radioactive waste, which ecological associations want to see disappear (European Nuclear Society, 2022). They argue that the risk of leakage is never zero and may lead to devastating consequences for our natural habitat (Leman, 2022). There are, however, new technologies that could greatly alleviate this trouble. The first is the new technologies for the plant, which would avoid the current waste of energy in the production process and, therefore, make the production more efficient (IEA, 2020). There are also promising research and projects using materials other than uranium. One is Thorium which has a radioactive life after processing of only 500 years against 250000 for uranium (World Economic Forum, 2018).

The current shock on energy prices has once more encouraged European energy independence. However, Europe's current hydro, wind, and solar energy production is not developed enough and is not meant to be the only energy source in the future. It is, therefore, impossible to fulfill Europeans' needs without nuclear energy. The most efficient long-term solution would be to gradually replace old plants with plants using new technologies and materials as it would provide the cheapest renewable and sustainable source of energy.

### ***3.2 Renewable and Sustainable Energies***

With the rapid increase in energy prices, the majority of European countries opt for investing more in sustainable energy. Some countries like Belgium, Portugal, and the Netherlands want to reduce their usage of non-renewable energy. Belgium aims to end the use of nuclear energy (International trade administration, 2021). The Netherlands set itself the objective to reduce its greenhouse emission by 2050 (Government of the Netherlands, 2022). Portugal has stopped extracting Fossil Fuels by 2020 and aims to close all coal production facilities by 2030 (IEA, 2021). Solar and wind energy are considered great alternatives; Belgium, Poland, Latvia, Germany, the Netherlands, and many other countries heavily invest in these renewable energies.

Portugal, for example, tries to use hydrogen to achieve carbon neutrality. Their strategy is to make use of the hydrogen in industry, domestic maritime shipping, road transport, and injection into the natural gas network (IEA, 2021). The National Energy climate plan sets targets for 2030, including a combination of public and private investments into R&D for sustainable energies with an expected 0,4% GDP increase (IEA, 2021).

Spain is planning to launch renewable energy projects. For their National Integrated Energy and Climate Plan, they need to get an additional 60 gigawatts of renewable energies by 2030. Public administration is transitioning to only using clean

energies (La Moncloa, 2021). The Spanish government provides aid to promote the implementation of renewable thermal energy installations in different sectors of the economy, such as industry, agriculture, and services (La Moncloa, 2021).

Germany aims to rapidly implement more solar and wind energies to reach the goal of having 100% renewable energies by 2035 (Delfs & Dezem, 2022). Germany targets an 80% share of wind and solar energies by 2030. This would imply that their onshore wind energy capacity doubled to 110 gigawatts (GW). The offshore wind should increase to 30 GW, and the solar energy capacity should triple to 200 GW (Reuters, 2022).

The Netherlands aims to reduce its greenhouse emission to zero by energy supply through solar energy, onshore/offshore wind energy, biomass energy, geothermal energy, and hydropower energy (Government of the Netherlands, 2022). Investments into sustainable energy technologies and research, and grant schemes for large energy projects for geothermal heat and solar parks, aim to achieve the zero-emission goal (Government of the Netherlands, 2022).

#### 4. Conclusion

Recent developments that cause energy prices to increase have raised the importance of countermeasures for European governments. The analysis shows that even though tax reductions are a common action, they fail to tackle the problem. Most companies will keep the price at its initial level and the resulting excess as profits. Hence, we conclude that this measure has more of a political effect on consumers rather than the prices they face. On the other hand, differentiated payments to affected groups are a more efficient action to take. These payments will effectively decrease the burden that households have to face. However, payments should only be made to low-income households because wealthier households can cover these extra costs by themselves. Also, it would help keep government debt low, which would correspond to lower tax rates in the future.

As seen throughout the analysis, these are short-term measures governments can use to overcome a temporary price rise. However, when these prices increase over a more extended period, governments should consider switching to the discussed long-term solutions. Nuclear plants are a relatively cheap alternative to gas and coal. Most countries could switch to their existing plants to close the supply shortage. Moreover, nuclear power production is more expensive than renewable energy alternatives.

Nevertheless, most countries lack a sustainable renewable energy infrastructure. Also, latest research has shown that alternative materials with less radioactive life can be used instead of uranium, lowering the waste problem. Also, building more efficient plants can drastically reduce the costs of nuclear energy. Nonetheless, governments should continue or instead start to invest heavily in the R&D of renewable energy alternatives and promote grant schemes for large projects. In this way, governments gain much more independence and are less affected by the actions of states like Russia or supply shortages. Furthermore, it would help solve the climate change and reduce costs for future generations.

In conclusion, governments should switch to nuclear power until they build renewable energy infrastructures. New nuclear plants can help increase productivity and lower the costs faced by consumers. Once a stable renewable infrastructure exists, governments can switch to these energy sources to avoid radioactive waste.

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