

# Chapter 2

## Energy shock and policy measures: the case of France

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### 1. Introduction

Since the start of the energy crisis and until February 2023, France has had lower inflation than its European partners, in particular because energy prices have increased by less. In January 2023, energy consumption prices in France were 37% higher than at the start of 2020, against 47% in the euro area. Accounting for the share of energy in consumption, energy prices contributed to increase the all-items HICP in the euro area by 3.2 percentage points of the total increase of 8.4% in 2022 and by just 1.9 percentage points of the 5.9% in France.

This lower rise in energy prices is the result of large-scale measures, in particular the freezing of energy prices, at a gross budgetary cost of around 75 billion euros over two years (2.8 percentage points of GDP). Although these measures are costly from a budgetary point of view, they would make it possible to reduce consumer prices of 2.2 points in average over two years (direct effects alone) and to reduce the effects of the energy shock over the 2022-23 period by almost the half, with the economic damage falling, as a result of these measures, from -2.2 points of GDP to -1.2 points.

For a year and a half, France, like all European countries, has been facing the return of inflation. In 2022, at 5.9%, it reached its highest level for almost forty years. It is the shock to energy prices, greatly amplified by the consequences of Russia's invasion of Ukraine, which has largely contributed to this rise in inflation.

The effects of the energy shock on the French economy are multiple, as are the budgetary measures put in place to deal with them. This is what we are seeking to analyse in this chapter.

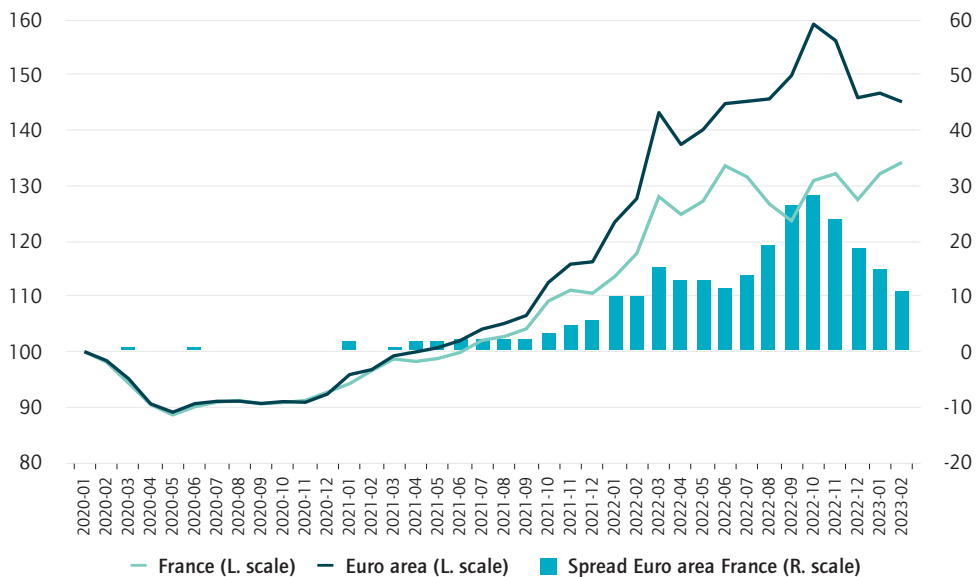
Section 2 focuses on the comparative dynamics between France and the euro area in terms of the general price trends but also of those of detailed energy prices. Section 3 reviews the details of the budgetary measures taken to deal with this energy shock while trying to assess its macroeconomic effects. Section 4 studies the impact of the rise in energy prices in 2022 on the household standard of living, as well as the redistributive impact of the budgetary measures. Finally, Section 5 looks at whether the measures taken in France to deal with the energy crisis are compatible with European climate objectives.

## 2. The return of inflation in the euro area... less strong in France

Consumer price inflation has never been as high since the launch of the euro, being well above the previous peak of 4% reached in August 2008 in France and in the euro area. Inflation in the euro area has breached the 2% inflation target since July 2021 and, in France, since August 2021. Inflation also started to accelerate earlier in the euro area (November 2021) than in France (February 2022).

French annual inflation (as measured by the Harmonised Index of Consumer Prices (HICP): Eurostat release) was 1.3 percentage points below the euro area HICP in February 2023; annual inflation was 7.2% for France and 8.5% in the euro area. Although this difference remains significant, it has been reduced over the past five months. If we look at the level of inflation since the beginning of 2020, the current gap averages 3.6 points (reaching a maximum of 5.4 points in October 2022) having started to widen in September 2021. Such a gap is unprecedented and the major reason is the difference in energy price dynamics (Figure 1).

Figure 1 Harmonised Index of Consumer Prices (energy) (100 = January 2020)



Source: Eurostat; authors' calculations.

In February 2023, energy consumption prices in France were 34% higher than at the start of 2020, against 45% in the euro area. Accounting for the share of energy in consumption, energy prices contributed to increase the all-items HICP in the euro area by 3.8 percentage points of the total increase of 8.4% in 2022, but by just 2.3 percentage points of the 5.9% in France (Figure 2a and 2b). At the peak of inflation in October 2022, energy prices contributed to increase the all-items year-on-year HICP in the euro area by 4.4 percentage points compared to just 2.0 percentage points in France. Currently (February 2023), with lower energy prices, the contribution of

energy prices to year-on-year HICP is lower both in France and in the euro area (by 1.5 percentage points in each case).

Among EU countries, energy price rises since the start of 2020 are much lower in France (34%) and Spain (20%) than in Italy (80%) or even Germany (48%).

Figure 2a Energy and non-energy HICP components for France (year-on-year, in %)

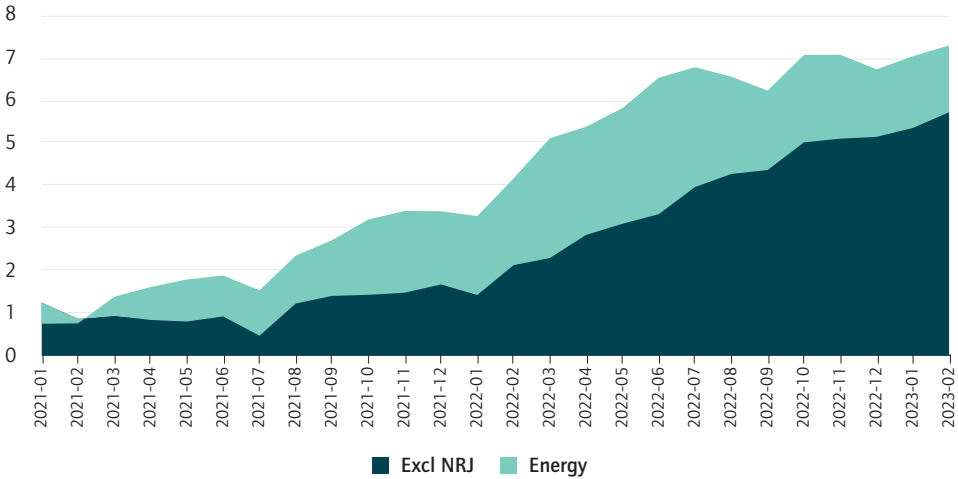
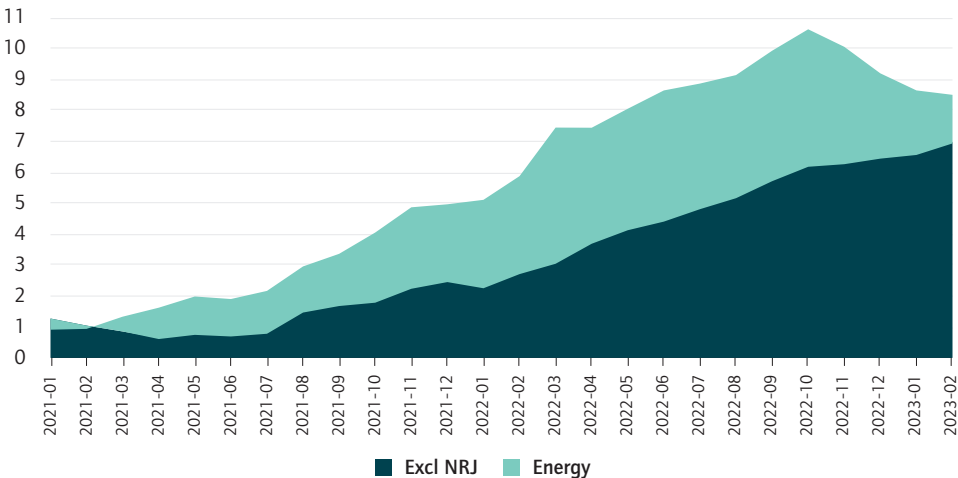


Figure 2b Energy and non-energy HICP components for the euro area (year-on-year, in %)



Source: Eurostat; authors' calculations.

France's comparative advantage vis-à-vis the euro area on energy prices stems mainly from the low rise in electricity prices, limited by the introduction of the tariff shield (bouclier tarifaire). Introduced at the end of 2021 by the French government, this is a mechanism freezing regulated sales tariffs for gas and limiting the rise in regulated

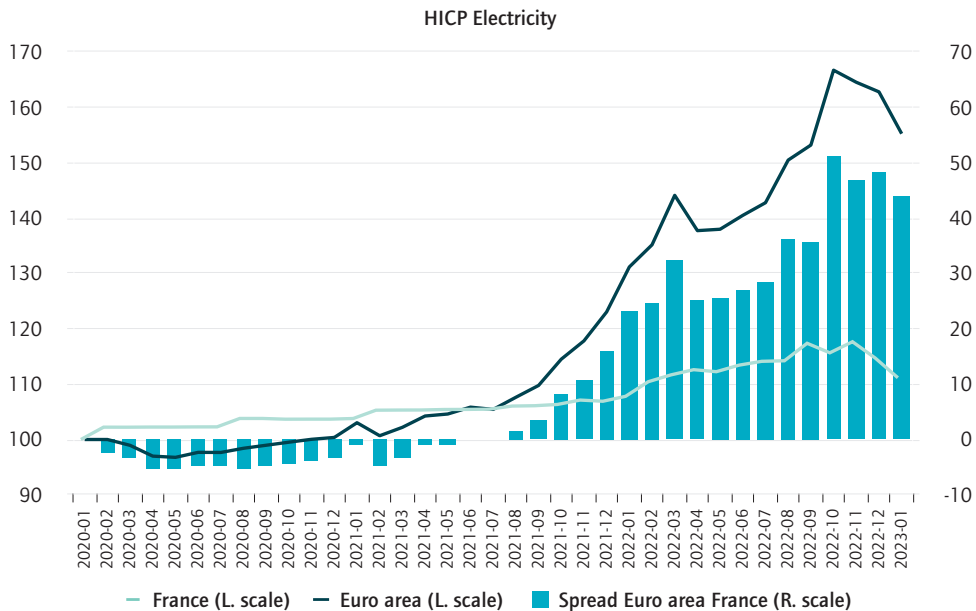
sales tariffs for electricity (for more details, see below). The tariff shield has significantly limited the rise in electricity prices in France compared to other EU countries.

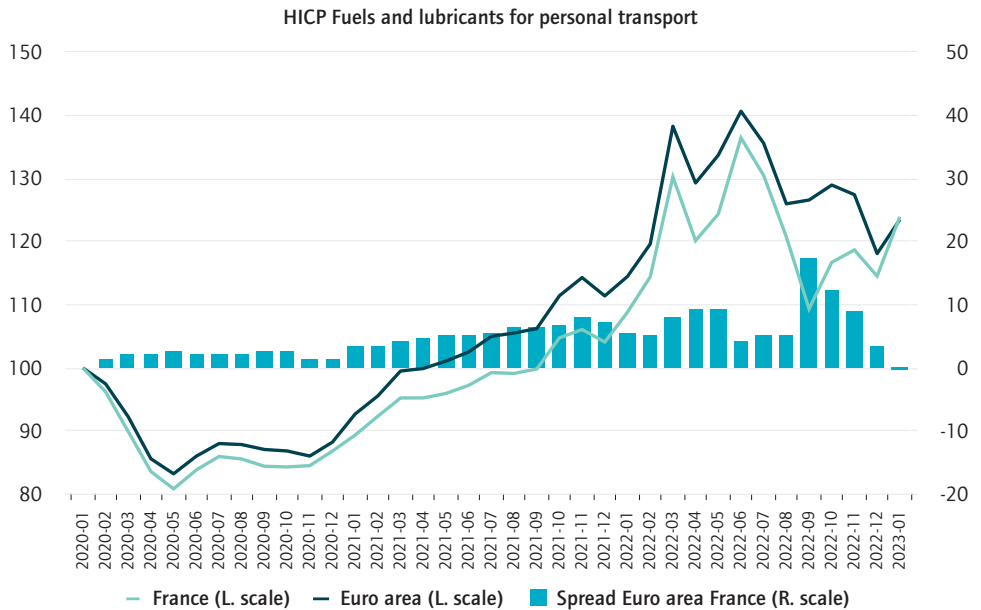
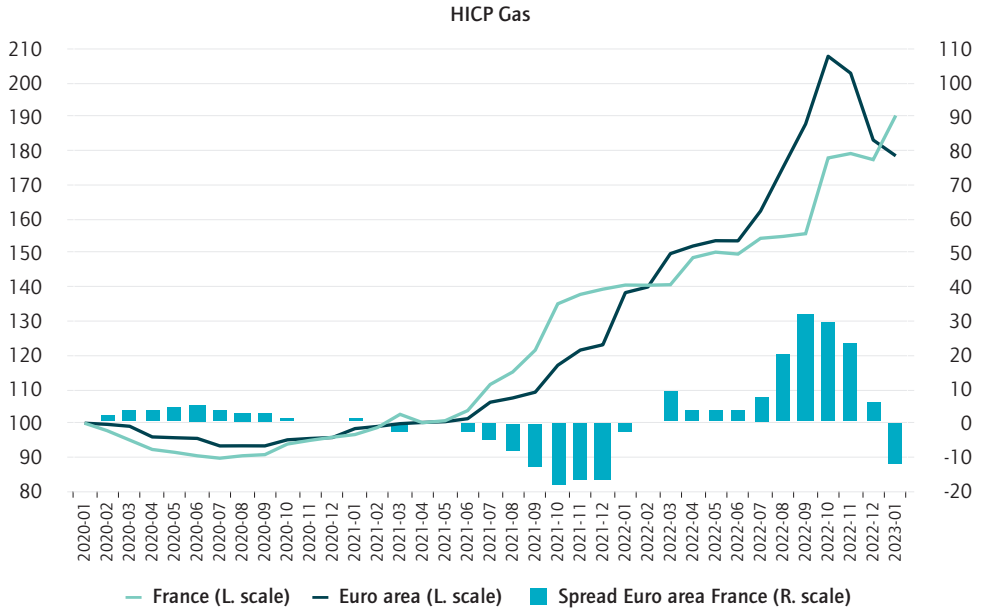
In January 2023, electricity prices were only 11% higher than in January 2020, in contrast to 55% on average in the euro area. Electricity prices have contributed just 0.3 percentage points to the HICP in France from the start of 2020, compared to 1.7 points in the euro area. The tariff shield in electricity has therefore strongly contained and smoothed out electricity prices (Figure 3). The spread of electricity price dynamics between France and the euro area thus explains almost half of the total inflation gap between January 2020 and January 2023.

Despite the tariff shield in gas, HICP gas prices in France were 90% higher in January 2023 than in January 2020, compared to 80% on average in the euro area. The gap in the gas HICP between the euro area and France is now negative but it was strongly positive until autumn 2022 before the drop in gas prices on the spot market.

The introduction of a fuel price subsidy limited the increase in petrol prices for personal transport but this was stopped at the end of 2022. Between January 2020 and January 2023, the price of petrol for personal transport increased by 24%, exactly the same as in the euro area over the same period. Most EU partners introduced fiscal measures in 2022 to deal with rising oil prices.

Figure 3a, 3b and 3c Index of energy prices (100 = January 2020)





Source: Eurostat; authors' calculations.

### 3. Dealing with the budgetary shock

#### 3.1 Measures to limit the impact on households and firms

The measures implemented to contain the impact of the energy shock on households and firms are mainly measures directly limiting the rise in energy prices. These price measures amount to 80% of all the fiscal measures implemented in 2021-23 to tackle the energy crisis (Table 1).

First of all, the tariff shield froze regulated gas tariffs at the end of 2021 and limited the increase in regulated electricity tariffs to 4% in February 2022. In 2023, the government has maintained the tariff shield, although with a 15% rise in regulated gas prices in January 2023 and a 15% rise in regulated electricity prices in February 2023.

It is important to note that, despite the tariff shield, the gas Consumer Price Index (CPI) has increased much more than the electricity CPI. There are two explanations for this: the first is that the gas CPI had already increased significantly before the implementation of the tariff shield from November 2021, which was not the case in electricity: gas prices had already increased by 40% between the start of 2020 and October 2021. The second is that only households with regulated tariffs benefit from the tariff shield and the share of households on such tariffs is lower in gas than in electricity. Households benefiting from regulated tariffs, or market offers indexed to the regulated tariff, represent 45% of households for gas but almost 70% for electricity.

The other major measure to limit the rise in fuel prices was a 15 cents (excluding VAT) per litre subsidy for fuel prices from April to August 2022, rising to 30 cents between September and mid-November but falling to 10 cents from then to December. This was abolished in January 2023.

The tariff shield in gas and electricity is estimated to cost 24.9 billion euros in 2022 (18.2 billion for electricity and 6.7 billion for gas) and 27 billion euros in 2023 (24.7 billion for electricity and 2.3 for gas). On top of this, the fuel price subsidy cost 7.9 billion euros in 2022. The total cost of these measures amounts to 1.2% of GDP in 2022 and to 1.0% in 2023. In total, 60.2 billion euros will have been deployed in these two years (1.1% of GDP on average) in limiting the rise in energy prices.

At the same time, the net cost to public finance is very different due to the lower charges linked to service public de l'énergie (SPE; the public energy service), the latter corresponding to the funding by the state of the difference between guaranteed purchase prices (or compensation mechanisms on the market with bonus) for renewable energy producers and the market price of electricity or gas. The sharp increase in energy market prices since the end of 2021 has led to a sharp reduction in the cost of this public aid and even to payments from producers to the state. Moreover, as part of the legislation adopted in several European countries to limit the infra-marginal rents linked to the rise electricity prices, the government has set up an exceptional mechanism on infra-marginal rents from electricity producers. This would bring in 1.6 billion euros in 2022 and 3.5 billion in 2023. These lower SPE charges and the

levy on infra-marginal rents would thus reduce the budgetary cost to the state by 49.4 billion euros (1.8 points of GDP).

Table 1 Fiscal measures implemented to mitigate the impact of the energy price shock

	2021		2022		2023		Total 2021-2023	
	Billion euros	% of GDP	Billion euros	% of GDP	Billion euros	% of GDP	Billion euros	% of GDP
<b>Price measures</b>	<b>0.4</b>	<b>0.0</b>	<b>32.8</b>	<b>1.2</b>	<b>27.0</b>	<b>1.0</b>	<b>60.2</b>	<b>2.2</b>
Gas (tariff shield)	0.4		6.7	0.3	2.3	0.1	9.4	0.4
Electricity (tariff shield)			11.2	0.4	15.9	0.6	27.1	1.0
Reduction of TICFE* (tariff shield)	0.0	0.0	7.0	0.3	8.8	0.3	15.8	0.6
Fuel prices (discount per litre)			7.9	0.3			7.9	0.3
<b>Measures to support households</b>	<b>4.3</b>	<b>0.2</b>	<b>1.6</b>	<b>0.1</b>	<b>1.6</b>	<b>0.1</b>	<b>7.5</b>	<b>0.3</b>
Inflation allowance	3.8	0.1					3.8	0.1
One-off energy cheque and fuel oil assistance	0.5	0.0	1.2	0.0			1.7	0.1
Revaluation of <i>Forfait kilométrique**</i> and Fuel allowance			0.4	0.0	1.6	0.1	2.0	0.1
<b>Measures to support companies</b>			<b>1.4</b>	<b>0.1</b>	<b>6.1</b>	<b>0.2</b>	<b>7.5</b>	<b>0.3</b>
<b>Total gross cost</b>	<b>4.7</b>	<b>0.2</b>	<b>35.8</b>	<b>1.4</b>	<b>34.7</b>	<b>1.2</b>	<b>75.2</b>	<b>2.8</b>
Lower SPE expenditure and treatment in revenue if gains of SPE*** charges	-1.9	-0.1	-10.1	-0.4	-8.6	-0.3	-20.6	-0.8
Mechanism levied on infra-marginal rents from electricity producers	-0.1	0.0	-1.6	-0.1	-3.5	-0.1	-5.2	-0.2
<b>Total net cost</b>	<b>2.7</b>	<b>0.1</b>	<b>24.1</b>	<b>0.9</b>	<b>22.6</b>	<b>0.8</b>	<b>49.4</b>	<b>1.8</b>

Note: \* Taxe intérieure sur la consommation finale d'électricité (domestic tax on the final consumption of electricity) \*\* Professional costs entailed by the use of vehicles that households may deduct from their pre-tax incomes \*\*\* Service public de l'Énergie.

Sources: Fiscal documents; Projet de loi de finances 2024; OFCE's forecast.

The other measures taken by the government to support household purchasing power included, at the end of 2021, the indemnité inflation (inflation allowance) which was a one-off energy refund of 100 euros allocated to 38 million people for a global amount of 3.8 billion euros. On top of that, one-off payments (chèque énergie exceptionnel and aide au fioul) added a total of 0.5 billion euros in 2021 and 2.2 billion in 2022 (0.1% of GDP). The amount of the chèque énergie exceptionnel is 100 to 200 euros, depending on household income and composition; its payment is planned from the end of 2022 and 12 million households will benefit from it. Furthermore, there is also a rise of 10% in the forfait kilométrique (the professional costs entailed by the use of vehicles that households may deduct from their pre-tax incomes) and a fuel allowance of 100 euros for the 10 million lowest income workers in 2023.

Last, the tariff shield also applies to very small enterprises (fewer than 10 employees). Sectoral aid measures for businesses were provided in 2022. For other companies, state aid is available in two ways up to an amount of 1.4 billion euros in 2022 (0.1% of GDP) and 6.1 billion euros in 2023 (0.2% of GDP). The first ensures an immediate reduction in electricity bills for small and medium firms (those that do not already benefit from

regulated electricity sales tariffs). The other form of support will be paid in the form of aid to large and medium-sized companies in difficulty because of energy prices which must be requested from state services.

The total gross cost of these measures to limit the impact of the energy shock on households and firms amounts to more than 75 billion euros (2.8% of GDP)<sup>1</sup> between the end of 2021 and the end of 2023. Of this 75 billion, more than 80% can be regarded as non-targeted (price measures) while less than 20% is targeted (the one-off household support to lower income groups and measures to support companies under certain conditions).

### 3.2 Macroeconomic effects

From a macroeconomic point of view, the measures taken by the government have been effective in countering inflation in several respects: above all, limiting the rise in energy prices reduces the contribution of the energy component of inflation. According to our estimates, the tariff shield and the fuel price discount directly, i.e. excluding indirect and second-round effects, cut the CPI by 2.4 percentage points in 2022 and by 2.0 points in 2023 (Figure 4).

Section 4 analyses the redistributive impact of the energy shock on the household standard of living and the main budgetary measures put in place to deal with it (the tariff shield and the fuel subsidy).

By reducing inflation, the expected second-round effects regarding wages and social benefits are limited. Lower inflation will mechanically contain the risk of an inflationary spiral because automatic increases will be lower (regarding the minimum wage, rents, benefits, etc.), as will negotiated increases since wages have to increase less to compensate for inflation.

The tariff shield, a French singularity in 2022, is the main explanation for the inflation gap, amounting to 2.5 points, between France and the euro area in 2022 with France then having the lowest inflation in the European Union.

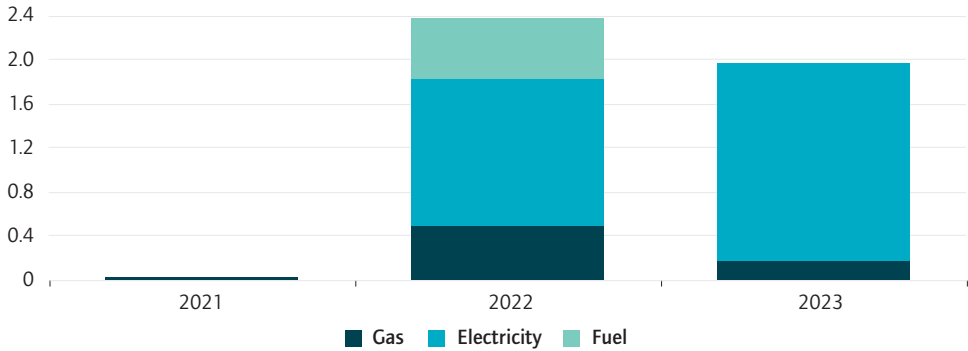
According to our assessment, the energy shock arising from the large increases in energy prices is, by itself, estimated to reduce French GDP by 1.5 percentage points in 2022 and by 2.2 points in 2023, but the fiscal measures introduced to tackle the energy crisis soften the shock by 1.0 of GDP in 2022 and 1.1 points in 2023 (Figure 5). The whole impact of the shock on French GDP, accounting for fiscal measures and also from the investment measures targeted at accelerating the green transition and reducing fossil fuel consumption, would amount to -0.5% in 2022 and -1.1% in 2023.

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1. As we have specified above, the net cost is substantially lower (1.6% of GDP).

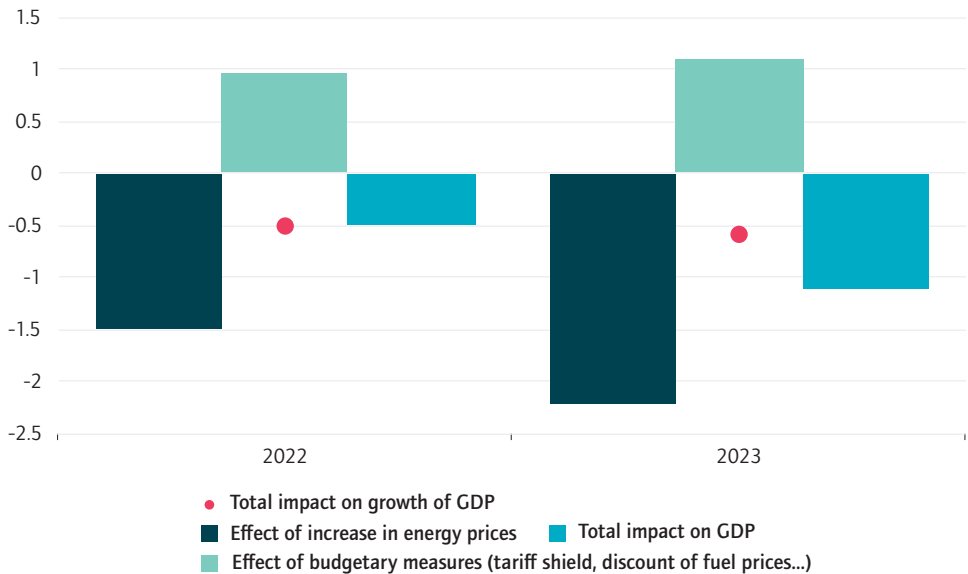


Figure 4 Contribution of the tariff shield and the fuel price subsidy to the cut in CPI (in % points of CPI)



Source: INSEE; Projet de loi de finances 2023; Rapport public annuel 2023 de la Cour des comptes; OFCE forecasts.

Figure 5 Impact of the energy shock on French GDP (in % of GDP)



Source: INSEE; Projet de loi de finances 2023; Rapport public annuel 2023 de la Cour des comptes; OFCE forecasts.

#### 4. Impact of the energy shock and the budgetary measures on living standards

According to L'institut national de la statistique et des études économiques (INSEE; National Institute of Statistics and Economic Studies), CPI in France increased by 5.2% in 2022. This is largely due to the acceleration in energy prices (+23.1%). The actual impact of this shock on the purchasing power of households depends to a large extent on the weight of energy expenditures in the consumption basket. Thanks to the

2017 Family Budget Survey we can assess the impact of the energy shock according to households' position on the living standards scale.

In order to assess the impact on household purchasing power of measures such as the tariff shield and the fuel price discount, it is necessary to produce a counterfactual scenario of the prices that would have prevailed in the absence of these policies. By definition, the construction of such a scenario is based on assumptions (Box 1).

In our assessment, in the absence of these public measures, the immediate loss of purchasing power – excluding behavioural effects – would have been in the order of 1310 euros per household in 2022 (5.2% of the household standard of living in metropolitan France). By quintile, the shock would have been particularly sizable for the 20% least well-off households (-8.6%), but it would have been significant all along the scale of living standards (Table 2).

Table 2 **Assessment of the energy shock and the effects of public measures by standard of living quintile**

Quintile	Euros					% of standard of living		
	Total shock to prices	Tariff shield on electricity	Tariff shield on gas	Fuel price subsidy	Net impact	Total shock prices	Total budgetary measures effect	Net impact
1	-980	330	180	70	-400	-8.6	5.1	-3.5
2	-1120	340	210	90	-470	-6.3	3.6	-2.7
3	-1250	380	210	120	-550	-5.6	3.1	-2.4
4	-1400	420	240	130	-610	-4.9	2.8	-2.2
5	-1750	470	380	140	-760	-3.9	2.2	-1.7
Overall	-1310	390	250	110	-560	-5.2	2.9	-2.2

Source: Authors' calculations based on the 2017 Family Budget Survey.

The public measures have thus significantly mitigated the impact of the shock. Without taking into account endogenous changes in the consumption basket, which depend on substitutability between energy products, the average loss of purchasing power per household directly linked to the increase in the price of energy products would be 560 euros (2.2 points of the living standard). As a percentage of the standard of living, the effect of the measures is 5.1% for the first quintile and up to 2.2% for the wealthiest households. The measures have therefore made it possible to limit the ultimate cost of the energy crisis to 3.5% of the standard of living in the first quintile and to 1.7% in the wealthiest quintile. They have absorbed, on average, 56% of the impact of the energy shock on households. The share of the shock they have absorbed is relatively close among income groups. Consumption patterns of energy are more heterogeneous within income groups than between them. This may explain the attraction of implementing non-targeted measures in response to a sudden energy price shock.

This assessment neglects some factors. Endogenous changes in consumer behaviour are not taken into account. In addition, some household incomes may be indexed due to specific rules (the minimum wage) or discretionary decisions (acceleration of

the pension revaluation schedule). More broadly, primary incomes themselves may react endogenously (in terms of the acceleration of wage negotiations). Since all these effects are not considered, the figures shown in Table 2 constitute an upper boundary regarding the effects of the energy crisis (and of the policy measures) on household living standards.

### Box 1 Methodology

L'Enquête Budget des Familles (Family Budget Survey; BDF) aims to reconstruct the entire set of household accounts: the annual expenditures and incomes of households residing in France (both metropolitan and overseas). The survey asks for information on expenditures based on approximately 900 budgetary items compatible with the nomenclature of the national accounts and the CPI. For income, BDF builds on administrative data.

Since the Survey was last carried out in 2017, we adjust the budgetary coefficients for each household using 2021 national accounts data at macro level to account for the important behavioural changes that followed the Covid-19 crisis. With household-level data we can measure the exposure of households to different price shocks (gas, electricity, fuel).

It is important to notice that our analysis neglects two factors. On the one hand, there is the change in sociodemographic composition that may have occurred between 2017 and 2021 (changes in employment, ageing of the population, etc.); on the other, we do not integrate the behavioural effects observed between 2021 and 2022 linked in particular with the relative price changes that have taken place since 2021.

In addition, in order to evaluate the impact of the programmes it is necessary to produce a counterfactual scenario of the prices that would have prevailed in the absence of these measures. The construction of such a scenario relies by definition on some assumptions.

To construct a counterfactual scenario for gas and electricity, we use the series of regulated tariffs (RT) excluding the tariff shield published regularly by the Commission de Régulation de l'Énergie (CRE; French Energy Regulatory Commission) for 2022. According to the CRE, the gas RT should have been 1.9 times higher under the standard rules while the electricity RT should have been multiplied by 1.4. We assume that 45% of households would have benefited from the lesser increase in gas prices and nearly 70% in respect of electricity prices. This figure includes households subject to the RT and those with market offers indexed to the RT. We assume that the market price would not have been affected by the tariff shield, which implies a strong segmentation of markets. According to these assumptions, the CPI for gas would have risen by 89% (instead of the 41% observed) while the CPI for electricity would have risen by 49% (instead of the 7% observed). The calculations for electricity CPI include the impact of the reduction in the Taxe Intérieure sur la Consommation Finale d'Electricité (TICFE).

For fuel prices we use data on the average price at the pump of SP98, SP95 and diesel before constructing a synthetic price according to the shares of each in household consumption. We then estimate a statistical model linking this synthetic price to the fuel CPI. On this basis we can construct a synthetic price without the state rebate (with a unit pass-through). According to our calculations, the fuel CPI should have increased by 31% instead of the 23% actually observed.

## **5. Aligning social and climate objectives when dealing with the effects of the energy price crisis**

In accordance with its European commitments, French governments have developed plans to apply for NextGenerationEU grants and to fulfil the objectives of the European Green Deal. After briefly sketching these, we question their overall consistency with the policies implemented to limit inflation.

### 5.1 The French National Recovery and Resilience Plan (NRRP) of April 2021

France decided to use its full grant allocation from the Recovery and Resilience Facility (a total of 39.4 billion euros over six years, or 0.27% of 2021 GDP on an annual basis) for 20 reforms and 71 investments dedicated to climate-related objectives and the digital transition. Some 46% of the funds will support the former objectives while 21% will foster the latter. France decided not to apply for loans.

In terms of climate-related objectives, the NRRP focuses on building renovation (5.8 billion euros) and sustainable transport (4.4 billion euros for the modernisation of the railway network). It also features significant investments in R&D and innovation in the field of green technologies such as hydrogen (1.9 billion euros for low-carbon hydrogen). The decarbonisation of industrial processes is allocated 0.3 billion euros.

Looking at digital objectives with a possible impact on the environment, 240 million euros will be invested in high-speed broadband across the territory, aiming to provide access to very high-speed networks for all households by 2025. Among other things, it will facilitate teleworking and thus limit commuting.

In addition, the Climate and Resilience Law (August 2021) aims at fostering behavioural changes to achieve the objectives of the Paris Agreement and those of the European Green Deal. It targets consumer habits via, for example, more education on sustainability; production via, for example, the greening of public procurement; and mobility by, for example, ending the sale by 1 January 2030 of new passenger cars emitting more than 123 grams of carbon dioxide per kilometre according to the WLTP (Worldwide Harmonised Light Vehicle Test Procedure) standard, as defined in Commission Regulation (EU) 2017/1151.

### 5.2 The Integrated National Energy and Climate Plan (NECP) for France of March 2020: an update

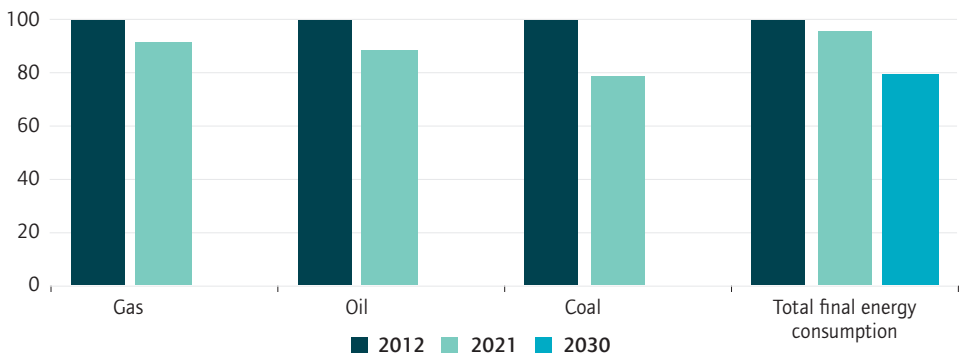
The NECP for France consists of two plans adopted by France: first, the Multiannual Energy Plan (MEP) that establishes the priorities for government action in the field of energy for the next 10 years; and, second, the National Low-Carbon Strategy which is France's roadmap for climate change mitigation. While both have much in common, the MEP restricts its scope to metropolitan France while the latter strategy also covers the overseas departments. In the following, we concentrate on metropolitan France.

The NECP includes many objectives (the share of renewable energy, greenhouse gas emissions, etc.), but we focus on only two: those in which recent policies aiming to dampen inflation may have had an impact. The NECP sets targets for final energy consumption and primary fossil fuel consumption for 2030. With reference to 2012, the former should decline by 20% while the latter should decline by 40%.

Before commenting on recent trends in French achievements in these two respects, it is worth acknowledging that the NECP rests on dated assumptions on commodity prices. Drawing on the EU 2016 reference scenario, elaborated by the European Commission in 2017, the NECP assumes that the yearly rate of increase in the prices of Brent oil, coal and gas will be 4.6, 3.9 and 2.6% respectively between 2015 and 2030. Similar variations in market prices between the end of 2015 and the latest available data for 2023 ranges between 12 and 13% for oil, coal and gas. This actual rise in commodity prices may outperform the NECP scenario unless there is a very substantial slowdown in oil, coal and gas prices (keeping in mind that the provisional data for 2023 are well below the peaks of 2022); or, otherwise, massive changes in behaviour (lower price elasticities) occur. This may be reflected in an acceleration of the positive outcomes of the NECP in 2022, but full data are not yet available.

Drawing on the data that are available, the achievements of the NECP have been quite positive so far. The reliance on coal for final energy consumption (Figure 6) has already declined by 20% since 2012 (last available year: 2021). Meanwhile, the reliance on gas has only declined by 8% although reliance on oil has improved a bit more. Taking all energy into account, and thus including electricity consumption, it appears that France remains quite far from its 2030 objective. Between 2012 and 2021, the annual decline in final energy consumption has been 0.5% when one of 0.8% up to 2030 is necessary to achieve the objective.

Figure 6 Change in final energy consumption following implementation of the MEP (base year: 2012)

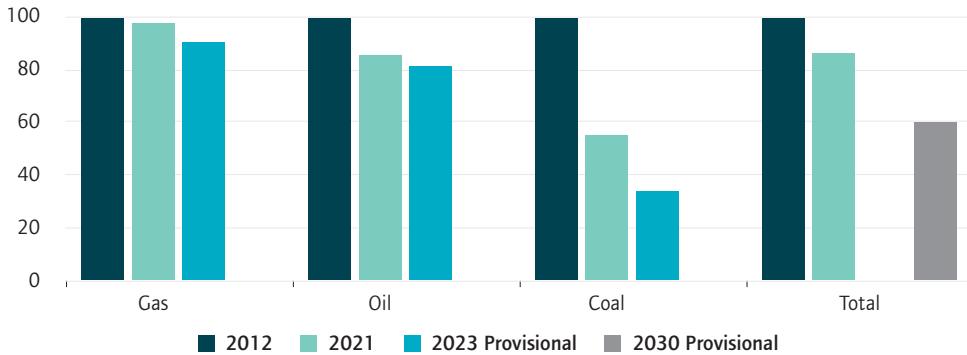


Source: Bilan énergétique 2021 for 2012 & 2021; and Programmation pluriannuelle de l'énergie (MEP) for the objective of 2030.

In terms of the primary consumption of fossil fuels, the objective of the French government is quite stringent and the results so far have been positive, although certainly insufficient. While the strategy does not clearly identify separate objectives

for gas, oil and coal, one-third of the path towards a reduction of 40% by 2030 has already been fulfilled, mostly thanks to coal and oil whose reliance in terms of primary consumption has significantly declined (Figure 7). That being said, the decline in primary consumption of fossil fuels to match the 2030 objective will have to accelerate. Between 2012 and 2021, the annual decline in primary energy consumption was 1.7% when one of 2.8% until 2030 is necessary to achieve the objective.

Figure 7 Change in the primary consumption of fossil fuels following implementation of the MEP (base year: 2012)



Source: Bilan énergétique 2021 for 2012 & 2021; and Programmation pluriannuelle de l'énergie (MEP) for the forecast of 2023 and the objective of 2030.

### 5.3 Have the recent measures implemented to curb inflation had an impact on the energy transition?

As the above sections have shown, measures implemented by the government to limit inflation have consisted in the main of a tariff shield on electricity and gas and a per-litre subsidy on the fuel price at the pumps.

With regards to the climate objectives set out in the NRRP and NECP, these policy measures raise a few comments.

First, they have been intended to attenuate the impact of rising energy prices on the purchasing power of households. We may then argue that they have helped the price of oil and gas stay as close as possible to the assumed trajectories of their prices in the energy consumption reduction forecasts of the NECP, at given price elasticities. In this respect, they have made these trajectories more credible in a period of accelerating and volatile energy prices.

Yet, and second, the government has reduced the price signal that a more massive rise in energy prices for households and firms would have generated. By reducing the price signal, the French government has prevented the outperformance of the NECP targets in energy efficiency. Indeed, one would have expected a greater change in energy consumption behaviour if energy prices had surged to higher levels. According

to Labandeira et al. (2017), the average price elasticity of demand for energy is -0.18 for natural gas and -0.29 for petrol in the short run. In the long run, they become -0.68 and -0.77 respectively. In limiting the price signal of the recent energy crisis, the government has given its preference to a more social objective (limiting losses of purchasing power) at the expense of the acceleration of the reduction in energy consumption that will be required to cope with the climate objectives. Overall, the cost of this choice in terms of the achievement of climate objectives depends on the value of the price elasticity of demand. It is worth acknowledging that the distribution of short-run price elasticities in the meta-analysis by Labandeira et al. (2017) reveals much heterogeneity (see Geerolf 2023) so that the average data should not be overstated.

The question remains as to whether the limitation of the price signal has definitely fulfilled a social objective. One might object that the policy decisions to curb inflation in France have not sufficiently distinguished between low-income and high-income earners. Table 2 above shows that they have had a higher impact on the first than on the fifth quintile of the income distribution, but the net effect of the inflation surge in terms of the standard of living has been greatest in the first quintile and the lowest in the fifth after the policies have been implemented. Despite these policies, inflation has had redistributive effects but the inflationary shock has more heterogeneous redistributive effects within the deciles themselves than between them. We may argue that the French government could have conditioned its policies by taking greater account of household income, but income cannot be the only criterion. Other criteria, such as the localisation of residence and the form of energy used, the mode of transport, distance to work and family structure are also important ones in targeting. Furthermore, from an operational point of view, multi-criteria targeting was technically difficult to set up quickly. However, there is clearly a lack, in return for the protection of the shield, of strong incentives to reduce energy consumption.

Last, the application of the Climate and Resilience Law (August 2021), that should trigger greater sobriety in the use of energy, could have been eased by more targeted policies towards inflation. As a recent OFCE study has shown (Madec et al. 2023), the inflation surge has had redistributive effects on households, not so much regarding standards of living as across ages (inflation has hurt the elderly more) and across residential location (inflation has hurt those living in rural areas more). Policy decisions linked to the price shield could have been made conditional, at least partly, on efforts to reduce fossil fuel consumption.

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