Chapter 4
Transition pains: how well have social and climate objectives been aligned in Greek counter-inflation policies during the energy crisis?

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1. Introduction

Have the measures that the Greek government has been taking to alleviate the energy price shock managed to align climate and social objectives effectively? Greece is an interesting case to study with regards to this question. Like other EU Member States, it has to navigate a challenging transition to a climate neutral socioeconomic model. More than other EU Member States, however, Greece demonstrates significant social vulnerabilities including low employment/high unemployment rates, especially among the young, a high risk of poverty rate and, especially, energy poverty, and a weak social safety net. The recent inflationary episode and the challenges it has created for real incomes have been the third major economic shock that the country and its population have undergone since 2010, following the public debt crisis and the Covid-19 pandemic. The economy might have just recovered from the pandemic crisis, though the public debt crisis has deeply scarred the economy, as it has shrunk by an extent unseen during peacetime while net investment has been negative for several years.

Greece's inflation rose more than the euro area average during the energy crisis. In some estimations (Sgaravatti et al. 2023), its government was one of the most active in terms of spending on measures to alleviate the impact of high prices on consumers and businesses (as a share of GDP). Given the importance of the energy sector in the competitiveness of an economy and the fragile social and economic state of Greece, an alignment between climate and social objectives would be even more necessary for navigating the climate transition without 'leaving anyone behind'.

In order to address the question asked at the beginning of this Introduction, in Section 2 we provide the policy context within which the energy crisis has been manifested. We then examine in Section 3 the evolution of inflation in Greece and its deviation from the euro area and draw some links to the policy context. Section 4 looks into the measures that the Greek government has taken from September 2021 to date to alleviate the impact of energy inflation on consumers in the short and medium run. Finally, in Section 5 we assess whether these measures have been achieving their social objectives and aligning climate and social objectives.

1. The authors would like to thank Vlassis Missos for his valuable comments. The usual disclaimer applies.

2. The policy context in which Greece entered the energy crisis: climate objectives and prioritised policy actions in its first National Energy and Climate Plan

Greece spelled out its climate and energy transition objectives for 2030 in its first National Energy and Climate Plan (NECP), the final version of which was submitted to the European Commission in December 2019. The obligation to submit an NECP was established as part of the governance system included in the Clean Energy for All legislative package, itself a step in the implementation of the EU Energy Union; that is, the EU's plan to transform the EU energy model. The EU Energy Union strategy set out energy and climate targets for the EU to be met by 2030 along five dimensions while the NECPs defined Member States' strategies and policy priorities for 2021-2030 to contribute to meeting these targets.[2]

The objectives of the 2019 Greek NECP were to reduce greenhouse gas (GHG) emissions by 42% compared to 1990 (and by 56% compared to 2005); to increase the penetration of renewable energy sources (RES) in gross final energy consumption to at least 35% and at least 60% in gross final electricity consumption; to improve energy efficiency so that final energy consumption is lower than that recorded in 2017 and to achieve a 38% qualitative improvement in energy efficiency in final energy consumption; and to phase out completely the use of lignite in power generation by 2028.

The adoption of the European Green Deal scaled up the ambition of EU climate action in line with the Paris Agreement and the UN's Sustainable Development Goals, with objectives being enshrined in the Climate Law and further operationalised in the 'Fit for 55' legislative package. The multiannual financial framework, coupled with the NextGenerationEU pillar, provides EU financing (and conditionality) towards these objectives. The war in Ukraine has forced the EU and Member States to revise their plans further and devise the RePowerEU plan with a view to achieving energy security by 2030. At the time of writing, Greece had not yet submitted its revised NECP.

The policy priorities of the Greek NECP submitted in 2019 were structured around the dimensions of the EU Energy Union.[3] Several of these framed the context within which Greece entered the energy crisis triggered by the war in Ukraine, most notably, priorities related to the dimensions of the decarbonisation of the economy and the creation of a fully integrated EU internal energy market.

A cornerstone in the pursuit of decarbonisation in the NECP context has been the phasing out of the use of lignite. In October 2019, the Greek government announced that all lignite-fired electricity production stations that operated in Greek territory would shut down and the fuel would stop being extracted and used by 2028. By that

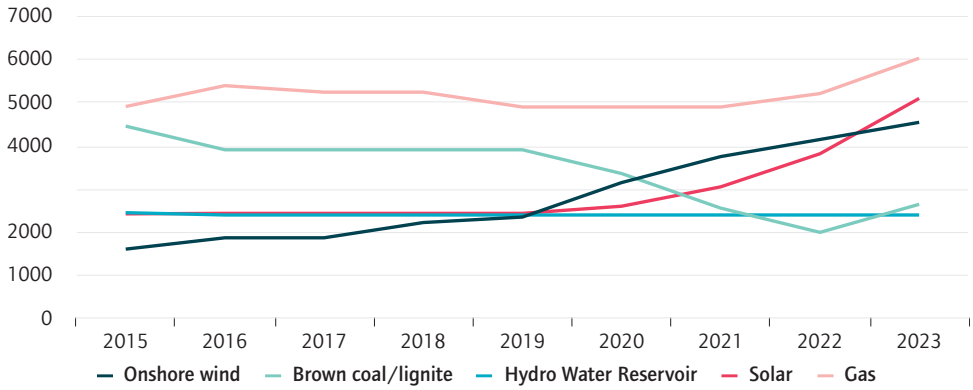
2. For more information on the EU Energy Union, please see here: https://energy.ec.europa.eu/topics/energy-strategy/energy-union_en

3. The dimensions are: (energy) security, solidarity and trust; a fully integrated EU internal energy market; energy efficiency; climate action and the decarbonisation of the economy; and research, innovation and competitiveness. The Greek NECP also mentions 'agriculture, transport and tourism' as 'new areas of interest' among the Energy Union dimensions (Hellenic Republic-Ministry of the Environment and Energy 2019: 27).

time, the share of gross domestic energy consumption accounted for by lignite had more than halved compared to 2000 (33% vs. 15%) due to the increasing cost of CO_2 emissions.

Nonetheless, the energy crisis has set back, at least temporarily, the transition plan to zero lignite production. As reported in Figure 1, the installed capacity of lignite is expected to rise in 2023 above the level of 2021, as the Greek government decided to postpone the retirement of its lignite-fired generation plants in an attempt to maintain energy security for production and consumption purposes at more affordable prices.

Figure 1 **Installed capacity per production type in MW**



Note: Installed capacity per production type shows the sum of installed net generation capacity (in MW) for all existing production units equalling or exceeding 1MW. The information is published annually no later than one week before the end of the year, effectively referring to the generation capacity installed as at 1 January of the following year. Values for 2023 are estimates based on the Greek government's plan.
Source: ENTSO-e.

Despite aiming at the increased penetration of RES for decarbonising electricity generation and in the heating, cooling and transport sectors, the Greek NECP of 2019, in line with European policy, also promoted natural gas as an intermediate fuel for reducing the carbon footprint of the energy system and more generally for switching to a low GHG emissions model in all final consumption sectors (see also Figure 1) (Hellenic Republic-Ministry of the Environment and Energy 2019: 69). The International Energy Agency, commenting on the revised draft Greek NECP, stated that Greece is still 'over-reliant' on natural gas as a transition fuel (Aposporis 2023). Thus, until the war in Ukraine, the dependence of Greece on natural gas had been increasing, with natural gas accounting for 40% of electricity generation in Greece. Overall, in 2021 the share of fossil fuels in general in electricity generation was 59.4%, the sixth highest in the EU.

The original Greek NECP also spelled out the policy priorities and actions seeking to integrate the Greek electricity market into the evolving EU internal energy market. The domestic electricity and gas markets were reorganised to comply with European directives and regulations so as to set up the so-called 'target model' in the wholesale Greek energy market. Key requirements to that end have been the coupling of the Greek electricity market with the neighbouring (Italian and Bulgarian) electricity

markets and reinforcing competition in the domestic market. The integration of the domestic electricity and gas markets in the wider EU was one of the 'prerequisites' for attaining the climate and energy objectives of the Greek NECP, while at the same time improving the competitiveness of the Greek economy (Hellenic Republic-Ministry of the Environment and Energy 2019: 193).

Given the central role of NECPs in implementing the Energy Union, the expected benefits of energy market integration also reflect the market-dominated approach of the EU towards changing its energy model, the origins of which date back to the 1990s. This approach has been criticised in the past for prioritising the creation of the internal energy market over climate objectives (Keay 2013) and for not being fit for purpose and aligned with Member State practices for the promotion of clean technologies (Roques 2020). Interestingly, the priority and related actions for tackling energy poverty – a particularly acute problem in Greece as, in 2020, it had the third worst performance in the EU on the set of indicators used to track it (Manalis and Matsaganis 2022) – are mentioned in the NECP under the dimension of the internal energy market as complementary measures to address the adverse distributional outcomes of market integration (Hellenic Republic-Ministry of the Environment and Energy 2019).

The target model consists of four interconnected energy markets. In the forward energy market, participants either trade in the context of an 'energy exchange' in long-term (from more or less four years ahead of delivery) standardised contracts or bilaterally in 'off the counter' customised deals. This market gives participants the opportunity to hedge against the unpredictability of electricity prices, itself the outcome of a host of known factors which nevertheless cause volatility in prices (Ioannidis et al. 2021). Wholesale or spot markets, including the day-ahead market (DAM) and the intraday market (IDM), in which supply and demand for energy closer to the delivery date are matched (compared to the forwards market), set the market clearing price. Producers of electricity provide bids to the system operator stating the quantity they would supply and the price at which they would offer it. The system operator accepts bids to match forecasted demand, including from long-term contracts and any net exports/imports of electricity, and pays them the so-called marginal price. The IDM allows for the adjustment of energy quantities on the day of the delivery between sellers and buyers, while the balancing market ensures the correction of any imbalances in supply and demand in real-time.[4] While all sub-markets affect the energy price, the day-ahead market is the most important in terms of its role in setting the market clearing price (Florence School of Regulation 2020).

In the case of Greece, the early stages of establishing the target model from November 2020 onwards in the wholesale energy market have been associated with elevated electricity prices (see Figures 2-4 in Section 3 for the evolution of the contribution of energy to headline inflation), a development that has been contrary to the expected benefits of market integration. A combination of reasons could explain this.

4. For a full description of the structure and the operation of the target model see Makrygiorgou et al. (2023) and Ioannidis et al. (2021).

Liquidity in the forward market of the target model remained limited, thus making the wholesale day-ahead market vulnerable to factors that can create price volatility, as way too much of the electricity supply was being traded there. Indeed, in June 2021, very high temperatures led to higher than usual demand, pushing up prices. The rising price of natural gas even before the war in Ukraine was another such factor, as in 2021 natural gas accounted for 38% of the generation of electricity traded in the day-ahead market. Moreover, liquidity in the intra-day market also remained relatively limited due to its coupling with non-EU neighbouring countries, the incomplete regulatory framework for RES and the participation of consumers in the market (Makrygiorgou et al. 2023). Higher quantities of energy traded in the IDM would have allowed more scope for market participants to correct their positions in response to changes in demand or supply closer to the delivery time before the adjustment of supply had to take place in the balancing market.

The balancing market is where the greater dysfunction has been manifested, as prices, especially for energy (as opposed to capacity) balancing, have been much higher than in the previous market arrangement and as large deviations have been observed between the quantities of planned supply and actual demand needed to keep the system in balance. This has been due partly to the aforementioned shortcomings in the functioning of the other markets of the target model as operated in Greece and partly to some structural problems with the network (notably, in the Peloponnese). Partly also, however, it has been due to the abusive behaviours of gas-using electricity producers with oligopolistic power in the wholesale market who have exploited the structure of the target model and the liberalisation of prices to achieve much higher profits by supplying high energy quantities in the balancing market (Ioannidis et al. 2021).

While these seem to be problems that could be remedied as the implementation of the target model matured in Greece, with increased liquidity in the forward and intra-day markets as reliance on natural gas waned and market competition increased, they did shape the context within which the country entered the European/global energy crisis. Energy prices started rising in spring 2021 and were already increasing the problem load for public policymakers prior to the energy crisis caused by the war in Ukraine.

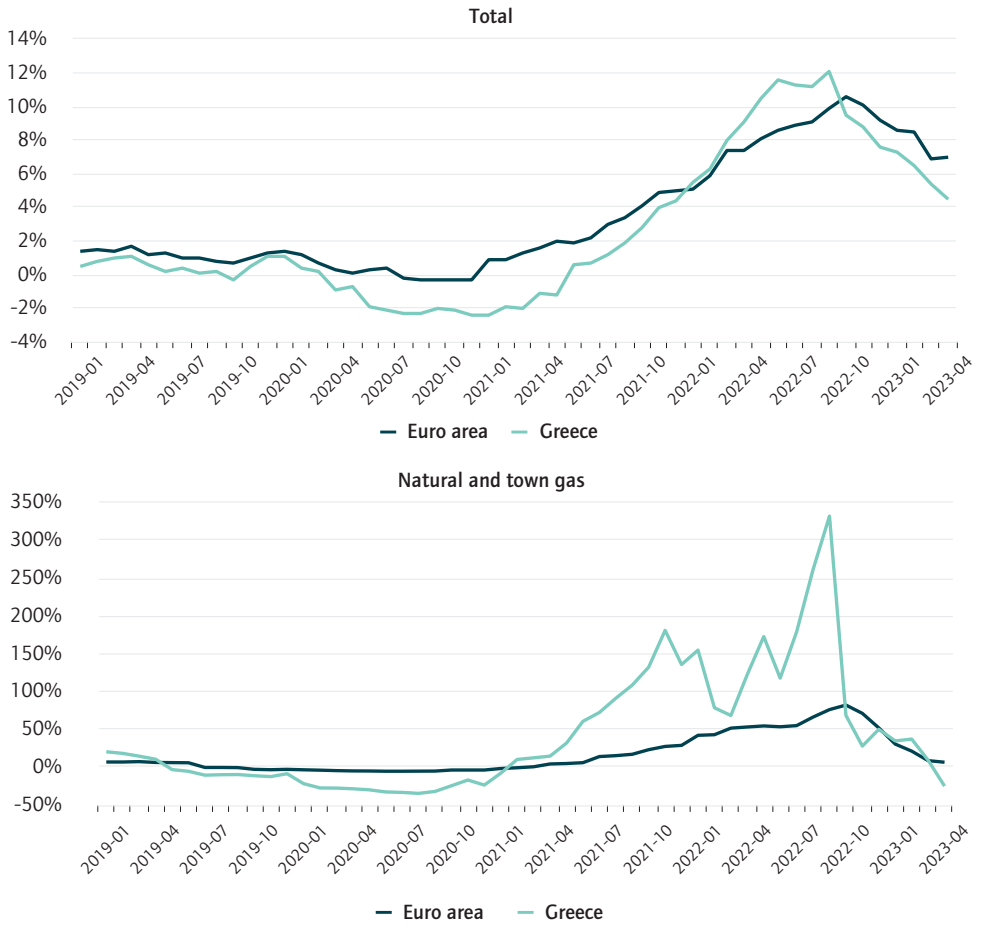
3. Inflation developments in Greece since 2019

Between May 2021 and September 2022 the overall Harmonised Index of Consumer Prices (HICP) in Greece increased sharply (see Figure 2) at a much higher rate than in the euro area, peaking at 12.1% year-on-year. Subsequently, after a sudden drop of headline inflation in Greece in October 2022, both rates moved in parallel, following a downward trend. Similar to the rest of the EU, the higher pace of inflation in Greece, up until September 2022, has been attributed to the rise of the associated indices of electricity and gas. In particular, the Electricity HICP presented much greater volatility compared to the overall HICP: in April 2022 it stood at an annual 88.8% whereas in the euro area the respective rate was 31.9%. In the following six months, electricity inflation dropped immensely, while energy prices started to fall in November 2022.

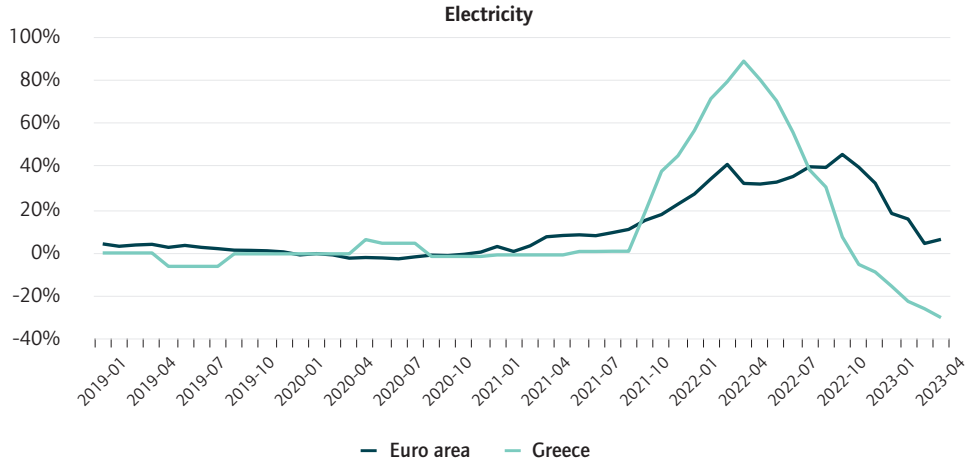
A prominent explanation of this wide variation in electricity prices is the respective variation in the price of gas which, as mentioned, holds a large share in electricity production. This high dependence of Greece on imported energy has further aggravated the impact of higher gas prices on electricity prices.[5] The annual rate of change in the Natural and Town Gas HICP more than doubled in 2022, peaking at 332% in September that year. For comparison, the respective rate in the euro area reached 81.8% at its peak in October. Subsequently, both rates dropped significantly and they have since moved in line with each other.

Overall, between May 2021 and October 2022 energy prices in Greece diverged strongly from the euro area average while, afterwards, prices either converged again or followed the same trend. The roots of this excessive volatility can be traced to the functioning of the target model mentioned previously.

Figure 2 **Harmonised Index of Consumer Prices and respective indices for electricity and gas in Greece and in the euro area (% annual change, January 2019 – March 2023)**



5. According to Eurostat data, in 2021 Greece registered the fifth highest import dependency in the EU.



Source: Eurostat.

Indeed, the performance of the DAM in Greece has been highly inflationary. According to the Greek Regulatory Agency for Energy (RAE), in the first quarter of 2023 the median DAM price in the EU was 137.32 euros/MWh (in Belgium) and a minimum 76.41 euros/MWh (in Sweden). The DAM price in Greece was the highest across the EU, being equal to 171.93 euros/MWh, despite the overall trend of falling energy inflation. Additionally, Ioannidis et al. (2021) mention that DAM prices were increasing in Greece several months before the outbreak of the energy crisis and the war in Ukraine.

According to ACER-CEER (2022), the pivotal factor in explaining the negative performance of the Greek energy market in terms of prices is the high concentration in the energy sector which has resulted in excessively high mark-ups. In 2021, the mark-up in the Greek gas market was the second highest in the EU, with a significant pass-through to electricity and, in turn, to other sectors of the economy. As noted in the Vaasa-ETT report (Vaasa-ETT 2022), wholesale gas prices in Greece have a very strong and fast impact on the retail energy component compared to elsewhere in the EU or to past performance.

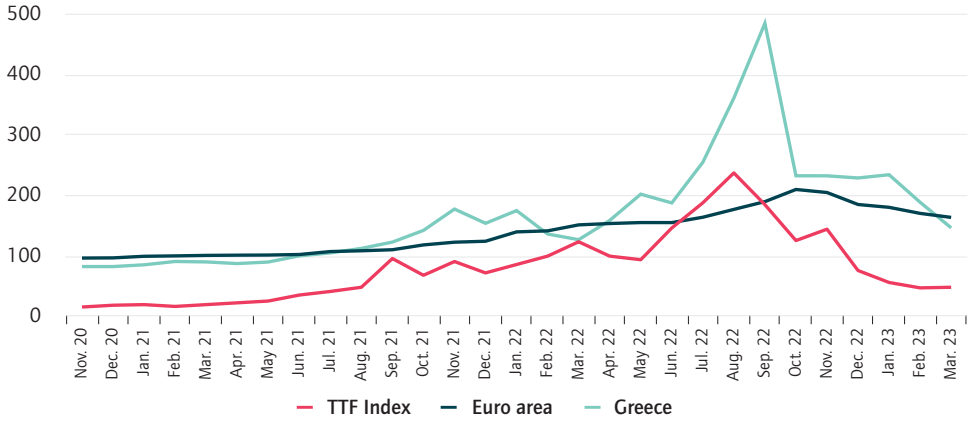
This is also evident in Figure 3 which presents the evolution of the Dutch Title Transfer Facility (TTF) Index and the Gas HICP in the euro area and in Greece.[6] The trend in the Greek Index closely followed that of the TFF, but overshot it at the height of the energy crisis in September 2022. On the contrary, the euro area Index followed a much smoother course.

The announcement in mid-September 2022 of the European Commission emergency intervention, which included among other measures, a cap on the marginal costs of electricity production, brought down the gas price ahead of its actual implementation in December 2022. Overall, the liberalisation of the Greek energy market, its high concentration and its shallowness (Ioannidis et al. 2021) resulted in an immense

6. It is noteworthy that the TFF currently serves as the reference point for continental Europe's gas market.

rise in energy prices which came utterly to an end after the European Commission's intervention. Another contributing factor to the improved outlook is the rising share of RES in the energy mix. According to ADMIE (the Independent Power Transmission Operator), by the end of 2022, the share of renewables in the energy mix was for the first time the highest among all types of energy inputs (38.9% while the share of natural gas, the second highest, was equal to 35.4%).

Figure 3 **Dutch Title Transfer Facility Index (euros/MWh) and Gas HICP in the euro area and Greece (2015=100)**

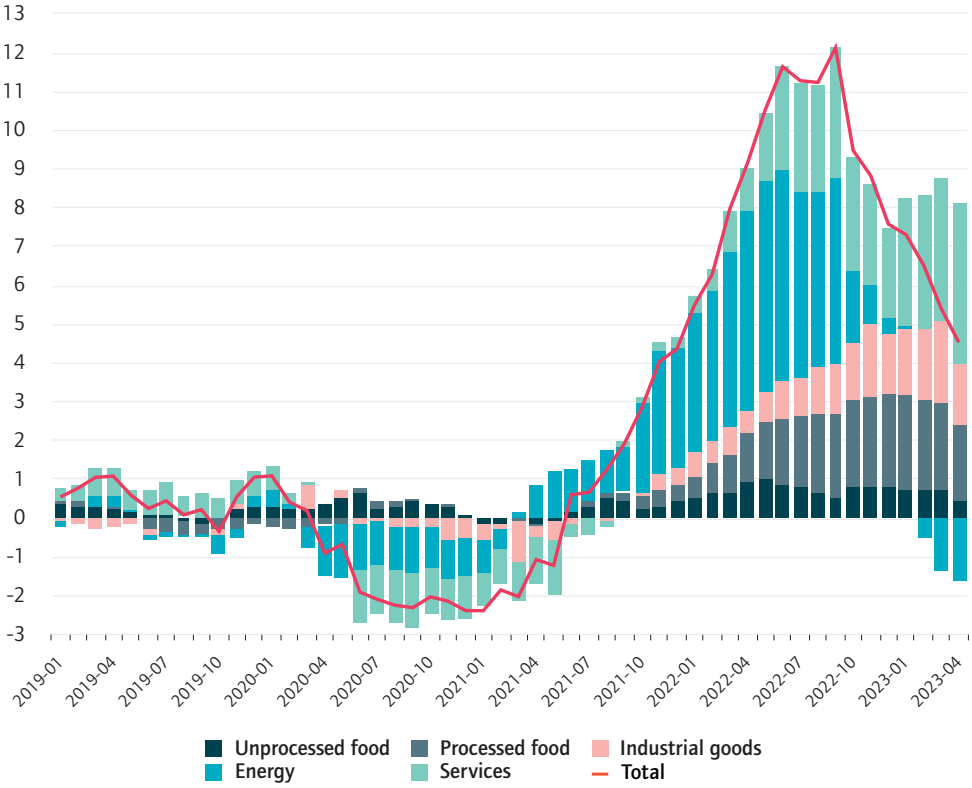


Source: Eurostat and Investing.com.

It is important to note that, despite energy prices currently easing off, a lagged pass-through of energy costs to other production costs is preventing headline inflation from falling back to the 2020 level. This is shown in Figure 4 which presents the contribution of each component of headline inflation. As already explained, energy was the main driver of headline inflation up until September 2022. At its peak, in the May of that year, more than half of headline inflation was attributed to the energy component. In the last quarter of the year, however, the inflationary pressure from energy to consumer prices practically vanished while in the first quarter of 2023 the contribution was negative. Headline inflation is currently being driven by inflation in services, processed food and, to a lesser extent, in industrial goods.

Such an outcome could reflect not only the lagged pass-through from energy to elsewhere but also a rise in mark-ups in these sectors. This, however, is not a Greek exception. As noted by Arce et al. (2023), unit profits in services, manufacturing and agriculture were, in 2022, important drivers of the GDP deflator across the euro area. In accordance with this, Donovan (2023) characterises the current phase of inflation as profit-led while, according to Weber (2022), it is not only fossil fuel companies that have benefited to a substantial degree from price increases but also other agents connected with them via real and financial channels.

Figure 4 **Contributions (%) to the annual rate of change of the HICP (Greece, January 2019 - March 2023)**



Source: Bank of Greece (own calculations).

4. Counter-inflation policy responses and their impact

4.1 Fiscal and regulatory policy responses

The Greek government, backed up by the (partly) state-owned providers of electricity and natural gas, has gone to great lengths to mitigate the impact of high and rising energy prices on residential and business users mostly, but not only, by means of price subsidies for consumers. In July 2022, the Greek government also attempted to decouple the retail price from the volatile international gas wholesale price by establishing a mechanism that recoups the revenues of electricity producers which are above their real operating cost. It has sought additionally to increase competition in the electricity market and, in November 2022, it imposed a 90% levy on the windfall profits of energy companies for the period between October 2021 and March 2022.

According to some estimates, a total of 9.5 billion euros, or 5.2% of GDP, had been allocated by February 2023 (Sgaravatti et al. 2023), the sixth highest percentage among

EU Member States. According to our own calculations based on figures from the Greek Stability Programmes of 2022 and 2023 (Hellenic Republic-Ministry of Finance 2022b and 2023), the Greek government had spent over 12.1 billion euros or 6.4% of GDP (2021) between September 2021 and June 2023. The public fiscal measures have been financed by a special Energy Transition Fund whose resources have come, in addition to the general government budget, from the expected increased revenues for Greece from auctions of carbon trading allowances; the surpluses in the Special Account for Renewable Energy Sources (thanks to the higher electricity prices); the windfall revenues from the price capping mechanism in the wholesale market (on which see more below); and from the windfall tax imposed on energy companies.

In what follows, we go through the different types of measures which have been deployed since September 2021 to mitigate the impact of inflation on households and firms.[7]

In September 2021, the price subsidy scheme for residential users of electricity was launched, initially offering a subsidy of 30 euros/MWh or 9 euros/month for the first 300 kWh of household consumption for the main residence. This scheme has undergone expansion, extension and recalibration on a regular, usually monthly basis to adapt to fluctuations in the cost of electricity production (see Table 1 for details). Increased subsidies, often reaching 100% of the price increase, have been provided for those who are on social tariffs. This special targeting, together with measures improving the energy efficiency of household residences vulnerable to the risk of energy poverty, are part of the Greek Action Plan for combating energy poverty. From March 2022, the scheme has been expanded to include the private university accommodation of dependent family members[8] while, from May 2022, price subsidies became available for secondary residences, initially at a lower level but, from July 2022, at the same rate. Up until May 2022, only the first 300 kWh of consumption were subsidised, at declining rates, whereas over the summer period the scheme started to cover the entire electricity consumption of household residences.

Until July 2022, the only incentive to reduce electricity consumption could be found in the somewhat lower subsidy available for higher levels of consumption. This differentiation, and the incentives, were eliminated between July and September 2022 when all consumption was subsidised at the same rate (for all residences). In October 2022, the government re-introduced scaled subsidies for different brackets of consumption levels, with increases of 50 euros in each subsidy if average daily consumption was reduced by 15% compared to the same month in the previous year. From November 2022, this increase in the subsidy was only applied to consumption of over 500 kWh per month while, from February 2023, households with this level of consumption received the same subsidy as those with lower consumption only if they

7. Information about the different measures announced in Greece to mitigate the impact of higher energy prices since September 2021 has been mostly drawn from press releases published in Greek by the Ministry of Environment and Energy and complemented in some cases by information found in Greek newspapers and on news sites.

8. In Greece, families usually cover at least partly, if not entirely, the private university housing costs of their financially dependent children as the supply of publicly subsidised university accommodation is extremely limited.

had reduced their average daily consumption by 15% compared to the same month in the previous year. The estimated cost of this scheme for 2022 was 3.6 billion euros (Hellenic Republic-Ministry of Finance 2022: 26) while, for the period between September and December 2021, the estimated cost of price subsidies for low-voltage users (households) was 326 million euros (Hellenic Republic-Ministry of Finance 2021: 30).

Table 1 **Announced electricity price subsidies for residential users**

Date of announcement	Subsidy per MWh (€)	Ave. subsidy/ month (€)	Range of consumption for which subsidy applies (kWh)	Type of residence	Period of announced applicability	Cost (if available)* (€m)
13/09/2021	30	9	0-300	Primary	Sep-21-Dec-21	
08/10/2021	60	18	0-300	Primary	Oct-21-Dec-21	
	80	24	0-300 (social housing tariff)	Primary	Oct-21-Dec-21	
10/11/2021		39	0-300	Primary	Nov-21-Dec-21	
		45	0-300 (social housing tariff)	Primary	Nov-21-Dec-21	
07/01/2022	160	42	0-150	Primary (and retrospectively university student residential connections of dependent family members)**	Jan-22	157
	120		151-300	Primary (and retrospectively university student residential connections of dependent family members)**	Jan-22	
	180	54	0-300 (social housing tariff)	Primary	Jan-22	
09/02/2022	150	39	0-150	Primary (and retrospectively university student residential connections of dependent family members)**	Feb-22	150
	110		151-300		Feb-22	
	170	51	0-300 (social housing tariff)	Primary	Feb-22	
17/03/2022	150	40	0-150	Primary and university student residential connections of dependent family members	Mar-22	148
	110		151-300		Mar-22	

Date of announcement	Subsidy per MWh (€)	Ave. subsidy/ month (€)	Range of consumption for which subsidy applies (kWh)	Type of residence	Period of announced applicability	Cost (if available)* (€m)
17/03/2022		53	0-300 (social housing tariff)	Primary	Mar-22	
	270	72	0-150	Primary and university student residential connections of family members	Apr-22	218
	210		151-300		Apr-22	
	290	87	0-300 (social housing tariff)	Primary	Apr-22	
06/05/2022	205	56.6	0-150	Primary and university student residential connections of family members	May-June 22	200 (for May)
	160		151-300			
	100		>300	Primary	May-June 22	
	100		All	Secondary		
	215		All (social housing tariff)	Primary	May-June 22	
05/07/2022	200		All	All	Jul-22	
	240		All (social housing tariff)	Primary	Jul-22	
25/07/2022	337		All	All	Aug-22	
	377		All (social housing tariff)	Primary	Aug-22	
23/08/2022	639		All	All	Sep-22	748
	677		All (social housing tariff)	Primary	Sep-22	
21/09/2022	436 (+50 if consumption reduced by 15% compared to October 2021)		0-500	All	Oct-22	
	380 (+50 if consumption reduced by 15% compared to October 2021)		501-1000		Oct-22	
	336 (+50 if consumption reduced by 15% compared to October 2021)		>1001		Oct-22	
	485		All (social housing tariff)	Primary	Oct-22	

Date of announcement	Subsidy per MWh (€)	Ave. subsidy/ month (€)	Range of consumption for which subsidy applies (kWh)	Type of residence	Period of announced applicability	Cost (if available)* (€m)
27/10/2022	238		0-500	All	Nov-22	
27/10/2022	188 (+50 if consumption reduced by 15% compared to October 2021)		501-1000		Nov-22	
27/10/2022	98 (+50 if consumption reduced by 15% compared to October 2021)		>1001		Nov-22	
27/10/2022	286		All (social housing tariff)	Primary	Nov-22	
25/11/2022	221		0-500	All	Dec-22	
25/11/2022	171 (+50 if consumption reduced by 15% compared to October 2021)		501-1000		Dec-22	
25/11/2022	81 (+50 if consumption reduced by 15% compared to October 2021)		>1001		Dec-22	
25/11/2022	269		All (social housing tariff)	Primary	Dec-22	
23/12/2022	330		0-500	All	Jan-23	
23/12/2022	280		501-1000		Jan-23	
23/12/2022	190		>1001		Jan-23	
23/12/2022	378		All (social housing tariff)	Primary	Jan-23	
31/01/2023	40		0-500; >500 if consumption reduced by 15% compared to daily average of Feb-22	All	Feb-23	
31/01/2023	88		All (social housing tariff)	Primary	Feb-23	
28/02/2023	40		0-500; >500 if consumption reduced by 15% compared to daily average of Mar-22	All	Mar-23	
28/02/2023	84		All (social housing tariff)	Primary	Mar-23	

Date of announcement	Subsidy per MWh (€)	Ave. subsidy/ month (€)	Range of consumption for which subsidy applies (kWh)	Type of residence	Period of announced applicability	Cost (if available)* (€m)
24/03/2023	15		0-500; >500 if consumption reduced by 15% compared to daily average of Apr-22	All	Apr-23	
24/03/2023	54		All (social housing tariff)	Primary	Apr-23	
04/05/2023	15		0-500; >500 if consumption reduced by 15% compared to daily average of May-June 22	All	May-June 23	
04/05/2023	50		All (social housing tariff)	Primary	May-June 23	

Note: * Cost figures may not be announced for the specific measures alone. ** In March 2022, the subsidy was retrospectively expanded to the private university residential connections of dependent family members.
Source: Compiled by authors from government announcements.

A price subsidy scheme for electricity prices in respect of non-residential, i.e. business, users was launched in January 2022. Initially, subsidies were applied horizontally but, from March 2022, top-ups were provided to small and small-medium enterprises with connections of up to 25 kilovolt-amperes (kVA), as well as bakeries. The scheme was expanded to include those with connections of up to 35 kVA from May 2022, while from the July these top-up subsidies were differentiated across different groups such as farmers, enterprises with connections over 35 kVA and professional and industrial connections, with firms with lower voltage connections and farmers receiving the highest amounts.

Up until October 2022, these price subsidies (across the board and top-up) concerned the entire electricity consumption of the beneficiary firms. From then, however, subsidies were offered at a declining rate depending on the level of consumption (with the differentiation point being set at 2000 kWh). Farmers continued receiving price subsidies for their entire consumption even after that date while, from March 2023, they have been the only non-residential users receiving price subsidies on their consumption. Additionally, in January 2023, the government offered a retrospective subsidy (85 million euros) on the electricity bills of commercial users with connections of up to 35 kVa, bakeries and farmers regardless of power supply or voltage who were on variable price contracts between February and November 2022. The estimated cost of these price subsidies for business users for 2022 was 5.5 billion euros (Hellenic Republic-Ministry of Finance 2022) (for a table with more details on this aspect, see Pierros and Theodoropoulou 2022).

The Greek government has also put in place price subsidies for natural gas for both residential and business users. State subsidies for residential users have been topped up by price 'discounts' (effectively subsidies) offered by the commercial arm of DEPA (the Public Natural Gas Company), which is partly state-owned. Subsidies are applied to the entire consumption regardless of residential type, business size, turnover or number of employees. Given the fluctuation in natural gas prices in wholesale markets, the level of these subsidies has been announced monthly. The cost of this scheme was estimated at 440 million euros in 2022 (Hellenic Republic-Ministry of Finance 2022) (for a detailed table, see Pierros and Theodoropoulou 2022). Again, natural gas price subsidies for households benefiting from social tariffs are part of the Greek Action Plan for combating energy poverty.

As mentioned, the partly state-owned electricity and natural gas providers have backed up government policies with support measures. DEH (the Public Power Corporation) began offering discounts of 30% in August 2021 over the increased prices it would otherwise have charged its customers due to the higher costs of electricity generation. From September 2021, it offered an additional 4% discount for consumption levels of 300-600 kWh per month, complementing the state price subsidies for the first 300 kWh of consumption. Given monthly electricity consumption figures, the price subsidy and the DEH discount were expected respectively to cover up to 72% and 80% of low-voltage consumers (household, professional and farmer electricity account holders), regardless of their income. DEPA steadily offered price discounts to its residential customers on a par with the government while, in October 2021, it also provided gas to other (private) gas providers at a discounted price with the aim that they pass on the lower price to their customers. The government estimates that, between September 2021 and April 2022, the value of the subsidies to consumers offered by the two companies reached 1.261 billion euros.

Electricity and natural gas bills have also been reduced for households and companies by means of ad hoc measures. The payment of natural gas user charges was deferred for all users between November and December 2021. The payment of charges for public utility services[9] was also postponed for the period between November 2021 and March 2022 for customers on electricity connections for the industrial use of low voltage connections (medium voltage for all other uses, including medium voltage agricultural connections for triple phase supply of less than 85 kVA, for industrial use of medium voltage connections up to 13 GWh consumption, and general medium voltage users). Moreover, in February 2023, in the context of the EU's temporary crisis framework for state aid measures to support the economy following the war in Ukraine, the government announced a subsidy of 50 euros/MWh for the whole of 2023 addressed to companies in energy-intensive sectors which have been particularly exposed to loss of competitiveness due to higher prices.

9. The charges for public utility services are raised from the majority of suppliers of electricity connections to support vulnerable or special societal groups (e.g. the long-term unemployed, disabled people, those on low incomes and where there are three or more dependent children, all subscribers to the social housing tariff, island residents, as well as some organisations offering social services) to allow them access to electricity at an affordable cost.

Beyond the price subsidies, the Greek government has offered a range of income supports to various, mostly vulnerable groups of citizens, some of them new and some of them already established but reinforced under the circumstances.

In December 2021, income subsidies were provided to households in arrears with their electricity bills which had the power supply to the main residence suspended and which fulfil the criteria for subscribing to the social housing tariff, as a means of helping them pay off these bills. The subsidies covered the owed amounts either in full (for amounts of up to 6000 euros) or in part (30% for amounts over 12 000 euros). The measure applied from the end of December 2021 to the end of March 2021 and the estimated cost was 40 million euros.

An established form of income support has been the annual allowance for heating fuel costs, an income subsidy over the winter granted to households meeting income criteria. This allowance is calculated for different beneficiaries by multiplying the base allowance by an index (ranging from 0.12 to 1.62) depending on the beneficiary's location and then, in the case of couples or families, topped up by a percentage for each dependant. While this subsidy existed before the recent energy price shock, it was reinforced in both the winters of 2021-22 and 2022-23: the base level was increased (from 220 euros, first to 300 euros and then to 330 euros); the minimum and maximum levels of the allowance were increased (from 80 euros to 100; and from 650 euros firstly to 750 and then to 800); and the percentage by which the allowance is topped up for each dependant was doubled (to 20% from 10). Moreover, for those households using natural gas for heating, the allowance was topped up from 36% for households with one dependant to 68% for households with three dependent children. Last but not least, the income and wealth (housing property value) criteria for defining beneficiaries have been expanded. The reinforcement of this allowance doubled the originally budgeted cost for winter 2021-22 from 84 million euros to 168 million; and further increased it to 300 million euros for 2022-23.

The government has also provided another range of income and price subsidies and reductions in excise taxes for the use of vehicle fuels. In March 2022, it announced the launch of what became known as the 'Fuel Pass', a subsidy for the fuel costs of vehicles and motorcycles owned by persons fiscally residing in Greece (one vehicle/motorcycle per person) with incomes of up to 30 000 euros, to cover the increased costs of fuel for the months of April to June. Its estimated cost was 60 million euros. An extension of the measure ('Fuel Pass 2') was announced in July, with higher but still flat-rate subsidies to cover the increased costs of consumption for July to September 2022 at an estimated cost of 200 million euros. In parallel, the government twice announced subsidies of the price of diesel in 2022 (for April-June and for July-September) to mitigate the costs of mobility for consumers. Providers of taxi services received a subsidy of 200 euros in March and April 2022 (at an estimated cost of 5.7 million euros) and farmers have been receiving a return of the special consumption tax on vehicle fuel for agricultural users, a measure which, when announced, was expected to cost 60 million euros.

In March 2022, the government announced one-off income subsidies for groups of financially vulnerable citizens such as families with dependent children, low-income

pensioners, the uninsured elderly, the beneficiaries of disability allowances and the beneficiaries of guaranteed minimum income. The payment was made in April and, at the time, the estimated cost was 324 million euros (97.5 million for child allowance, 135 million for support to low-income pensioners, 7 million for uninsured elderly citizens, 33.4 million for support to citizens with special needs and 50.9 million for the beneficiaries of guaranteed minimum income). Similar means-tested subsidies (varying for families with dependent children from 42 euros to 420, depending on the number of dependent children and family income, and 250 euros for all other categories) were again paid in December 2022 to these groups, including the long-term unemployed (unemployed for between one and two years and not receiving unemployment benefits).

In June, the Greek government announced an additional subsidy (the so-called 'Power Pass') for residential electricity consumers with net household incomes of up to 45 000 euros for the electricity connection to their main residence and university private accommodation (situated in Greece) of any dependants (up to three student residences per family). The subsidy would be applied to electricity bills issued between 1 December 2021 and 31 May 2022 and would cover up to 60% of the increased electricity costs arising from the application of the so-called adjustment clause, after having deducted the provided price subsidies. The adjustment clause is a formula used by electricity providers for those on variable price contracts in which retail prices are periodically adjusted to price variations in the wholesale energy market and the subsequent variations in the production cost of electricity. In the recent circumstances, it has been a driver of the ever-increasing energy bills for consumers with variable price contracts. This additional subsidy spanned between 18 and 600 euros.

The measures taken by the Greek government have not been limited to subsidies but have included some regulatory interventions and additional taxation. In June, legislation was introduced (which came into force from 1 August 2022) which eliminated the adjustment clause, forced electricity supply companies to publicise their prices a month in advance and allowed consumers to switch to a different provider at short notice without penalties, all in an attempt to improve transparency, increase competition in the retail electricity market and raise the pressure on electricity providers to contain their price increases.

The government also legislated for a mechanism recouping the windfall revenues of electricity producers by setting a ceiling on the maximum compensation they could receive, based on their real operational cost. The difference between that cost and the market price of electricity is taxed and used to finance the Energy Transition Fund. In this way, fluctuations in the wholesale price of gas have been decoupled from retail electricity prices. This measure has been in application since July 2022 and was due to last until 1 June 2023. By late May 2023, the total revenues from the mechanism had, according to the government, surpassed 3.25 billion euros but it was then extended until the end of September 2023. In November 2022, the government also imposed a 90% tax on the windfall profits of domestic energy producing companies for the period of October 2021 to June 2022, with the revenues used to finance the support measures to consumers.

In parallel to these policies of direct and more short-term relief for electricity and gas consumers (residential and non-residential), the Greek government implemented a programme which provides financial support for enhancing the energy efficiency of residential buildings (under the name of the Greek for 'I save'). This programme was included in the Greek Recovery and Resilience Plan and qualified for funding from the Recovery and Resilience Fund (RRF). Its budget is 3.1 billion euros, of which half is funded by the RRF and the rest by the own funds of the beneficiaries at an increasing scale depending on their income. This policy was launched before the energy crisis but came to prominence with the surge in energy prices. A part of the funds is earmarked for the improvement of residential energy efficiency for those at risk of energy poverty.

Overall, the emphasis of Greek public support policies for more direct and short-term relief to households and firms has been on price subsidies in electricity and natural gas, the expenditure on which, at least for 2022, accounted for around 80% of the expected total discretionary expenditure[10] on measures to mitigate the impact of the energy crisis. Ad hoc income and smaller income subsidies, especially for mobility and heating fuel, were also provided. What has been remarkable, apart from their cost, is the bluntness of the price subsidies as, for the most part, they have been granted to different categories of beneficiary without any explicit income criteria while, until October 2022, they also provided no explicit incentives for energy saving. A more detailed assessment, particularly of the distributional effects, is provided below.

4.2 Summary of measures

Table 2 (available online under www.etui.org/publications) provides a summary of the types of support measures undertaken in Greece between September 2021 and October 2022 to mitigate the impact of high energy prices on households and firms and to limit price increases.

A few remarks are in order in the context of this chapter. For the largest part, the amounts spent on transfers, whether to households or firms, took the form of price subsidies rather than income transfers. Vulnerable households – that is, those defined as being at risk of energy poverty – were targeted insofar as they benefit from the social tariff scheme for their electricity costs. These beneficiaries have received higher subsidies than other residential users, covering the price increases almost entirely. The targeting of households above the threshold of energy poverty and of firms has, however, been rather weak given that, especially in the case of households, no other income criteria has been in place (with the exception of social housing tariff consumers) and that, from May and July 2022, the ceiling on consumption was removed and benefited all residential accounts (whether primary or secondary).

10. Estimate based on the figures provided by the Greek government in the Draft Budgetary Plan it submitted to the European Commission in October 2022.

While Greece still faces important fiscal constraints, it seems that, under the current circumstances, it has so far managed to deploy large amounts of public spending without significantly departing from the fiscal path it was supposed to follow prior to the energy crisis. It is an open question whether, given the bluntness of the most important measures, the significant public expenditure could have gone further in supporting the economy and society to face the challenges that lie ahead.

5. A preliminary assessment

To assess the public policy measures taken in Greece during the energy crisis in order to mitigate the social impact of inflation, we ask two questions. First, whether these measures have managed to counter the regressive distributional effects of inflation and stem the rises in inequality; or, in other words, whether the measures have been effective in cushioning the social impact of the energy crisis. Second, we assess whether these measures, which clearly had a social objective, have supported or undermined Greece's climate policy objectives as set out in the NECP.

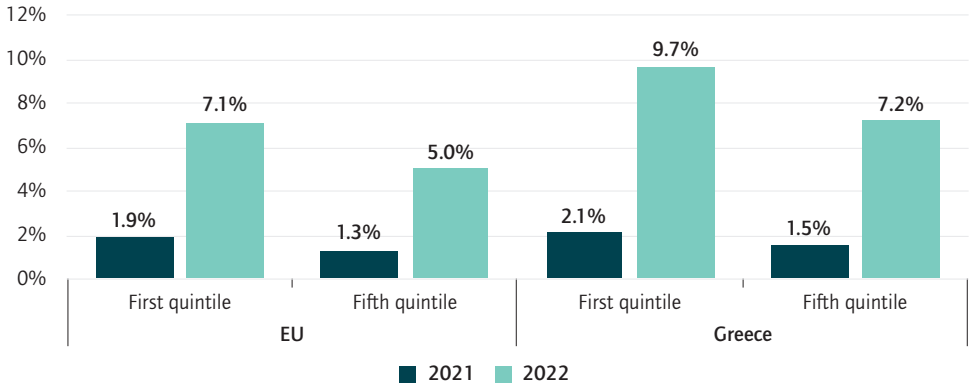
5.1 Have the measures offset inequality dynamics in Greece?

In order to assess the impact of inflation on inequality we first applied the method of Villani and Vidal Lorda (2022). We inflated the share of housing and energy costs in the total consumption of the first and the fifth income quintiles by the respective inflation rate. More specifically, we used the 2020 consumption bundles of the bottom and top quintiles (latest available data provided by Eurostat for all Member States) and the 2021 and 2022 annual inflation rates of housing, water, electricity, gas and other fuels, comparing the results with the EU average.[11] The larger the share of housing and energy costs is in total consumption for the bottom quintile, compared to that of the top quintile, the larger the impact of inflation on inequality will be. Figure 5 presents the associated results.

As expected, energy inflation was mostly felt by households in the first income quintile, both in Greece and the EU. In 2021, inflation differentials between income quintiles were practically the same in both areas (0.6% higher energy inflation for the bottom quintile). Nonetheless, in 2022 energy inflation was higher for the bottom quintile in Greece, with the respective rate reaching almost 10%. In addition, the difference of energy inflation between the first and the fifth quintiles in Greece increased by 1.9 percentage points whereas in the EU the respective increase was 1.5 points.

11. A significant drawback of this approach is that it implicitly assumes a constant consumption pattern. However, in reality this assumption is rather biased (for a discussion along these lines see Matsaganis and Theodoropoulou 2022). A proper treatment of this drawback would require data for 2022 which are as yet unavailable. For this reason, the assessment can only be preliminary.

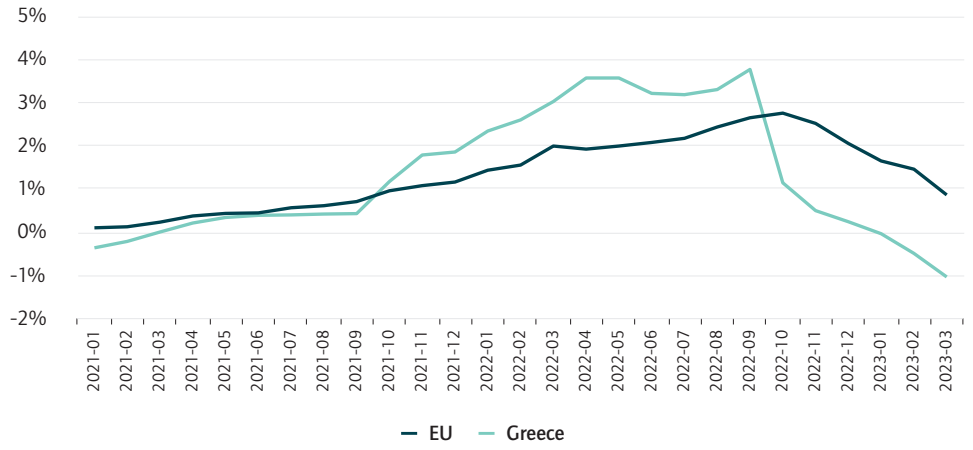
Figure 5 **Inflation of housing and energy costs by income quintile**



Source: Eurostat (authors' own calculations).

We further elaborated on inflation-driven inequality by providing an overview of its evolution on a monthly basis. Specifically, we applied the approach of Claeys and Guetta-Jeanrenaud (2022) according to which the share of energy consumption differentials between the bottom and the top income quintiles are inflated by the respective rate. Figure 6 reports overall inflation inequality in Greece and in the EU. Inequality has been on the rise from the start of 2021. However, in October 2021, inequality in Greece followed a steep rise and remained higher than in the EU up until September 2022.

Figure 6 **Inflation inequality (difference in inflation facing the top and bottom quintiles), driven by inflation in housing and energy costs**

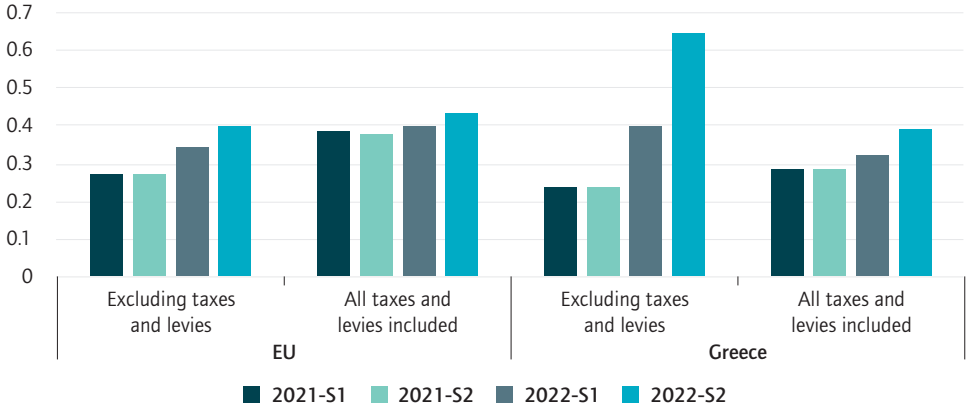


Note: Positive values imply a higher burden for the lowest income quintile vis-à-vis the highest; negative values indicate the opposite.
Source: Eurostat (authors' own calculations).

The fall in electricity prices which commenced in October 2022 improved the inequality outlook. Notably, in the first quarter of 2023 energy inflation-driven inequality in Greece decreased.

Nevertheless, it seems that, despite the measures taken by the Greek government in the course of 2022, inequality increased considerably. With regards to household consumption, as reported in Figure 7, the measures in Greece have been more effective in reducing electricity prices than the EU average. In 2021, the difference between electricity prices excluding and including net taxes was similar both in Greece and the EU. However, in 2022, net taxes in Greece became negative, implying that the subsidies significantly exceeded indirect taxes. This is even more evident in the second semester of 2022 during which the electricity price including net taxes was 38.6% lower than the respective price excluding net taxes.

Figure 7 **Electricity price for household consumers in PPS per kWh for monthly consumption lower than 1000 kWh**



Source: Eurostat.

The measures might have been effective in bringing down household consumer electricity prices but they were mostly horizontal. The absence of well-targeted policies implies, on the one hand, an unequal impact of energy inflation across the income scale and, on the other, the inefficient allocation of funds. This is evident in Figure 8. Specifically, we used data from the 2021 ELSTAT Household Budget Survey (HBS) for Greece in order to retrieve the mean monthly electricity consumption across the income scale, both in terms of quantities and nominal values.[12] We further estimated the 2021 effective electricity price for each income scale and inflate it according to the 2022 average growth in household electricity prices before and after taxes and levies.[13]

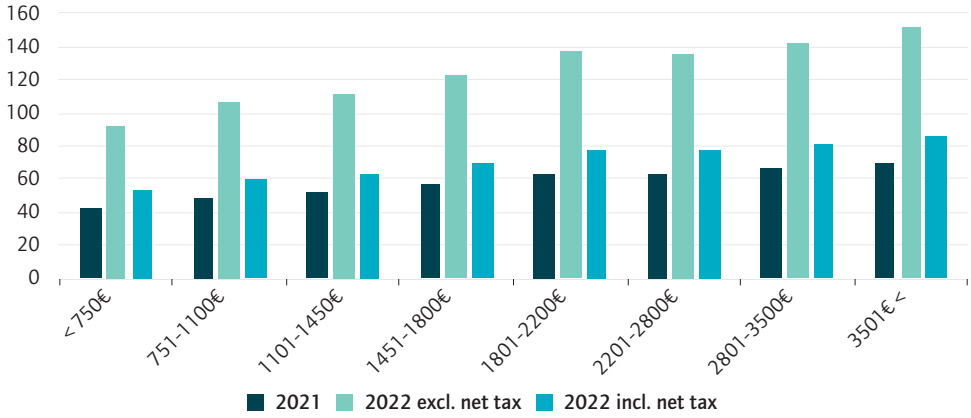
Assuming that consumption patterns, in terms of quantities, remained the same in 2022, the nominal value of electricity consumption would have more than doubled compared to 2021, excluding taxes and subsidies. Nevertheless, the subsidisation of

12. Specifically, we divide households into income groups and then examine their respective consumption patterns. Income reports in the HBS database are not as reliable as in the SILC database. Nonetheless, we apply this approach due to the inconsistency between the two databases. Our results are indicative and not definite.

13. Mean monthly consumption in all income scales was lower than 500 kWh in 2021; thus we used the prices provided by Eurostat for consumption lower than 1000 kWh.

electricity prices, at a level that far exceeded taxes, limited the electricity price rise to about 23%. In nominal terms, a poor household would have paid 40 euros more per month. At the same time, however, a middle-income household with monthly earnings between 1450 and 1800 euros would have paid 53 euros more while a rich household earning more than 2800 euros per month would have paid 62 euros more. The implicit amount gained by rich households is very small in terms of fraction of income. In this respect, the amount spent on subsidies by the government could have been allocated in a more efficient manner.[14]

Figure 8 **Household monthly electricity consumption in 2021 and 2022 in euros (before and after taxes and levies)**



Source: Eurostat and ELSTAT (authors' own calculations).

5.2 Have the measures aligned climate and social objectives?

In the earlier sections of this chapter, we considered two types of measures: first, those aimed at alleviating the social impact of inflation with a short-term effect; and, second, those aimed at reducing its impact in the medium term, most notably by reducing the reliance of households and producers on fossil fuels, such as natural gas and oil, and by increasing the energy efficiency of residences and appliances.

Regarding the more short-term measures, we saw that they have mostly been based on price subsidies for residential and non-residential users. Price subsidies have also targeted those households whose electricity consumption is subject to a social tariff scheme and, therefore, in line with the Action Plan on combating energy poverty. For a long time during the crisis, these subsidies were granted without any conditionality on reducing consumption, even to households (well) above the energy poverty threshold, and were extended to those occupying more than one residence. In that sense, they

14. Note that the first income quintile includes households that are below the poverty threshold and whose energy consumption was fully subsidised. Due to data unavailability, their exclusion from this group was infeasible.

were aimed at alleviating the impact of high energy prices on residential consumers but with questionable outcomes concerning the promotion of the objective of decarbonisation and energy efficiency. This is both because higher income households tend also to have a higher carbon footprint through their consumption patterns and because the linking of price subsidies to conditions of reducing consumption emerged only in autumn 2022.

Moreover, subsidies have also been provided to the users of vehicles and also for heating with the eligibility criteria being made more inclusive. In this respect, these measures, while intended to offer relief to a large constituency, have not been well aligned with climate objectives.

Regarding the second type of measure, most notably the programme aimed at subsidising the energy efficiency of private residences, one consideration is whether it explicitly integrates social objectives (Mandelli 2022). This has been the case. Part of the funds earmarked for the renovation of private residences has been dedicated explicitly to households affected by energy poverty while even the extent of the subsidy increased progressively for those on lower incomes. However, to the extent that households received generous price subsidies on their energy consumption, topping these up with their own funds, it is questionable how these, combined with the renovation subsidies, could concurrently promote climate and social objectives.

In assessing whether the measures considered in this chapter have aligned social objectives with climate ones, a final point to note is the impact of the EU context framing the energy transition. This context has increased Greece's vulnerability in that natural gas has been promoted as the transition fuel of choice. The establishment of the target model also contributed to higher energy prices even before the commencement of the war in Ukraine, while it has also been criticised for not being fully fit for the purpose of promoting RES. In that sense, the social problem load that Greek public policymakers have faced during the recent energy crisis has been shaped by the EU's market-oriented policy choices for promoting energy transition. Meanwhile, several years of economic adjustment programmes and imposed structural reforms in the markets during the 2010s seem not to have prevented an oligopolistic market structure from prevailing in the energy market by 2021. This has had significant consequences for energy prices and ultimately for the competitiveness of the economy that these structural reforms were intended to improve.

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