# LESSONS FROM 2021 TO 2023

## Inflation management calls for a sustainable energy transition in Europe

RECLAIM Finance

# LESSONS FROM 2021 TO 2023

## Inflation management calls for a sustainable energy transition in Europe

**Authors:**
Paul Schreiber, Reclaim Finance
Henri Her, Reclaim Finance

**Data analysis:**
Henri Her, Reclaim Finance
Sarah Brown, Ember

**Contributors:**
Sarah Brown, Ember
Clarisse Murphy, Reclaim Finance
Léo Martin, Reclaim Finance

**Graphic design:**
Jordan Jeandon

**Publication date:**
December 2023

This note has been written with the support and data from Ember.

# INTRODUCTION

Since 2021, Europe has known a period of high inflation. Breaking off decades of accommodating monetary policy designed to raise inflation to its 2% target, the European Central Bank (ECB) raised interest rates throughout 2022 and 2023 in the hope of bringing down inflation that was not forecasted to get back below target any time soon.

If this strategy contributed to stopping the rise of inflation in the EU, it does not consider the root causes of the inflation and price volatility that arose in 2021-2022.[1] While the ECB clearly identified the energy component as a key driver of this inflation and instability,[2] its policy response toughens financing conditions for the whole economy without distinctions. This makes deploying capital-intensive solutions that would lower the energy component of inflation by reducing fossil fuel demand and producing alternative energy more difficult.[3] Following this line of reasoning, the ECB's current response to inflation would actually impair its ability to ensure price stability in the longer term, and thus be incompatible with its mandate. The central bank should therefore adapt its policy to ensure that energy transition solutions are not hindered and are instead supported.

**In this note, we look at how gas demand and renewable energy deployment have an impact on inflation.** To do so, we explore the link between the EU's fossil fuel dependency and inflation during the 2021-2023 period, building on EU energy data - electricity and gas demand and prices - and on inflation data - Harmonized Indices of Consumer Prices or HICP and HICP energy *(see the information on data sources)*.

**We show that gas prices are a major driver of electricity prices, and a reduced reliance on gas contributes to lower and less volatile electricity prices. In turn, lower and less volatile electricity prices contribute to lower and less volatile energy inflation and facilitate overall inflation management.**

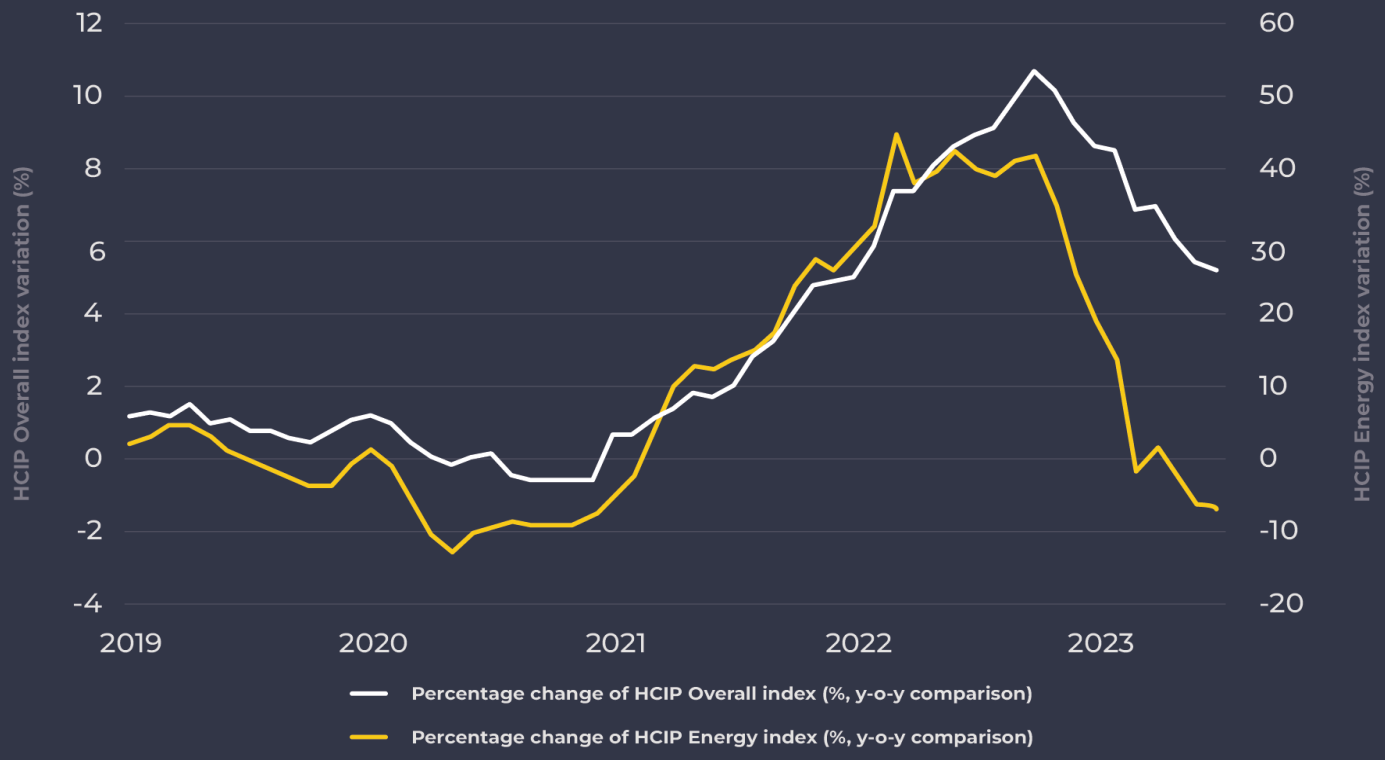
For the ECB and Eurosystem, **this means that a monetary policy that negatively affects the deployment of solutions to reduce energy demand and replace gas with renewable alternatives is not compatible with the price stability mandate. On the contrary, ECB policy should contribute to the energy transition, for example by setting up differentiated and lower interest rates for funding renewable energy and efficient building renovation.**

[1] Paul Schreiber, "Part 1. 2. Fossilflation: when fossil fuels add financial despair to environmental destruction", in *Managing Inflation by Supercharging a Clean Energy Transition*, Reclaim Finance, September 2022

[2] Luis de Guindos, "The euro area economy and the energy transition", *ECB*, November 2022

[3] International Energy Agency, *World Energy Outlook 2023*, October 2023 / Rens Van Tilburg, "Options for the ECB to neutralise the negative effects of its monetary policy for the European energy transition", *Sustainable Finance Lab*, June 2023

## Figure 1: Evolution of HICP overall index inflation (left axis) and HICP energy index inflation (right axis) over the last 5 years



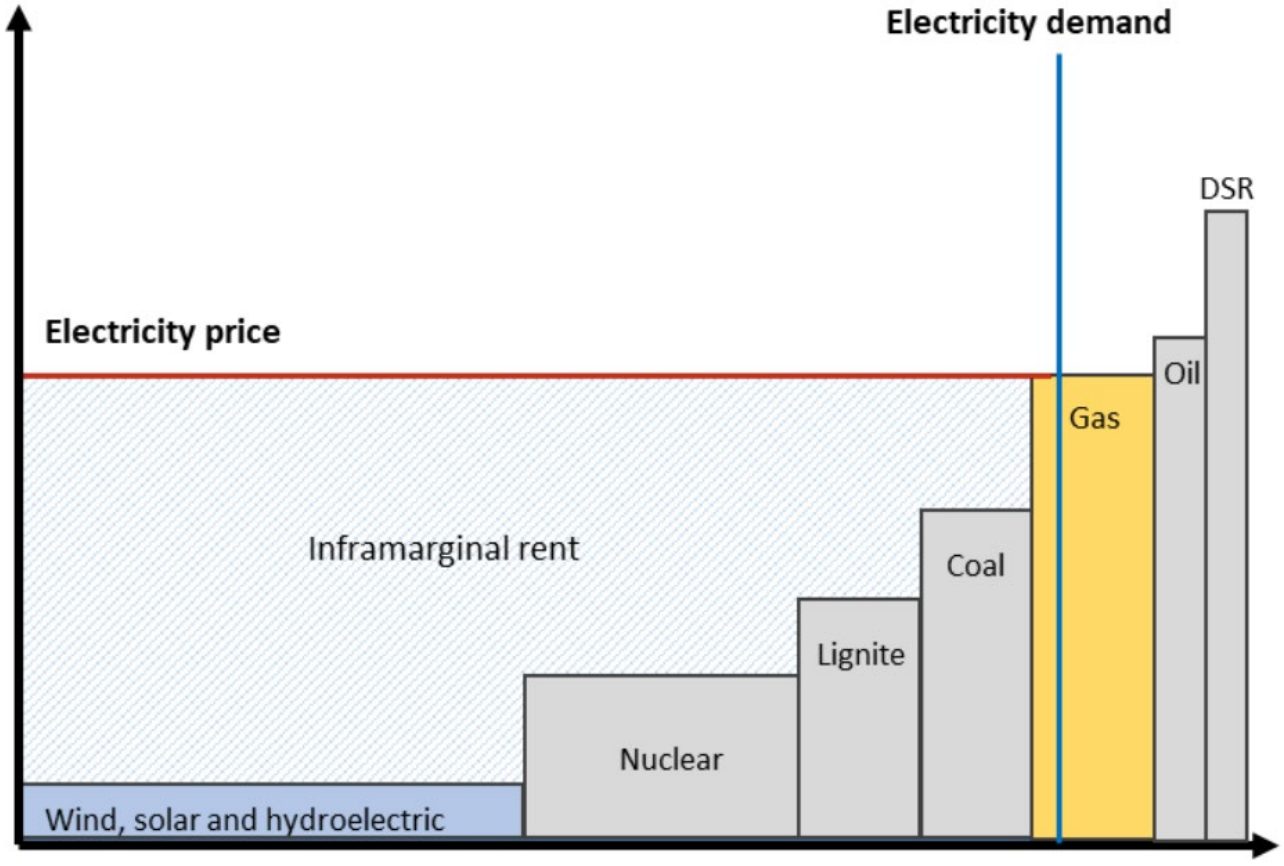

*Source: Reclaim Finance analysis, based on data from the European Central Bank Data Portal*

**In 2021-2022, the historic rise in EU HICP was driven by its energy component**

# THE RELIANCE ON GAS POWER DRIVES ELECTRICITY PRICES BUT CAN BE REDUCED

In today's European electricity system, power plants are sorted by generation costs and called to generate in a cost-effective order (i.e. from the cheapest to the most expensive) to meet electricity demand. **The price of electricity is therefore set by the latest generator called on-line, called the marginal generator.**

**Figure 2: Illustration of merit order-based price setting in the European electricity market**




*Source: Gasparella A., Koolen D. and Zucker A., The Merit Order and Price-Setting Dynamics in European Electricity Markets, European Commission, Petten, 2023, JRC134300*

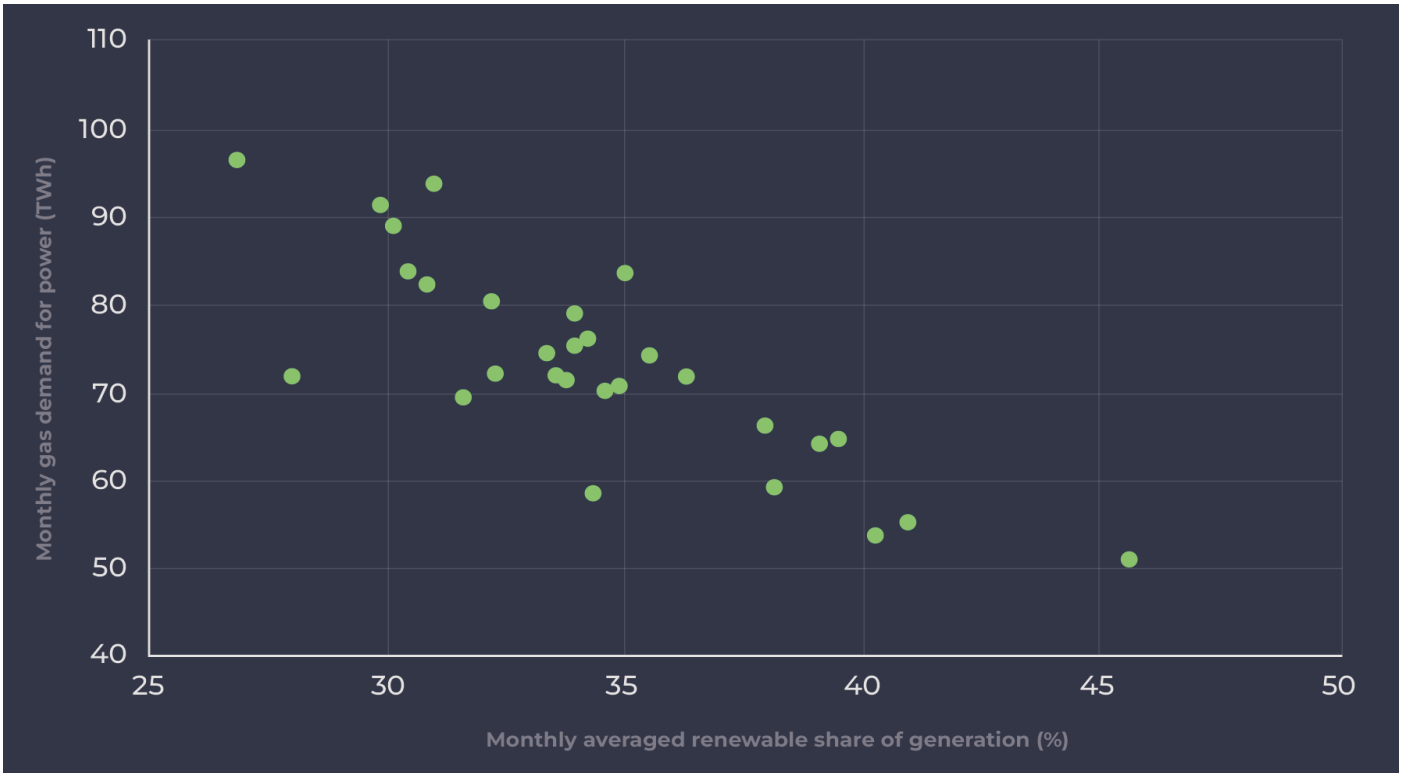
**A higher share of renewable power generation means a lower demand for gas in power**

**As renewable capacity remains too low to meet the whole EU electricity demand, the marginal generator setting EU electricity prices remains gas-based most of the time (see Figure 2). Gas has set electricity prices 55% of the time in 2022 while generating only 19% of total EU electricity.[4] However, the production costs for gas power are significantly higher than those from renewables and much more volatile as they depend on the global gas market.** To summarize, the higher the gap between renewable production and electricity demand, the more demand for such generators and the more costly electricity becomes.
There are two main levers to reduce this aforementioned gap and the resulting demand for gas for power.

## a. Increasing renewable generation capacity

As renewable electricity is cheaper to produce, it is bid at a lower price than gas and ends up dispatched first. More renewable energy capacity means more demand is met by such sources, reducing the need for fossil

**Figure 3: Correlation between monthly gas demand for power and monthly share of renewable electricity production**




*Source: Reclaim Finance analysis, based on data from Bruegel for the gas demand and from Ember for the share of renewable electricity production*

[4] Gasparella A., Koolen D. and Zucker A., The Merit Order and Price-Setting Dynamics in European Electricity Markets, European Commission, Petten, 2023, JRC134300

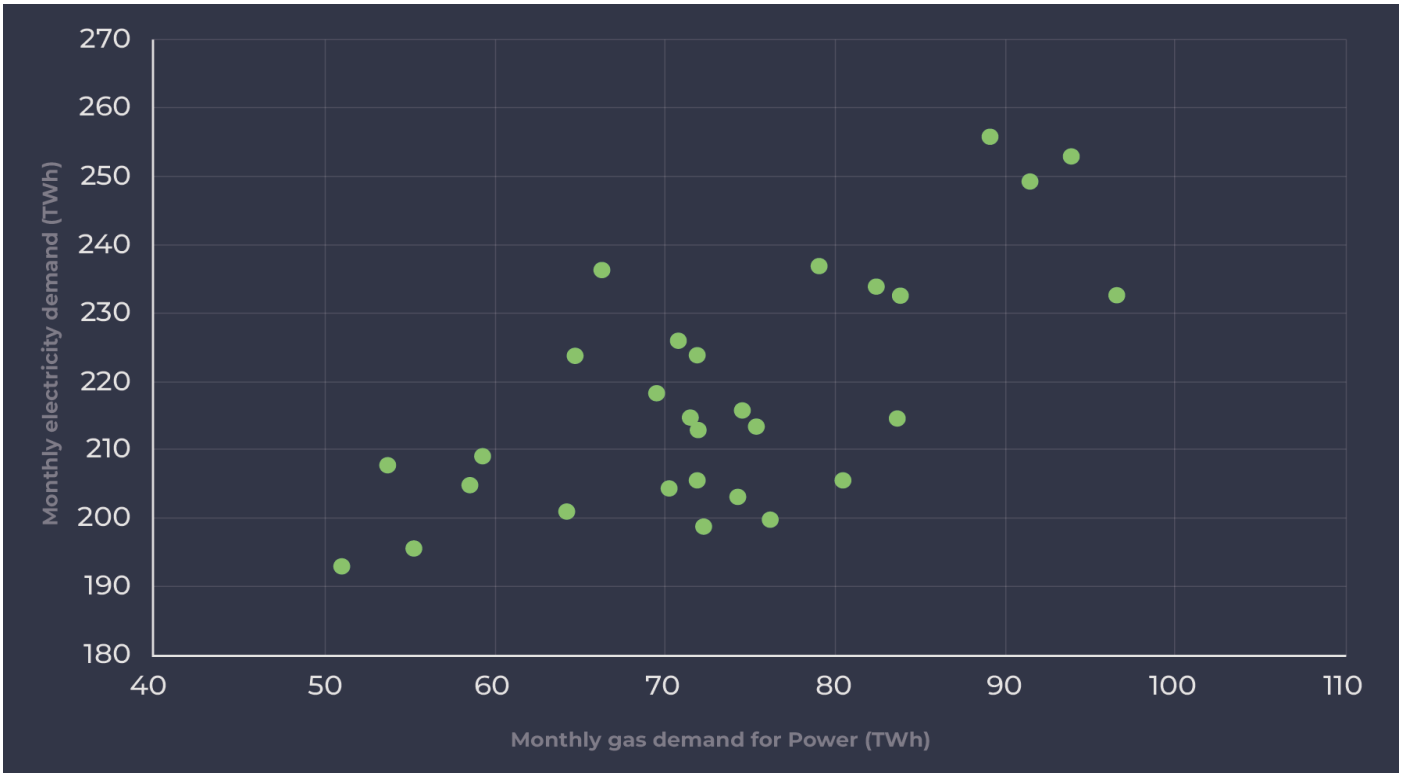
fuel-based generators. **All things being equal, a higher renewable generation capacity will eat into the demand for gas in the power sector.** This correlation is shown in figure 3.

It is worth noting that, unlike gas and other fossil fuel-powered sources, wind, solar and hydrological energy do not require the constant supply and consumption of resources. As the International Energy Agency (IEA) repeatedly underlined,[5] **a renewably-powered grid is therefore much less vulnerable to price volatility and can deliver both lower and more stable energy prices.** It can also enable import-dependent countries and regions like the EU to gain more independence from fossil fuel producers.

## b. Reducing electricity demand through improved energy efficiency

As gas is used to fill the gap between renewable electricity generation and overall demand, lower electricity demand will reduce the size of the deficit that is covered by fossil-powered sources. Indeed, after the invasion of Ukraine, one of the main and fastest avenues to reduce the EU dependency on Russian gas was to reduce demand.[6] All things being equal, a lower gap equates to lower gas demand for power. This correlation is shown in figure 4.

### Figure 4: Correlation between monthly gas demand for power and electricity demand




*Source: Reclaim Finance analysis, based on data from Ember for the electricity demand and from Bruegel for the gas demand for power.*

**Lower electricity demand contributes to lower gas demand for power**

[5] International Energy Agency, World Energy Outlook 2023, October 2023 / International Energy Agency, World Energy Outlook 2022, October 2022 / International Energy Agency, World Energy Outlook 2021, October 2021

6 Council of the EU, "Council adopts regulation on reducing gas demand by 15% this winter", August 2022

# 2. LOWERING GAS USE IN POWER CUTS ELECTRICITY PRICES AND EXPOSURE TO VOLATILE MARKETS

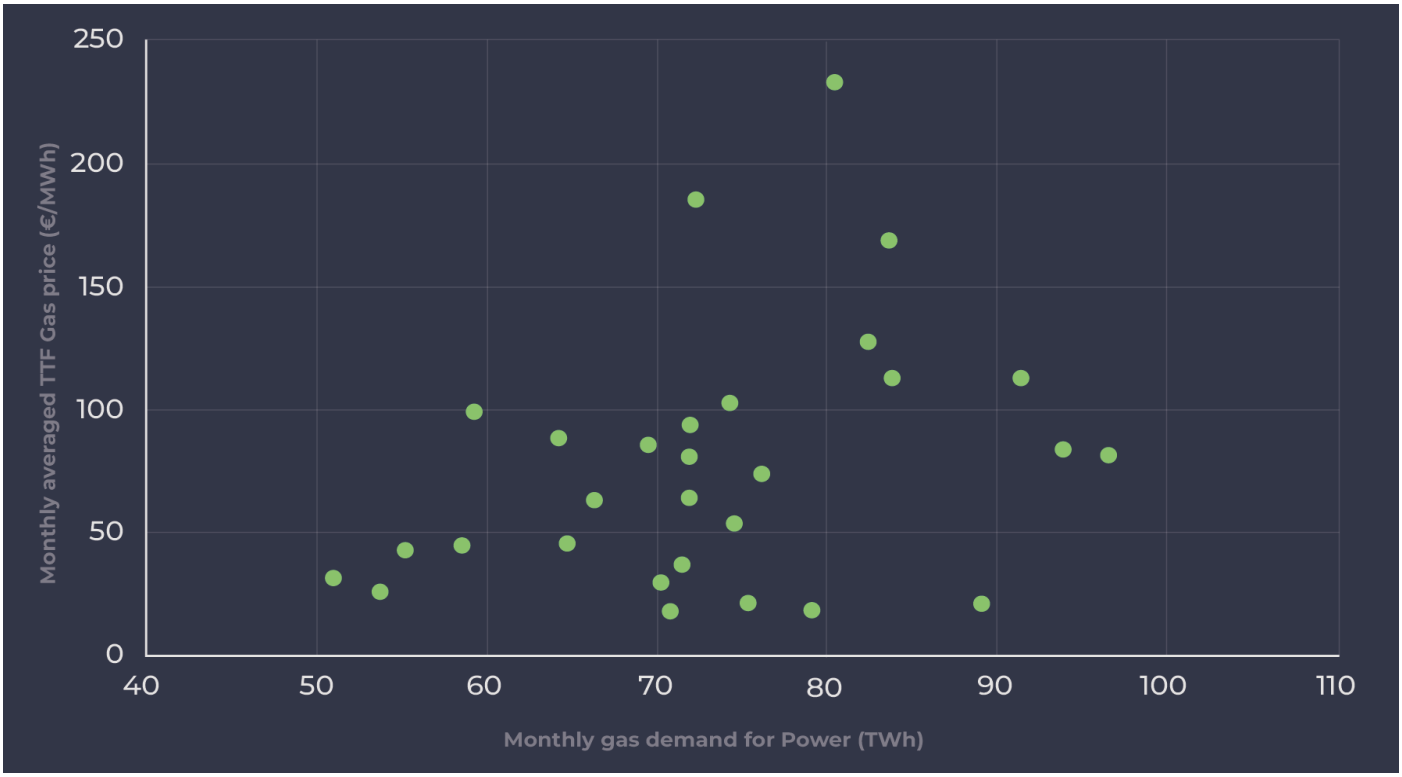
**Reducing the gas demand for power impacts the level of electricity prices in two ways:**

- **A lower demand for gas power generation can be met by the gas plants with the lowest operational costs** while plants with the highest costs are kept offline. This in turn decreases the electricity price, due to the cost-effective order of dispatch of power plants in the European market.
- **When renewable generation can satisfy all electricity demand, no gas power plant is required and the power price is set by cheaper renewable sources.** This significantly reduces electricity prices.

Not only does reducing gas demand for power impact the level of electricity prices, but it also reduces Europe's exposure to volatile global gas markets. **As shown in figure 5, gas demand for power is currently highly insensitive to gas prices:** this is a result of the need for gas, regardless of its price, to meet electricity demand until enough renewable capacity is installed.

On the other hand, figure 6 shows the direct correlation between gas prices and electricity prices, due to gas plants setting the price of electricity in many cases. As long as gas is needed and acts as a marginal generator in the electricity system, electricity prices remain high

**Figure 5: Correlation between Title Transfer Facility (TTF) gas price and gas demand for power**




*Source: Reclaim Finance Analysis, based on data from Bruegel for the gas demand for power and from Montel for the TTF gas price*

**Power demand is not sensitive to gas prices**

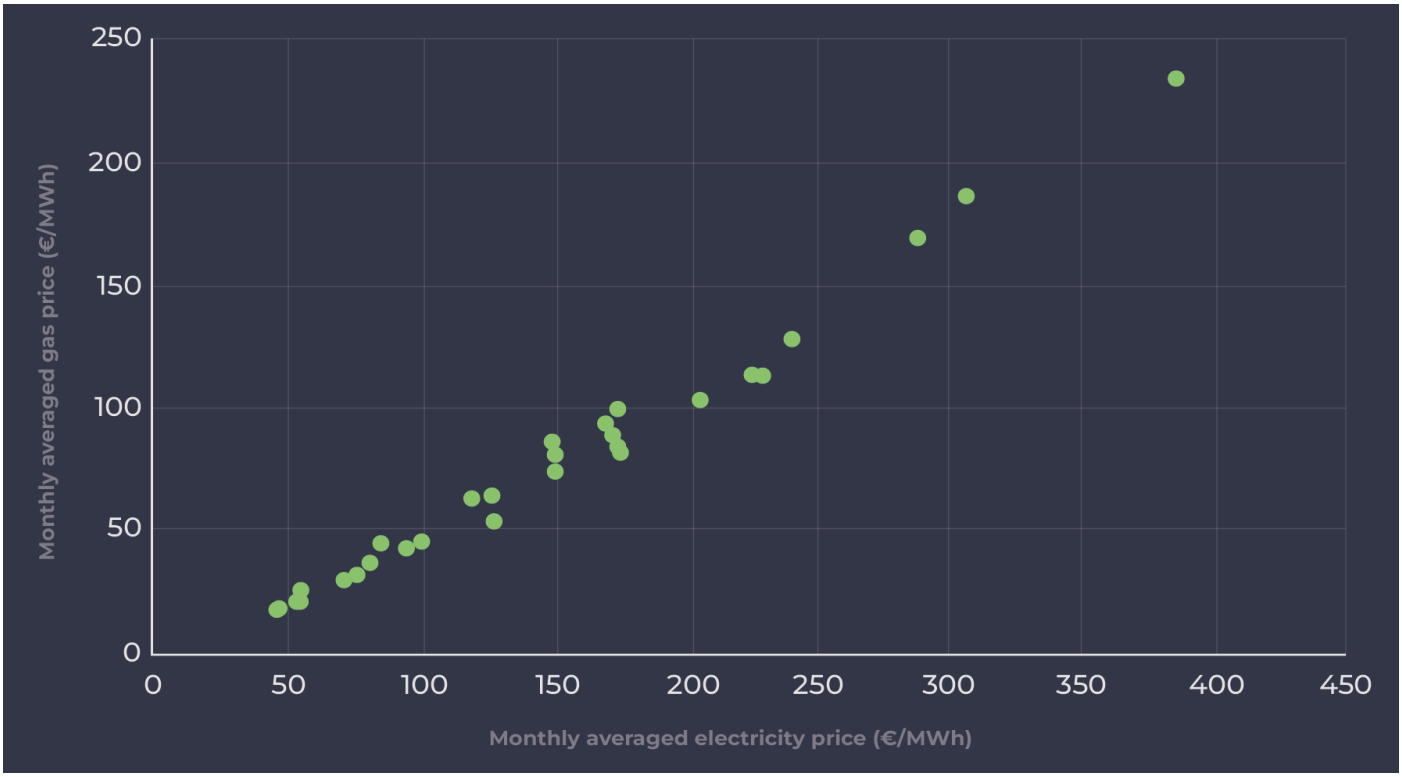
and are directly exposed to variation and global shocks in gas prices.

**The deep connection between gas prices and electricity prices is all the more concerning given that the EU is currently increasing the share of Liquefied Natural Gas (LNG) in its gas supply.** LNG is generally costlier than the gas delivered by pipeline. Furthermore, a large share of LNG production is traded on spot markets, meaning that prices are highly volatile and that the EU would be vulnerable to changes in demand in other parts of the world. For example, in the week of October 13th, 2023, European gas futures jumped almost 23% despite no major change in consumption due to geopolitical unrest in the Middle East and fears of strikes in Australian LNG infrastructures.[7]

Even in the event of a reform of the electricity market that changes price-setting rules and lowers the influence of gas as a marginal generator, gas will remain an important driver of prices as long as the size of gas demand for power and its share in the electricity mix remains significant. Indeed, the preliminary agreement of EU member states on such a reform would enable long-term electricity supply contracts to work with a floor and ceiling price.[8] When the market price exceeds the ceiling, the difference is paid to states and redistributed to consumers. When the market price falls below the floor, states pay the difference to producers. However, the level of the floor and ceiling prices themselves will be affected by the reliance on gas. Countries that importantly rely on it will have the highest floor and ceiling prices, and the prices set in countries where gas is a marginal generator will still be pushed up. Furthermore, the volatility of gas prices makes it more likely that market prices will not remain within the floor and ceiling prices, making the level of public payouts to producers highly uncertain and creating potential instability for the whole power sector.

**Higher gas prices bring higher electricity prices**

## Figure 6: Correlation between gas prices and electricity prices




*Source: Reclaim Finance analysis, based on data from ENTSO-e for electricity prices and from Montel for the TTF gas price*

[7] Seb Kennedy, "Shock Therapy", Energyfluxnews, October 2023
[8] Council of the EU, "Reform of electricity market design: Council reaches agreement", October 2023

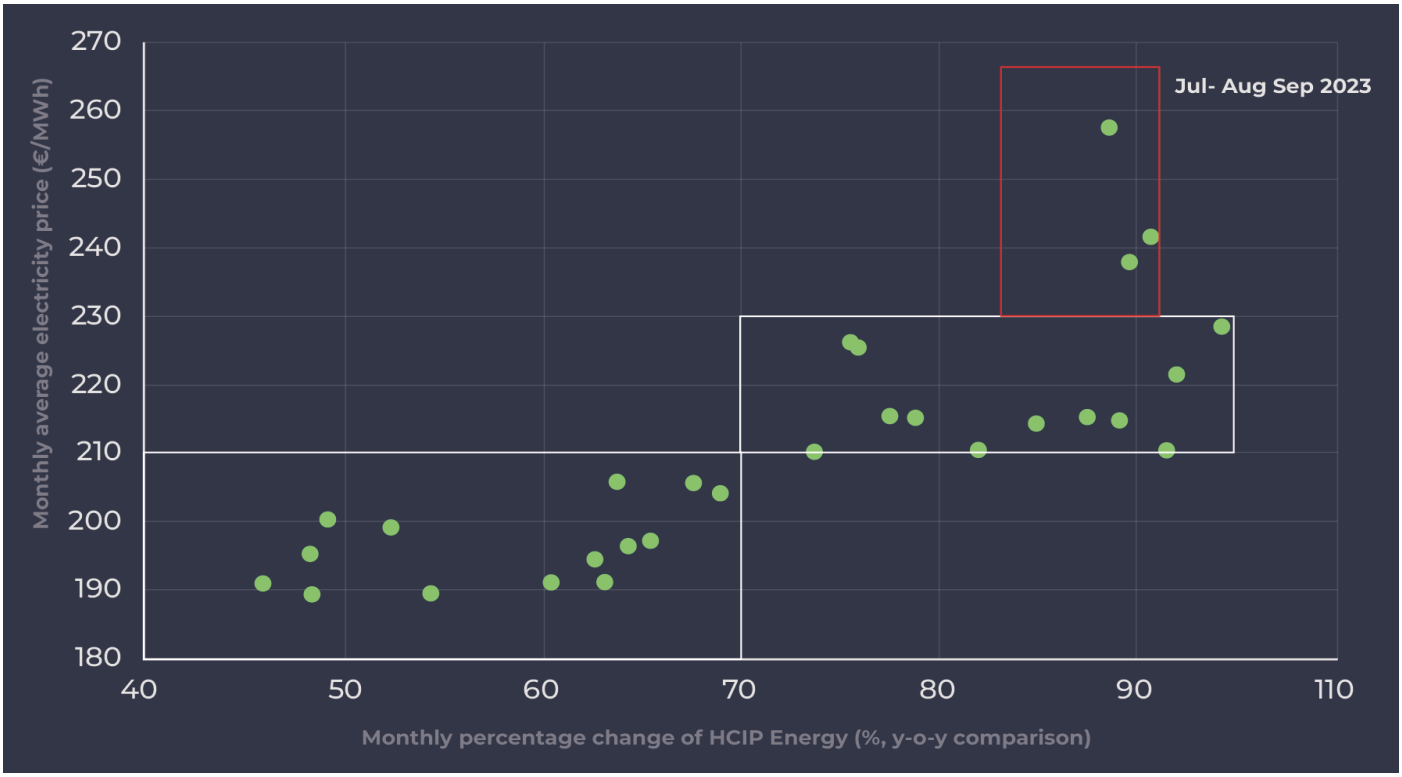
# 3. LOWER ELECTRICITY PRICES CORRELATE TO LOWER ENERGY INFLATION

Figure 7 shows **the correlation between the price of electricity and the energy component of inflation since 2021**. The weight of electricity prices on HICP energy is illustrated in the upward trend we can observe on the graph:

- **When electricity prices stay below 150€/MWh, the HCIP energy does not rise more than 20% above the previous year**. In most cases observed in the 2021-2023 period, it is below 15% (and in some instances negative).
- **Above 150€/MWh, the HCIP energy climbs up between 20% and 45% above the previous year**

**It is worth noting the effect of electricity prices on HICP Energy and overall HICP was reduced due to the exceptional measures taken by European states in 2022.** Indeed, from 2021 to 2023, many states deployed measures to help households and companies shoulder higher energy prices. According to the European Commission, the total amount of energy subsidies in the EU increased to an exceptional 216 billion euros by 2021 and 390 billion in 2022[9] (including a surge in fossil fuel subsidies from 56 billion euros in 2021 to 123 billion in 2022). The ECB underlined that energy and inflation-related fiscal support measures jumped from 0.2 to 1.9% of GDP

**Figure 7: Correlation between electricity price and HCIP Energy index inflation**




*Source: Reclaim Finance analysis, based on data from ENTSO-e for the electricity prices and from the European Central Bank Data Portal for inflation.*

**Electricity prices above 150 euros per MWh are linked to HICP energy 20-45% higher than in the previous year**

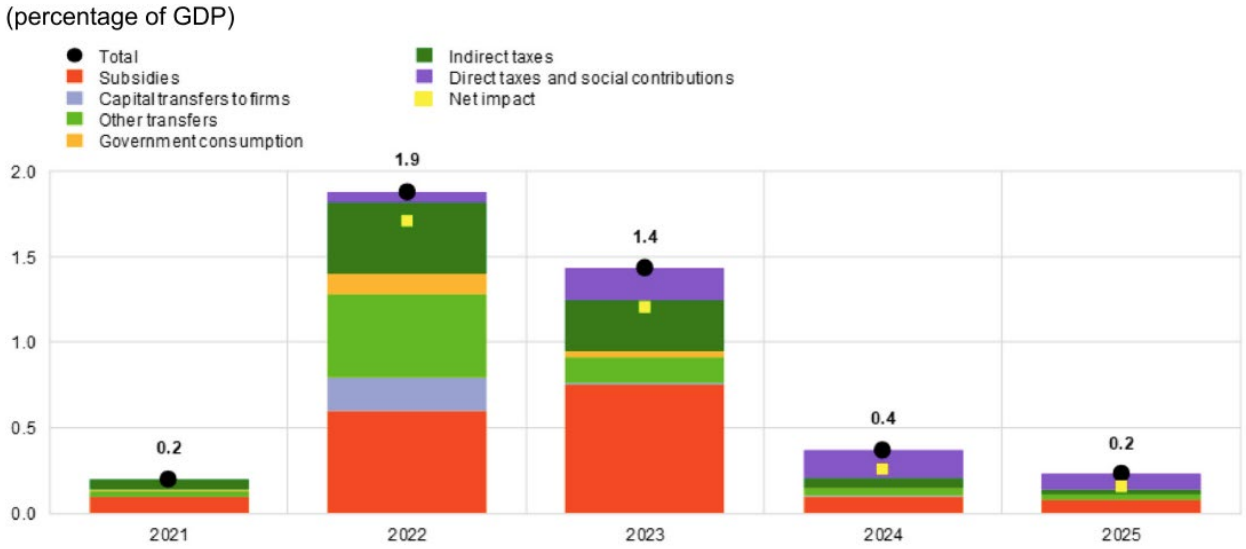
in 2022 (see Figure 8). Board Member Fabio Panetta noted that "more than half of these measures had a direct negative impact on the cost of energy", and underlined that this exceptional mobilization of public finance was supported by the ECB's "Transmission Protection Instrument" (TPI).[10] **ECB calculations suggest this contributed to contain inflation by 0.9 percentage points over the period 2022-2023.**

These elements show that:

- **Gas and electricity prices would have a much larger impact on EU inflation without such exceptional public support measures.** The correlation between electricity prices and HICP could therefore be stronger in such a situation.
- **The ECB played a role in mobilizing public finance to alleviate energy prices during the Covid crisis by creating the TPI** - a mechanism that allows the Eurosystem to make secondary market purchases of securities issued in EU countries experiencing a deterioration in financing conditions.[11] Though the TPI was not activated,[12] this shows deploying measures that help mobilize finance to lower gas demand and/or roll out renewable energy is not a longshot, but is on the contrary relatively close to the current ECB logic.

Given electricity prices are correlated to the energy component of inflation, decreasing these prices could help lower inflation. Furthermore, as the ECB itself underlined, **energy prices also have an indirect impact on inflation beyond the specific energy component**. Indeed, our economy is energy-intensive and the shift in energy prices at least partially reverberates in the price of goods and services, including food.[13]

## Figure 8: Energy and inflation-related fiscal support measures in the euro area




*Source: Fabio Panetta, "Investing in tomorrow: Future-proofing fiscal policies and governance in Europe", ECB, September 2023*

[9] European Commission, State of the Energy Union Report 2023, October 2023 / European Commission, 2023 Report on Energy Subsidies in the EU, October 2023
[10] Fabio Panetta, "Investing in tomorrow: future proofing fiscal policies and governance in Europe", ECB, September 2023
[11] ECB, "The Transmission Protection Instrument", July 2022
[12] Isabel Schnabel, "Monetary and financial stability – can they be separated?", ECB, May 2023
[13] Paul Schreiber, "Part 1. 1. Climateflation: when global warming heat up prices", in Managing Inflation by Supercharging a Clean Energy Transition, Reclaim Finance, September 2022

# CONCLUSION

Significant investments in the energy transition have the potential to reduce inflation by acting on its energy component, as well as to reduce the European electricity market's exposure to gas-driven inflationary shocks and volatility.

**To manage inflation in line with its mandate,[14] the ECB should contribute to lower gas demand through renewable energy and energy efficiency deployment.** A renewable-based and more efficient power system will deliver electricity to all Europeans at relatively cheap and stable prices, thus reducing price volatility and making inflation management easier.[15] For the ECB, contributing to the emergence of such a system is also a way to fulfill a long-disregarded "secondary mandate" that requires it to contribute to the Union's policy goals.

Furthermore, **supporting the energy transition is essential to help mitigate the risk of another inflation originating directly from the physical impacts of climate disruptions and to bring about an "orderly" transition[16]** that minimizes climate-related risks and delivers the best outcome for all.[17]

However, **the ECB's current interest rate policy is a barrier to capital-intensive investments in renewable energy and energy efficiency. Indeed, research showed that the additional annual costs of renewable energy deployment resulting from an interest rate increase of 3% are respectively €3.5 billion (+5,4%) in 2030 and €7.6 billion (+9%) in 2050 in the Netherlands**.[18] 54% of the members of the Dutch Renewable Energy Association indicated that they have or foresee problems with the financing of new sustainable energy in the short term, and 32% have already delayed or called off planned investments. In France, rising interest rates are already affecting the ability of social housing landlords to fund the necessary building restoration to reach national climate goals.[19]

This should be worrying for the ECB and Eurosystem central banks: providing the above elements, **if energy transition investments are depressed by the high rate policy, then the central bank is jeopardizing its ability to manage inflation in the longer term.**

**In line with the ECB's mandate, and to avoid monetary policy impairing the EU energy transition, we call on the ECB and Eurosystem central banks to set up differentiated and lower interest rates for projects related to the energy transition.**

---

[14] Paul Schreiber, "Part 2. The clean energy transition in the ECB's mandate", in Managing Inflation by Supercharging a Clean Energy Transition, Reclaim Finance, September 2022

[15] Paul Schreiber, "Part 1. 3. Greenflation myth: when a planned energy transition lowers prices and increases stability", in Managing Inflation by Supercharging a Clean Energy Transition, Reclaim Finance, September 2022

[16] Paul Schreiber, "Part 1. Why facing climate-related inflations requires supporting a clean energy transition", in Managing Inflation by Supercharging a Clean Energy Transition, Reclaim Finance, September 2022

[17] Luis de Guindos, "Need for speed on the road to Paris", ECB, September 2023 / Allen Thomas and al, "Using Short-Term Scenarios to Assess the Macroeconomic Impacts of Climate Transition", Banque de France, June 2023

[18] Rens Van Tilburg, "Options for the ECB to neutralise the negative effects of its monetary policy for the European energy transition", Sustainable Finance Lab, June 2023 / Rutger Bianchi and al, "Impact of rising interest rates on sustainable projects", Berenschot, May 2023

[19] Raphaël Richard, "Logement social : vers un arbitrage entre réhabilitation et construction", Banque des Territoires, Septembre 2023

# Data sources

**Inflation data**: ECB data portal
Time scope: January 1997 to July 2023
Geographical scope: Euro area (changing composition) (U2)

**Electricity price:** ENTSO-e
Time scope: January 2017 to June 2023
Geographical scope: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden

**TTF gas price:** Montel
Time scope: January 2020 to June 2023
Geographical scope: EU benchmark price - Dutch Title Transfer Facility

**Electricity demand:** Ember
Time scope: January 2021 to June 2023
Geographical scope: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden

**Gas demand:** Bruegel
Time scope: January 2021 to May 2023
Geographical scope: Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden

**Electricity generation:** Ember
Time scope: January 2021 to June 2023
Geographical scope: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden

# Scope for correlation studies

The scope used in the correlations presented in this document corresponds to:

**Time scope:** January 2021 to May 2023

**Geographical scope (intersection of previous scopes):** Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden

Note that the last correlation exploring the link between electricity prices and the inflation of HCIP Energy involves inflation at the Euro area level, and not only at the level of the mentioned geographical scope.

*Price data is averaged and demand data is summed over the geographical scope.*

# LESSONS FROM 2021 TO 2023
## Inflation management calls for a sustainable energy transition in Europe

Reclaim Finance is an NGO affiliated with Friends of the Earth France. It was founded in 2020 and is 100% dedicated to issues linking finance with social and climate justice. In the context of the climate emergency and biodiversity losses, one of Reclaim Finance's priorities is to accelerate the decarbonization of financial flows. Reclaim Finance exposes the climate impacts of financial players, denounces the most harmful practices and puts its expertise at the service of public authorities and financial stakeholders who desire to bend existing practices to ecological imperatives.


## Contact
contact@reclaimfinance.org



## Credits
Adobe Stock | Pexels


RECLAIM Finance