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Revisiting monetary policy and price stability in the green transition

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Summary

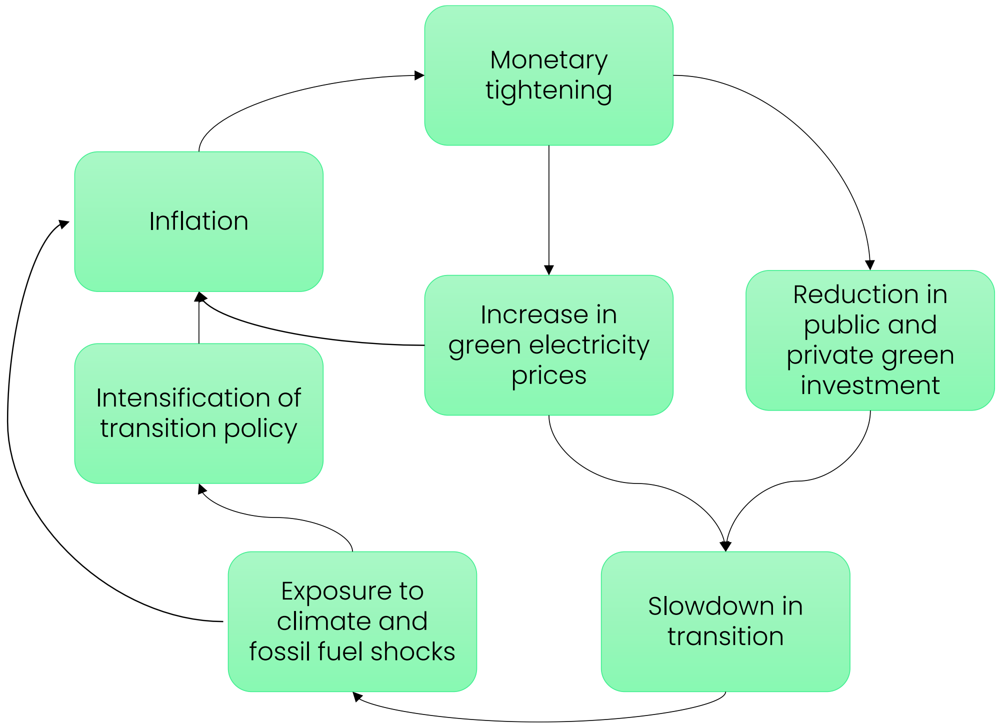
Climate change and volatile fossil fuel prices increasingly drive macroeconomic and price instability. A successful green transition is a precondition for price stability in the long term but could generate inflationary pressures over shorter time horizons. A restrictive monetary response to such pressures would disproportionately affect the capital-intensive green investment needed for a transition. To maintain price stability without compromising the green transition, we propose adaptive inflation targeting, adjustments to monetary operations, and an institutional architecture for systematic monetary–fiscal coordination.

Climate change and volatile fossil fuel prices, as drivers of macroeconomic and price instability, are already material and are projected to intensify in high greenhouse gas emissions scenarios. This means that a successful green transition is a precondition for price stability in the long term. Physical climate hazards, particularly extreme heat and drought, generate short-term inflationary pressures primarily through food prices, with effects that increase non-linearly with hazard intensity and that transmit across borders through commodity markets and supply chains. Volatility in fossil fuel prices transmits to domestic inflation through electricity markets and global energy supply chains. The transition can, in principle, reduce exposure to both sources of instability.

However, the green transition itself could generate inflationary pressures in the short to medium term. Climate change mitigation policies tend to manifest as negative supply shocks, dampening output and placing upward pressure on prices. The magnitude of these pressures will depend on the design and sequencing of transition policies. These effects are typically temporary and moderate in well-designed policy environments, but factors such as disorderly policy sequencing and geoeconomic fragmentation can amplify and prolong them. Either way, these supply-led sources of inflation pose a challenge for applying inflation-targeting frameworks rigidly, despite their successful track records in addressing demand-driven inflation.

Conventional monetary tightening risks undermining the very conditions on which long-term price stability depends. Monetary policy is ill-equipped to deal with supply-side pressures and the structural transformation that the green transition requires. Moreover, its typical reaction function could generate a self-defeating cycle. Higher interest rates disproportionately hamper private and public investment in green capital, due to the capital-intensive cost structure of renewable energy generation. They also increase the cost of green energy through their effect on financing costs, which can transmit to consumer prices via long-term contracts such as contracts for difference. Through these mechanisms, standard monetary tightening can generate self-reinforcing dynamics that undermine the conditions required for long-term price stability. By slowing the pace of the transition, tightening leaves the economy more exposed to physical climate risks and volatile fossil fuel prices in the medium and long term. The short-term disinflationary benefits of tightening during the transition, operating primarily through lower fossil fuel prices and weaker aggregate demand, come at the cost of slowing the structural transformation needed to secure price stability over longer time horizons. These feedback dynamics are illustrated in Figure S1 below.

Figure S1. Feedback loops between monetary policy, inflation and the low-carbon transition



Source: Authors.

Policy options to maintain price stability in a green transition

There are several monetary policy options that could avoid such a vicious cycle, maintaining price stability in the medium term and supporting a green transition. The first of these is an adaptive inflation targeting (Adaptive-IT) framework set out in Barmes et al. (2024). This involves adapting the existing inflation targeting framework to enhance its flexibility, allowing central banks to 'look through' transient supply-driven price spikes for longer periods in a world of recurring supply shocks, and leaving more space for fiscal policy to respond to first-round effects. In practice, the process could involve wider tolerance bands, longer convergence horizons and, potentially, an effort to revisit the inflation target itself. Fiscal measures that successfully contain realised inflation also play an important role in anchoring inflation expectations and limiting upward pressure on long-term interest rates, both of which support the credibility of the framework. The 2022–23 inflationary episode provides extensive evidence of fiscal instruments' effectiveness in lowering inflation while maintaining output.

Second, where monetary tightening becomes necessary nonetheless, the design of monetary operations can be adjusted to protect the green transition from the repercussions of restrictive policy. For example, climate-related adjustments to collateral frameworks could favour assets that are aligned with the green transition, and green refinancing operations could provide preferential financing conditions for renewable energy and other projects relevant to the transition. While these measures depart from the principle of market neutrality, there is a case for doing so. Market prices do not adequately incorporate climate risks, which are long-term, non-linear and subject to tipping points. Moreover, the capital-intensive nature of renewable technologies means that they are disproportionately affected by changes in financing conditions and the monetary policy stance.

Third, preparing for a world of recurring supply shocks will require an institutional architecture for systematic monetary–fiscal coordination. Anticipating and responding to adverse supply shocks from any source will require the relevant authorities to act in coordination with one another. The precise design of these arrangements remains an open question and will vary across jurisdictions, but will likely require changes to central banks' internal governance, new multi-stakeholder coordination bodies and closer collaboration at the international level. Without such coordination, the framework changes we propose may not be sufficient for policymakers to maintain price stability while achieving a green transition amid geoeconomic fragmentation.

1. Introduction

Decarbonisation supports long-term price stability by reducing exposure to climate-related supply shocks and fossil fuel price volatility. Yet the policies required to drive it may generate short- to medium-term inflationary pressures that conventional monetary frameworks[1] are ill-equipped to handle. This report puts forward proposals to better navigate these trade-offs and calls for a revised institutional architecture that ensures strategic consistency between monetary and fiscal policy.

The low-carbon transition is a structural transformation of historic proportions – one that will reshape energy systems, production processes and consumption patterns across the global economy over the coming decades. While the long-term macroeconomic case for decarbonisation is increasingly well established, the short- to medium-term consequences for inflation and monetary policy remain underappreciated and inadequately addressed in both policy frameworks and the academic literature. This report aims to help fill that gap.

Over time, decarbonisation can reduce economies' exposure to two major recurring sources of inflationary pressure: climate-related physical supply shocks and volatile fossil fuel prices, particularly for net importers such as the EU and the UK. As the empirical evidence shows, this contributes to a more structurally stable inflation environment. The inflationary impact of extreme weather events on food and energy prices is already well documented and is projected to intensify substantially as warming continues. At the same time, greater use of renewable energy can progressively weaken the transmission of fossil fuel price shocks to domestic inflation, reducing the vulnerability that made the 2022–23 energy price surge, and subsequent episodes, so damaging.

Yet this long-term alignment between climate and price stability does not occur automatically or immediately. The policies required to drive the transition in carbon pricing, green subsidies and public investment, and regulatory mandates are potential sources of short- to medium-term inflationary pressure in themselves. The empirical and modelling evidence we review suggests that these inflationary effects are typically temporary and moderate in well-designed policy environments. However, factors such as disorderly policy sequencing (of the kind that is likely in real-world scenarios) and geoeconomic fragmentation could make these effects more pronounced and persistent. Either way, these supply-led sources of inflation pose a challenge for conventional monetary policy frameworks that were built for demand-driven inflationary environments.

This challenge runs deeper than might initially appear. A central bank responding mechanically to transition-driven inflation through conventional monetary tightening risks triggering a self-defeating cycle. Higher interest rates increase financing costs for capital-intensive renewable projects, slow green investment, and erode governments' fiscal capacity to finance the transition. If this delays decarbonisation, the economy becomes more exposed to physical and fossil fuel price risks that monetary policy is ill-equipped to address, generating higher long-term inflation. Conversely, if the transition proceeds despite monetary tightening, rising green energy costs can feed directly into headline inflation, prompting further rate increases. Standard inflation-targeting frameworks, designed for a world of demand-driven price pressures, do not adequately account for these dynamics.

[1] In this report, "conventional monetary tightening" does not refer to policy-rate increases per se, nor does it imply that inflation targeting is inherently rigid. It refers more specifically to an implementation bias within inflation-targeting frameworks that: applies a rules-based reaction function too rigidly or mechanically, rather than using the flexibility inherent in the framework to assess the nature, persistence and transmission of the supply shock at hand, thereby creating a presumption in favour of rate increases; and places excessive weight on short-term realised inflation, inflation expectations and financial-market pressure for tightening, without adequately articulating the more complex intertemporal trade-offs – including the effects on output, investment and medium- to long-term price stability, which may be harder to communicate.

We set out recommendations for how monetary frameworks should adapt to these limitations, building on Barmes et al.'s (2024) case for an adaptive inflation targeting (Adaptive-IT) framework. This is the adaptation of the existing inflation targeting framework, extending its flexibility to allow central banks to 'look through' transient, supply-driven price pressures for a longer period in a world of recurring supply shocks, leaving greater space for fiscal policy to address first-round effects. In practice, this could involve wider tolerance bands, longer convergence horizons and, potentially, an effort to revisit the inflation target itself. Fiscal measures that successfully contain realised inflation also play an important role in anchoring inflation expectations and limiting upward pressure on long-term interest rates, both of which support the credibility of the framework. The 2022–23 inflationary episode provides extensive evidence on the available fiscal instruments and their relative effectiveness.

Where monetary tightening becomes necessary nonetheless, the design of monetary operations can be adjusted to limit its effects on the green transition. Climate-related adjustments to collateral frameworks could favour transition-aligned assets, while green refinancing operations could offer preferential financing conditions for renewable energy and other transition-relevant investments. Although these measures depart from the principle of market neutrality, the case for doing so rests on the empirically grounded premise that market prices do not adequately incorporate climate risks – which are long-term, non-linear and subject to tipping points.[2]

Lastly, achieving both price stability and a green transition requires an appropriate institutional framework: one through which monetary and fiscal authorities work in a more coordinated manner in their respective mandates, with strategic consistency across policy domains, and not through the subordination of either one to the other. The fiscal measures needed to contain transition-driven inflation may themselves create challenges for such coordination, making such a framework all the more necessary. By themselves, the approaches discussed above (ranging from looking through supply shocks to implementing targeted refinancing operations) are unlikely to guarantee that the desired level of green investment will materialise. To remain effective and legitimate while pursuing such an agenda, central banks' institutional arrangements may need to evolve through changes in internal governance, new multi-stakeholder coordination bodies and closer collaboration at the international level.

Structure of the report

- Section 2 explores why the green transition matters for long-term price stability, examining inflationary channels linked to physical climate hazards and fossil fuel price volatility.
- Section 3 assesses the potential short- to medium-term inflationary impacts of transition policies.
- Section 4 analyses how conventional monetary policy could delay the transition while simultaneously undermining price stability.
- Section 5 builds on Barmes et al.'s (2024) call for Adaptive-IT, providing several avenues through which monetary policy could be adapted to the new climate reality, and assessing the broader implications for monetary–fiscal coordination.
- Section 6 concludes.

[2] Moreover, there is precedent for departures from strict market neutrality. For example, the Eurosystem tilted the reinvestment of its maturing corporate bond holdings towards issuers with better climate performance.

2. Why the green transition matters for long-term price stability

Without a low-carbon transition, economies face escalating exposure to two major sources of price instability: the physical impacts of climate change, which generate increasingly severe inflationary supply shocks as warming intensifies; and volatile fossil fuel prices. This section reviews the evidence on both channels. It first explores the growing evidence of how physical climate hazards affect inflation, showing that these effects are already material and are projected to intensify. We then consider how the restructuring of energy systems away from fossil fuels and towards renewables can progressively weaken the transmission of fossil fuel price shocks to domestic inflation.

Reduced exposure to climate-related physical supply shocks

Physical climate hazards can affect prices through multiple channels, including damage to capital and infrastructure, reduced agricultural yields, lower labour productivity, and disrupted supply chains (Baleyte et al., 2024; Drudi et al., 2021; Network for Greening the Financial System [NGFS], 2024a; Angeli et al., 2022). There is empirical evidence that climate hazards produce short-term inflationary pressures, primarily through food prices. In summer 2022, extreme summer contributed an estimated 0.34 percentage points (pp) to annual headline inflation and 0.67 pp to food inflation in Europe (Kotz et al., 2024). Similarly, in 48 advanced and emerging economies, summer heat shocks have raised headline and food inflation, with stronger effects in hotter countries (Faccia et al., 2021). Recent summer temperature anomalies of 0.4°C above their monthly long-term average for 1951–80 raise global food commodity prices by around 10% within a year, with production data confirming that this operates through reduced crop yields, especially grains (Falck and Schulte, 2025).

Droughts generate the largest and most persistent effects among the hazards studied. Moderate or severe droughts contribute up to 3 pp to headline inflation within four quarters, with food inflation reaching up to 10 pp (Kabundi et al., 2022). Storms and hurricanes also generate short-term inflationary pressures, particularly in food markets (Heinen et al., 2019; Cashin et al., 2017; Bao et al., 2023). Precipitation shocks produce more mixed results, but extreme reductions in rainfall (closely associated with drought conditions) consistently raise food prices (Kabundi et al., 2022; Kotz et al., 2024). The short-term inflationary impact of climate hazards is often followed by medium-term disinflation, as wealth destruction, heightened uncertainty and impaired balance sheets suppress aggregate demand (Parker, 2018; Kabundi et al., 2022; Angeli et al., 2022). This pattern is consistent with the concept of a 'Keynesian supply shock' (Guerrieri et al., 2020), in which an adverse supply disturbance raises costs on impact but subsequently triggers a contraction in demand.[3]

Three pieces of evidence suggest that climate-related supply shocks will become more severe as climate change worsens. First, the relationship between hazard intensity and inflation is non-linear: larger and more severe events have disproportionately large price effects, consistent with the finding that severe disasters overwhelm economies' capacity for resilience (Parker, 2018; Faccia et al., 2021; Kabundi et al., 2022). This non-linearity extends to seasonality. In northern mid-latitudes, the inflationary impact of temperature shocks in summer is nearly twice as large as that in winter (Kotz et al., 2024; Falck and Schulte, 2025; Ciccarelli and Marotta, 2024). As extreme summer temperatures become more frequent, they are likely to result in recurrent supply shocks. While adaptation measures may partially mitigate the overall impact of a given temperature increase, they will not be able to eliminate it entirely. This remains a challenge even for more economically developed countries, which have greater adaptation capacity. Natural disasters already increase the probability of high-inflation, low-

[3] Faccia et al. (2021) explicitly invoke this interpretation.

growth outcomes; this amplification of tail risk is substantially greater in high-emissions scenarios (Chavleishvili and Moench, 2023).

Second, most empirical studies focus exclusively on the domestic effects of localised climate-related shocks and, therefore, underestimate overall inflationary exposure. In an interconnected global economy, climate hazards transmit across borders through food commodity markets, energy markets and supply-chain networks. A 10% increase in world food prices raises inflation in advanced economies by an estimated 0.5 pp after one year (Furceri et al., 2016); international food commodity price fluctuations account for nearly 30% of headline inflation variation in the euro area (Peersman, 2022). Climate-related supply-chain disruptions are an additional and understudied channel: weather anomalies contribute to bottlenecks in production networks, with a one-standard-deviation shock of supply-chain pressures raising headline inflation by around 2 pp in China, 2.1 pp in the UK and 3.8 pp in the US over a 24-month period (Cevik and Gwon, 2024).

Third, the inflationary effects of climate shocks are amplified by the degradation of natural ecosystems. Agricultural production depends on ecosystem services (e.g. pollination, pest regulation, water regulation) that are also deteriorating. Disruptions to these services propagate into consumer prices, with shocks to ecosystem services raising food inflation by more than 2 pp and headline inflation by around 0.5 pp over one to two years (Wegner et al., 2025). This suggests that future climate shocks striking in contexts of degraded natural capital will generate stronger inflationary effects than similar shocks in intact ecosystems.

Crucially, the scale of these inflationary pressures depends on the world's emissions pathway. By 2035, higher average temperatures could add between 0.32 pp and 1.18 pp annually to global headline inflation and between 0.92 pp and 3.23 pp annually to global food inflation in a high-emissions scenario (Kotz et al., 2024). In a best-case emissions scenario, by contrast, the additional inflationary pressures in 2060 would be only marginally higher than those in 2035.[4]

Reduced exposure to volatility in global fossil fuel prices

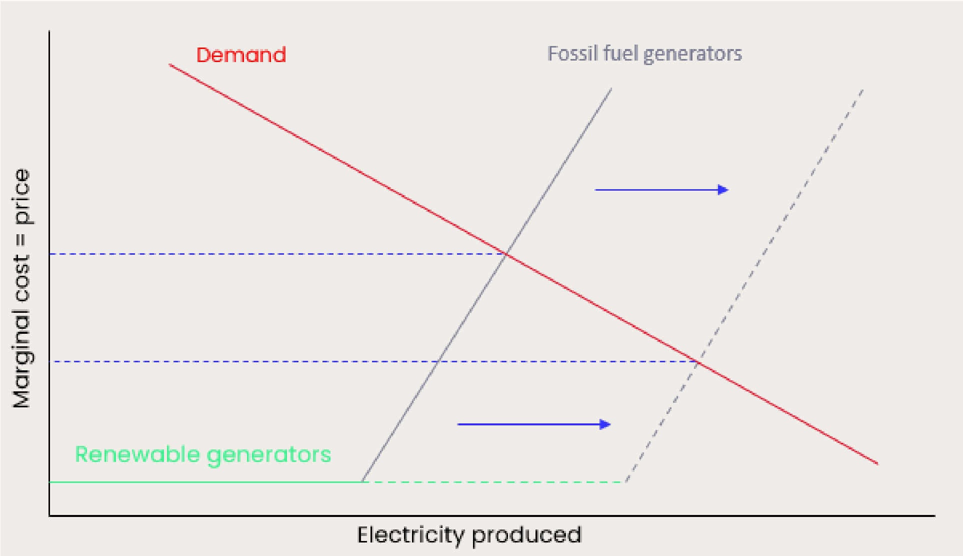
For net fossil fuel importers (as most countries are), the energy transition can, in theory, improve long-term macroeconomic stability by reducing their exposure to volatile fossil fuel prices (Americo et al., 2023), which can feed into both the price of electricity and the price of oil and gas used in heating and transport. In this vein, Panetta (2022) argued that replacing fossil fuels with renewables could generate a 'divine coincidence' between climate objectives and price stability,[5] while Schnabel (2022) and Elderson (2026) similarly linked recent inflationary episodes to 'fossilflation', suggesting that greater reliance on renewables may weaken the transmission of global energy price shocks to domestic inflation over time (including due to the electrification of transport and heating). However, the structure of electricity markets and the way in which electricity is priced mean that the path to this divine coincidence is not necessarily straightforward or linear. Furthermore, maintaining incentives to invest in new renewables capacity requires mechanisms to secure stable long-term revenues (see Box 2.1 below).

Many liberalised power systems[6] rely on a marginal pricing framework: power generators are dispatched in ascending order of short-term marginal cost until demand is met. The wholesale electricity price is set by the most expensive accepted unit that is required to serve the final increment of demand in each period (Zakeri et al., 2023; Blázquez et al., 2018; Newbery, 2023; Fabra, 2023). Because wind and solar have very low short-run marginal costs (as they require no fuel inputs once installed), renewable generators bid at or near zero and are dispatched whenever their output is available. The expansion of renewable capacity shifts the supply curve outward, displaces higher-cost thermal generation and exerts downward pressure on wholesale electricity prices. This is referred to as the

[4] For a more detailed review of the literature on physical hazards and inflation, see Barmes et al. (2024).
[5] The notion of "divine coincidence" was formalised by Blanchard and Galí (2007), who showed that, absent real rigidities, stabilising inflation automatically stabilises the output gap, providing a justification for inflation targeting as a sufficient framework for macroeconomic stabilisation. However, this 'coincidence' breaks down in the presence of cost-push shocks or real rigidities.
[6] Including the UK wholesale market, the European electricity market, and most North American markets.

‘merit-order effect’, as can be seen in evidence from several jurisdictions (Cevik and Ninomiya, 2022; Navia Simon and Diaz Anadon, 2025).

Figure 2.1. Renewable energy shifting the electricity supply curve



Source: Adapted from Blázquez et al. (2018).

However, renewable energy expansion alters not only the level but also the variability of wholesale prices. The intermittency of wind and solar introduces an additional source of variability, as generation becomes increasingly dependent on weather conditions rather than prices. Periods of high renewable energy output are associated with a greater frequency of very low wholesale prices, as zero-marginal-cost generation displaces higher-cost plants in the merit order. Meanwhile, periods of low renewable availability increase the likelihood that dispatchable thermal generation will be required to meet demand. As a result, growth in renewable energy capacity tends to widen the distribution of wholesale prices over time, with more frequent low-price hours and continued price dispersion rather than a uniform reduction in prices (Blázquez et al., 2018; Zakeri et al., 2023; Mallapragada et al., 2023; Navia Simon and Diaz Anadon, 2023).

Box 2.1. How contracts for difference support renewable energy deployment and stable prices

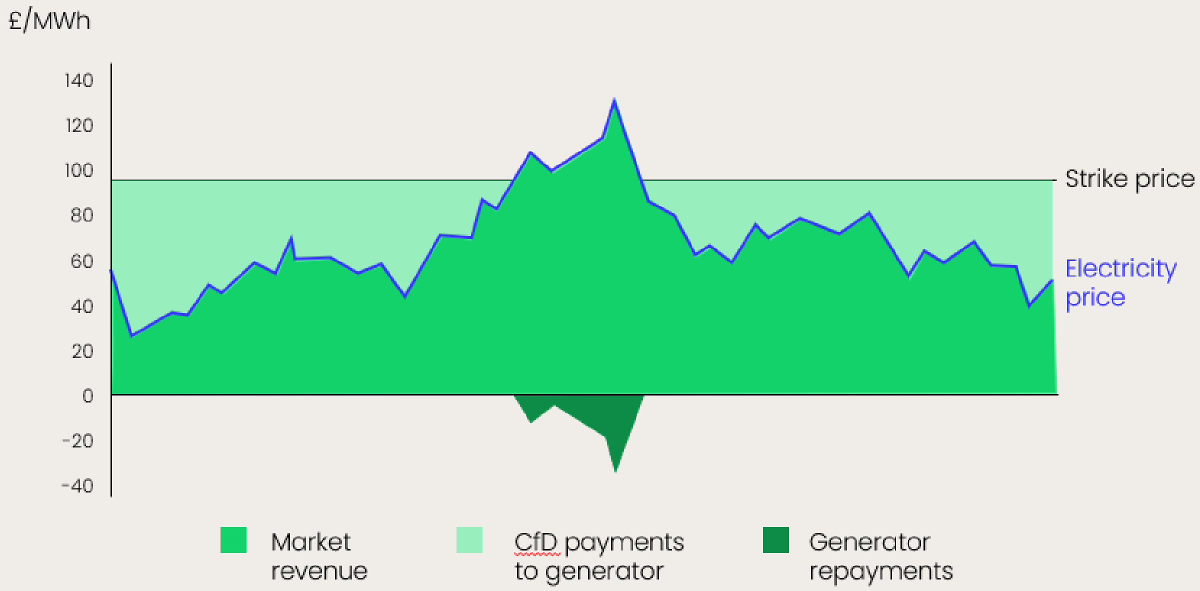
The cost structure of renewable energy technology is fundamentally different from that of fossil fuel generation: over 90% of the lifetime costs of renewables are fixed costs (e.g. construction costs and fixed operations and maintenance costs) with very low marginal costs thereafter (Department for Energy Security and Net Zero, 2023). Revenue earned over the asset’s lifetime must recover this fixed investment. However, as renewable capacity expands, renewables increasingly set the wholesale price themselves and, given that they bid at near-zero marginal cost, the market price in those hours is near zero. This ‘cannibalisation effect’ means that wholesale market income alone may be insufficient to recover the substantial fixed capital costs of new renewable energy investment (Fabra, 2021; Beiter et al., 2024). This deters such investment, even when renewables are the lowest-cost generation technology available.

Contracts for difference (CfDs) address this problem. In a two-sided CfD, a renewable energy generator receives a guaranteed strike price: if the wholesale market price falls below the strike price, the generator receives a top-up payment; if the market price exceeds it, the generator pays back the difference – so that the generator always receives the CfD price regardless of the prevailing wholesale price (Newbery, 2023; Fabra, 2021). When wholesale prices are, on balance, below the strike prices, there is a net cost to the scheme, which is recovered through a levy on electricity suppliers and passed through to consumers' bills.

In the UK and elsewhere, the CfD strike price is set via an auction process in which generator developers bid on the strike prices (between an upper and lower bound) that they will receive if they are successful. The institution responsible for administering the auction then awards contracts to various bidders, starting with those that bid the lowest strike price, until the budget for that allocation round has been allocated.

The UK has operated a CfD scheme since 2014 (Watson and Bolton, 2024). CfDs have now been adopted or are under development across much of Europe: the EU's 2024 Electricity Market Design Reform (Directive 2024/1711) mandates two-way CfDs for all new publicly supported investments in renewables and nuclear generation. Globally, CfDs have been used for more than half of all offshore wind capacity procured to date (Beiter et al., 2024).

Figure 2.2. Contracts for difference



Source: Adapted from Watson and Bolton (2024).

The two-sided structure also functions as a price stabilisation mechanism for consumers, since generators are obliged to return revenues above the strike price when wholesale prices are high. This was demonstrated during the 2021–22 energy crisis: in aggregate, CfD generators in the UK paid back more than they received in 11 of the 15 months between October 2021 and November 2022 (Watson and Bolton, 2024). There was a similar pattern across Europe, with CfD-type schemes generating surpluses that were redistributed to consumers in Portugal (€2.5 billion in 2023), France (close to €6 billion in 2022–23) and Denmark (an estimated €700 million in 2022) (Morawiecka and Scott, 2023).

While the merit-order effect means that greater renewable energy penetration can lower average wholesale electricity prices, this does not imply that the divine coincidence between decarbonisation and price stability automatically emerges as renewables' share of total generation rises. A study of 69 countries between 1973 and 2022, the most explicit cross-country test of the divine coincidence hypothesis to date, found no evidence that a higher renewable energy share systematically reduces the sensitivity of energy inflation to changes in international fossil fuel prices (Millischer et al., 2024). This counterintuitive result may reflect three factors. The first is cross-country heterogeneity in energy policies that the study's empirical framework does not fully account for, including subsidies, price controls and other interventions shaping pass-through. Second, threshold effects arising from marginal pricing in power markets can cause fossil fuel generation to remain disproportionately important for price-setting even as its average share of total generation declines. Third, due to trade and spillover channels, even countries that use a large share of electricity from renewables can import higher energy prices via integrated markets and shifts in external demand for their energy carriers (ibid.).

The marginal pricing and spillover explanations are closely aligned with evidence from the electricity market that fossil fuels can continue to set prices for a large share of hours despite accounting for much lower shares in total generation (Zakeri et al., 2023). However, the evidence suggests that the divine coincidence is attainable in specific conditions. In Latin American countries where a very large share of electricity comes from renewables, the pass-through from international oil price shocks to energy and headline inflation is markedly smaller and less persistent (Cornejo et al., 2025). While wholesale electricity prices in the euro area tracked gas prices closely during the 2021–22 crisis, their reaction to the current Middle East crisis has been far more muted (Arce et al., 2026). This may be partly because the share of renewables and nuclear generation in the energy mix has grown in the interim (ibid.). Modelling indicates that as renewables penetration deepens and the energy system becomes more flexible, electricity prices grow less sensitive to fossil fuel price shocks and are increasingly determined by the opportunity costs of storage, interconnection and demand response (Navia Simon and Diaz Anadón, 2025). As the share of renewables in electricity generation rises and the electrification of energy systems intensifies, policy mechanisms such as CfDs are likely to play an increasingly important role in determining the energy prices paid by consumers.

3. The impacts of transition matters for long-term price stability

The policies required to drive the low-carbon transition will shift relative prices across the economy. For instance, carbon pricing should increase the price of fossil fuel-based energy, while subsidies could lower the price of electricity from wind and solar. Meanwhile, Contract for Difference schemes will be crucial in determining the price of renewable energy in both the short and long run. Whether these policy interventions translate into more persistent inflationary pressures will depend on how any short-term effects propagate through supply chains, aggregate demand and inflation expectations. This section reviews the potential sources and transmission channels of short-term inflationary pressures triggered by low-carbon policies.[7]

The review in this section draws on the theoretical, empirical and modelling literatures and is organised around three main types of policies: carbon pricing, subsidies and command-and-control regulations. As each of these policy approaches ultimately aims to increase green investment, we also discuss the impacts of green investment itself.

Carbon pricing

Carbon pricing is the most widely discussed policy driver of the green transition (Wunsch, 2023; Cocker, 2025). Its prominence reflects the emphasis in economics on the price mechanism as a driver of behaviour and the tendency of modelling frameworks to represent a variety of climate policies through an explicit or implicit ('shadow') carbon price.

Carbon pricing can take the form of a carbon tax scheme (CTS), an emissions trading scheme (ETS), or some combination of the two. By design, carbon pricing schemes increase the cost of carbon-intensive goods and services, thereby incentivising a reallocation of consumption and investment expenditures towards cleaner technologies.

The empirical literature on carbon pricing suggests that its effects on inflation are generally modest and short-lived, with CTS having a slightly smaller impact than ETS. The research on CTS, for example, tends to find that while carbon taxes can lead to inflation in the energy component of the Consumer Price Index (McKibbin et al., 2021; García and Suárez-Varela, 2022; Konradt and Weder di Mauro, 2023; Konradt et al., 2024),[8] there is little evidence for them having a sustained impact on headline or core inflation (Metcalf, 2021; Metcalf and Stock, 2023; Konradt and Weder di Mauro, 2023; Kapfhammer, 2023; Konradt et al., 2024; Ciccarelli and Marotta, 2024; Moessner, 2025). Conversely, the empirical evidence on ETS generally suggests somewhat stronger (albeit still moderate) macroeconomic effects, with tightening emissions caps associated with increases in inflation and inflation volatility, as well as reductions in output and employment (García and Suárez-Varela, 2022; Känzig, 2023; Känzig and Konradt, 2024; Moessner, 2025).[9]

There are several reasons why a CTS may have more limited macroeconomic effects than an ETS. First, in a CTS, the price of emissions is typically known well in advance, which reduces uncertainty and encourages firms and households to change their consumption and investment behaviour (Angeli et

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[7] As such, the longer-term potential for disinflationary or deflationary effects from the transition is not discussed in detail.
[8] Similarly, carbon border adjustments, which essentially operate as a tax on imported carbon, are likely to increase inflation in the short term (but may be deflationary longer term if they drive innovation) (NGFS, 2024a).
[9] Although one study finds more significant and persistent impacts on inflation via the effects of the ETS on commodity prices (Copeland et al., 2025).

al., 2022; Konradt and Weder di Mauro, 2023; Konradt et al., 2024). Conversely, in an ETS, the carbon price adjusts to the cap, which can generate price volatility and increase uncertainty.

Second, CTS often exclude high-emitting industries, whereas ETS cover more energy-intensive industries with higher cost pass-through to prices (Avgousti et al., 2023; Konradt and Weder di Mauro, 2023; Känzig and Konradt, 2024; Konradt et al., 2024; Moessner, 2025).

Third, CTS often target transport fuels, which helps limit the pass-through from the tax to consumer prices. This is because firms in the transport sector are better positioned to absorb part of the tax (McKibbin et al., 2021) or to adjust by switching to lower-emission fuels or alternative forms of transport (Konradt et al., 2024).

Fourth, a CTS disproportionately affects low-income households, as a larger proportion of their spending is on heating, transport and other carbon-intensive goods. This can dampen aggregate demand and thereby reduce inflationary pressures (Konradt and Weder di Mauro, 2023).

Fifth, by more frequently using their revenues to reduce other taxes, CTS can lower the overall tax burden of the median firm, with these reductions potentially passed onto consumers in the form of lower prices (Yamazaki, 2017; Angeli et al., 2022; Konradt and Weder di Mauro, 2023; Konradt et al., 2024). An important question concerns whether the relatively modest impacts of carbon pricing schemes observed in the empirical literature provide a reliable guide to their future macroeconomic effects. This is a particularly salient issue given that carbon prices remain relatively low and would need to rise substantially (e.g. from £30 to £1,000 in the EU)[10] to drive a low-carbon transition. Some macroeconomic studies have attempted to shed light on this question by modelling different carbon pricing schemes, but their findings are mixed and, occasionally, contradictory. For example, some studies suggest that carbon pricing will be highly inflationary and contractionary: in Vermeulen et al. (2018), the harmonised index of consumer prices is 3.5% higher relative to the baseline; in Allen et al. (2025), inflation is almost 2 pp higher relative to baseline, while in Airaudo et al (2022) inflation increases from 4% to 12% in the short run (and output falls by 8%).[11] Other studies, meanwhile, show more modest increases in inflation during a transition (Delgado-Téllez et al., 2022; Coenen et al., 2024; Ferrari and Nispi Landi, 2024; Allen et al., 2025; Fornaro et al., 2025) or even deflationary impacts (Andaloussi et al., 2022; Ferrari and Nispi Landi, 2023; Bartocci et al., 2024).

The variation in modelling results can be attributed to five main factors. One is the type of economy being modelled. In general, the smaller, more open and less developed the economy, the larger the positive impact on inflation and negative impact on output (Airaudo et al., 2022).[12] In addition, carbon taxes implemented abroad have been found to negatively affect domestic GDP via their impact on exports, while improving/worsening the terms of trade for energy-importing/commodity-exporting economies, with knock-on effects for inflation (Brand et al., 2023). A divergence in inflationary pressures across different types of economies is particularly evident in a recent study by the NGFS and the International Monetary Fund (IMF), in which NDC-aligned carbon pricing raises euro area headline inflation by around 20 basis points at peak but up to 50 basis points for oil exporters (NGFS, 2026c). The currencies of these exporters depreciate as revenues from fossil fuel exports fall, while appreciation dampens the effect elsewhere (ibid.).

Another factor is the design of carbon pricing scheme. Those schemes in which carbon prices increase by more (Allen et al., 2025) or are more front-loaded (Delgado-Téllez et al., 2022; Coenen et al., 2024) tend to be associated with larger but shorter-lived effects on inflation and output. By contrast, more gradual carbon price increases typically generate more muted impacts that persist over longer time horizons (Delgado-Téllez et al., 2022; Brand et al., 2023; Ciccarelli and Marotta, 2024; Coenen et al., 2024; Konradt et al., 2024).

Assumptions around expectation formation also contribute to the variation in model results. In some models, more forward-looking pricing behaviour by firms causes inflationary effects to be front-loaded (because they increase their prices in anticipation of the carbon price); in others, backward-looking

[10] According to the Bank of England’s 2021 Climate Biennial Exploratory Scenario (CBES).
[11] These papers contain multiple scenarios. We report the scenarios with the largest inflationary impacts.
[12] Because these countries are typically more exposed to external price shocks, less able to substitute away from carbon-intensive inputs, and less able to cushion the impact of any shocks.

pricing behaviour delays these effects (Brand et al., 2023). However, in some models, forward-looking expectations result in smaller inflationary – or even deflationary – effects, as anticipated future carbon tax increases induce households to reduce current consumption or investment (Andaloussi et al., 2022; Ferrari and Nispi Landi, 2023, 2024; Bartocci et al., 2024). The de-anchoring of inflation expectations from the central bank's target can similarly amplify inflation outcomes in some models (Ferrari and Nispi Landi, 2024).

Another factor concerns how the revenues from carbon pricing are recycled. In general, transfers to lower-income or liquidity-constrained households are typically associated with the largest positive effects on output (Allen et al., 2025; Brand et al., 2023; Coenen et al., 2024), although in some models, they also generate increases in inflation (Delgado-Téllez et al., 2022). Reducing indirect taxes, by contrast, has less of an impact on inflation while still having a positive effect on output (McKibbin et al., 2020; Estrada and Santabárbara, 2021; Liu et al., 2021; Konradt and Weder di Mauro, 2023). Increasing public investment, meanwhile, can improve economic efficiency (Delgado-Téllez et al., 2022).

Finally, modelling outcomes are critically dependent on the assumed monetary policy response. Tightening policy to counteract inflationary pressures amplifies any negative output effects, while looking through price increases implies a relatively looser stance that allows higher near-term inflation and creates risks for credibility and expectations anchoring (Brand et al., 2023). The literature is divided on the appropriate response. Some studies argue in favour of looking through inflationary effects where they are temporary or relatively small, particularly when tightening policy would entail large output losses (McKibbin et al., 2020; Del Negro et al., 2023; Olovsson and Vestin, 2023; Coenen et al., 2024; Gnocato, 2025; Carli et al., 2025). Others caution that prioritising output stabilisation may ultimately result in higher inflation (Brand et al., 2023) or argue that the trade-off could be better managed through alternative monetary frameworks or closer coordination between monetary and environmental policy (McKibbin et al., 2020).

Government subsidies

Government subsidies can also drive energy transitions by incentivising green investment and by lowering the operating costs of green technologies, thereby making them more competitive relative to fossil fuels. Subsidies can also offset inflationary or contractionary impacts stemming from the transition itself. Similarly, reducing fossil fuel subsidies can help accelerate the transition by increasing the relative cost of fossil fuel consumption and production.

From a theoretical perspective, the overall macroeconomic impact of increasing green subsidies (or decreasing fossil fuel ones) depends on several factors, including how expenditures are financed, the design and targeting of the subsidy or investment scheme, the presence of supply bottlenecks and the extent to which expenditures expand productive capacity (NGFS, 2024a). For example, financing via taxation or expenditure reductions elsewhere means any immediate macroeconomic effects will depend on the relative magnitudes of the relevant fiscal multipliers. By contrast, financing via debt issuance implies an increase in aggregate demand (in the absence of crowding-out, Ricardian equivalence, exchange rate, or public debt threshold effects). Similarly, cutting fossil fuel subsidies without increasing spending elsewhere would have contractionary macroeconomic effects, while also raising fossil fuel prices (and so would be similar to a carbon tax) (NGFS, 2024a).

The overall impact of a subsidy scheme will also depend on what the subsidy targets. When financed through debt instruments, subsidies targeting consumption or investment will likely increase green output and employment, which may place upward pressure on inflation (Schnabel, 2022; NGFS, 2024a). By contrast, subsidies that reduce costs for firms and households are more akin to a positive supply shock, as lower energy costs reduce prices and inflation while potentially increasing output (NGFS, 2024a). Ultimately, the longer-term impacts will depend on how each subsidy affects energy costs, inflation expectations, and the balance between supply and demand (Panetta, 2022; NGFS, 2024a).

Importantly, large-scale debt-financed subsidy schemes may only be viable in countries with a reasonable amount of fiscal space and a strong sovereign borrowing capacity. As such, these schemes may be more difficult to implement in emerging markets and developing economies, as they tend to face higher borrowing costs, tighter fiscal constraints and competing development priorities that reduce the scope for sustained public support. This, in turn, reinforces the need for these countries to act to crowd in private and international capital.

The empirical evidence on subsidy schemes is somewhat constrained by the limited availability of long-run, large-scale green subsidy programmes. However, some studies have examined the impact of smaller subsidy programmes during specific inflationary episodes. For example, several European governments recently implemented large-scale support measures to partially offset the inflationary pressures stemming from Russia's full-scale invasion of Ukraine in February 2022. These measures reduced euro area inflation by 1.1 pp in 2022 and 0.3 pp in 2023, albeit at a fiscal cost of 1.9% of GDP in 2022 and 1.8% in 2023 (European Central Bank [ECB], 2022; 2023). The unwinding of these measures, however, contributed to the prolonged period of above-target inflation in 2024–25 (Lagarde, 2026).

There are also several modelling studies that attempt to understand the potential macroeconomic impacts of subsidy schemes. In general, studies that look at specific schemes (such as the US Inflation Reduction Act) estimate that there will be large impacts on energy sector investment (Bistline et al., 2023), very modest impacts on output and inflation, and some potential for supply bottlenecks and/or higher interest rates that can crowd out fossil fuel or green investments (Bistline et al., 2023; Voigts and Paret, 2024).

Other studies look at the potential impacts from more generic subsidy schemes. Here, the results are more mixed. Some studies show that subsidies increase the production of green energy goods and reduce their price, which generates deflationary effects at the macroeconomic level (if prices are not fully flexible and there is no offsetting action from the central bank) (Allen et al., 2025; Del Negro et al., 2023). Others find that transitions generated by subsidy schemes and public investments generate large fiscal costs and may increase debt ratios by up to 45% in advanced economies (IMF, 2023).

Another strand of the generic subsidy literature argues that subsidy-led transitions are likely to be slower than those driven by carbon pricing and may also be contractionary, particularly in small, open economies (Airaudo et al., 2022). However, this result appears to rest on the assumption of Ricardian households responding to the subsidies by cutting expenditures, in anticipation of tax rises to fund the additional government spending. Some studies that model more generic subsidy schemes introduce subsidies as complementary measures to offset the adverse effects of carbon pricing. These studies tend to find that subsidy programmes can mitigate some of the negative impacts of carbon pricing by increasing output and reducing inflation – in some cases, by impacting productivity growth (Bartocci et al., 2024; Fornaro et al., 2025; Carli et al., 2025).

Command and control regulations

Other potential drivers of energy transitions are command and control policies such as regulatory standards, production quotas or bans, and information instruments. Policies in these areas can accelerate a transition via their impacts on production costs, input prices, consumption and investment patterns, and technological innovation (NGFS, 2024a). For example, emissions or efficiency standards can compel firms to adopt cleaner technologies, technology mandates can spur deployment of low-carbon infrastructure by removing fossil fuel alternatives from the market, and renewable energy targets and portfolio standards can drive investment by guaranteeing market share. Similarly, building codes, appliance standards and transport regulations can help lock in long-term energy efficiency gains and reduce energy usage, while information disclosure can help consumers and investors make greener choices.

In theory, the overall impact of non-market-based climate policies will depend on several factors, including the types and stringency of interventions, the speed of implementation and the availability of compliance technologies. For example, command and control policies may initially push up prices by shifting demand towards high-cost technologies or by creating compliance and administrative burdens. Over the longer term, however, costs can fall as efficiency gains are realised, innovation occurs and productivity improves (the Porter hypothesis) (Porter, 1996; NGFS, 2024a).

Empirical evidence suggests that non-market-based policies can accelerate the adoption of green technologies but may also lead to increases in inflation. In the US, for example, renewable portfolio standards were associated with a 44% increase in wind capacity between 1990 and 2019 (Deschênes et al., 2023), and electricity price increases of up to 10% (Tra, 2016; Upton Jr and Snyder, 2017; Greenstone and Nath, 2020).[13] In contrast, studies examining the introduction of energy-efficiency standards find that they lead to improvements in product quality (Houde and Spurlock, 2015) and reductions in prices (Brucal and Roberts, 2019).

Modelling studies of regulatory interventions paint a more nuanced picture. While regulatory measures are generally found to deliver relatively rapid decarbonisation, their macroeconomic effects can vary considerably. For instance, in some models, GDP growth and inflation remain largely unaffected by regulatory interventions (Carton et al., 2023); in others, the same types of intervention are associated with either moderate increases in inflation (Voigts and Paret, 2024) or significant increases in inflation (e.g. 1.5 pp above the baseline) and reductions in output (Fornaro et al., 2025; Allen et al., 2025). Crucially, regulatory policies that impose a hard cap on emissions can generate rapid price increases when demand exceeds the threshold at which the cap becomes binding (Fornaro et al., 2025).

Green investment

Each of the policy options discussed above aims to drive the green transition by increasing private investment in green technologies. These expenditures, in turn, will have independent effects on inflation and output, as will any direct public investment in green capital.

Private sector spending is expected to account for the majority of investment required for the net zero transition. In the UK, for example, it is projected to make up just under two-thirds of total investment (Office for Budget Responsibility [OBR], 2025). However, public investment is also expected to play a critical role, by both directly expanding green capacity in areas where private sector participation may be limited and by helping crowd in private investment more broadly.

From a theoretical perspective, green investments are expected to stimulate output and employment, at least in the short run. The overall effect of the investments will depend on their scale and the associated multiplier effects. The investment may also generate inflation, depending on the shape of the Phillips curve and the presence of supply bottlenecks (International Energy Agency [IEA], 2021b; Hyvönen et al., 2023). Over the longer run, these investments are also expected to result in productivity gains and efficiency improvements that help alleviate any inflationary pressures they create, especially if they lead to increases in R&D and productivity growth (Angeli et al., 2022). Moreover, public investment outcomes may depend on how the investment is financed. As discussed, debt financing is potentially more expansionary than tax financing in the presence of crowding-in (as opposed to crowding-out) effects (NGFS, 2024a).

Empirical studies on the macroeconomic impacts of green investments generally point to expansionary effects on output and employment, particularly when compared with equivalent fossil fuel investments. For instance, Batini et al. (2022) find that renewables investment multipliers are roughly twice as large as fossil fuel investment multipliers (1.1–1.5 versus 0.5–0.6), suggesting the transition could have a net positive impact on growth. Other studies emphasise employment effects, finding that the transition is likely to generate small but positive impacts on overall employment levels (IEA, 2021a). These aggregate gains, however, can also mask significant sectoral shifts, with the energy sector and energy-intensive industries – such as manufacturing, construction and transport – expected to be the most negatively affected by the transition, along with the blue-collar jobs they provide (Chateau et al., 2018).

Several modelling studies examine the effects of driving a transition either fully or in part via public investment (Jaumotte et al., 2021; Airaudo et al., 2022; Allen et al., 2025).[14] Overall, transitions led by public investment rather than green subsidies or carbon pricing are faster and results in higher GDP growth relative to green-subsidy and carbon-price-led transitions (Airaudo et al., 2022). However, the evidence on inflation is more mixed: one study reports no inflationary effects from green investment

[13] One study (Maguire and Munasib, 2018) found no impact on prices.
[14] For Jaumotte et al. (2021), the transition is driven by a carbon tax, public green investments and subsidies; for Allen et al. (2025), the investments are financed via a carbon tax.

(Airaudo et al., 2022), partly due to its impact on productivity growth, while another finds substantial inflationary impacts (Allen et al., 2025).

Studies examining private-investment-led shocks or transitions (Allen et al., 2025; Jackson and Jackson, 2025) reveal more dynamic effects on output and inflation. For example, in both Allen et al. (2025) and Jackson and Jackson (2025), output initially rises before falling back and then subsequently recovering. The effects on prices, however, are more mixed, with Allen et al. (2025) reporting a deflationary transition and Jackson and Jackson (2025) finding a more inflationary outcome. These differences can be attributed to several factors, including that Jackson and Jackson (2025) model a full energy transition while Allen et al. (2025) focus more on shorter-term impacts.

4. Impacts of restrictive monetary policy on the green transition

Should the inflationary pressures discussed in the previous sections materialise, central banks' mandates and operating frameworks would most likely push them towards raising interest rates.[15] This could, however, interact with the low-carbon transition in ways that ultimately undermine price stability. Because low-carbon investment is capital-intensive, has high fixed costs and is highly dependent on external finance, it is disproportionately sensitive to changes in interest rates. This section explores how higher rates can affect the transition through two main channels. First, they can raise the cost of green energy relative to fossil fuels, potentially contributing to further inflation in a self-defeating cycle. Second, they can reduce both private and public investment in green capital, slowing the pace of the transition and thereby increasing the economy's longer-term exposure to physical climate risks and volatility in fossil fuel prices.

Reduced private and public investment

Increases in interest rates could delay the transition to net zero by reducing private and public sector investment in green capital. Green investment is particularly sensitive to financial conditions – as well as other factors (see e.g. Parker and Parraga Rodríguez, 2026) – due to its capital-intensive nature and its reliance on external finance, with a greater emphasis on debt funding than equity (Egli et al., 2018; Schmidt et al., 2019; Martin et al., 2024; Fornaro et al., 2025).

As shown by panel evidence from 27 European countries' experiences between 2001 and 2021, monetary contractions are associated with a sharp fall in additions of new renewable energy capacity: a 25 basis-point policy-rate increase is linked to an 8% decline in new offshore wind capacity and a 26.5% decline in new solar photovoltaic (PV) capacity, with a smaller but still negative effect for onshore wind (Serebriakova et al., 2025). Furthermore, tighter credit conditions disproportionately reduce green innovation, with contractionary monetary policy shocks responsible for an estimated 60% of the recent slowdown in green patenting (Aghion et al., 2024). Firm-level data from the US corroborates this: tighter financial conditions reduce investment and R&D at green innovators more than at either non-innovators or non-green innovators, consistent with green innovators' higher perceived cost of capital and their higher leverage ratio relative non-green innovators (Fornaro et al., 2025).

One study of 150 years of macroeconomic and energy data from advanced economies adds a longer-run perspective, showing that a monetary contraction lowers total energy use but raises the energy intensity of the capital stock by around 3% (Jordà et al., 2026). Because long-lived capital turns over slowly, investment undertaken under tight financing is less energy-efficient, and the economy recovers with a dirtier capital stock that persists for six to eight years after conditions normalise.

[15] These pressures would initially operate mainly through energy prices and headline rather than core inflation, meaning that some policymakers might favour looking through them. However, the 2021–2023 and 2026 inflationary episodes demonstrated that increases in headline inflation can nonetheless prompt monetary tightening — whether to maintain institutional credibility, because supply-side shocks feed into inflation expectations, or because the price pressures in question are not purely transitory. Several of the transition scenarios discussed above fall into this last category: a gradual but persistent increase in carbon pricing, for example, would generate year-on-year price increases rather than a one-off change in relative prices, undermining the case for treating these shocks as temporary. Moreover, after the inflation forecasting errors and delayed policy responses observed during the recent inflation surge, central banks may exhibit a greater aversion to the risk of underestimating inflationary pressures, creating an asymmetry in policy preferences that favours a more precautionary or hawkish response even when inflation originates primarily from supply-side factors.

Alongside their effects on private investment, higher interest rates can also weaken governments' fiscal positions and constrain their ability to invest in the low-carbon transition, especially when coupled with weaker aggregate demand. This, in turn, can pressure the government to undertake a fiscal consolidation to reduce the public deficit or debt ratio. Such pressure is likely to intensify given that public debt-to-GDP ratios are projected to rise substantially in the coming decades (from already high levels) largely as a result of demographic trends and climate-related spending commitments (OBR, 2024; 2025). Consequently, higher interest rates may incentivise governments to cut green public investment (Wolff and Darvas, 2022) or raise taxes on low-carbon products such as electric vehicles, both of which could further slow the transition. Any increase in fiscal pressure would be particularly challenging for emerging market economies with already high debt-to-GDP ratios, and could leave them unable to meet their green public investment needs without international support (IMF, 2023).

While we focus on transition-related issues, it is worth noting that higher interest rates also raise the cost of adaptation investment. For instance, when farmers face higher borrowing costs to build on-farm resilience and their crops become more vulnerable to climate hazards, this leaves the economy more exposed to the physical impacts of climate change.

Increases in green electricity prices

As discussed, the capital-intensive cost structure of renewable energy generation makes the price of green energy particularly sensitive to financing conditions. As a result, financing costs account for a substantial share of the levelised cost of electricity (LCOE) for renewables. For Germany, Schmidt et al. (2019) estimated that a five-year return of interest rates to pre-2008 levels would raise the LCOE of solar PV by around 11% and of onshore wind by around 25%, enough to reverse the cost declines that continued technological progress delivered. By contrast, the cost structure of fossil fuel generation is dominated by fuel costs, making it far less sensitive to changes in interest rates. Higher interest rates, therefore, widen the cost gap between renewable and fossil fuel energy.

These cost increases transmit directly to consumer energy prices when renewable energy deployment is supported by price-setting mechanisms such as CfDs. As discussed in Box 2.1, in a two-sided CfD the strike price must be set high enough to allow generators to recover their capital costs; when financing costs rise, so must the strike price at which new capacity is viable. The link between interest rates and green capital costs means that monetary tightening can increase energy-system costs over time. This was the case during the recent tightening cycle, as increases in input costs and interest rates threatened the financial viability of offshore wind projects, contributing to contract renegotiations and cancellations in the UK and the US (Millard, 2025).

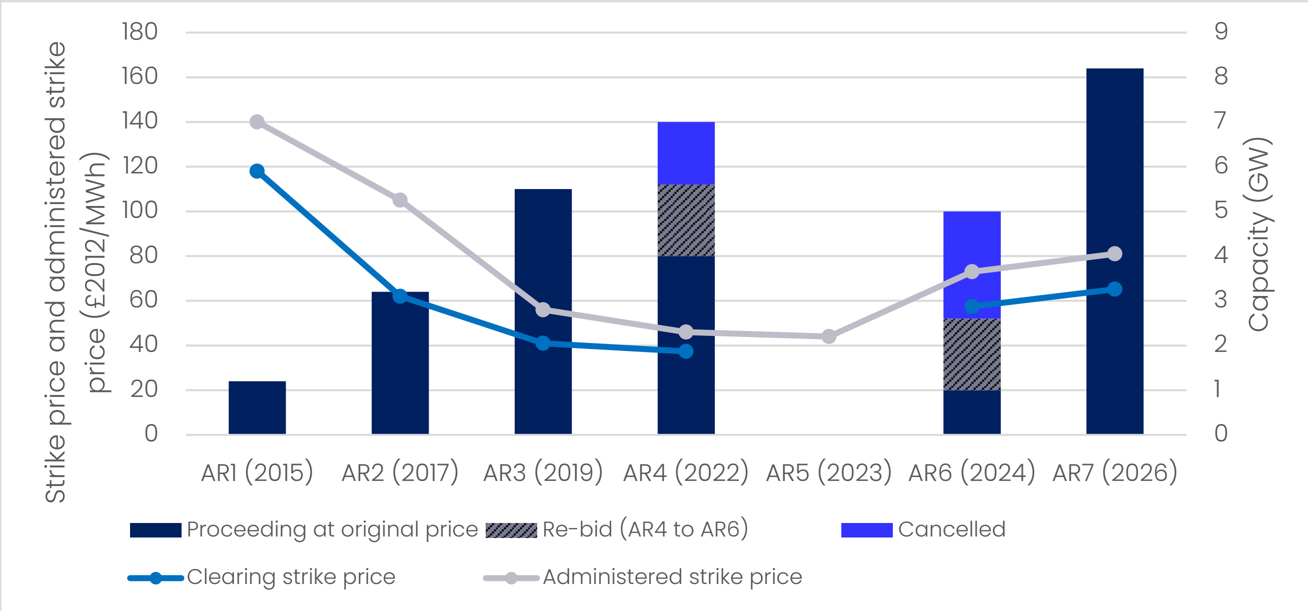
The UK's CfD scheme illustrates how rising interest rates (among other factors) can disrupt renewable energy deployment and increase the cost of the transition for consumers. As detailed in Box 4.1, the CfD scheme initially delivered significant cost reductions, demonstrating long-term price guarantees' potential to drive down the cost of renewable energy. However, the combination of input cost inflation and increases in interest rates that followed led to the failure of the 2023 CfD auction, prompting an increase in the CfD strike price and the cost of electricity for consumers.

Monetary tightening also widens the relative cost gap between green and fossil fuel energy from the other direction, by reducing fossil fuel prices. As shown in one vector autoregression estimate based on European data, monetary tightening has a significant downward effect on energy prices, particularly gas prices (Fornaro et al., 2025). This is consistent with several mechanisms through which gas and commodity prices more broadly may negatively correlate with interest rates, including inventory and carry costs (Frankel, 2008), Hotelling-type effects related to extraction timing (Hotelling, 1931), exchange rate effects (Frankel and Rose, 2010), speculative dynamics, and price effects stemming from weaker aggregate demand. By dampening the relative price of fossil fuels, restrictive monetary policy weakens the market signals that drive substitution towards clean energy. An important asymmetry is that the disinflationary effect on fossil fuel prices is cyclical and reverses as rates come down, while the increase in green energy costs is locked in for the duration of long-term CfD contracts, which typically run for 15 to 20 years.

Box 4.1. How rising interest rates can disrupt renewable energy deployment: the UK's contracts for difference scheme

Between 2015 and 2022, the average strike price for offshore wind fell from £120/megawatt hour (MWh), in 2012 prices, in allocation round 1 (AR1) to under £40/MWh in AR4, as competitive auctions combined with falling technology costs and low financing costs to deliver progressively cheaper capacity (Watson and Bolton, 2024). This trend halted in 2023, when AR5 failed to attract a single offshore wind bid. The administrative strike price (the price set by the authorities before the auction that caps the clearing strike price in the auction) was set slightly below the previous round's despite significant increases in input costs, supply chain disruptions and the cost of capital resulting from the post-pandemic surge in inflation and subsequent monetary tightening cycle. As a result, offshore wind projects were no longer viable at the prices on offer (ibid.).

Figure 4.1. Offshore wind strike prices and secured capacity at CfD allocation rounds



Source: Authors' analysis based on CfD allocation round data.

As shown in Figure 4.1, the government responded by substantially raising the administrative strike price in AR6 (September 2024). Consequently, new offshore wind CfDs were successfully auctioned in AR6, with approximately 5 gigawatts (GW) awarded, but at strike prices of £54–58/MWh, up to nearly 60% higher than in AR4. Even so, macroeconomic headwinds continued to undermine delivery. In May 2025, Ørsted discontinued the 2.4 GW Hornsea 4 project, citing continued increases in supply chain costs, interest rates and execution risk since it won the CfD just nine months earlier (Ørsted, 2025). This echoed Vattenfall's earlier decision to shelve its Norfolk Boreas project in 2023, reinforcing the idea that securing a CfD does not guarantee delivery when the underlying macroeconomic environment remains hostile to capital-intensive investment.

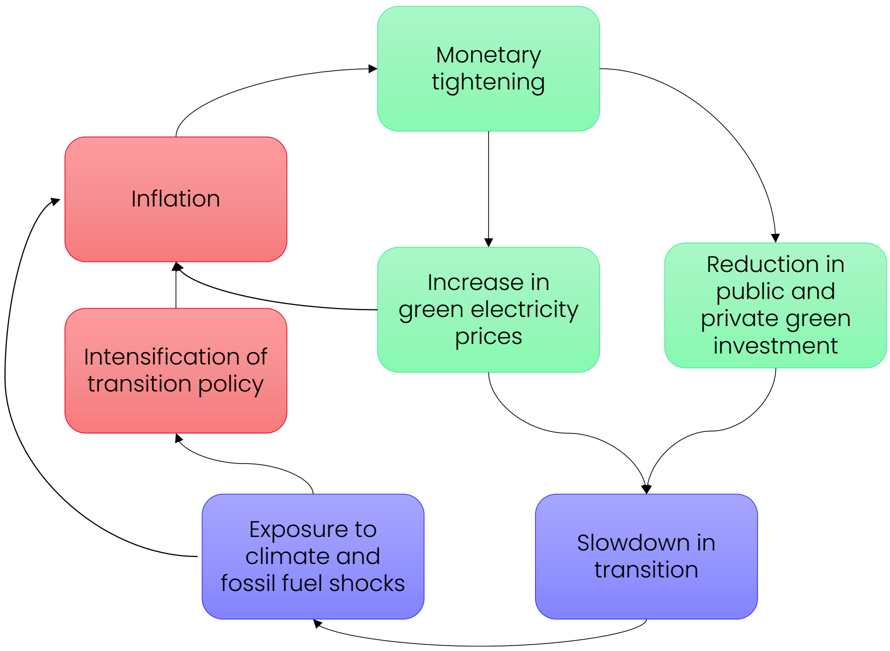
The AR7 auction, announced in January 2026, represented a further recalibration. The auction set the administrative strike price at £81/MWh and procured a record 8.2 GW of offshore wind capacity. The contract duration was extended from 15 to 20 years to reduce financing costs, and the government shifted to a capacity-led rather than budget-led approach to ensure sufficient volume. Nonetheless, the 1.5 GW Morgan project in the Irish Sea, developed jointly by JERA Nex bp and EnBW, failed to secure a CfD in AR7, after which EnBW withdrew from the project, citing challenging market conditions and recording an impairment of €1.2 billion (EnBW, 2026). The trajectory from clearing prices of £37/MWh in AR4 to £65/MWh in AR7 within just four years illustrates that by raising the cost of capital for renewable projects, monetary tightening does not merely slow the transition but increases the price at which new capacity is eventually contracted. This has consequences for energy costs that persist for the 20-year duration of each contract.

Implications for long-term price stability

The price and investment consequences of monetary tightening discussed above could generate feedback loops that simultaneously undermine the prospects for a successful green transition and for long-term price stability. By slowing the pace of the transition through reduced green investment and weakened relative price signals away from fossil fuels, monetary tightening leaves the economy more exposed to physical climate risks and volatile fossil fuel prices over the medium and long term, particularly in a scenario of ongoing geoeconomic fragmentation. Furthermore, by raising the cost of new green capacity, it locks in higher energy prices for the 15 to 20 year duration of CfD contracts, while delayed transition investments also raise the eventual policy effort required to meet a given carbon budget, which could lead to a scenario of rising transition-related costs in a more abrupt and pronounced form. We illustrate this potential vicious cycle in Figure 4.2.

These feedback dynamics between monetary policy, inflation and transition policy are not well captured in the scenarios central banks currently use to assess the impacts and risks of energy transitions. The NGFS modelling suite entirely omits the impacts of monetary policy on the transition and its connections to price stability. This is due to the lack of a mechanism linking rising interest rates in the National Institute Global Econometric Model to increases in green energy costs in the associated integrated assessment models. As a result, a monetary tightening in response to transition-related inflation does not, in these scenarios, affect either green energy prices or the pace of green investment.

Figure 4.2. Feedback loops between monetary policy and the low-carbon transition



Source: Authors' analysis. Note: The blue boxes map to Section 2 of this report; the red boxes map to Section 3; the green boxes map to Section 4. Section 5 discusses how these feedback loops could be averted.

In summary, monetary tightening during the green transition involves an intertemporal price stability trade-off. Tightening can lower headline inflation in the short term, primarily through lower fossil fuel prices and weaker aggregate demand. But over longer time horizons, tightening can also raise the cost of green energy in ways that persist through long-term contracts, slow the transition and thereby increase exposure to physical and fossil fuel shocks, and create policy coordination problems that intensify the inflationary pressures associated with reaching a given climate target. Taken together, these dynamics suggest that central banks should not treat the pace of the low-carbon transition as exogenous to their policy decisions: their influence on the success or failure of the transition will have important implications for their price stability mandate. As Dhingra (2026) puts it, "the risk is that policy responds to today's supply shock in a way that makes tomorrow's supply side less resilient."

5. Rethinking monetary policy and price stability in the green transition

To prevent the potential vicious cycle outlined in Figure 4.3, central banks will need to rethink their policy reactions to supply-side inflationary pressures. Inflation targeting frameworks should give central banks more space to look through supply shocks, which in turn calls for more room for fiscal policy to manage first-round effects. Where tightening becomes necessary nonetheless, the design of monetary operations can be adjusted to protect the green transition rather than impede it. Macroeconomic policy that is aligned with a green transition and can safely navigate a world characterised by recurrent supply shocks may require new governance, communication and coordination arrangements.

Adaptive inflation targeting and the role of fiscal policy

Our starting point in seeking to break the feedback loops discussed in Section 4 is to revisit conventional flexible inflation targeting, which was designed for a demand-driven inflationary environment and is increasingly out of step with the supply-side pressures the transition is likely to generate. We argue that the framework should evolve towards Adaptive-IT, which would make greater use of the flexibility of inflation targeting regimes. This would allow monetary policymakers to look through inflationary spikes for longer in a world of recurring supply shocks, leaving more space for fiscal and other authorities to respond to first-round effects. The goal is to balance credibility with adaptation of the framework being well anticipated, communicated, and embedded in existing institutional mandates before inflation dynamics deteriorate, and with a recognition that monetary policy is no longer neutral with respect to the transition. In practice, Adaptive-IT can be understood as a layered process of adaptation rather than a one-off regime shift (Scialom, 2022). The initial stage of Adaptive-IT involves a diagnosis of inflation that distinguishes between demand pressures and supply-driven shocks (including those associated with the transition).

A more substantial step involves adjusting the core parameters of the monetary policy framework. One option is to formalise (larger) accommodation bands around the current 2% target, so that temporary deviations linked to supply conditions can be tolerated without aggressive tightening. A more ambitious option would be to shift to a range such as 2–3.5% (Bloesch, 2022) or a higher point target such as 3%, as proposed by Blanchard (2022), albeit for different reasons. This may be justified if structural supply volatility becomes persistently higher than it was during the period when current low-target regimes were consolidated. The appropriate adjustment would vary across jurisdictions, depending on the existing target and on the threshold at which inflation becomes salient to households and firms (Korenok et al., 2023). Institutionalising tolerance of supply-driven inflation overshoots also requires better data and analysis on the supply side of the economy. Supply-chain stress testing, developed in coordination with finance ministries and other government departments, could play a similar role to the financial stress tests introduced after the 2008 Global Financial Crisis. See Table 5.1 below for the key differences between flexible and adaptive inflation targeting.

The corollary of giving central banks more space to look through supply shocks is that fiscal policy should, and can, do more to mitigate the effects of supply shocks. Fiscal policy is traditionally used to deal with structural change and is better suited than monetary policy to addressing the first-round effects of supply-side shocks, as it can target specific sectors, prices and households. The 2022–23 inflationary episode provides extensive evidence on the effects of the available instruments. For example, governments in advanced and emerging economies implemented measures that included reductions in indirect taxes and excise duties on energy products, retail price caps, regulated tariffs, and direct subsidies to producers and consumers, alongside targeted cash transfers to vulnerable households (Amaglobeli et al., 2023; Uxó González, 2023). Fiscal measures that followed the 2022 energy price shock successfully stabilised inflation and output in the euro area, lowering the inflation overshoot by 2 pp and potentially preventing a subsequent undershoot (Dao et al., 2023). Similarly, as shown in a comparative analysis of fiscal responses in the EU, France, Germany and Spain, unconventional fiscal policies were effective at reducing inflation while maintaining economic output, and rapid implementation contributed to a swifter fall in inflation (Jameson et al., 2025). This points to the importance of policy design: instruments should be tailored to preserve price signals, targeted at the most vulnerable people, and time-limited, particularly where they incentivise the consumption of energy-intensive goods.

Table 5.1. Key differences between flexible and adaptive inflation targeting

Framework	Target	Time horizon	Toolkit
Flexible inflation targeting	Usually a point target (typically 2%), sometimes with small accommodation bands.	Medium term, typically two years.	Policy rate, collateral policy and post-Global Financial Crisis unconventional monetary policies, all focused on managing aggregate demand.
Adaptive-IT	Option 1: Point target of same 2% but with bigger accommodation bands. Option 2: Explicitly targeting a range around 2%. Option 3: A higher point target (3%) with smaller accommodation bands.	Same as flexible inflation targeting, with a longer horizon (three or more years) when supply-side disruptions are pervasive.	Same as flexible inflation targeting, with additional targeted instruments focused on supply-side resilience, macroprudential policy that adequately prices climate risk, and forecasting frameworks featuring climate and supply-side risks.

Source: Adapted from Barmes et al. (2024)

The main objection to looking through supply shocks for longer is that this strategy risks de-anchoring inflation expectations (Mann, 2023; Greene, 2025; NGFS, 2026b). Yet the empirical literature on whether inflation expectations actually affect inflation through the theorised channels is very mixed, inconclusive and, often, at odds with New Keynesian theory (Bandera et al., 2023; Rudd, 2022). Equally, there is little evidence that monetary policy influences household expectations in the direction that theory predicts: roughly two-thirds of US households surveyed by Grigoli et al. (2026) expected a rate hike to raise inflation rather than lower it, interpreting tighter policy through a cost-channel logic. To the extent that expectations are formed adaptively (i.e. in a backward-looking manner), efforts to anchor them depend on whether realised inflation comes down, regardless of which policy instrument achieves this. Therefore, in efforts to anchor expectations, the fiscal measures discussed above can play a role that is similar to monetary tightening and may be more direct, given that household expectations are most sensitive to salient prices, such as food and energy prices (D'Acunto et al., 2021; Anesti et al., 2025). Indeed, longer-term inflation expectations in the euro area would have been 0.3 pp higher by the end of 2022 in the absence of fiscal measures, suggesting that fiscal action helped anchor expectations in the recent inflationary episode (Dao et al., 2023).

A second objection could be that long-term interest rates, not policy rates, are what matter most for green investment decisions. In this view, an accommodative central bank that keeps short rates low may achieve little if long rates rise in response to higher expected inflation or higher term premia. As with the expectations objection, however, the validity of this concern depends on the outcomes of fiscal policy. If fiscal measures successfully contain realised inflation, the upward pressure on long rates from inflation expectations is mitigated, and credibility around the framework is reinforced. Term premia also depend on expectations about the path of policy rates: a credibly less aggressive tightening cycle should compress term premia more than an aggressive one does. To the extent that long rates do rise, the operational measures discussed in the following subsection can affect financing conditions for green projects independently of the general level of long rates.

Nevertheless, fiscal interventions have costs and their feasibility is determined by the available fiscal space. Many advanced economies were able to deploy large-scale energy subsidies, tax reductions and transfer programmes during the recent inflationary episode, but such measures may be considerably harder to sustain in emerging markets and developing economies (EMDEs), where public debt constraints, higher sovereign borrowing costs and more limited fiscal capacity reduce the scope for countercyclical intervention. This asymmetry is particularly relevant in the context of the green transition. Whereas jurisdictions such as the EU, the US and China have mobilised substantial public resources to support decarbonisation and cushion distributional impacts, many EMDEs face the dual challenge of financing development and climate investment while maintaining debt sustainability. Fiscal policy can still play an important role in such cases, but its effectiveness may depend less on public expenditure than on access to concessional finance, multilateral support, risk-sharing mechanisms and policies that crowd in private investment.

Greening monetary operations with a view to long-term price stability

While fiscal policy should be considered the first-best response to first-round effects of supply shocks, there will likely be circumstances in which monetary tightening will nonetheless become necessary to address second-round effects and any residual inflation. Where this is the case, central banks can adjust their operations to mitigate the adverse effects of tightening on the green transition (Barmes et al., 2024).

The NGFS has examined how transition-related considerations can be integrated into a range of central bank operations on both the asset (NGFS, 2021) and liability (NGFS, 2026a) sides of the balance sheet (see Table 5.2). Asset-side measures include adjustments to asset purchase programmes through, for example, preferential purchases of green bonds, as well as changes to credit operations through collateral eligibility criteria and valuation haircuts. The Eurosystem's climate factor provides a recently implemented example of this: it adjusts collateral valuations for non-financial corporate bonds based on issuer-specific exposure to transition-related uncertainties, sector-specific stressors derived from climate stress tests, and asset-specific vulnerability based on residual maturity (ECB, 2026). Such measures are often justified as protecting central bank balance sheets from climate-related financial risks, but they are likely to also affect financing conditions for the underlying assets, and to affect the cost of capital for borrowers engaged in activities relevant to the transition.

Table 5.2. Climate considerations on central banks' balance sheets

Assets	Liabilities
Open market operations (e.g. asset purchases of private and sovereign debts).	Reserve requirements (e.g. differentiated reserves based on the 'greenness' of counterparties' activities).
Credit operations with counterparties (e.g. changes to collateral eligibility criteria and valuation haircuts, or dual interest rates).	Certificate of deposit and debt securities (conditioned on 'greenness' of counterparties' activities).
Others (not discussed in this report), e.g. cash, foreign exchange and gold reserves.	Others (not discussed in this report), e.g. current account, central bank digital currencies, deposits from government, equity.

Source: Adapted from NGFS (2026).

More targeted instruments are also available to address the effects of monetary tightening on the transition (Monnet and van' t Klooster, 2023). Green dual interest rates, for instance, would offer preferential financing conditions to counterparties that are more engaged in green activities, or would differentiate the treatment of green and non-green loans within a single counterparty's portfolio

(Jourdan et al., 2024; Lonergan and Greene, 2020). Green refinancing operations could provide cheaper liquidity against green collateral. For sovereign bonds, differentiated valuation that recognises long-term climate-related stability risks — which rating agencies, with their shorter time horizons, may tend to underweight — could help anchor sovereign borrowing costs for governments financing the transition (Serrano Rodriguez et al., 2026). Policy options on the liability side include differentiated remuneration or tiering of reserve accounts based on climate-related lending, the issuance of green short-term debt instruments, and the provision of central bank accounts to non-bank financial institutions that are engaged in sustainable projects.

Designing an institutional framework to facilitate monetary–fiscal coordination while handling potential trade-offs

Many central bankers consider fiscal policy to be the first line of defence against negative supply shocks (Bandera et al., 2023) and accept that central banks can green some of their operations. However, central bankers tend to be sceptical of the notion that monetary and fiscal authorities should work in a more coordinated manner. Yet, combining fiscal subsidies with targeted credit policies can shield green investment from the effects of monetary tightening while reducing output losses and maintaining inflation at target (Fornaro et al., 2025).

As discussed, the fiscal measures needed to contain transition-driven inflation may create challenges for monetary–fiscal coordination. For example, if such policies increase public debt and erode market confidence in sovereign bonds, this would curtail governments' capacity to invest in long-term climate mitigation. Countries' experiences of the 2022–23 inflationary episode provided several examples of how measures designed to address supply-side pressures could substantially reduce fiscal space (while also containing inflationary impacts). Such dynamics could also trigger currency depreciations, further complicating the implementation of monetary policy in the short term.

In this context, the measures discussed above – ranging from looking through supply shocks to implementing dual interest rates – will likely be insufficient to ensure both price stability and the desired level of green investment. As such, central banks will have a clear role to play in communicating that their actions only serve as an accompanying measure, signalling that the monetary authorities are doing their part, while explicitly calling for stronger fiscal and broader government action to address supply-driven price increases.

To remain effective and legitimate while on such a path, central bank institutional arrangements may need to evolve in several dimensions. First, decision-making bodies such as Monetary Policy Committees could benefit from broader and more diverse expertise, including specialists in labour markets, climate economics, financial stability and social impacts. This would enhance the quality of deliberation and reduce the risk of policy blind spots in a complex macroeconomic environment.[16]

More broadly, Adaptive-IT and policy coordination require new institutional arrangements. For instance, an effective model for the EU could be a European Credit Council operating under the European Parliament's authority (Monnet, 2024). Inspired by the post-war credit councils in several countries, such a body would institutionalise a regular dialogue between monetary authorities, fiscal authorities and other stakeholders (e.g. business representatives, commercial banks and labour unions). This dialogue would systematically address the potential policy actions warranted by these distinct stakeholders, their alignment and the trade-offs involved.

The success of such a framework would partly depend on how the shift towards it was communicated. Any adjustments to inflation-targeting frameworks, and the conditions under which the adjustments applied, would need to be communicated clearly to anchor expectations and limit risks to credibility. This communication would be most effective if it set out a coordinated framework that treated adjustments as components of a broader policy approach in which the fiscal authorities had an

[16] Similar points could be made about fiscal institutional arrangements, though the case is somewhat weaker given that fiscal policy is inherently more politically contested than monetary policy. But fiscal authorities and watchdogs are arguably subject to the same critique as monetary policy committees: a lack of diversity in expertise and perspective that narrows the terms of debate. Embedding a broader range of views into fiscal institutions – including on how to sustain public investment despite tight fiscal space – would therefore represent an equally valuable institutional shift.

explicit role in containing first-round effects. The aim would be to clarify that the central bank was adjusting how it operationalised its commitment to price stability but was not wavering on the commitment itself.

International coordination of this communication would further reduce credibility risks. A unilateral move towards Adaptive-IT by a single central bank could be misinterpreted as opportunistic or as a weakening of its commitment to price stability. Climate change is a global phenomenon, and transition-related supply shocks will affect multiple jurisdictions simultaneously. To present framework adjustments as a collective response to a shared problem, policymakers could engage in internationally coordinated discussion of the shift in venues that have historically shaped monetary policy frameworks at the global level, such as the Bank for International Settlements, the IMF and the G20. Such coordination would not require harmonised frameworks across jurisdictions; the appropriate adjustment would vary by context. It would, however, reinforce the perception that climate-related supply-side risks are a global problem that calls for an evolution of existing frameworks, with adjustments anchored in collective deliberation about how to maintain price stability under transition-related supply pressures.

Nonetheless, this approach would be contested in some quarters, as it could be interpreted as departing from the traditional principle of market neutrality that has guided most monetary policy operations. Critics argue that central banks should not influence the allocation of credit across sectors or assets, particularly in areas that have distributional and political implications. However, strict adherence to market neutrality implicitly assumes that market prices fully and efficiently reflect underlying risks. In the case of climate change, this assumption is increasingly untenable. Historical asset pricing systematically fails to incorporate either transition or physical climate risks, which are long-term, non-linear and subject to tipping points. Accordingly, market neutrality may be misleading and complacent: by replicating existing market allocations, central banks could misprice climate risks and entrench carbon-intensive investment patterns.

At the same time, coordination should not be confused with fiscal dominance or financial repression. The literature on fiscal dominance and central banks' independence stresses that when markets perceive monetary policy as subordinated to government financing needs, this can lead to a rise in inflation expectations, term premia and exchange-rate pressures. This risk is especially relevant to EMDEs, but it is not confined to them. Recent debates around the Federal Reserve's leadership transition illustrate that even in the US, perceptions of a more politically influenced or more dovish central bank can affect market pricing, with investors focusing on the risk that easier short-term policy could translate into higher long-term yields, a weaker currency and a higher inflation risk premium. For this reason, any framework for monetary–fiscal coordination should be accompanied by a clear message: such coordination does not weaken central banks' independence but acts as a rules-based mechanism for assigning instruments to shocks more effectively, preserving price stability and preventing monetary policy from becoming the only tool used to manage structural supply-side pressures.

6. Conclusion

This report has argued that the green transition reshapes the conditions under which monetary policy operates, and that meeting the price stability mandate over the longer term will require an evolution of the framework that currently guides central bank decisions. The transition redefines the objective itself: price stability is no longer only a matter of controlling inflation in the short run, but of ensuring the structural conditions under which inflation can remain stable over time.

A successful transition is itself a precondition for long-term price stability. Without it, economies will face escalating exposure to inflationary physical climate shocks and persistent volatility in fossil fuel prices, both of which will intensify in high-emissions scenarios. The transition could, however, generate inflationary pressures in the short to medium term. Conventional monetary policy is poorly suited to dealing with these pressures: higher interest rates could reduce private and public investment in green capital and raise the cost of green energy. The short-term disinflationary benefits of tightening during the transition, primarily operating through lower fossil fuel prices and weaker aggregate demand, come at the cost of slowing the structural transformation needed to secure price stability over longer time horizons.

Therefore, the monetary policy framework needs to evolve. Adaptive-IT offers a credible starting point, as a gradual evolution of the existing flexible inflation targeting framework that allows central banks to look through supply-driven price spikes to a greater extent. This leaves space for a more active fiscal policy, which is better suited to addressing first-round effects. Where monetary tightening becomes necessary, the design of monetary operations can be adjusted to limit its effects on the green transition through measures such as differentiated collateral treatment, green refinancing operations and green dual interest rates. Taken together, these adjustments situate Adaptive-IT within a new macroeconomic regime in which short-term inflation control is balanced against long-term supply stability, policy horizons are extended, and price stability is viewed as a joint outcome of monetary, fiscal and financial policies.

Critics may argue that this approach risks subordinating monetary policy to fiscal policy, eroding central banks' credibility and potentially increasing inflation. The framework set out here is designed to avoid this outcome. It allows monetary policy to adapt to the fiscal stance while preserving the central banks' operational independence, including their ability to challenge fiscal inaction that undermines price stability. The objective is not to dilute central banks' independence but to redefine how this is exercised in the conditions imposed by climate change, ensuring that they have the tools needed to meet their core mandate in the long term.

The framework we set out would meaningfully reduce economies' exposure to inflationary pressures in the medium and longer term, primarily by supporting a smoother and faster green transition. Even so, supply shocks will continue to occur throughout the transition, and the design of the framework can only do so much to help monetary and fiscal authorities prepare for them. Anticipating and responding to such shocks effectively will, therefore, require an institutional architecture that supports systematic ex ante coordination between these authorities.

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