

[Navigating Climate Policy Shocks: Optimal Monetary Policy Responses](#)

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Carbon pricing policies and green subsidies can move relative prices sharply over the monetary policy horizon, affecting both production costs and household consumption. By influencing inflation and real activity simultaneously, these policies can generate stabilisation trade-offs for monetary policy. As the green transition progresses, understanding how monetary policy should respond to such shocks becomes increasingly important.

We study the monetary policy response to climate policy shocks using a multi-sector Environmental New Keynesian model with price and wage rigidities, calibrated to the Euro Area. The model distinguishes between a sticky-price non-energy sector and flexible-price fossil and green energy sectors, and it allows energy to enter both firm production and household consumption. A crucial feature of the framework is that energy is not easily substitutable with other inputs or goods. We model imperfect substitutability between fossil and green energy and imperfect complementarity between energy and labour and between energy and consumption goods. Climate policy shocks in this setting endogenously change cost and consumption shares.

We analyse two shocks: an increase in carbon pricing and an increase in green energy subsidies. We derive the monetary policy response that maximises household welfare when the central bank can commit to its policy path. We then compare this benchmark with simple Taylor rules targeting headline inflation, core inflation, or both inflation and the output gap.

We find that climate policy shocks are trade-off inducing for monetary policy. Rises in carbon prices lead to an increase in inflation and a fall in output, while green subsidies decrease inflation and increase output.

Optimal monetary policy resolves this trade-off in favour of stabilising real activity. Price stability is preserved over the medium term through a credible commitment to keeping inflation and inflation expectations anchored, while short-run inflation movements are accommodated.

The key mechanism behind this result is that energy is closely linked to other inputs and consumption goods. When energy prices change, firms' production costs and households' spending patterns adjust in ways that amplify the impact on real activity. In this setting, trying to stabilise inflation too tightly would require large and inefficient adjustments in wages, employment, and output, breaking the result that stabilising inflation also stabilises output (the so-called "divine coincidence").

A related channel operates through households. Because energy is part of the consumption basket and is difficult to substitute away from, a rise in carbon prices acts like a hit to real income, similar to a tax, which strengthens the contraction in demand and widens the welfare-relevant output gap.

Green subsidies generate the same mechanism with the opposite sign. As a result, the welfare gains from dampening real economic fluctuations outweigh the benefits of offsetting short-run inflation movements.

Consistent with these mechanisms, the welfare-optimal monetary policy response places greater weight on output-gap stabilisation and “looks through” short-run inflation fluctuations. When we compare it with simple monetary policy rules, we find that dual-mandate Taylor rules that respond to both inflation and the output gap deliver markedly lower welfare losses than inflation-only rules. Moreover, once policy actively stabilises the output gap, the difference between targeting core or headline inflation becomes much less important.