ECONPOL Policy Report

08 | 26
58
Volume 10

When Do Firms Invest Green? Carbon Prices, Uncertainty, and Policy Credibility

Mathias Dolls, Sebastian Link, Matti Liski, and Gerome Wolf

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EconPol Policy Report
ISSN 2566-9028 (online)

Publisher and distributor: CESifo GmbH
Poschingerstr. 5, 81679 Munich, Germany
Telephone +49 89 9224-0, email office@cesifo.de
EconPol Europe: www.econpol.eu

Editor: Andrea Balestracci

When Do Firms Invest Green? Carbon Prices, Uncertainty, and Policy Credibility*

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Abstract

Carbon prices in the EU Emissions Trading System have risen sharply over the past decade, yet they remain highly volatile, and private green investment still falls short of what climate neutrality requires. This report asks how the level and the uncertainty of expected future carbon prices jointly shape firms' green investment decisions. We use a conjoint survey experiment embedded in the ifo Business Survey, in which 830 German manufacturing firms each evaluate five hypothetical green investment projects under randomly assigned carbon price levels (EUR 50–200/tCO_2) and uncertainty ranges (±0–100 percent of the expected price).

We report three main results. First, higher expected carbon prices make firms substantially more willing to invest: at prices around EUR 50, close to recent ETS-1 levels, the average firm rejects the green project, while at EUR 175 it clearly favors it. Second, uncertainty deters investment: widening the price range from zero to ±100 percent offsets the entire gain from raising the expected price from EUR 50 to 175 – one percentage point of carbon-price uncertainty is worth about EUR 1.40/tCO_2 of expected price. Third, firms that regard climate policy as credible are far more willing to invest, with a gap exceeding the full price effect.

Reducing uncertainty – through price floors, price corridors, or credible long-term commitments – is therefore as important as raising the price itself, and ETS-2 should launch with robust price stabilization mechanisms from the outset.

* This EconPol Policy Report is based on Dolls, Link, Liski and Wolf (2026) and summarizes its key findings. Gerome Wolf is a PhD Trainee at the European Central Bank. The views expressed are those of the authors and do not necessarily reflect those of the ECB or the Eurosystem. Any errors are the authors' own.
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Executive Summary

Europe's green transition requires an unprecedented mobilization of private investment. Carbon pricing through the EU Emissions Trading System (EU ETS-1) is the centerpiece of EU climate policy, and the forthcoming ETS 2 is expected to extend market-based carbon pricing to the buildings and road transport sectors from 2028 onwards. Yet despite rising carbon prices since 2017, private climate-related investment has fallen short of what models project is needed for a Paris-compatible pathway.

Therefore, a central question for policymakers is: At what carbon price levels will firms invest in green projects, and how does uncertainty about future prices affect their decisions? Standard economic logic predicts that higher carbon prices make green investments more profitable and should stimulate them. Real options theory – a framework for irreversible investment under uncertainty – adds an important caveat: when the future carbon price is uncertain, firms may rationally delay even profitable investments, because deferring preserves flexibility until uncertainty resolves. This "wait-and-see" behavior can lead to systematic underinvestment even under ambitious carbon pricing regimes.

We study this question using a conjoint survey experiment with 830 German manufacturing firms, embedded in the February 2026 wave of the ifo Business Survey. Each firm makes five green investment decisions under hypothetical scenarios that randomly vary the expected future carbon price (seven levels from EUR 50 to EUR 200 per metric ton of CO_2) and the uncertainty surrounding that price (five ranges from ±0 to ±100 percent), yielding 4,150 observations. The random assignment identifies the separate causal effects of the price level and price uncertainty on firms' willingness to invest.

Our five key findings are:

- **Carbon markets are highly volatile.** The EU Allowance (EUA) price has risen from below EUR 5/tCO_2 in 2016 to nearly EUR 100 in April 2024, but month-to-month price changes regularly exceed ±20 percent and have reached ±45 percent. The Carbon VIX – the implied volatility of EUA options, analogous to the equity market's VIX – fluctuated between roughly 30 and 83 percent over 2014–23, far above typical equity market volatility, and even after easing to around 26 percent by the end of 2025 it remains above the equity VIX in calm periods. The Climate Policy Uncertainty Index has trended upward since 2014, spiking sharply in 2017 and late 2021 and reaching renewed highs in late 2024 and the first half of 2025. This elevated and persistent uncertainty is not merely a financial market phenomenon: as our results show, it directly suppresses firm investment.

- **Green investment is rising but insufficient.** Climate change mitigation (CCM) investment as a share of GDP rose across the EU-27 from about 0.4 percent of GDP in 2007 to approximately 0.8 percent in 2023, but with large cross-country variation: Sweden leads at roughly 1.4 percent, while Germany lags at about 0.7 percent. Our firm-level data confirm the investment gap: at carbon prices around EUR 50–75/tCO_2 – levels prevailing in the EU ETS-1 during much of 2024 – the average firm in our sample leans against green investments, with a mean investment response of −0.44 (at EUR

50) and −0.08 (at EUR 75) on a scale from −5 to +5. The transition point – where the average firm becomes willing to invest – occurs between EUR 90–100/tCO_2.

- **Higher expected carbon prices strongly boost green investment.** Raising the expected price from EUR 50 to 175 moves the average firm from rejecting the green project to clearly favoring it, and the effect is approximately linear: each €10 increase raises mean investment propensity by about 0.09 points. Higher carbon prices shorten the expected payback period of green investments, making them financially viable for more firms.

- **Carbon price uncertainty inhibits green investment – the real options effect.** The uncertainty effect is equally large and of opposite sign: moving from complete certainty to a ±100 percent range reduces investment propensity by as much as the entire price increase from EUR 50 to 200 raises it. Put differently, one percentage point of carbon-price uncertainty is worth about EUR 1.40/tCO_2 of expected carbon price. Because price and uncertainty are randomized independently, the two effects are separately identified and essentially unchanged when estimated jointly.

- **Policy credibility is a force multiplier.** Firms that regard climate policy as credible show an investment propensity 1.35 points higher than low-credibility firms – a gap exceeding the full carbon price effect in our experiment. ETS-1 participants are roughly twice as price-sensitive as non-participants, while firms that perceive a high risk of policy reversal respond only about half as strongly to prices. Institutional design – ensuring policy commitment and reducing reversal risk – thus has a very high return in unlocking private green investment.

These findings carry clear implications for climate policy. First, carbon prices in the EU ETS-1 are currently in the range (roughly EUR 70–90) where the average firm is beginning to lean in favor of green investment, but where a substantial share of firms still finds investment unattractive; sustaining prices at or above EUR 100/tCO_2 and avoiding backsliding is important. Second, reducing uncertainty may be as important as raising prices: a carbon price floor, credible long-term price trajectories, or price corridors for ETS-2 would unlock investment by shrinking the option value of waiting. Third, institutional credibility anchors expectations in climate policy just as it does in monetary policy: if firms believe that carbon pricing may be reversed, they respond much less to it – which reduces the observed investment effect, potentially reinforcing perceptions that carbon pricing is ineffective and creating political pressure for reversal. The EU should design ETS-2 with these lessons in mind from the outset.

1 Introduction

The transition to a low-carbon economy requires a massive reorientation of investment. Achieving the European Union's climate neutrality target by 2050 will demand trillions of euros in green investments – in renewable energy, energy-efficient buildings, clean transport, and industrial decarbonization. Market-based carbon pricing, through the EU Emissions Trading System (EU ETS), is the central policy instrument designed to provide the investment incentives needed for this transition. By making CO_2 emissions costly, carbon pricing is intended to raise the relative profitability of green investments over brown alternatives, thereby steering private capital toward decarbonization.

The EU ETS has undergone a substantial transformation in recent years. Following a decade of very low prices – prices were below EUR 10/tCO_2 for most of 2013–18 due to oversupply of allowances and the financial crisis – the European Commission's market stability reserve (MSR) reform and the subsequent tightening of the emissions cap drove a sustained price rally. Prices rose from around EUR 5/tCO_2 in 2017 to a peak of nearly EUR 100 in April 2024, before declining to the EUR 70–90 range as of 2025–26. The EU is also extending carbon pricing to the buildings and road transport sectors through a second Emissions Trading System (ETS-2), now expected to become fully operational in 2028, which will expose many more firms and households to carbon price incentives.

Despite this strong increase in carbon prices, private green investment in the EU has not accelerated proportionally. Climate change mitigation investment as a share of GDP has risen from around 0.4 to 0.8 percent since 2007 – a positive trend, but one that remains well below the investment levels implied by emissions pathways consistent with the temperature goals of the 2015 Paris Agreement. Several factors may explain this gap. One prominent explanation is the uncertainty surrounding future carbon prices. Carbon prices exhibit high and persistent volatility: month-to-month EUA price changes regularly exceed ±20 percent, the Carbon VIX (an options-implied volatility measure) has ranged from about 25 to 83 percent since 2014, and the Climate Policy Uncertainty Index has trended upward and remains elevated.

The theoretical connection between price uncertainty and investment is well established. Dixit and Pindyck (1994) show that when capital investments are irreversible – once installed, low-carbon capital cannot be costlessly resold or retrofitted—uncertainty creates an option value of waiting. Firms may therefore defer investment until the carbon price rises sufficiently above the deterministic break-even threshold. The investment trigger exceeds the net present value (NPV) break-even price, and this irreversibility premium, or hurdle rate, increases with uncertainty. This logic builds on the insights of Arrow and Fisher (1974) and Bernanke (1983), while Bloom et al. (2007) provide empirical evidence that uncertainty can delay investment and depress aggregate activity.

Empirically testing the real options mechanism in the context of carbon pricing is challenging because historical data do not provide independent variation in carbon price levels and carbon price uncertainty. In the EU ETS, the pre-2018 period had low carbon prices, while the post-2021 period combined much higher prices with substantial volatility. The historical time series therefore does not separately vary expected prices and uncertainty, making it difficult to identify their separate effects on investment.

This report draws on our working paper (Dolls et al. 2026) and summarizes its main findings. We use a conjoint survey experiment to generate independent variation in carbon price levels and carbon price uncertainty, allowing us to analyze whether and how greater uncertainty raises the investment trigger, as predicted by irreversible-investment theory. In February 2026, we embedded the experiment in the long-standing ifo Business Survey, while restricting the scope to manufacturing firms (N=830). Each firm made five green investment decisions under hypothetical scenarios in which the carbon price and its uncertainty range were randomly assigned. Firms were told that the investment projects under consideration would reduce their carbon emissions and improve their energy efficiency. Because each firm evaluated multiple vignettes, the design allows us to compare responses within firms, holding fixed all time-invariant firm characteristics.

Our main findings are as follows. First, higher expected carbon prices make firms more willing to carry out the green investment. In our experiment, firms are close to indifferent at carbon prices around EUR 75–100 per metric ton of CO_2, while higher prices generate a clear shift toward the green project. Second, uncertainty about future carbon prices substantially weakens this investment response. A firm facing a carbon price of about EUR 175 with a ±100 percent uncertainty range is approximately as willing to invest as a firm facing a price of EUR 50 under full certainty. This is the central real-options pattern: uncertainty raises the price required to trigger irreversible investment. Finally, using firms' background survey responses, we find that perceived policy credibility is strongly associated with investment: firms that view carbon pricing as credible are substantially more willing to choose the green project than firms that do not.

More broadly, the results point to a research agenda on carbon pricing under uncertainty. For policy, the implication is that the cost of uncertainty is real: when uncertainty raises the carbon price required to induce investment, the resulting higher prices are ultimately borne, at least in part, by consumers through higher final prices. For research, the experiment complements and connects several strands of work. It speaks to observational studies of carbon pricing by isolating the separate roles of price levels and price uncertainty (Colmer et al. 2025; Matzner and Steininger 2024; Anaya Longaric et al. 2024; Martinsson et al. 2024); it can inform expert recommendations on carbon pricing (Drupp et al. 2024); it links financial-market measures of carbon risk to firms' real investment decisions (Fuchs et al. 2026; Basaglia et al. 2025); and it shows how survey experiments can be used to study forward-looking investment behavior when historical data do not provide the needed variation (Ohlendorf et al. 2022; Dechezleprêtre et al. 2025). These links are preliminary, but they indicate where future work can build on the evidence reported here.

The remainder of the report is structured as follows. Section 2 provides background on EU carbon markets, climate policy uncertainty, and green investment trends, and develops the theoretical framework linking carbon price uncertainty to investment. Section 3 describes the survey experiment design. Section 4 presents the main results and heterogeneity analysis. Section 5 derives policy implications. Section 6 concludes.

2 Background: Carbon Prices, Uncertainty, and Green Investment

2.1 Carbon Price Dynamics in the EU ETS

The EU Emissions Trading System (EU ETS-1) was launched in 2005 as the world's first large-scale carbon market. Under this cap-and-trade system, covered installations – mainly power generators and large industrial emitters – must hold one EU Allowance (EUA) for each metric ton of CO_2 they emit. The overall cap on allowances declines over time, creating scarcity and thus a positive carbon price.

Figure 1 shows the monthly EUA price from 2008 to early 2026, excluding Phase I (2005–07), during which allowances could not be banked into subsequent periods and therefore became essentially worthless when the ICE December future expired in 2007. Three distinct phases emerge. In Phase II (2008–12), prices initially ranged from about EUR 20 to EUR 30, reflecting expectations of scarcity, but then fell sharply as the global financial crisis reduced industrial output and, with it, demand for allowances. By 2012–13, had dropped below EUR 5. Phase III (2013–20) was characterized by persistently low prices, mostly below EUR 10, as the surplus of allowances created during the financial crisis continued to weigh on the market. This surplus was reduced only after the introduction of a major market reform: the Market Stability Reserve (MSR), implemented in 2018 and strengthened in 2021, which canceled excess allowances. Together with more ambitious EU climate targets, including net-zero emissions by 2050 and a 55 percent emissions reduction by 2030, this reform helped drive a sustained price increase in Phase IV. Prices rose to EUR 25 by 2019, surpassed EUR 50 in 2021, reached EUR 100 in April 2024, and have since stabilized in the EUR 70–90 range.

Figure 2 shows the volatility of EUA prices. Month-to-month price changes range from −50 percent in April 2014 to +45 percent in multiple episodes, with typical monthly swings of ±15–25 percent. This volatility is substantially higher than that of most financial assets. The Carbon VIX – developed by Fuchs et al. (2026) as the implied volatility of EUA options, analogous to the VIX for equity markets – confirms this picture (Figure 3): it fluctuated between approximately 30 and 83 percent over the 2014–23 period, with no clear downward trend despite the price rally. Since 2024, implied volatility has eased noticeably, declining to about 26 percent – a series low – by December 2025. Even so, it remains above the 15–20 percent at which the equity VIX averages during non-crisis periods.

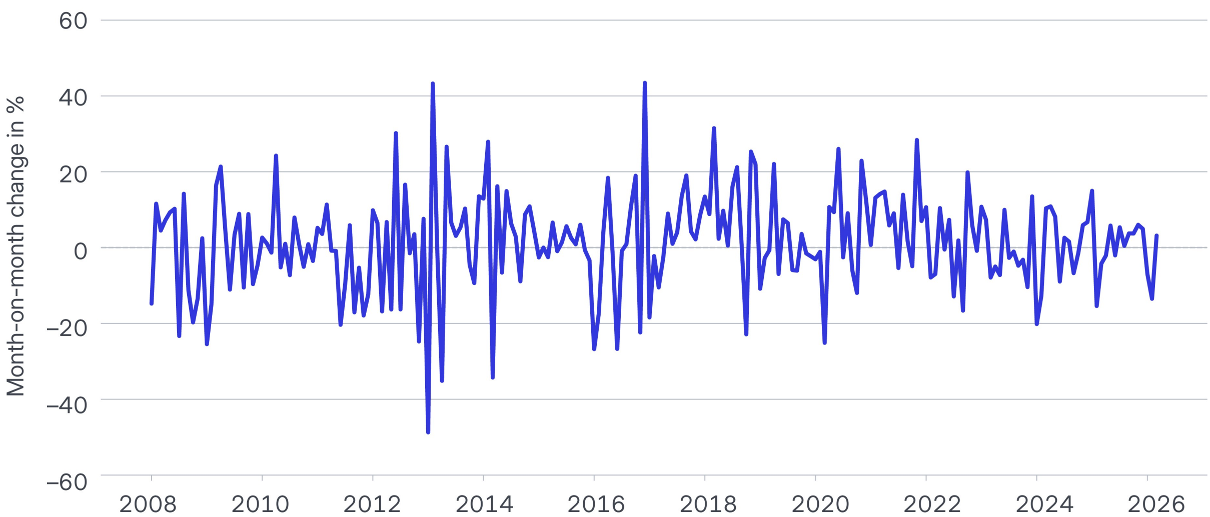
2.2 Climate Policy Uncertainty

Beyond the market-driven volatility of the carbon price itself, firms also face uncertainty about the future direction of climate policy. Future carbon prices depend not only on market forces but on political decisions: the stringency of the emissions cap, the design of the MSR, the scope of ETS coverage, and the stability of the regulatory framework. If governments are perceived as potentially reversing or weakening carbon pricing – whether

Figure 1
EUA Price (EU ETS-1), 2008–26

Note: Monthly average spot price of EU Emission Allowances in EUR per metric ton of CO_2e.
Source: Authors' calculations based on EEX/ICE exchange data.

Figure 2
EUA Price Change Month-on-Month (EU ETS-1), 2008-26

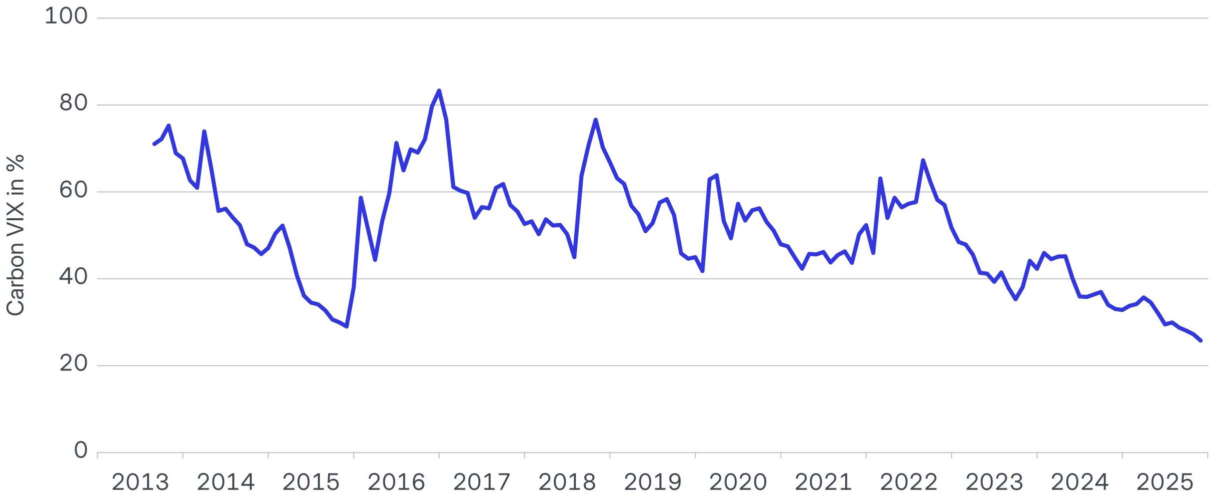


Note: Monthly average spot price of EU Emission Allowances in EUR per metric ton of CO_2e.
Source: Authors' calculations based on EEX/ICE exchange data.

due to electoral outcomes, energy price shocks, or industrial lobbying – firms will apply a higher discount rate to future carbon price scenarios and require a higher "policy credibility premium" before investing.

Figure 3

Carbon VIX Index (Monthly Average), 2014–25



Note: Carbon VIX: implied volatility of EU Allowance (EUA) options, in percent. Monthly averages. Calculated analogously to the equity market VIX as a model-free implied volatility measure.
Source: Fuchs et al. (2026)

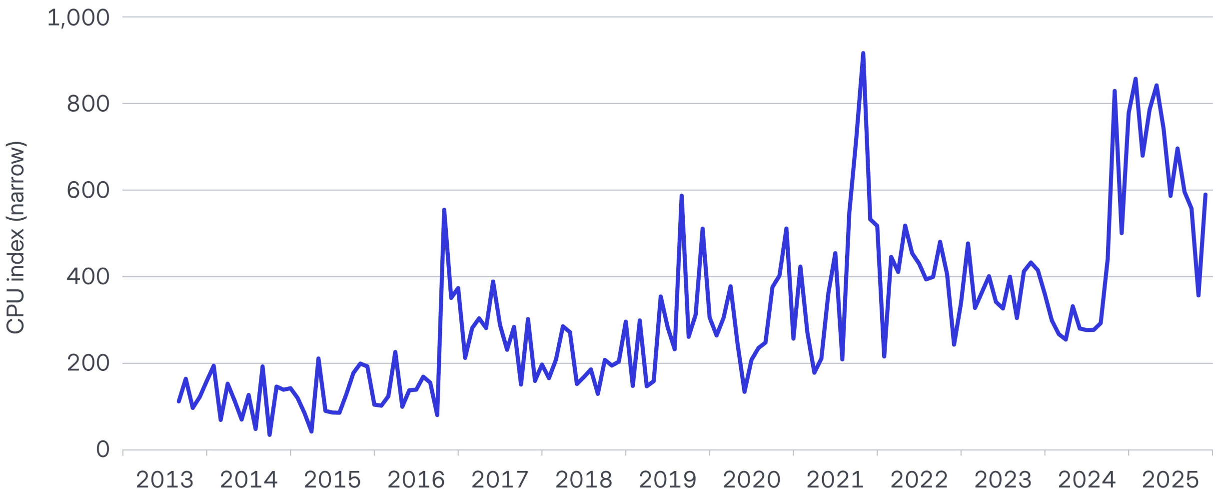
Figure 4 shows the Climate Policy Uncertainty Index (CPU), a text-based measure developed by Gavriilidis et al. (2026) that captures the frequency of newspaper mentions of climate policy alongside uncertainty-related terms. The CPU has trended sharply upward since 2014, with prominent spikes corresponding to the US withdrawal from the Paris Agreement (2017), the COVID-19 pandemic (2020), the European energy crisis (2021–22), and debates around the US Inflation Reduction Act (2022). In late 2021, the CPU reached values exceeding 900, compared to a baseline around 150–200 in 2014–16, and it climbed to renewed highs above 800 in late 2024 and the first half of 2025, coinciding with the 2024 US presidential election and the subsequent shift in US climate policy. Such elevated and rising policy uncertainty is consistent with a stronger option value of waiting for firms contemplating green investments.

2.3 Green Investment Trends

The link between carbon prices and actual CO_2 emissions is documented in a growing literature. Colmer et al. (2025) find significant emission reductions attributable to the EU ETS, while Martinsson et al. (2024) document substantial effects of the Swedish CO_2 tax. Figure 5 shows annual CO_2 emissions indexed to 1990 = 100. The EU-27 and Germany have achieved significant reductions, declining to roughly 60–65 percent of 1990 levels by 2022–23. The US has declined moderately. China, by contrast, has increased emissions roughly fivefold since 1990, with global emissions rising by about 65 percent over the same period. Decarbonizing Europe's economy while global emissions continue to rise underlines both the ambition and the limitations of regional carbon pricing.

Figure 4

Climate Policy Uncertainty Index (Monthly), 2014–25



Note: Climate Policy Uncertainty (CPU) index, narrow definition. Monthly values. Constructed from text analysis of newspaper articles mentioning climate policy alongside uncertainty terms.
Source: Gavriilidis et al. (2026)

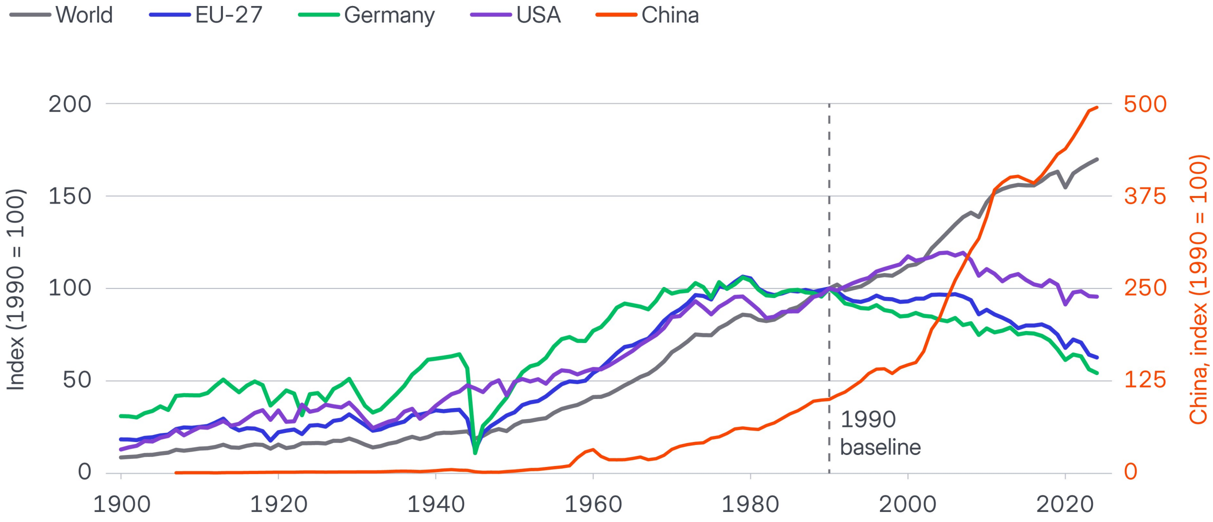
Figure 6 shows climate change mitigation (CCM) investment as a share of GDP across selected EU member states, based on Eurostat data. CCM investment covers expenditures to reduce greenhouse gas emissions, improve energy efficiency, and develop renewable energy. Across the EU-27, investment has risen from about 0.4 percent of GDP in 2007 to approximately 0.8 percent in 2023 – a doubling in relative terms, but a level that many assessments regard as insufficient for meeting the 2030 and 2050 climate targets. Sweden leads with roughly 1.4 percent of GDP; Germany lags at around 0.7 percent, well below what its industrial economy would need for a timely transition. France, Italy, and Poland cluster around the EU-27 average. The gap between current trends and required investment levels motivates the policy question at the heart of this paper: what carbon price conditions – in terms of both level and stability – are needed to shift private investment propensity?

2.4 Theory: Real Options and Carbon Price Uncertainty

The theoretical framework linking carbon price uncertainty to investment decisions is real options theory, developed most comprehensively by Dixit and Pindyck (1994) following foundational contributions by Arrow and Fisher (1974) and McDonald and Siegel (1986). The key insight is that irreversible investments under uncertainty resemble financial call options: the firm has the right – but not the obligation – to invest at any time. Like an option, this investment opportunity has value precisely because it can be exercised selectively, when conditions are favorable.

Figure 5

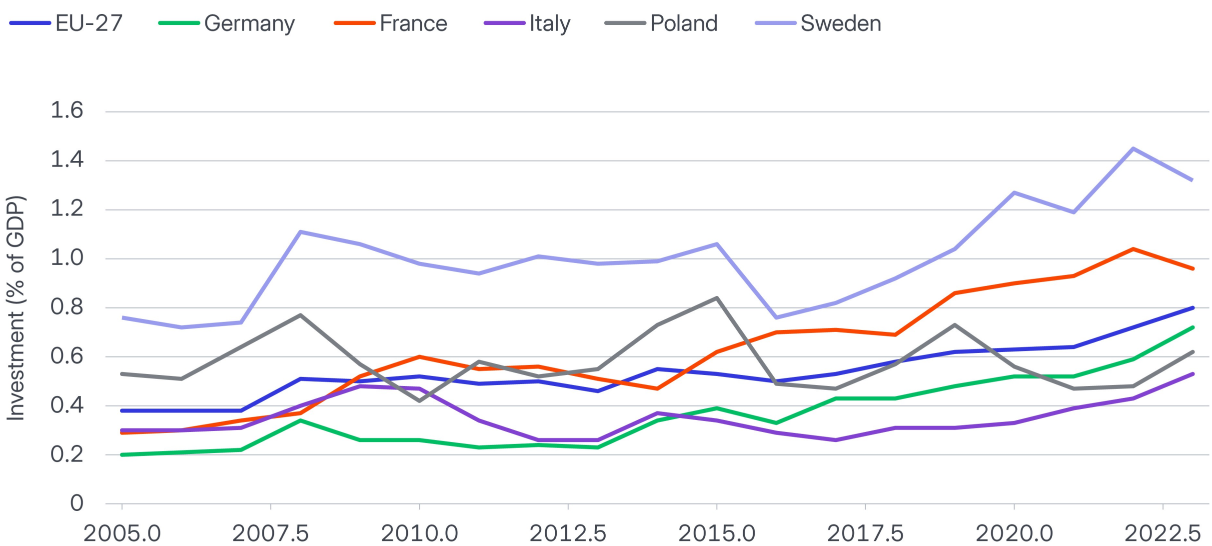
Annual CO_2 Emissions, 1900–2024



Note: Annual CO_2 emissions for selected regions and countries, indexed to 1990 = 100. China uses the right axis (scale: 0–500). Dotted vertical line marks 1990 baseline.
Source: Global Carbon Project / Our World in Data; authors' calculations.

Figure 6

Climate Change Mitigation Investment, 2005–23



Note: CCM investment as a percentage of GDP, 2005–23, for selected EU countries and the EU-27 aggregate.
Source: Eurostat, Environmental accounts – Climate change mitigation investment statistics (env_ac_ccminv).

To see why this matters for carbon pricing, consider a firm deciding whether to invest in a green project (e.g., replacing a fossil-fuel boiler with a heat pump) at cost I. The project's profitability depends on the future carbon price p: higher carbon prices make the green project more attractive relative to the brown alternative, because the brown alternative bears a carbon cost per metric ton of CO_2 saved, A. In a deterministic NPV framework, the firm invests if and only if the expected benefit exceeds the cost: $E[p] \times A/(r - \delta) \geq I$, where r is the discount rate and δ the depreciation rate of the investment. This yields a break-even (NPV = 0) carbon price of $p^* = (r - \delta) \times I/A$.

Under uncertainty, the firm's optimal policy is not to invest as soon as expected profitability turns positive. The reason is rooted in two features of the problem: the *persistence* of carbon prices and the *irreversibility* of the investment. Persistence reflects the durable nature of the forces that move carbon prices. A postponement or weakening of climate policy, a change of government, the extension of free allowances, or a geopolitical or energy-market crisis does not shift the price for a single period but it resets the regime for years. Under persistence, a realized low price is therefore not a transient setback the firm can avoid: it signals a low-price regime in which the irreversible outlay I underperforms for its entire life. Irreversibility makes this downside asymmetric – a firm that invests and then finds itself in a low-price regime cannot recover the sunk cost I, whereas a firm that waits can avoid committing into that regime. The option to wait is thus insurance against durable downside risk. Notably, this deters even projects that are profitable in expectation: $E[p] \times A/(r - \delta) \geq I$ can hold while the worst-case payoff falls short of I. The firm therefore waits until the expected price clears a trigger $p^{**} > p^*$ that exceeds the static break-even price, investing only when the margin is wide enough to compensate for the durable downside it would otherwise be locked into.

This logic identifies the lower bound of the price as the decision-relevant statistic. With an expected price p and a proportional uncertainty band of $\pm x$, the worst-case durable level is $p(1 - x)$, and the firm is fully protected against loss when $p(1 - x) \geq p^*$. Two channels therefore move the investment trigger in opposite directions. A higher expected price *protects*: under persistence it lifts the entire price path, raising the downside floor $p(1 - x)$ above the break-even threshold p^* and shrinking the loss tail. Higher uncertainty *exposes*: it lowers the floor and fattens the tail below p^*. The wedge $(p^{**} - p^*)$ is accordingly increasing in x and vanishes once p is high enough that $p(1 - x) > p^*$ even in the worst case.

This yields a substitutability between the price level and its uncertainty, holding all else equal. A high price paired with wide uncertainty and a low price paired with narrow uncertainty can leave a firm equally (un)willing to invest. This pattern is consistent with the results documented in Section 4.2: moving to ±100 percent uncertainty suppresses investment by about as much as the full EUR 50–200 price range raises it, so that a EUR 175 price under ±100 percent uncertainty and a EUR 50 price under no uncertainty leave the average firm equally close to indifference.

3 Survey Experiment

3.1 Survey Design and Sample

We embedded a conjoint survey experiment in the February 2026 wave of the ifo Business Survey (IBS), a large-scale monthly survey among a representative set of German firms that forms the basis of the ifo Business Climate Index.[1] The conjoint experiment was included as a supplementary module for 2,281 regular IBS participants in the manufacturing sector with at least 25 employees.[2]

In the first block of the questionnaire, firms answered questions about their characteristics and typical investment behavior. In the subsequent main experimental block, responses from the first block were used to calibrate a reference scenario against which firms evaluated five green investment opportunities under different conditions. After completing the five vignettes, firms answered a set of background questions on their carbon risk exposure, including EU ETS participation, fossil fuel cost share, energy intensity, and decarbonization plans, as well as their attitudes toward climate policy, including credibility and reversal risk.

Of the 2,281 firms invited, 830 (approximately 36 percent) completed all five vignettes and provided usable responses, yielding a total of 4,150 vignette-level observations. Nonresponses were dropped from the analysis.

3.2 Vignette Design

Each vignette presented firms with a hypothetical investment decision. The introductory text reads as follows (translated from German):

> "Please imagine that your company is considering an investment project aimed at reducing CO_2 emissions and improving energy efficiency. The required investment amount is *x* €. The economic viability of the project depends crucially on the future development of the CO_2 price. Please assume that the project's technical lifetime is similar to that of a typical investment project in your company.
>
> Below, you will see five scenarios. Each scenario shows:

[1] The ifo Business Survey has been conducted continuously since 1949 and is one of the most closely followed business sentiment surveys globally: Kerssenfischer and Schmeling (2024) document that the ifo Business Climate Index is among the top 20 macroeconomic data releases that systematically move global financial markets. The survey is representative of the German economy by sector and firm size (Hiersemenzel et al. 2022), and is typically completed by the CEO or owner (Hennrich et al. 2023), ensuring that responses reflect actual business decision-making.

[2] We focused on medium-sized and large manufacturing firms because they are more likely to face investment decisions in their day-to-day operations that resemble those presented in the vignettes.

- the expected average CO_2 price over the life of the investment project

- the uncertainty range around this average price

Any value within the uncertainty range is equally likely to be the average CO_2 price over the life of the investment project.

For reference, you will also be shown the expected payback period of the investment project, as well as the uncertainty around it, based on the CO_2 price scenario."

Firms were then shown a structured table summarizing the carbon price scenario. Our outcome measure asked respondents, on an 11-point scale, how likely their company would be to choose the investment project to reduce CO_2 emissions and improve energy efficiency under the stated conditions, with responses ranging from 0 ("very unlikely") to 10 ("very likely").

The vignette table presented the following information, with items (i) and (ii) shown in random order: (i) the expected average future carbon price over the lifetime of the investment project, in EUR/tCO_2; (ii) the uncertainty range around that expected average future carbon price, defined as the symmetric lower and upper bounds of a $\pm x$ percent interval; (iii) the corresponding lower and upper bounds of the expected average future carbon price, expressed in EUR amounts; and (iv) the implied amortization periods at the lower bound, the midpoint, and at the upper bound of the middle carbon price.[3] Before answering the outcome question, respondents were asked to assume that the amortization period of a typical investment project in their firm was y years. This value was based on the firm's reported typical amortization period, which was elicited before the experiment and rounded to the midpoint of the interval selected by the respondent. Figure 7 shows an example screenshot of the vignette table and the outcome question.

[3] The amortization periods were calculated based on a reference carbon price of EUR 125, a natural gas price of EUR 30 per MWh, and an emission factor of 0.2 t CO_2/MWh, yielding a cost structure of roughly 45 percent abatement savings (EUR 125 × 0.2 = EUR 25 vs. EUR 30 per MWh energy savings), that would entirely eliminate any (variable) expenditures related to fossil fuel-based inputs. The implied amortization period of the green investment opportunity was modeled as a hyperbolic function of the carbon price and finally converted into years.

Figure 7

Example vignette

05.02.26, 13:36 Umfrage

ifo Institut

Szenario 1	
Unsicherheitsspanne für den erwarteten durchschnittlichen CO_2-Preis (in %)	+/- 50 %
Erwarteter durchschnittlicher CO_2-Preis (€/Tonne)	200 €
Daraus folgende Unsicherheitsspanne für den erwarteten durchschnittlichen CO_2-Preis (€/Tonne)	100 € bis 300 €
Amortisationsdauer:	
bei höchstmöglichem CO_2-Preis	7 Jahr(e) 3 Monat(e)
bei mittlerem CO_2-Preis	9 Jahr(e) 5 Monat(e)
bei niedrigstmöglichem CO_2-Preis	13 Jahr(e) 2 Monat(e)

Stellen Sie sich vor, dass sich ein typisches Investitionsprojekt Ihres Unternehmens nach ungefähr **12 Jahren** amortisiert.

Wie wahrscheinlich wäre es, dass Ihr Unternehmen das **Investitionsprojekt** zur Verringerung von CO_2-Emissionen und zur Energieeffizienzsteigerung unter den genannten Bedingungen **auswählt**?

(0 = sehr unwahrscheinlich, 10 = sehr wahrscheinlich)

0 1 2 3 4 5 6 7 8 9 10

ZURÜCKSETZEN

ZURÜCK 28% WEITER

https://surveys.ifo.de/uc/ifo_MB_Befragungsteam/e39a/ospe.php?qb 1/1

The two key attributes randomized across vignettes are:

– **Carbon price level**: Seven attribute values – EUR 50, EUR 75, EUR 100, EUR 125, EUR 150, EUR 175, and EUR 200 per tCO_2. These values span a plausible range of future carbon prices in the EU ETS, from the 2024 trough (around EUR 50) to levels above EUR 150–200 that are consistent with Paris-aligned climate pathways according to standard integrated assessment models.

– **Uncertainty range**: Five attribute values – ±0, ±25, ±50, ±75, and ±100 percent of the expected price. At ±0 percent, the firm faces no uncertainty about the future carbon price. At ±100 percent, the realized price could range from zero to twice the expected level – a range consistent with the volatility observed in the actual EU ETS, where the Carbon VIX has frequently reached 50–75 percent.

The 7 × 5 = 35 possible vignette cells were randomly assigned to firms using a balanced incomplete block design, with each firm receiving exactly five vignettes. Randomization was orthogonal: within the set of five vignettes shown to a given firm, the carbon price level and uncertainty range varied independently. This orthogonality is essential for identifying the separate causal effects of price and uncertainty. The 11-point response scale was recentered to -5 to +5 for analysis, with positive values indicating a preference for the green project. In the regression analysis, we include firm fixed effects to absorb all time-invariant heterogeneity across firms, including risk attitudes, baseline green investment propensity, sector, and size, so that identification relies solely on within-firm variation across the five vignettes.

3.3 Additional Survey Variables

In addition to the five vignettes, the survey module collected background information that enables rich heterogeneity analysis. We elicited:

– **Carbon risk exposure measures**:

  - an indicator whether the firm participates in the EU ETS-1
  - the share of fossil fuels in total energy costs
  - an indicator whether the firm operates in an energy-intensive sector
  - a dummy whether it has a formal emissions reduction plan.

– **Policy attitudes**:

  - the firm's views on climate policy (elicited through an open-ended question)
  - its perceived risk of a policy reversal that would significantly weaken carbon pricing

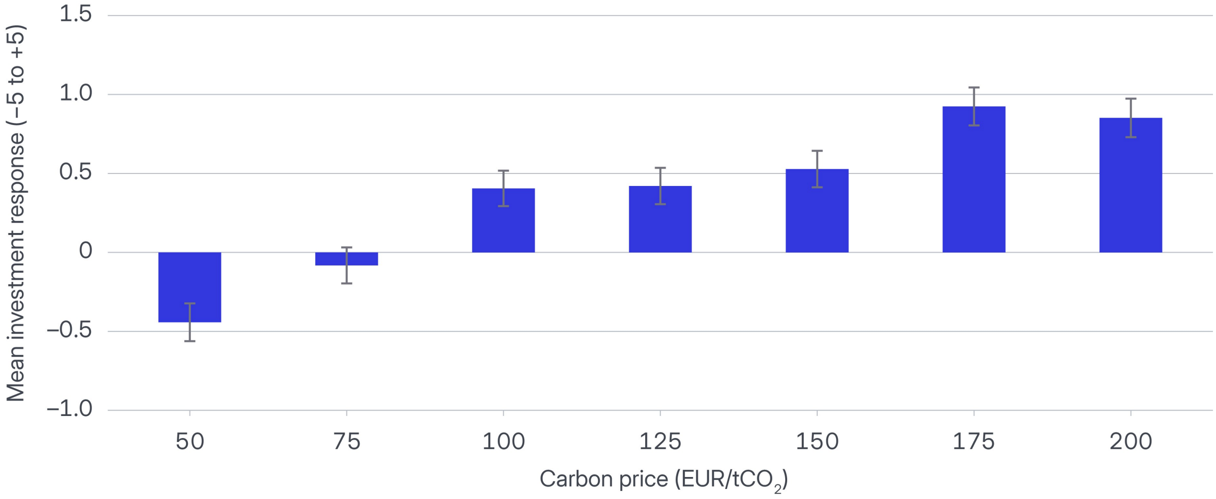
    - its assessment of the reliability of climate policy in Germany.

- **Time preferences**:
    - a patience scale measure
    - the importance the firm assigns to waiting before committing to an investment, which serves as a direct proxy for option value considerations.

These variables are elicited in either the special module or the regular IBS questionnaire, which routinely collects firm-level data on business situation, sector, firm size, and employment. The linkage of experimental responses to observational firm characteristics is a key advantage of embedding the experiment in an established panel survey.

Figure 8

Investment Response by Expected Carbon Price



Note: Mean investment response (scale -5 to +5, where +5 means "definitely invest in green project" and -5 means "definitely not") by carbon price level (€/tCO_2). Error bars show 95% confidence intervals. N = 3,937 vignette observations, 830 firms.
Source: Authors' calculations from ifo Business Survey conjoint experiment (February 2026).

4 Results

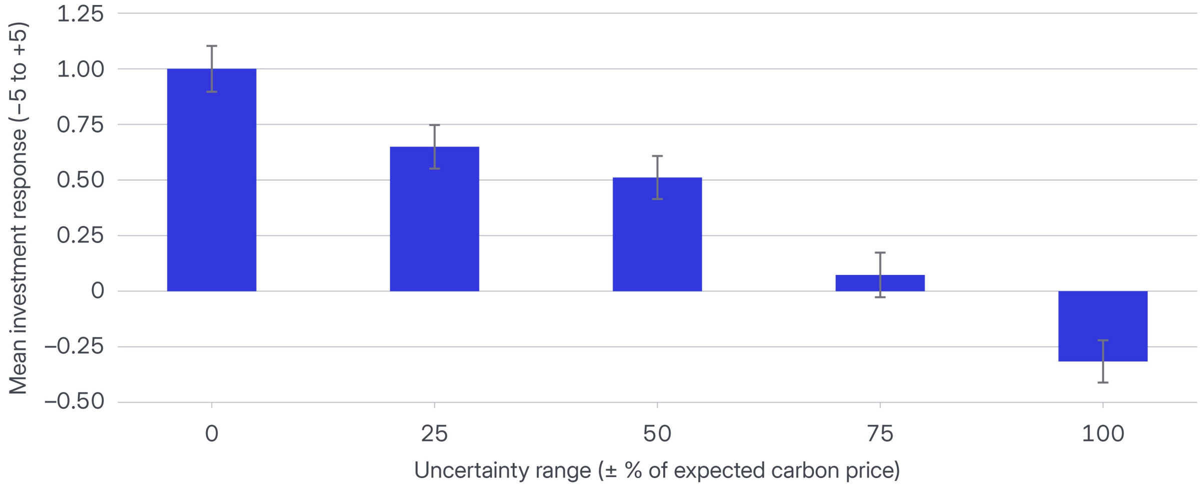
4.1 Main Effects: Carbon Price Level

Figure 8 shows the unconditional mean investment response at each carbon price level, pooling across all uncertainty conditions. The pattern is strikingly clear and monotone: investment propensity rises systematically with the expected carbon price. At EUR 50/tCO_2 – close to the ETS-1 price prevailing during the early 2024 downturn – the mean response is -0.44, meaning the average firm does not carry out the green project. At EUR 75, the response is nearly neutral (-0.08). Above EUR 100, the mean response turns positive: +0.41 at EUR 100, +0.42 at EUR 125, +0.53 at EUR 150, +0.92 at EUR 175, and +0.85 at EUR 200.

Table 1 presents the regression results. Column (1) uses the carbon price as a continuous variable in a simple OLS regression with robust standard errors. The coefficient is 0.0086 and highly significant ($p < 0.01$). Absorbing firm-level heterogeneity by means of firm fixed effects in Column (2) does not alter the results ($\hat{\beta} = 0.0091$; $p < 0.01$). Thus, each EUR 10 increase in the expected carbon price raises the investment response by approximately 0.09 scale points. Column (3) uses indicator variables for each price level (reference: EUR 50), which allows for a non-linear relationship. The estimates confirm the monotone pattern in Figure 8: relative to EUR 50, the coefficients for EUR 100, EUR 150, EUR 175, and EUR 200 are +0.67, +1.10, +1.25, and +1.38 (all significant at the 0.1 percent level with firm

Figure 9

Investment Response by Carbon Price Uncertainty



Note: Mean investment response (scale -5 to +5) by uncertainty range (±% of expected carbon price). Error bars show 95% confidence intervals. *N* = 3,937 vignette observations, 830 firms.
Source: Authors' calculations from ifo Business Survey conjoint experiment (February 2026).

fixed effects).

4.2 Main Effects: Carbon Price Uncertainty

Figure 9 shows the unconditional mean investment response at each uncertainty level, pooled across all price conditions. The pattern mirrors that in Figure 8, but in reverse: investment propensity falls monotonically as uncertainty rises. At zero uncertainty (±0 percent), the mean response is +1.00 – a clearly positive willingness to invest. As uncertainty increases to ±25 percent, the mean falls to +0.65. At ±50 percent, it declines further to +0.51. By ±75 percent, the mean drops to +0.07, which is essentially neutral. At ±100 percent, the mean response turns negative, reaching −0.32. This implies that, on average, firms would not undertake the green investment project, even though the expected carbon price remains positive.

Regression results for the uncertainty effect are shown in Table 1, Panel B. The continuous uncertainty coefficient with firm fixed effects is −0.0126 ($p < 0.01$): each percentage point increase in the uncertainty range reduces the investment response by 0.0126 scale points. A 100-percentage-point increase in the uncertainty range (from ±0 to ±100 percent) reduces the response by 1.26 scale points. The categorical estimates confirm the monotone pattern: the coefficients for ±25, ±50, ±75, and ±100 percent uncertainty are −0.34, −0.61, −0.90, and −1.27 respectively (all significant at the 0.1 percent level).

An important result from Table 1 is that both effects survive a horse-race regression.

Table 1
Baseline Regression Results

Variable	(1) OLS	(2) Firm FE	(3) FE-Cat.
Panel A: Carbon Price			
Price (continuous, €/tCO_2)	0.0086***	0.0091***	
	(0.0009)	(0.0006)	
Price: €75 [ref: €50]			0.391***
			(0.098)
Price: €100			0.672***
			(0.093)
Price: €125			0.781***
			(0.095)
Price: €150			1.096***
			(0.097)
Price: €175			1.246***
			(0.099)
Price: €200			1.384***
			(0.103)
Constant	−0.696***	−0.761***	
	(0.120)	(0.076)	
Panel B: Uncertainty			
Uncertainty (continuous, %)	−0.0128***	−0.0126***	
	(0.0013)	(0.0008)	
Uncertainty: ±25% [ref: ±0%]			−0.342***
			(0.080)
Uncertainty: ±50%			−0.612***
			(0.077)
Uncertainty: ±75%			−0.896***
			(0.080)
Uncertainty: ±100%			−1.274***
			(0.086)
Constant	1.024***	1.010***	0.210*
	(0.078)	(0.046)	(0.092)
Observations	3,937	3,937	3,937
Firm fixed effects	No	Yes	Yes
Adj. R^2 (Panel A)	0.023	0.739	0.764
Adj. R^2 (Panel B)	0.026	0.738	0.764

Note: Dependent variable: Investment response (scale −5 to +5). Robust standard errors in parentheses. Reference categories: €50 (price) and ±0% (uncertainty). Columns (1) and (2) include either price or uncertainty separately, so Panels A and B report two separate regressions per column; column (3) includes both jointly as categorical variables in a single regression, so the adjusted R^2 coincides across panels and a single constant (reported in Panel B) applies, referring to the reference cell (€50, ±0%). In the fixed-effects columns (2) and (3) the constant refers to the average firm, as firm effects are normalized to mean zero.
*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.
Source: Authors' calculations from ifo Business Survey conjoint experiment (February 2026).

Column (3) of Panels A and B shows estimates from the joint model with both price and uncertainty as categorical regressors and firm fixed effects. The price and uncertainty effects are virtually unchanged. This is a direct consequence of the orthogonal randomization design: within each firm's set of five vignettes, variation in price and uncertainty is independent, ensuring that neither estimate is confounded by the other.

The magnitudes merit emphasis. The total range of the uncertainty effect – from ±0 percent to ±100 percent – corresponds to a 1.27-point reduction in investment propensity. The total range of the price effect – from EUR 50 to EUR 200 – corresponds to a 1.38-point increase. These are essentially equal in magnitude. This means that the investment-deterring effect of high carbon price uncertainty can fully offset the investment-stimulating effect of high carbon prices. Firms facing an expected carbon price of EUR 175 with ±100 percent uncertainty display approximately the same investment propensity as firms facing a certain carbon price of EUR 50; both groups are, on average, near the neutral point. This implies that reducing uncertainty is as important a policy lever as increasing the price level. Put differently, the marginal rate of substitution between uncertainty and price is about EUR 1.4 per percentage point: holding investment propensity constant, firms would be willing to trade a ±100 percent uncertainty band for an increase of roughly EUR 138/tCO_2 in the expected carbon price.[4]

4.3 Heterogeneity Analysis

We examine two dimensions of heterogeneity: carbon risk exposure, as well as policy credibility and reversal risk. Table 2 summarizes the key results.

4.3.1 Carbon Risk Exposure

We first split the sample by EU ETS-1 participation status. Among ETS participants (N = 297), the price coefficient is 0.0151 ($p < 0.01$) – approximately twice as large as for non-ETS firms (0.0078; $p < 0.01$). This difference is economically intuitive: ETS-participating firms directly face carbon costs in their production decisions, making them more sensitive to changes in the expected carbon price. At the categorical level (Table A.1 in the Appendix), the contrast is even sharper: at a price of EUR 200, ETS participants show an investment response 3.04 scale points above the EUR 50 baseline, versus 1.17 for non-ETS firms. The uncertainty effect is also more pronounced for ETS participants (–0.0192 vs. –0.0117; both $p < 0.01$), consistent with these firms having more at stake in terms of carbon cost uncertainty. Heterogeneity analyses by fossil fuel cost share and energy intensity show similar patterns, confirming that firms more highly exposed to carbon costs respond more strongly to both carbon price levels and uncertainty signals.

Notably, although ETS participants are more responsive to both carbon price levels and uncertainty, the two effects increase proportionally. Their implied marginal rate of substitu-

[4] The marginal rate of substitution is the ratio of the continuous uncertainty and price coefficients, 0.0126/0.0091 ≈ 1.4 (EUR per percentage point of uncertainty).

tion is about EUR 1.3 per percentage point (0.0192/0.0151), compared with about EUR 1.5 for non-ETS firms (0.0117/0.0078), and the confidence intervals of the two ratios overlap widely. Thus, exposure to carbon costs amplifies firms' responsiveness but leaves the marginal rate of substitution between price and uncertainty essentially unchanged across groups.

4.3.2 Policy Credibility and Reversal Risk.

We split firms by their perceived credibility of climate policy and reversal risk. The credibility dimension generates the most striking results. Firms with high perceived policy credibility (N = 485) show a mean investment response of +1.44, compared to just +0.09 for firms perceiving policy credibility as low (N = 2,875). This baseline difference of 1.35 scale points exceeds the entire range of the carbon price effect in our experiment. It suggests that institutional trust – the belief that the government will maintain its carbon pricing commitments – can by itself make firms substantially more supportive of green investment, independent of the actual price level. The marginal effects of price and uncertainty are similar across credibility groups, indicating that credibility affects the baseline investment propensity more than the responsiveness to changes in price and uncertainty. Because credibility is measured rather than randomly assigned, however, this baseline difference should be interpreted as associational rather than causal.

Firms with high perceived reversal risk (N = 978) show a price coefficient of just 0.0050 ($p < 0.05$) – roughly half the full-sample estimate and half the low-reversal-risk coefficient of 0.0097 ($p < 0.01$). The mean investment response for high-reversal-risk firms is −0.26, meaning the average high-reversal-risk firm leans against green investment even when pooling across all price levels. By contrast, low-reversal-risk firms show a mean response of +0.71.

These results highlight a vicious circle: if firms believe that carbon pricing may be reversed, they respond much less to it – which reduces the observed investment effect, potentially reinforcing perceptions that carbon pricing is ineffective and creating political pressure for reversal.

Table 2
Heterogeneity Analysis: Carbon Risk Exposure and Policy Credibility

	Full	ETS: Yes	ETS: No	High cred.	Low cred.	High rev.	Low rev.
	N=3,937	*N*=297	*N*=3,587	*N*=485	*N*=2,875	*N*=978	*N*=2,476
Price (cont.)	0.0084***	0.0151***	0.0078***	0.0092***	0.0080***	0.0050**	0.0097***
	(0.0009)	(0.0034)	(0.0009)	(0.0021)	(0.0011)	(0.0019)	(0.0011)
Uncertainty (cont.)	−0.0126***	−0.0192***	−0.0117***	−0.0105**	−0.0134***	−0.0167***	−0.0120***
	(0.0012)	(0.0045)	(0.0013)	(0.0033)	(0.0015)	(0.0027)	(0.0015)
Constant	−0.034	−0.323	−0.025	0.807*	−0.237	−0.056	0.104
	(0.136)	(0.539)	(0.142)	(0.329)	(0.162)	(0.290)	(0.168)
Outcome mean	0.374	0.687	0.355	1.441	0.089	−0.263	0.712
Adj. R^2	0.048	0.111	0.042	0.057	0.047	0.043	0.055

Note: Dependent variable: Investment response (scale −5 to +5). Each column is a single pooled OLS regression of the investment response on the continuous price and uncertainty variables; firm fixed effects are not included. Robust standard errors in parentheses. "High cred." = high policy credibility; "Low cred." = low credibility; "High rev." = high perceived policy reversal risk; "Low rev." = low reversal risk. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.
Source: Authors' calculations from ifo Business Survey conjoint experiment (February 2026).

5 Policy Implications

5.1 Carbon Price Level: Near the Threshold, But Not There Yet

Our results reveal that the current ETS-1 carbon price – roughly EUR 70–90 in 2025–26 – is approaching but has not yet firmly crossed the investment threshold for the average German firm in our survey sample. In our experiment, at EUR 75 the average firm is essentially neutral (mean response -0.08), and at EUR 100 it leans modestly in favor of investing in decarbonization (mean response +0.41). These numbers are unconditional on the uncertainty conditions faced by firms in the experiment — and importantly, at observed levels of carbon price uncertainty (e.g., ±50 percent of the expected price), the effective threshold is higher.

Complementary theoretical literature finds that the optimal carbon price should rise over time, though for reasons distinct from ours: in Golosov et al. (2014) and Gerlagh and Liski (2018) the optimal tax tracks the social cost of carbon and rises with income. Our mechanism is different in nature: a credibly rising, stable price path raises investment by shrinking the option value of waiting that irreversibility and downside risk create. The two perspectives align on the policy conclusion: policy trajectories that maintain and gradually increase carbon prices are important. The EU's Fit for 55 package implies that carbon prices will rise significantly through the 2030s as the cap tightens. If markets price in these future scarcity trajectories, EUA prices above EUR 100 should become the norm. Avoiding political interventions that cap prices or delay emissions reductions – such as the temporary extension of free allowances or windfall profit taxes on ETS participants – is important for maintaining the investment incentive.

5.2 Reducing Uncertainty: Price Corridors, Floors, and Forward Guidance

Perhaps the most striking policy implication of our results is that uncertainty reduction may be as important as price increases. A ±100 percent uncertainty range suppresses investment by 1.27 scale points – as much as the full price effect from EUR 50 to EUR 200. Put in price terms, the average firm would value the elimination of a ±100 percent uncertainty band at roughly EUR 138/tCO_2 of expected carbon price; halving effective uncertainty would be worth on the order of EUR 69. At realistic levels of EUA volatility, e.g., with a Carbon VIX-implied uncertainty of ±50 percent or more for much of 2014–23, and still around ±30 percent in 2024–25, even ambitious average carbon price levels may fail to induce investment unless uncertainty is addressed as well.

Several mechanisms could reduce carbon price uncertainty. First, a carbon price floor – a minimum price below which EUA prices cannot fall – would eliminate the downside tail of price uncertainty. Borghesi et al. (2025) analyze an ETS price floor in a real-options model of firms' green investment and find that it accelerates the clean transition. Ohlendorf et al. (2022) survey German firms specifically on price floors and find strong support: a majority of surveyed firms favor a floor price as a policy instrument to support low-carbon investment. Our experimental results provide a quantitative complement: the uncertainty coefficients we estimate offer a basis for quantifying the investment gains from reducing downside price risk. Because our vignettes vary uncertainty symmetrically, mapping these estimates to the one-sided truncation a floor provides requires care – a task we leave to future work using floor-specific designs.

Second, credible long-term carbon price trajectories – announced by governments or embedded in legislation – could anchor firms' expectations about future price paths. The analogy with monetary policy is instructive: central banks' commitment to inflation targets has been shown to anchor inflation expectations and reduce their uncertainty (Mankiw and Reis 2002; Hensel et al. 2024). A similar commitment to a long-term carbon price path – perhaps with legally binding price floors that ratchet up over time – could similarly reduce the uncertainty firms face when planning long-lived capital investments.

Third, for ETS 2 (expected to become operational in 2028), our results provide direct design guidance. ETS 2 will initially face all the challenges that ETS 1 faced in its early years: thin markets with limited liquidity, uncertainty about the supply-demand balance, and no established track record of price formation. Our results suggest that these initial years of high uncertainty may be particularly damaging to investment if not mitigated by a price stabilization mechanism from the outset. The MSR took until 2018 to be introduced in ETS 1, leaving nearly a decade of low and volatile prices that – according to our estimates – may have substantially suppressed green investment. ETS 2 should not repeat this mistake.

5.3 Policy Credibility as an Investment Multiplier

Our heterogeneity results on policy credibility deserve special attention. The finding that firms that perceive climate policy more credible show an investment propensity 1.35 scale points above low-credibility firms – an effect larger than the full range of the carbon price effect – implies that the returns to institutional commitment are very high. Governments and central banks have long recognized the value of credibility in monetary policy (Bernanke 1983; Hensel et al. 2024). Our results suggest the same logic applies to carbon pricing.

What generates policy credibility? Several institutional features have been identified in the literature: independent regulatory authorities (analogous to independent central banks), legally binding price mechanisms that cannot be easily reversed by ordinary legislation, long-term political consensus across party lines, and consistent policy track records. For ETS, the introduction of the MSR and the successive tightening of the cap have built some credibility, but political episodes – such as calls to delay ETS compliance during the 2022 energy crisis, or debates about including aviation and shipping – have also created uncertainty. Our results suggest that the credibility premium is large enough that investing in institutional design is worthwhile: firms that believe in carbon pricing invest in green projects, creating a self-reinforcing dynamic that political economy models of carbon pricing should take seriously.

5.4 Implications for ETS Participants and Energy-Intensive Industry

Our finding that ETS participants are approximately twice as price sensitive as non-participants carries an implication for ETS-2, which extends carbon pricing to buildings and road transport. To the extent this gap reflects familiarity with the system, rather than differences in firm composition, the investment-incentive effect of ETS-2 may strengthen as covered firms gain experience. This motivates accompanying ETS-2 with support for small and medium-sized enterprises to build carbon-pricing literacy and integrate it into investment planning. At the same time, our results caution against expecting experience to substitute for stability: the price firms place on certainty is similar across exposure groups, so the case for a price stabilization mechanism (Section 5.2) applies to ETS-2 firms in full.

6 Conclusion

This report builds on Dolls et al. (2026), providing experimental evidence that expected carbon price levels and uncertainty jointly influence green investment decisions by German firms. Using a conjoint survey experiment embedded in the ifo Business Survey, we generate exogenous, orthogonal variation in both the level and the uncertainty of expected carbon prices across 4,150 investment vignettes evaluated by 830 firms. Our design cleanly identifies the causal effect of each dimension on investment propensity, overcoming the identification challenges that plague observational studies of existing carbon pricing policies.

Three main messages emerge.

1. Carbon prices work: higher expected price significantly and strongly increase green investment propensity. The current ETS-1 price range of EUR 70–90 is near the threshold for the average firm, and prices above EUR 100–150 generate clearly positive investment responses.

2. Carbon price uncertainty is a major barrier, with effects as large as the price level effects in our experiment. Reducing uncertainty through price floors, long-term commitments, and credible institutional design may be as effective as raising the price.

3. Perceived policy credibility is the single largest determinant of investment propensity beyond carbon price level and uncertainty effects, with a gap between high- and low-perceived credibility firms exceeding the full carbon price range effect. Institutions matter as much as incentives.

These results have direct relevance for the design of ETS-2, which is expected to be launched in 2028 and initially face all the uncertainty challenges that plagued ETS-1 in its early years. Our evidence supports introducing a price stabilization mechanism – a price floor or price corridor – from the outset, combined with long-term price trajectory commitments that anchor firms' expectations. The option value of waiting identified by real options theory is not just a theoretical curiosity: it operates with quantifiable force in real firm investment decisions. Reducing it should be a central design objective for next-generation carbon pricing systems.

Several important extensions lie beyond the scope of this report. First, we focus on German firms – future work should examine whether the findings generalize to other European countries or to the household sector. Second, our conjoint design captures stated investment preferences under hypothetical scenarios; linking these to actual investment outcomes will be an important test of external validity. Third, the optimal policy response to uncertainty – whether price floors, quantity restrictions, or technology-specific instruments – requires welfare analysis beyond the scope of this report and merits future theoretical and empirical investigation.

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A Appendix

Table A.1
Heterogeneity Analysis: Categorical Specification

	Full N=3,937	ETS: Yes N=297	ETS: No N=3,587	High cred. N=485	Low cred. N=2,875	High rev. N=978	Low rev. N=2,476
Price: €75 [ref: €50]	0.365*	2.098**	0.269	0.807	0.373	0.024	0.429*
	(0.165)	(0.690)	(0.171)	(0.438)	(0.195)	(0.360)	(0.208)
Price: €100	0.842***	2.263***	0.741***	1.292**	0.818***	0.675	0.890***
	(0.163)	(0.643)	(0.170)	(0.426)	(0.192)	(0.344)	(0.204)
Price: €125	0.840***	2.448***	0.753***	1.647***	0.785***	0.887**	0.880***
	(0.165)	(0.647)	(0.171)	(0.433)	(0.193)	(0.340)	(0.209)
Price: €150	0.942***	2.278***	0.877***	1.739***	0.841***	0.484	1.065***
	(0.165)	(0.627)	(0.172)	(0.458)	(0.191)	(0.358)	(0.204)
Price: €175	1.323***	3.240***	1.179***	1.664***	1.270***	0.918*	1.489***
	(0.166)	(0.566)	(0.175)	(0.438)	(0.196)	(0.356)	(0.209)
Price: €200	1.282***	3.042***	1.170***	1.619***	1.269***	0.671	1.513***
	(0.169)	(0.628)	(0.176)	(0.413)	(0.203)	(0.356)	(0.208)
Uncertainty: ±25% [ref: ±0%]	−0.351*	−0.591	−0.336*	−0.048	−0.531**	−0.389	−0.373*
	(0.139)	(0.493)	(0.146)	(0.354)	(0.166)	(0.313)	(0.172)
Uncertainty: ±50%	−0.512***	−0.467	−0.504***	−0.549	−0.566***	−0.873**	−0.513**
	(0.139)	(0.474)	(0.147)	(0.361)	(0.167)	(0.305)	(0.172)
Uncertainty: ±75%	−0.919***	−1.618**	−0.834***	−0.501	−1.077***	−1.241***	−0.851***
	(0.142)	(0.544)	(0.148)	(0.347)	(0.170)	(0.303)	(0.177)
Uncertainty: ±100%	−1.286***	−1.839***	−1.213***	−1.169**	−1.399***	−1.673***	−1.247***
	(0.139)	(0.496)	(0.146)	(0.383)	(0.163)	(0.311)	(0.171)
Constant	0.195	−0.722	0.229	0.631	0.052	0.036	0.425*
	(0.152)	(0.538)	(0.159)	(0.411)	(0.177)	(0.324)	(0.191)
Outcome mean	0.374	0.687	0.355	1.441	0.089	−0.263	0.712
Adj. R^2	0.048	0.122	0.041	0.063	0.047	0.041	0.055

Notes: Categorical counterpart to Table 2. Dependent variable: Investment response (scale −5 to +5). Each column is a single pooled OLS regression of the investment response on indicator variables for the price and uncertainty levels; firm fixed effects are not included. Robust standard errors in parentheses. Reference categories: €50 (price) and ±0% (uncertainty). "High cred." = high policy credibility; "Low cred." = low credibility; "High rev." = high perceived policy reversal risk; "Low rev." = low reversal risk. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.
Source: Authors' calculations from ifo Business Survey conjoint experiment (February 2026).

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