



# ASSESSING THE ECONOMIC IMPACTS OF ENVIRONMENTAL POLICIES

Evidence from a Decade of OECD Research

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## Motivation

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- The introduction of **environmental policies** raises concerns about their costs and their impact on firms' **“competitiveness”**
  - Particularly if environmental policy stringency differs across countries
  - Especially in pollution-intensive sectors
- This requires a better understanding of
  - The (relative) stringency of environmental policies
  - The economic and environmental costs and benefits of these policies



# New OECD Book: The Economic Impacts of Environmental Policies

The book addresses key questions:

1. What are the **economic costs** (employment, competitiveness, productivity, trade, investment) of environmental policies?
2. Are environmental policies **effective at reducing emissions?**





# OECD WORK ON ENVIRONMENTAL POLICIES & ECONOMIC OUTCOMES



# The OECD Environmental Policy Stringency Indicator

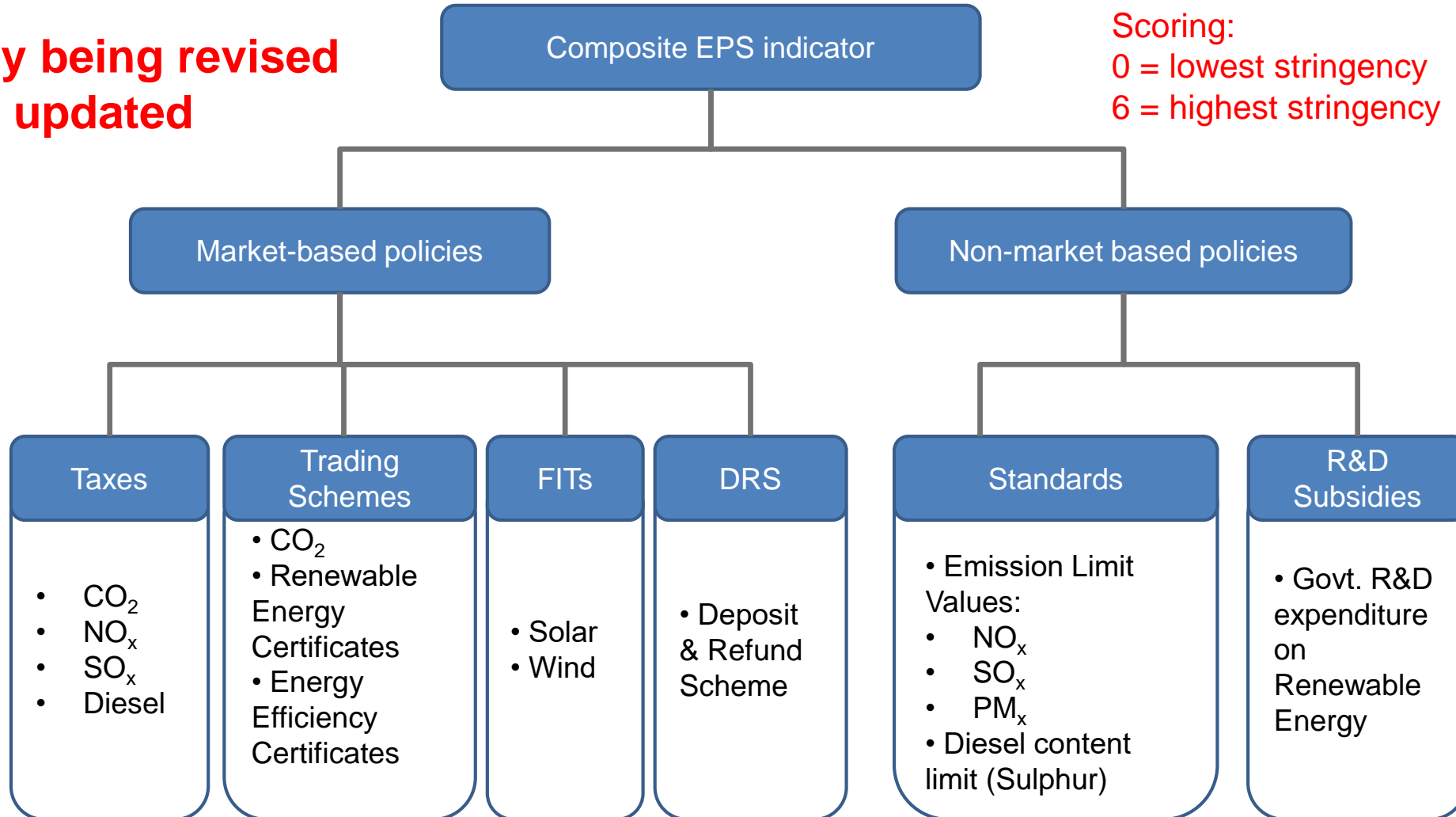
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- OECD developed an indicator of **Environmental Policy Stringency** (EPS)
  - Covering 27 OECD countries and BRIICS for 1990-2015
    - Currently being updated until 2020;
  - Focusing on climate/energy/air pollution
- We used the EPS and energy prices to assess the impact of environmental policies on
  - Multiple measures of **economic performance**: productivity, trade, investment, FDI, employment
  - **Environmental performance** (energy consumption, CO<sub>2</sub> emissions)



# Measuring the stringency of environmental policies – a proxy

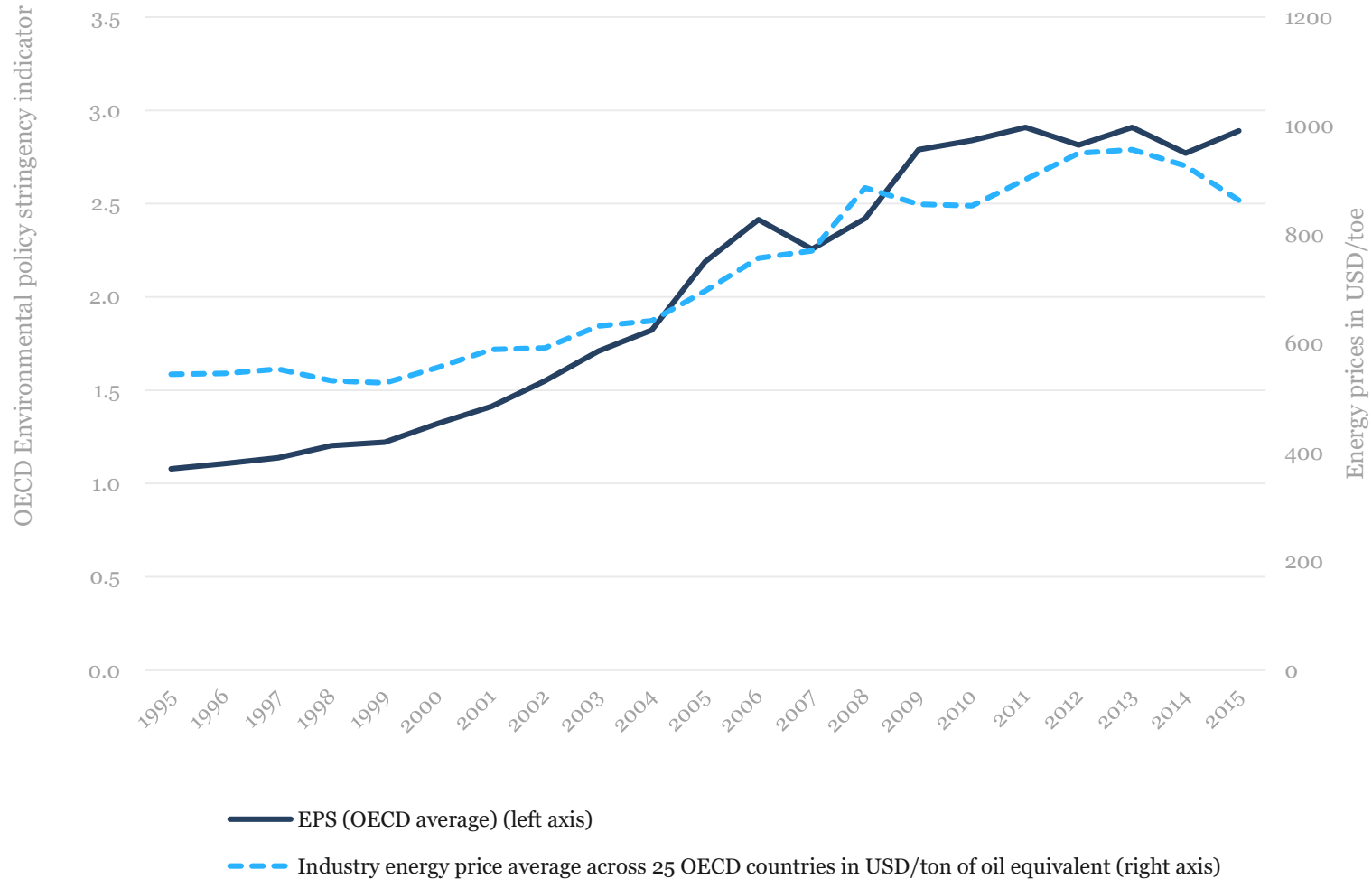
**Currently being revised  
& updated**



Enrico Botta & Tomasz Koźluk, 2014. "Measuring Environmental Policy Stringency in OECD Countries: A Composite Index Approach," OECD Economics Department Working Papers 1177, OECD Publishing.



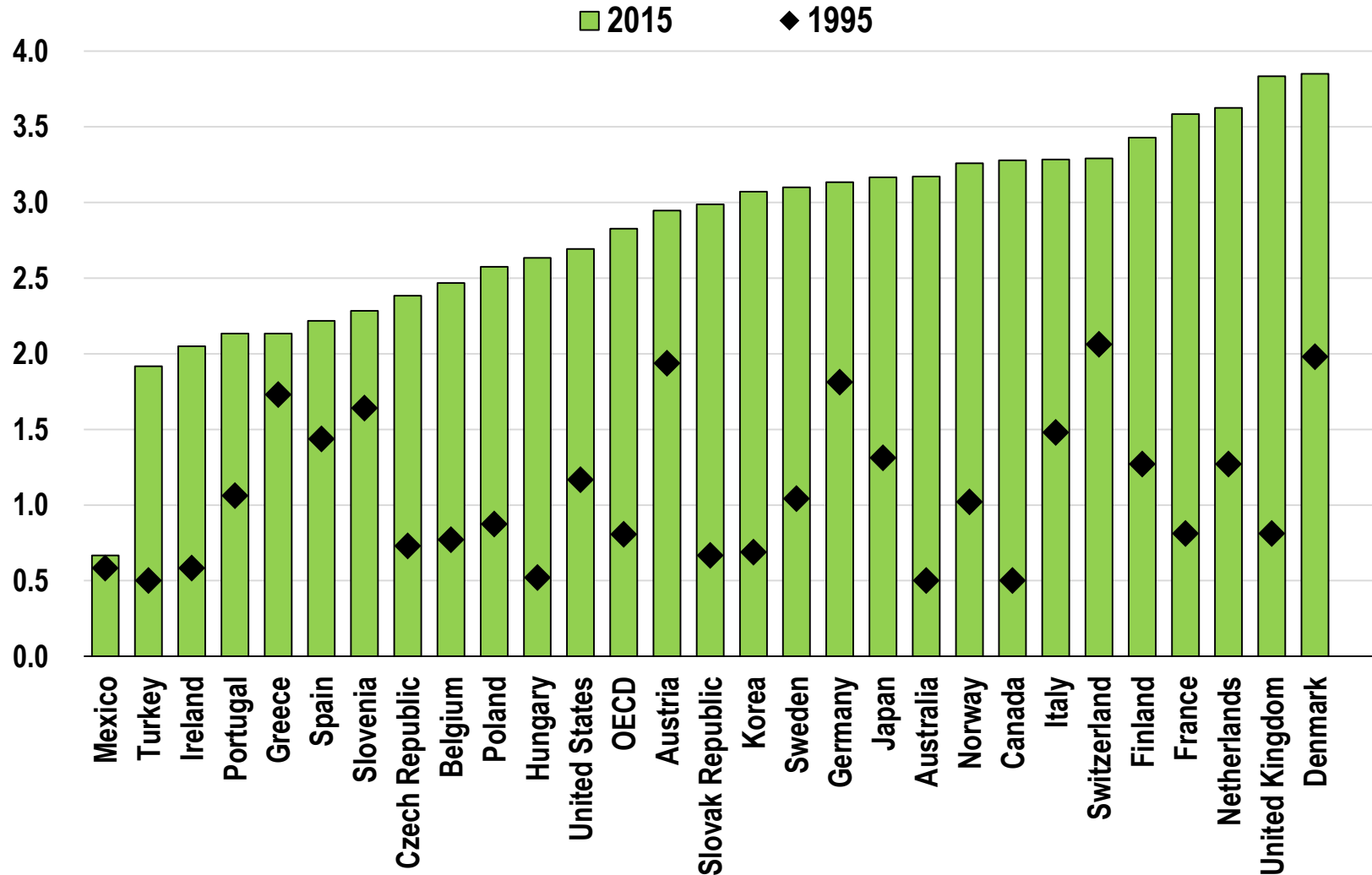
# Past changes in environmental policy stringency have been significant



Note: The OECD EPS average is an unweighted average across 28 OECD countries for which data are available. The industry energy price data are taken from Sato et al. (2019[5]). The values are computed from their VEPL\_MER variable (Variable weights Energy Price Level at Market Exchange Rate). It is based on a weighted average of fuel consumption by fuel mix. The graph is based on their industry-level prices which covers 12 industrial sectors across 25 OECD countries. Source: OECD (2021); Sato et al. (2019).



# Increased ambition on average, but diverging across countries



- **Divergence in policy stringency** often raises concerns about impacts on firms' competitiveness and jobs
- **The OECD's Environmental Policy Stringency (EPS) Index** allows cross-country comparison of policy stringency



# THE ECONOMIC IMPACTS OF ENVIRONMENTAL POLICIES – EVIDENCE FROM OECD ANALYSIS



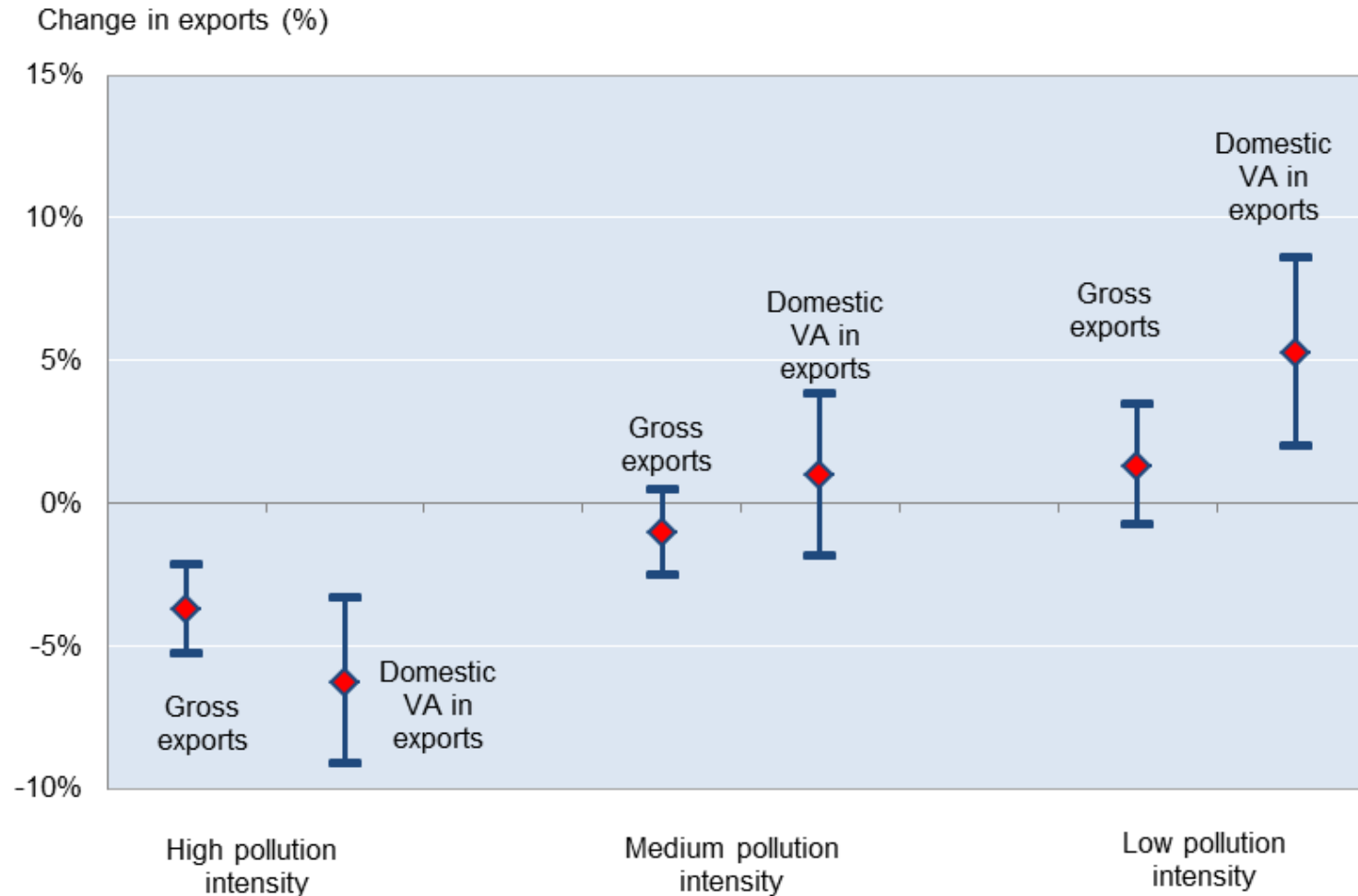
# 1. Impacts of environmental policies on economic outcomes: Empirical evidence

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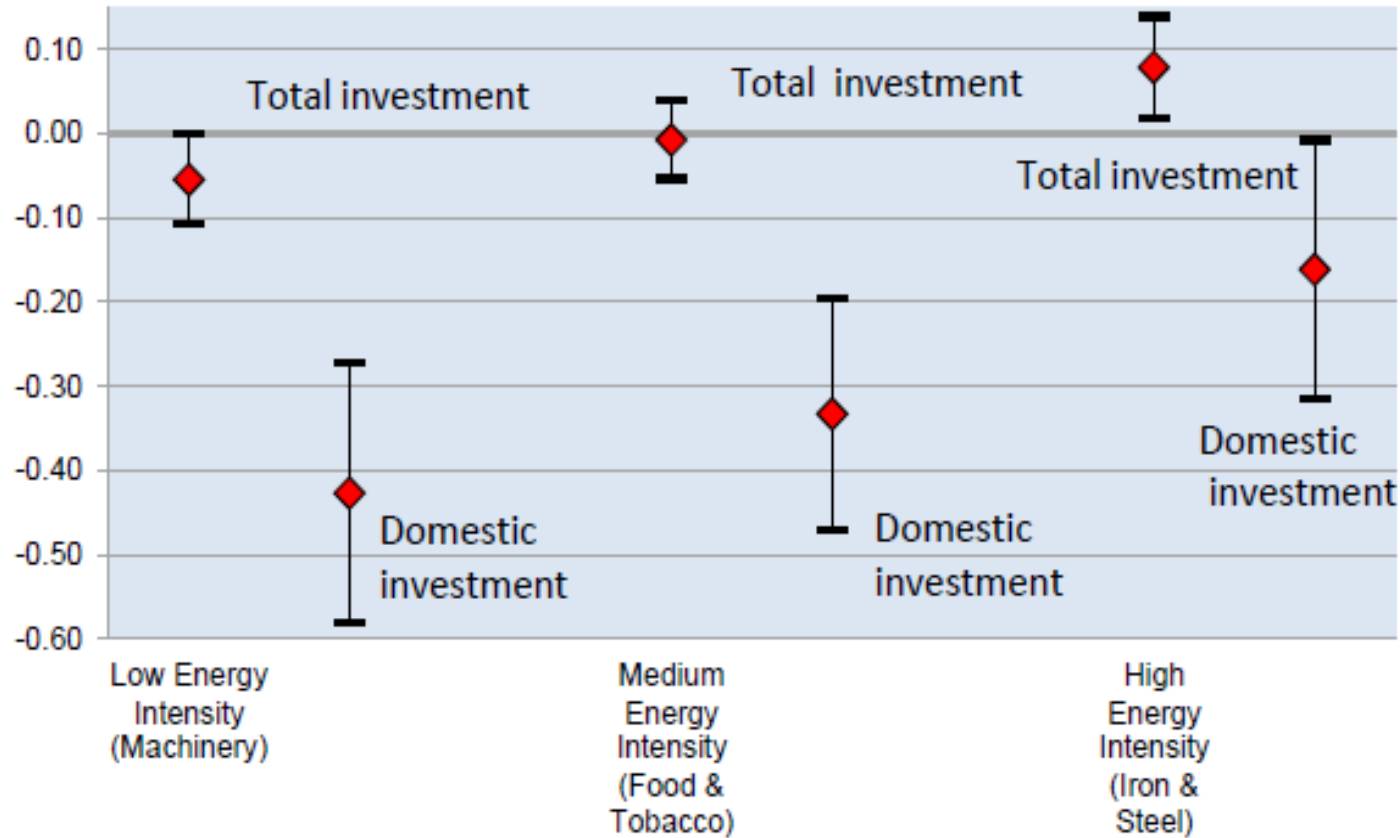
# Environmental policy decreases exports in high pollution sectors, increases exports in low pollution sectors



- A **large increase** in the difference of environmental policy stringency between two countries, has a **relatively small effect on the overall trade performance**.
- With more stringent environmental policies in the exporting country, exports of high-pollution sectors decline, whereas exports of lower-pollution sectors increase.



# Increases in energy prices barely affect total investment but decrease domestic investment



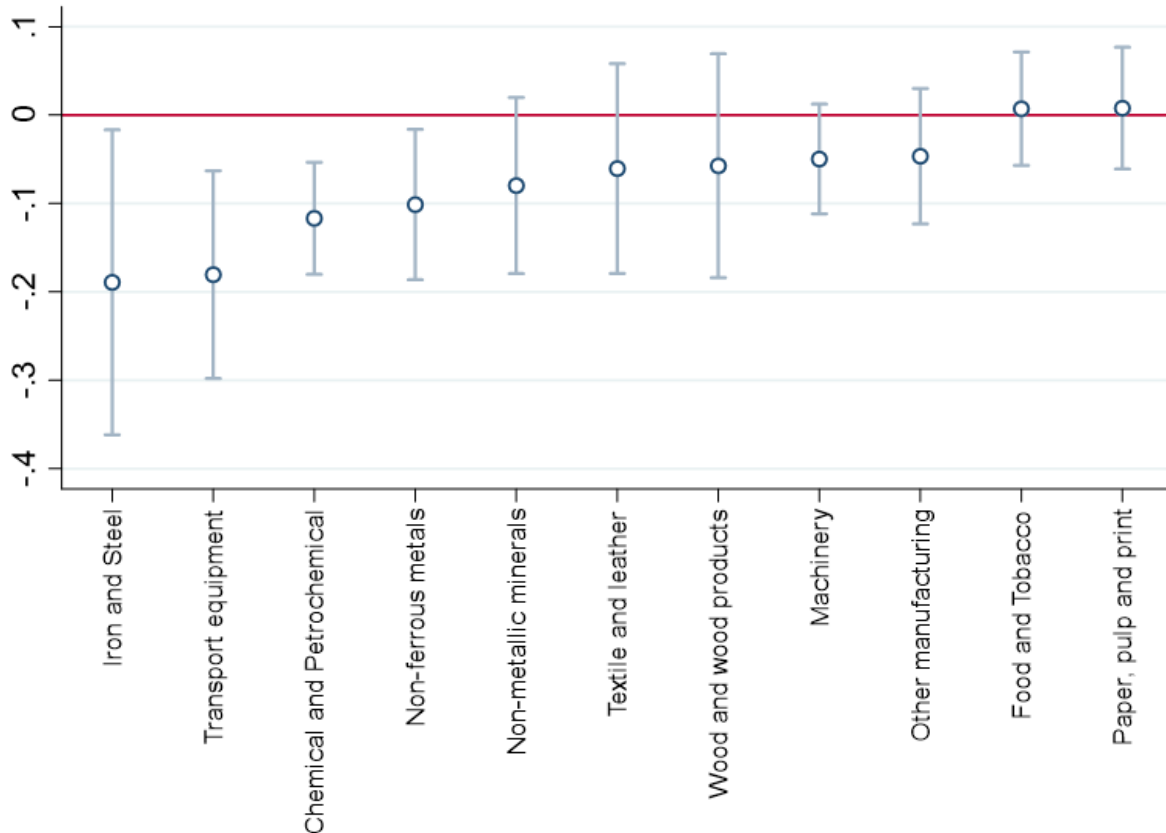
- Energy prices barely affect **total investment**.
- For **domestic investment**, a **large relative increase** in **energy prices** (from the median to the 75<sup>th</sup> percentile of the price distribution), reduces the domestic investment by less than 0.5 ppt for the most affected sectors - **a relatively small effect**.



# But impacts are heterogeneous across firms and industries

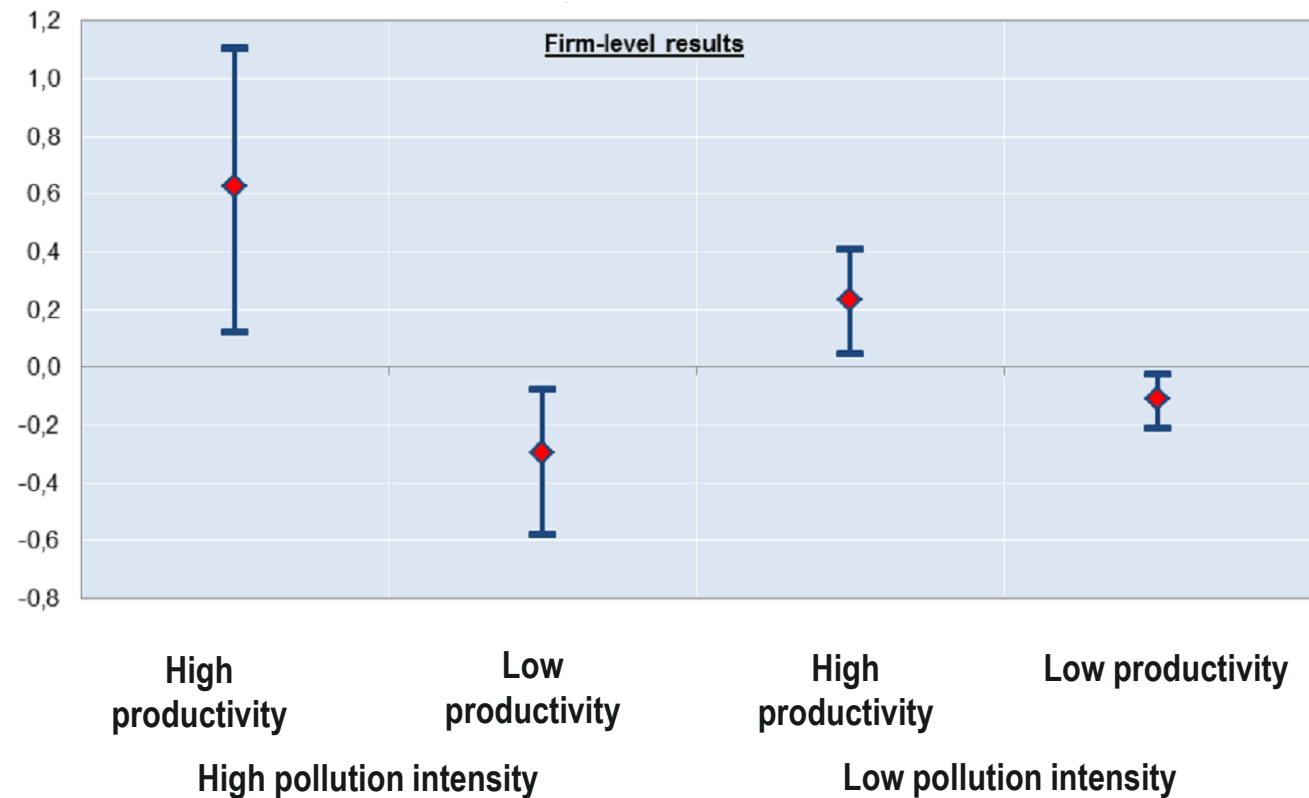
## Employment

Short-term employment effect of a 10% increase in energy prices across sectors, elasticity



## Productivity

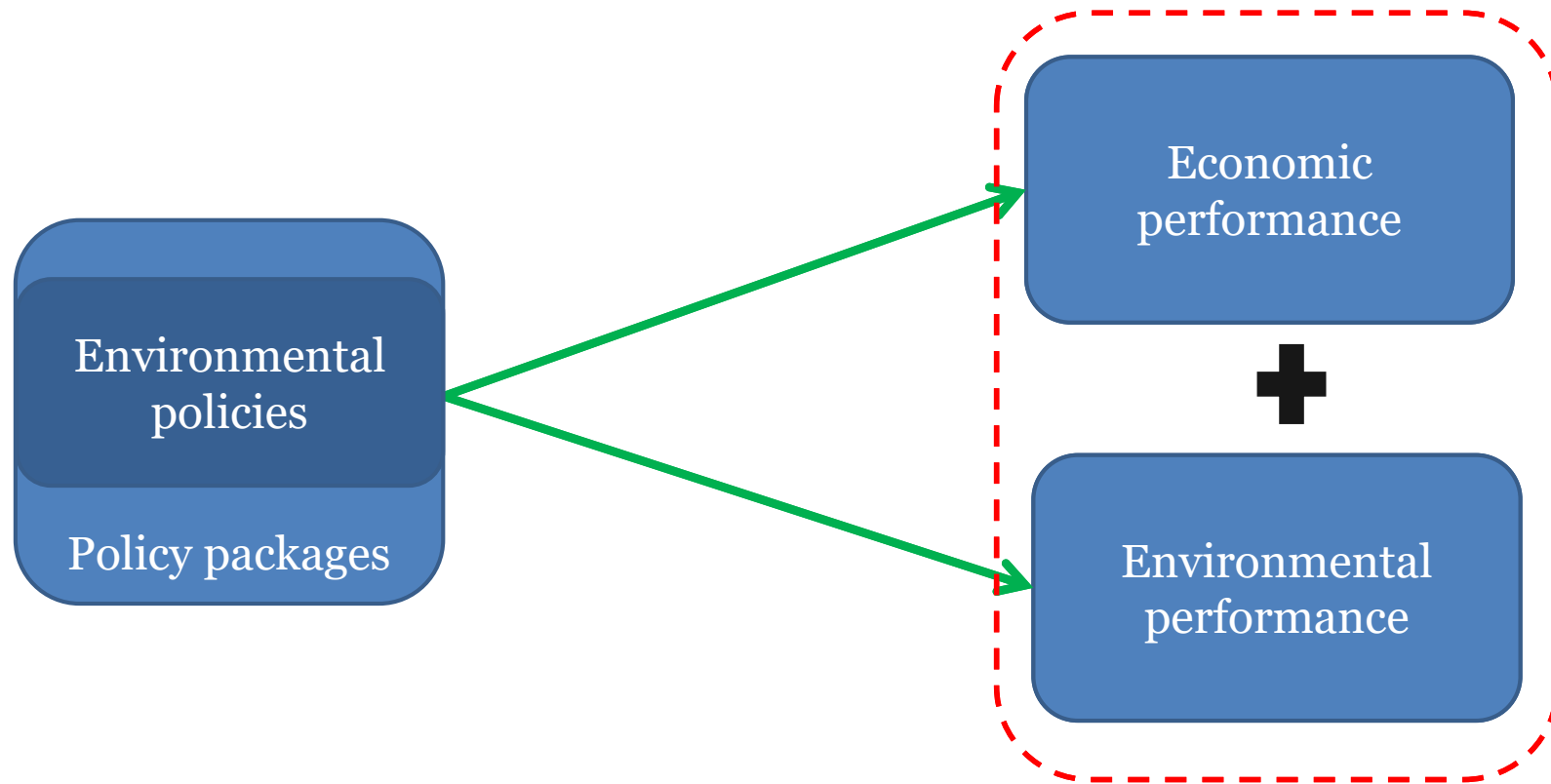
Change in productivity growth, firm-level results, % points



ARE THE ECONOMIC EFFECTS  
SMALL ONLY BECAUSE THE  
EFFECTS ON ENVIRONMENTAL  
OUTCOMES ARE SMALL?



## 2. The *joint* impact of environmental policies on environmental and economic outcomes





## Analysing joint impacts using micro data

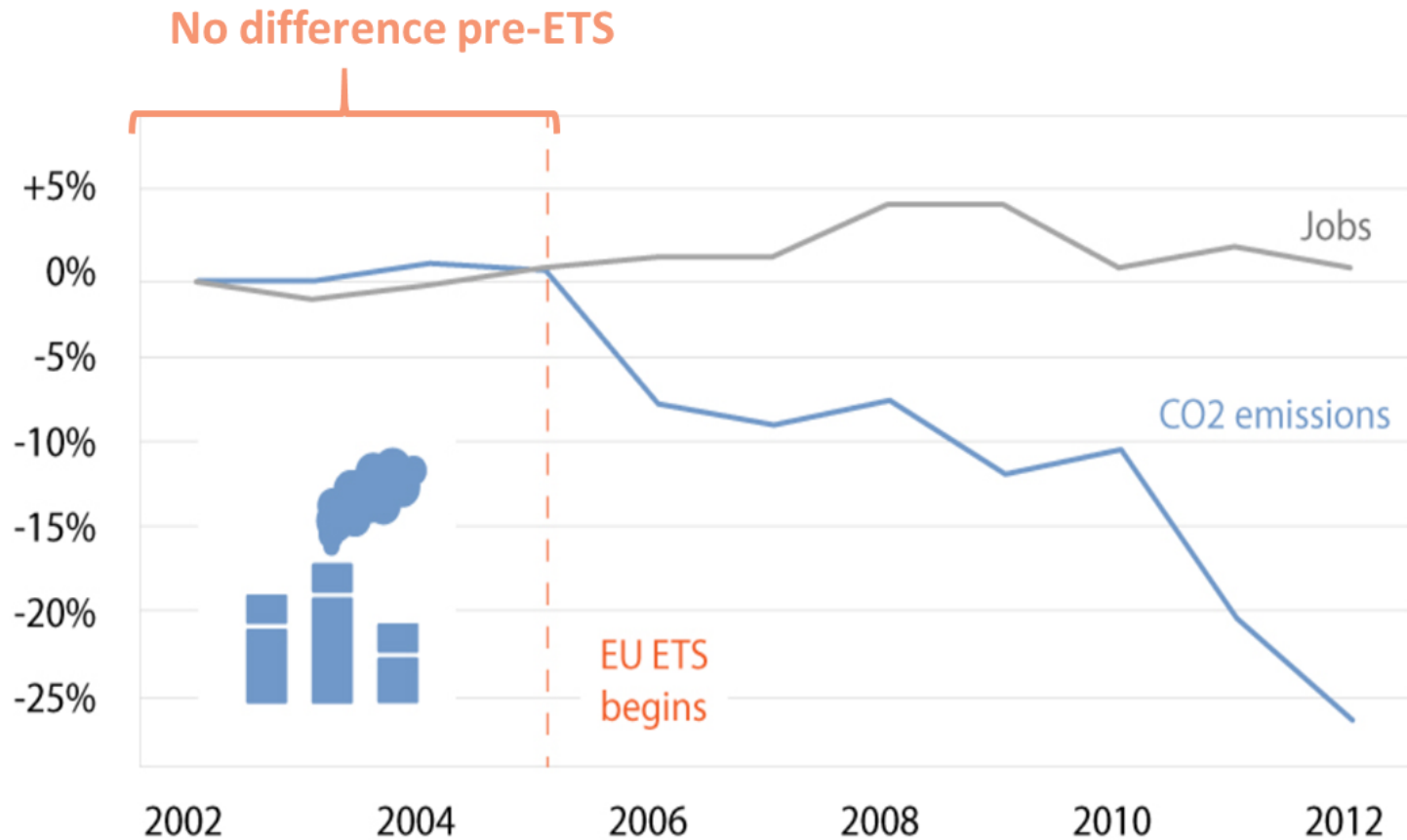
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- Challenges for the analysis of joint impacts:
  - Data for emissions and energy consumption are typically only available from confidential micro data sources (government).
- The book contains three empirical case studies to assess joint effects, covering:
  - EU Emissions Trading Scheme (EU ETS)
  - French carbon tax
  - Indonesian energy price reform





# The EU Emissions Trading Scheme (EU ETS) reduced emissions, not employment



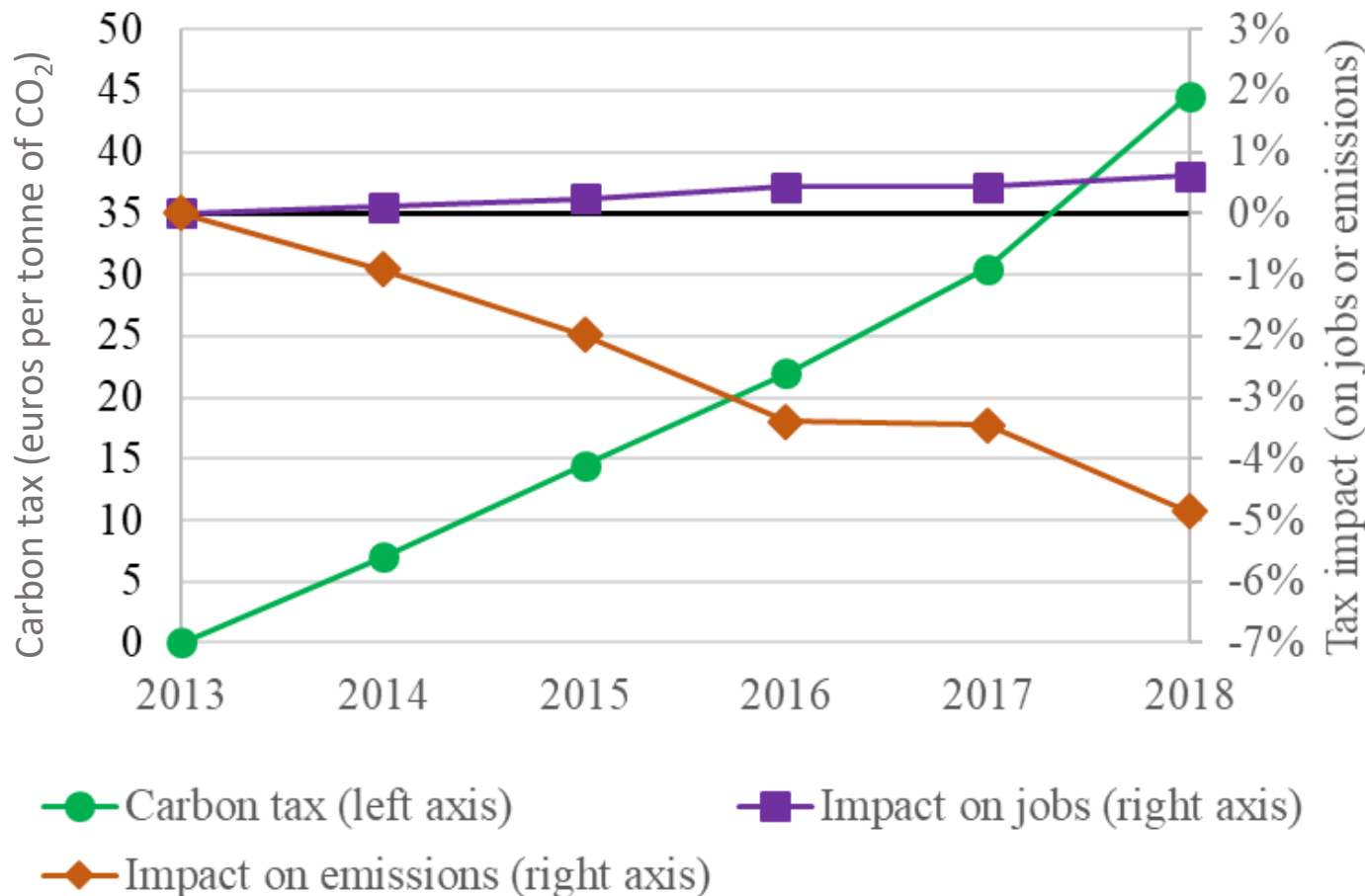
- The EU ETS **reduced emissions on average by 10%** between 2005 and 2012
- The EU ETS has had **no significant effect on jobs and profits** of regulated firms

*Note:* The figure shows the causal year-specific impact of participation in the EU ETS on CO<sub>2</sub> emissions of regulated plants and number of employees of their mother companies by year. Over the period 2005-12, the average treatment effect is +2% for employment (not statistically significant) and -10% for CO<sub>2</sub> emissions.

Source: Dechezleprêtre, A., D. Nachtigall and F. Venmans (2018), "The joint impact of the European Union emissions trading system on carbon emissions and economic performance", OECD Economics Department Working Papers, No. 1515, OECD Publishing, Paris, <https://dx.doi.org/10.1787/4819b016-en>.



# The French carbon tax reduced emissions, not employment



- The **French carbon tax reduced emissions by up to 5%** between 2013 and 2018, while having no negative impact on aggregate jobs.
- On average, across (OECD & non-OECD) studies, a **10% increase in energy prices** (e.g. through a carbon tax) **reduces carbon emissions by 5-10%**.

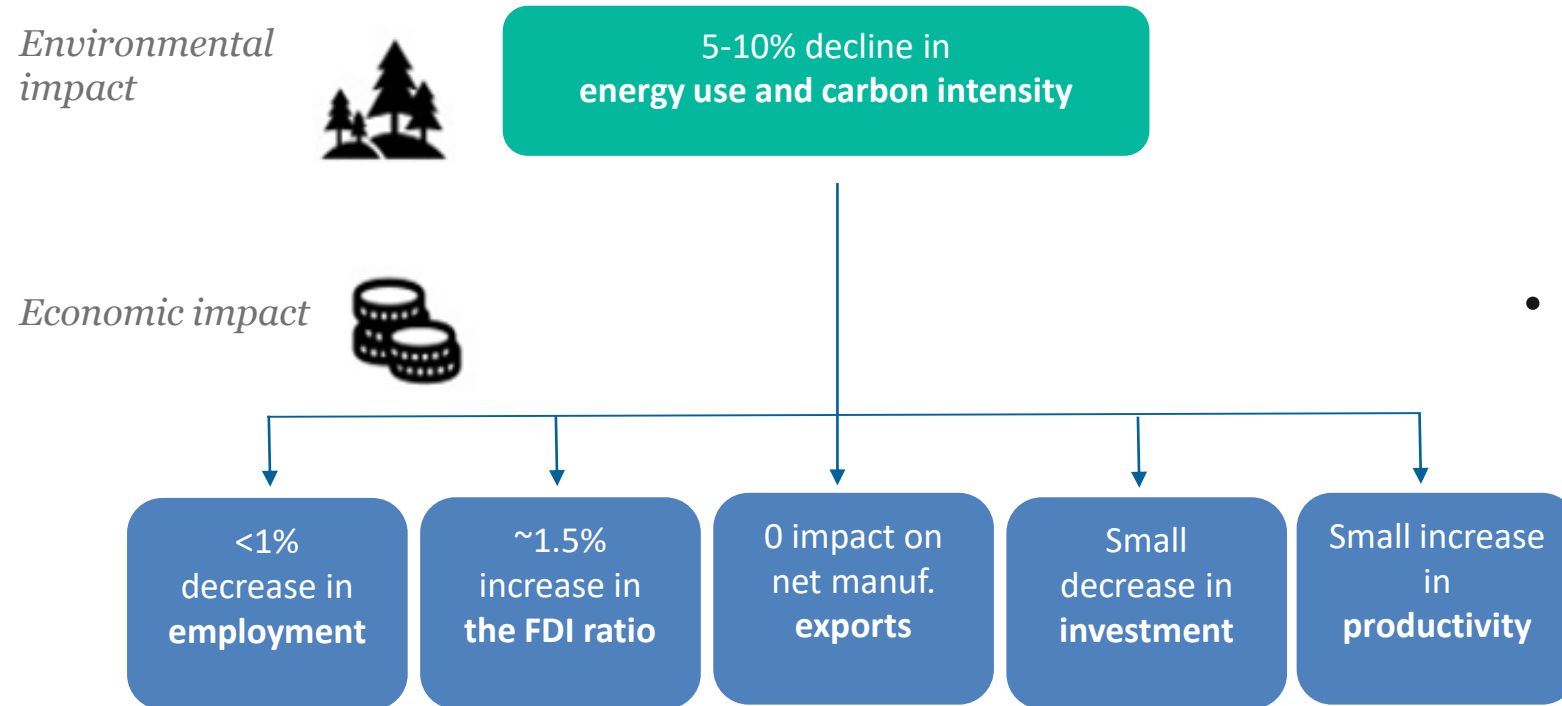
*Note:* The figure shows the impact of the carbon tax on the number of jobs and CO<sub>2</sub> emissions of the French manufacturing sector.

Source: Dussaux (2020), "The joint effects of energy prices and carbon taxes on environmental and economic performance: Evidence from the French manufacturing sector", OECD Environment Working Papers, No. 154, OECD Publishing, Paris, <https://dx.doi.org/10.1787/b84b1b7d-en>.



# Summing-up

## Expected effects from a 10% increase in energy prices on manufacturing sectors



- Overall, **environmental policies had:**
  - significant environmental benefits
  - no large negative economic impacts
  - heterogeneous effects on firms; some firms and industries gain, others lose
- Potential **Caveats:**
  - future challenges may require more radical changes
  - past policies often had elements to reduce negative effects built in

Note: This figure illustrates average expected effects from a 10% increase in industry energy prices on environmental and economic outcomes in manufacturing sectors. It shows effects from across several OECD studies, which cover different samples, time periods and methods. Effects may differ across countries depending on country-specific policy contexts, macro-economic effects and the time horizon.



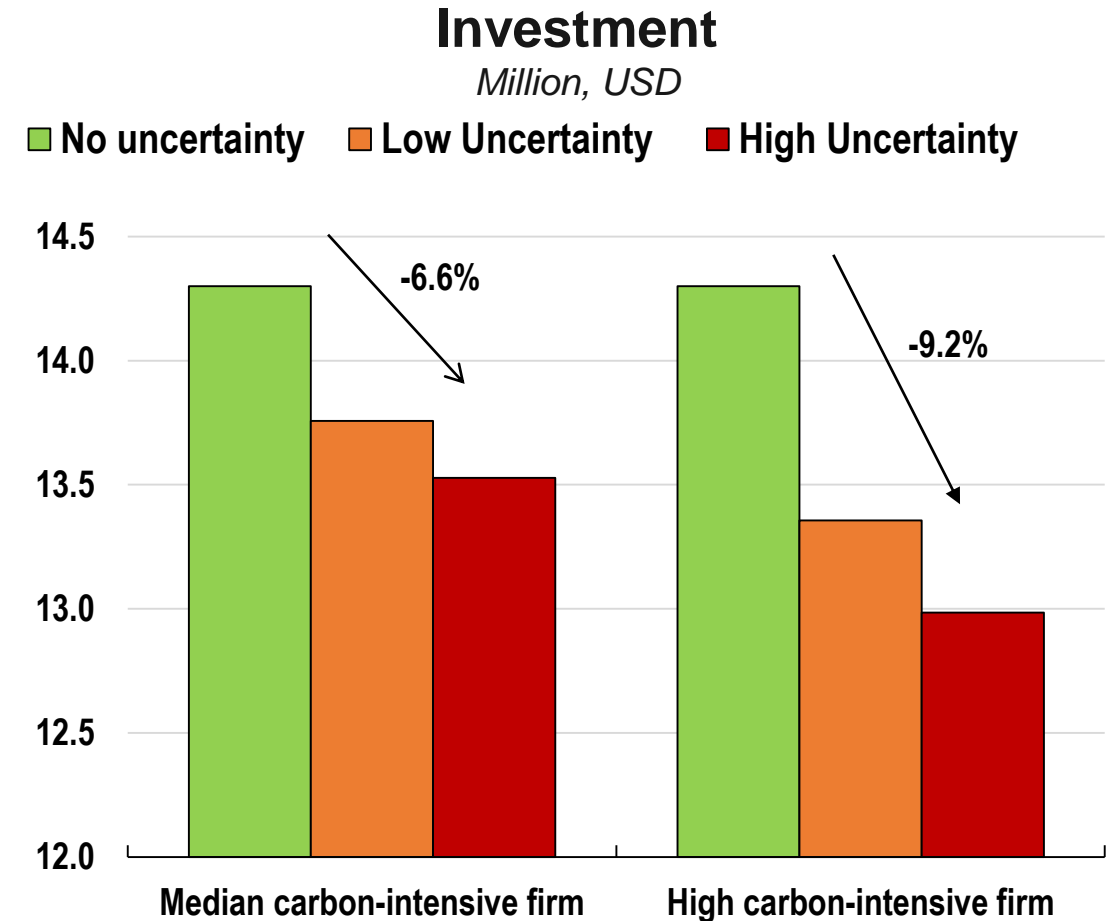
WHAT'S NEXT?

POLICY UNCERTAINTY AND POLITICAL  
ECONOMY CONSIDERATIONS



# Climate policy uncertainty can jeopardise the transition

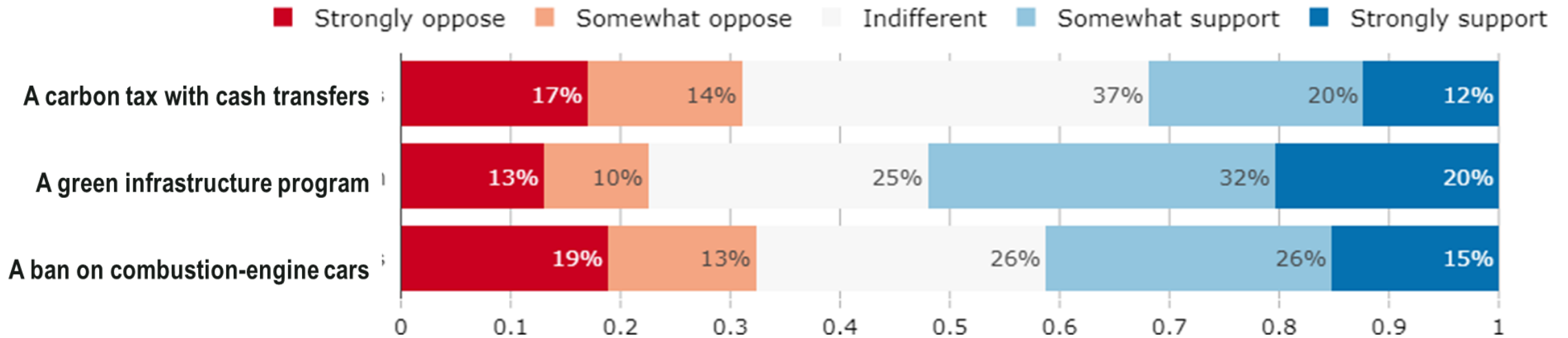
- The OECD has constructed a novel **cross-country indicator of Climate Policy Uncertainty (CPU)** based on newspaper article counts, covering 12 countries between 1990-2018.
- **CPU significantly reduces firm-level investments.** Particularly, in large and carbon-intensive firms
- **Governments should avoid policy reversals,** and implement longer-term trajectories





# Public acceptability needs to play an important role in policy design

## Do you support or oppose the following policies?



- The OECD is conducting large-scale nationally representative surveys to understand public support for specific climate change policies across several OECD and non-OECD countries.

Note: OECD forthcoming work on the public acceptability of climate change mitigation policies, a cross-country comparison. The preliminary results are from a representative sample of the US population. The above graph is generated based on a sub-sample, which corresponds to respondents in the control group  
Source: OECD (forthcoming)



*Thank you*

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