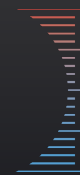




Environmental Policy and Directed Technological Change: Evidence from the European carbon market

Raphael Calel & Antoine Dechezleprêtre

Grantham Research Institute, London School of Economics

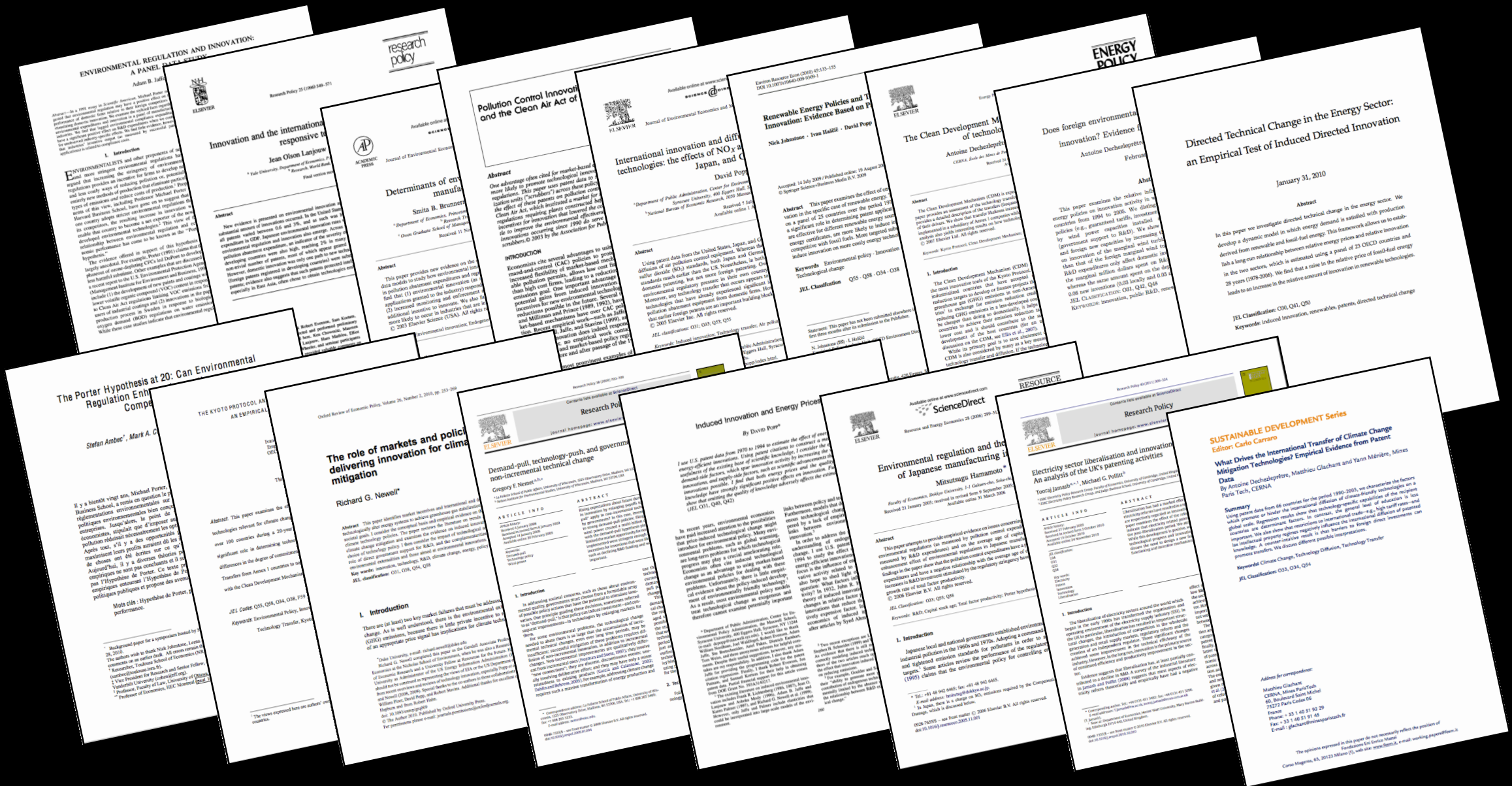


“The ETS remains the engine to drive low-carbon growth in Europe.”

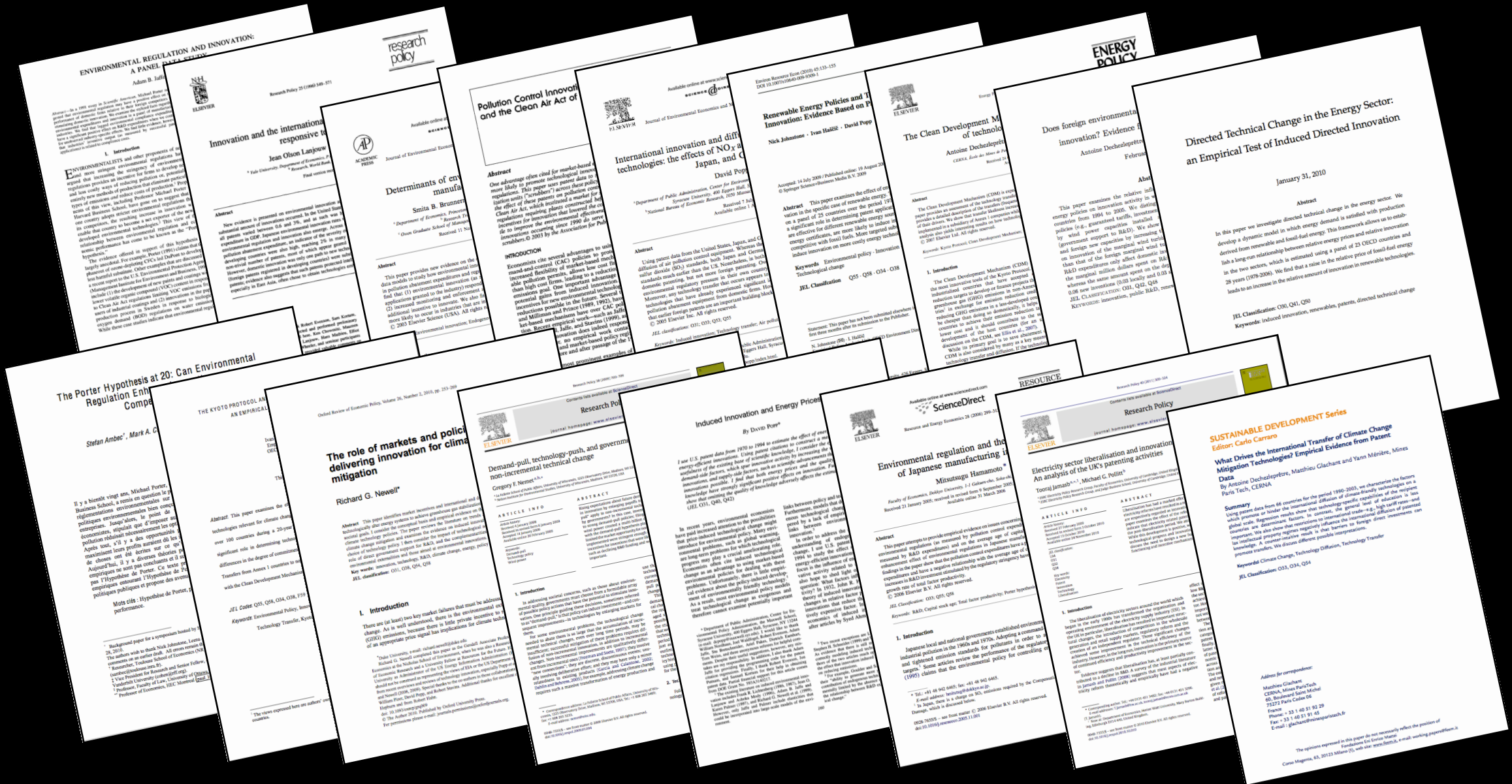
***– Connie Hedegaard (May 2011)
European Commissioner for Climate Action***

Does Environmental Policy Induce 'Green' Innovation?

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Yes... mostly

What about the EU ETS?

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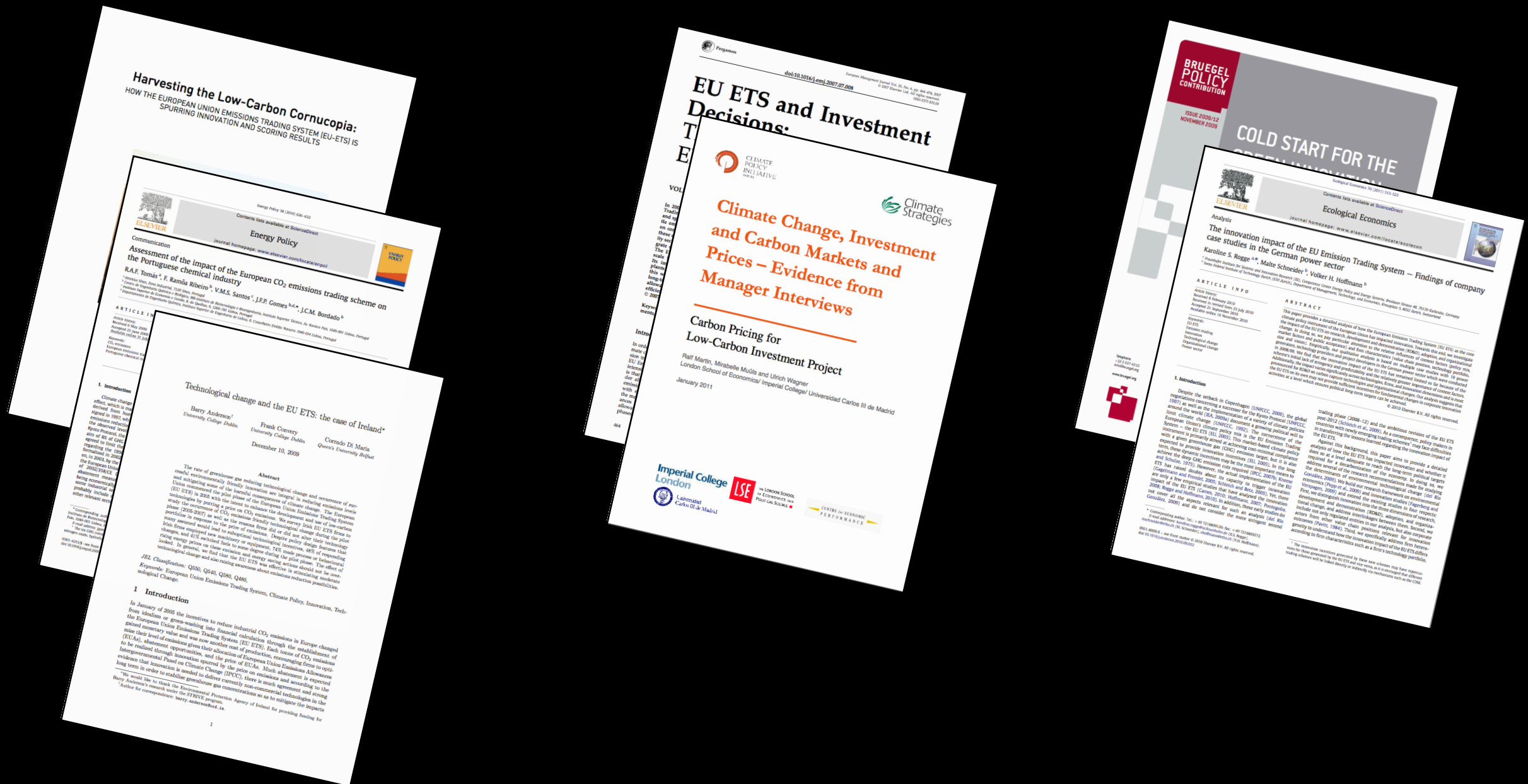


What about the EU ETS?

Strong effect

Weak effect

No effect

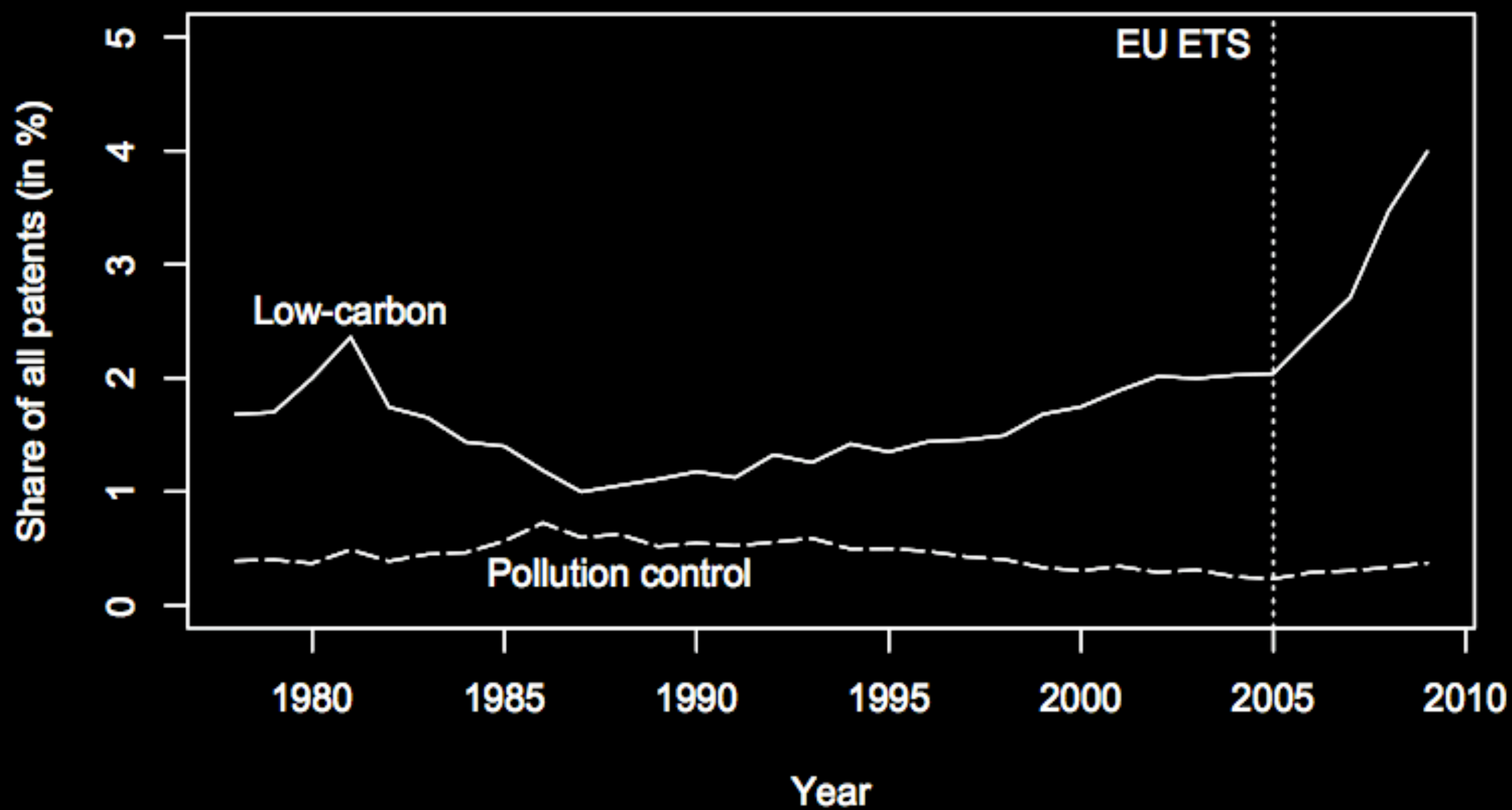


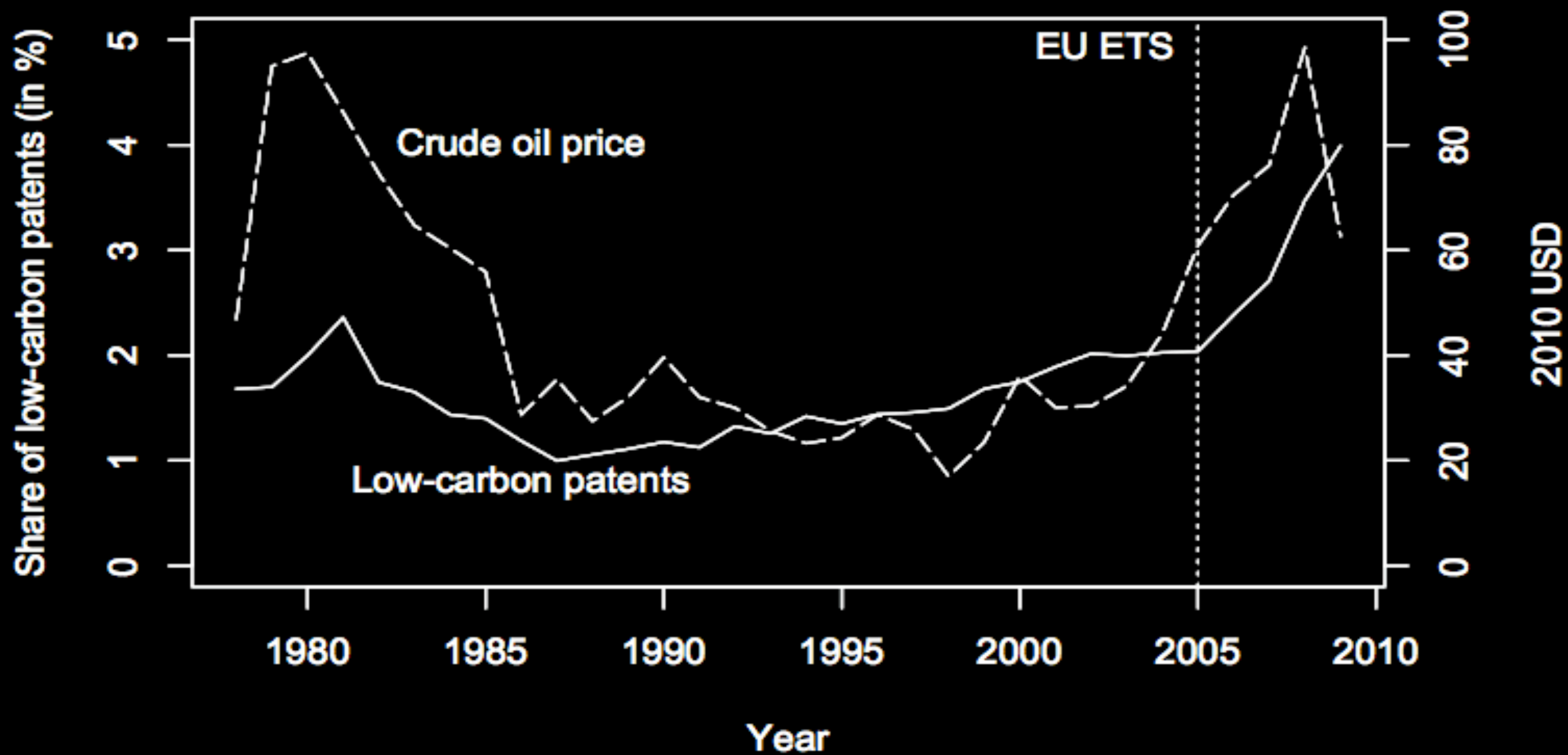


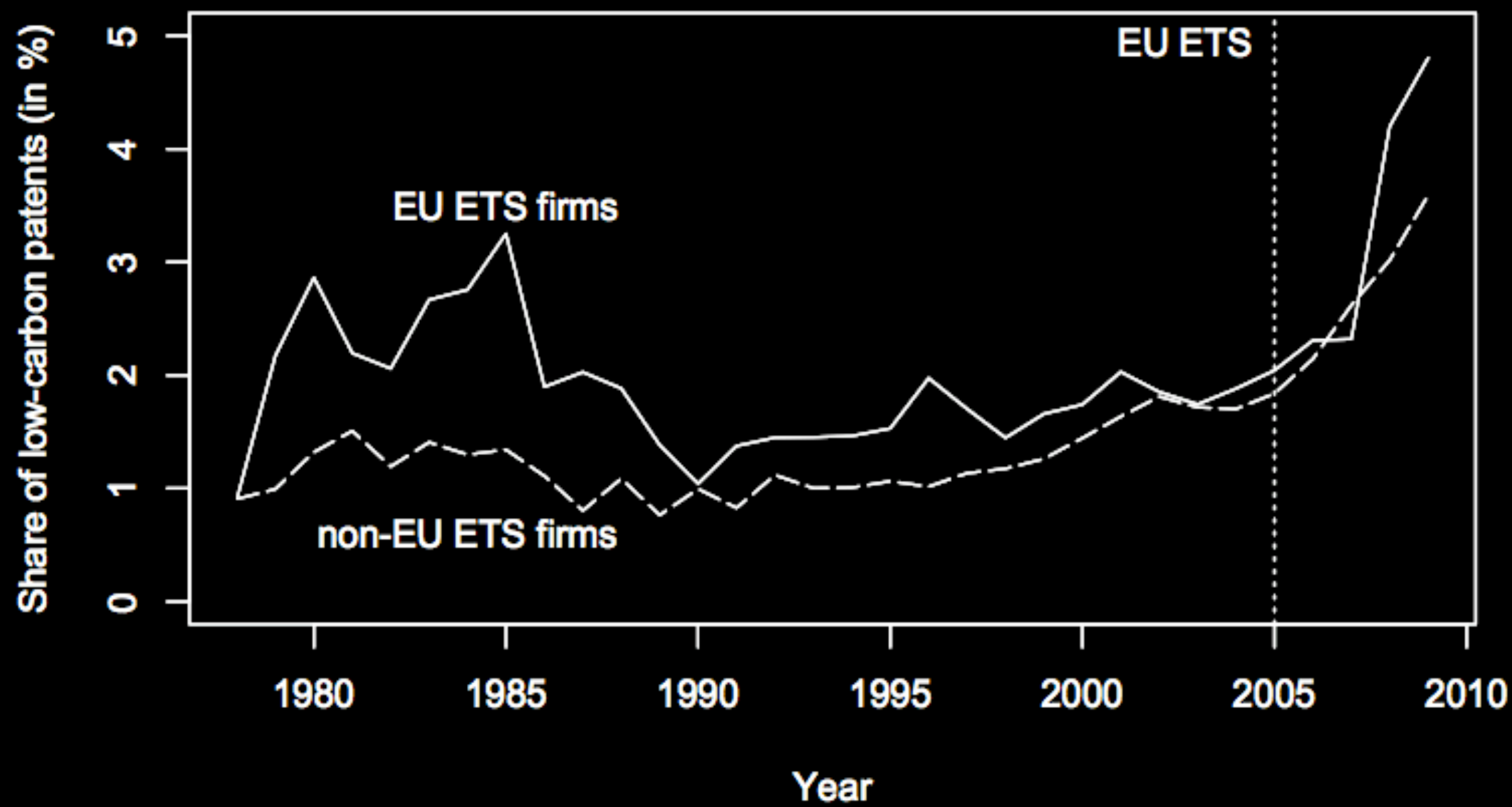
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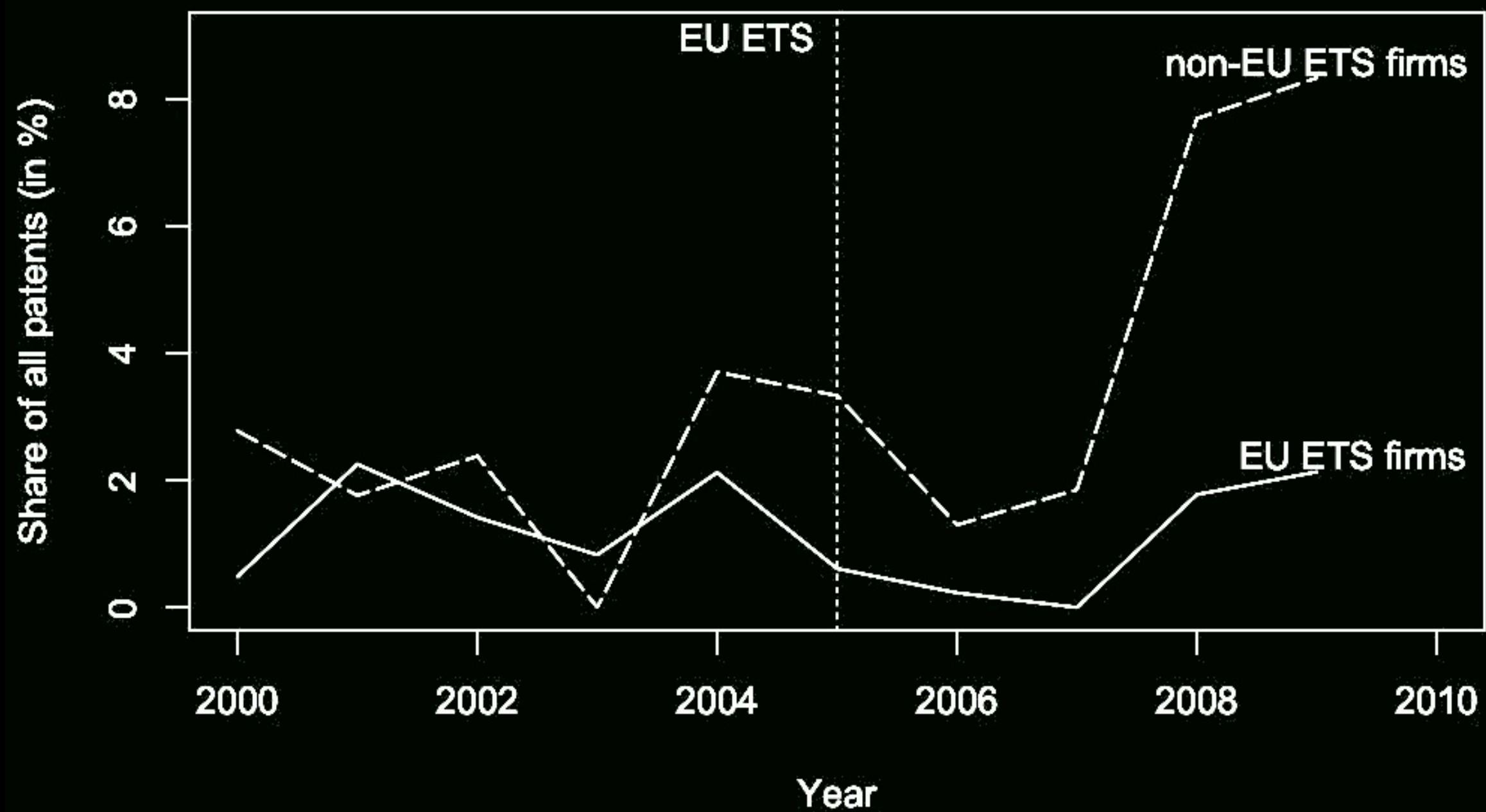
Measuring *patents* by *EU ETS firms*

- Added incentives to innovate
- Firms in sample filed over 25'000 patents (2% protecting low-carbon technologies)









Competing explanation 1:

Artifact of how we measure technological change

Too narrow?

- Extended “low-carbon” definition
- Patents filed with national patent offices

Too coarse?

- Citation-weighted
- Family size-weighted

Competing explanation 2:

Omitted variable bias

Firm-level emissions

Complementary policy

Competing explanation 3:

Non-EU ETS firms responding to EU ETS

Response because of “peer effects” or “market effect”

Re-match with Bulgaria, Norway, Romania, and Switzerland

Competing explanation 4:

Estimate valid for sub-sample, not EU ETS

Use 2005 turnover figures

Over 3'000 matched groups

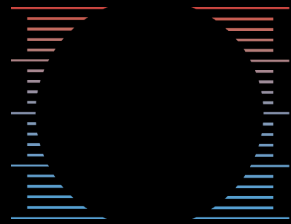
Distribution of firm characteristics much the same



EU ETS appears insufficient

Fix EU ETS?

Technology policies?



Centre for
Climate Change
Economics and Policy



Grantham Research Institute on
Climate Change and
the Environment

Thank you

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Presented at 5th Atlantic Workshop, June 2012

Competing explanation 5:

Hidden bias in study design

Estimating “known effects”:

- Non-greenhouse gas pollution control technologies

“Competing” explanation 6:

Technologies developed further up the technology supply chain

Firms in sample filed over 25'000 patents

2% of patents protecting low-carbon technologies