Making low-carbon technology support smarter

Georg Zachmann

Agenda

Introduction

Key policies to drive innovation in low-carbon technologies

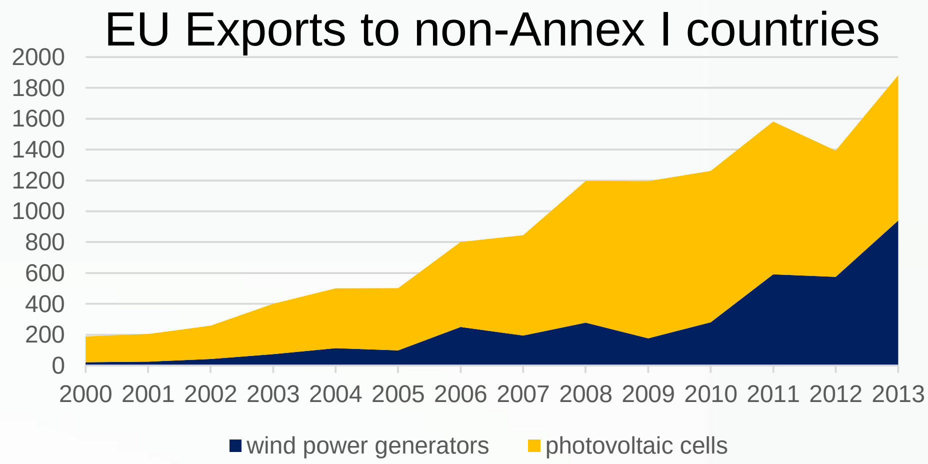
Four approaches for making technology support smarter

Rational for supporting low-carbon innovation

For the Climate

- **2°C -> by 2050 global emissions would have to decline by ~60%**
- **Need technologies that are (almost) competitive with fossil fuels (otherwise incentive by countries to deviate)**
- **Markets underinvest in:**
  - Innovation *per se*
  - Technologies that make domestic decarbonisation cheaper
  - Technologies that make foreign decarbonisation cheaper

For EU Industry



Key policies to drive innovation in low-carbon technologies

Introduction

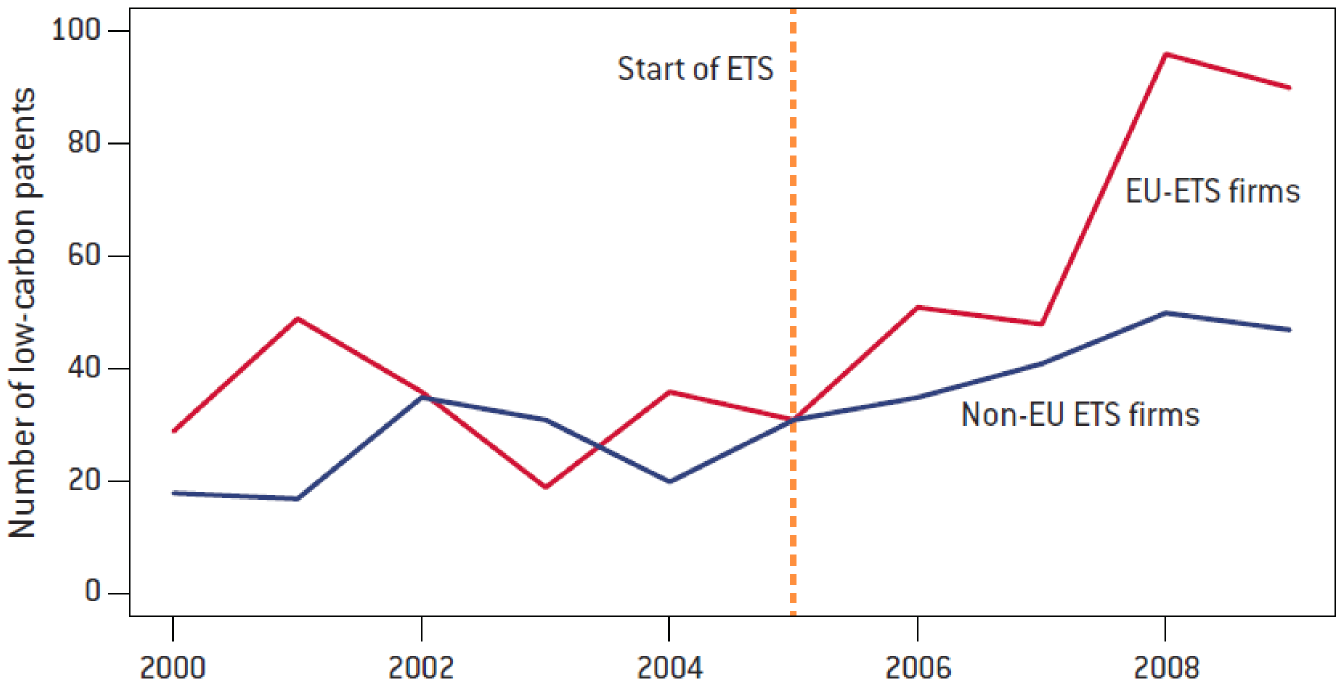
Key policies to drive innovation in low-carbon technologies

Four approaches for making technology support smarter

Pricing Carbon

- **Lift's all low-carbon boats**
- **Price signal should have long-term visibility**

Figure 1: Share of low carbon patents by companies falling under the ETS and companies not falling under the ETS

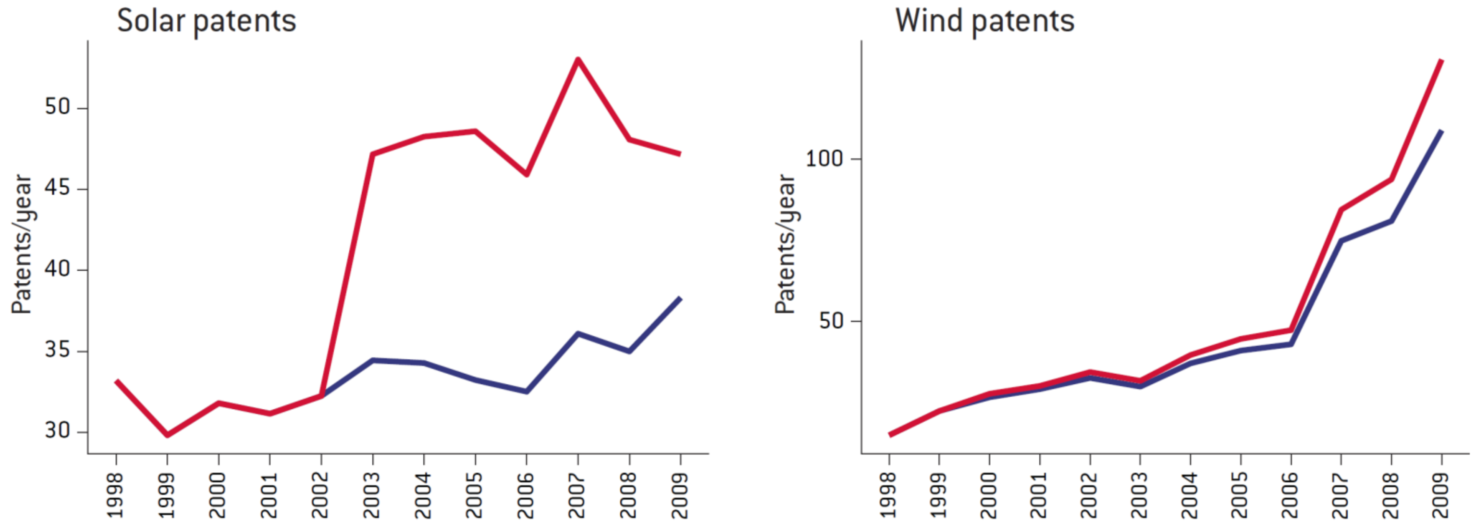


Source: Calel and Dechezleprêtre (2015). Note: start of the ETS: 2005.

Supporting deployment

- **Demand side of innovation**
- **Carrot for industry to innovate all-along the value chain**

Figure 2: Estimated impact on the number of corresponding patents of an increase in deployment of solar panels and wind turbines in Germany

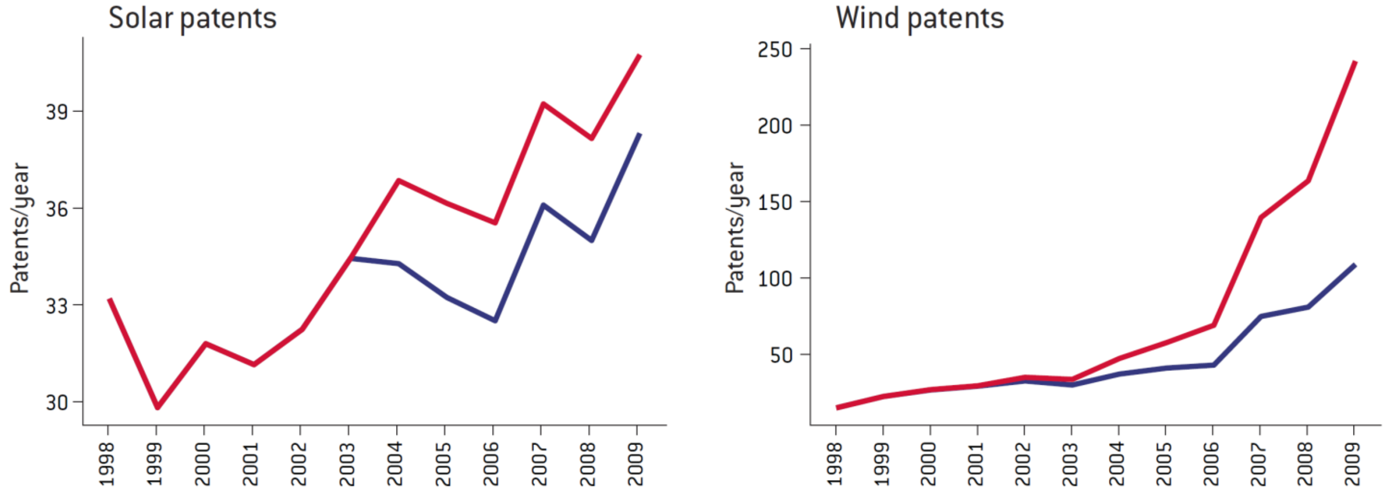


Source: Zachmann *et al* (2014). Note: in both panels, blue line: number of patents estimated with no policy change; red line: number of patents estimated with one standard deviation higher deployment after 2002.

Public RD&D spending, and support to private RD&D

- **R&D funding targeted on supply side of innovation**

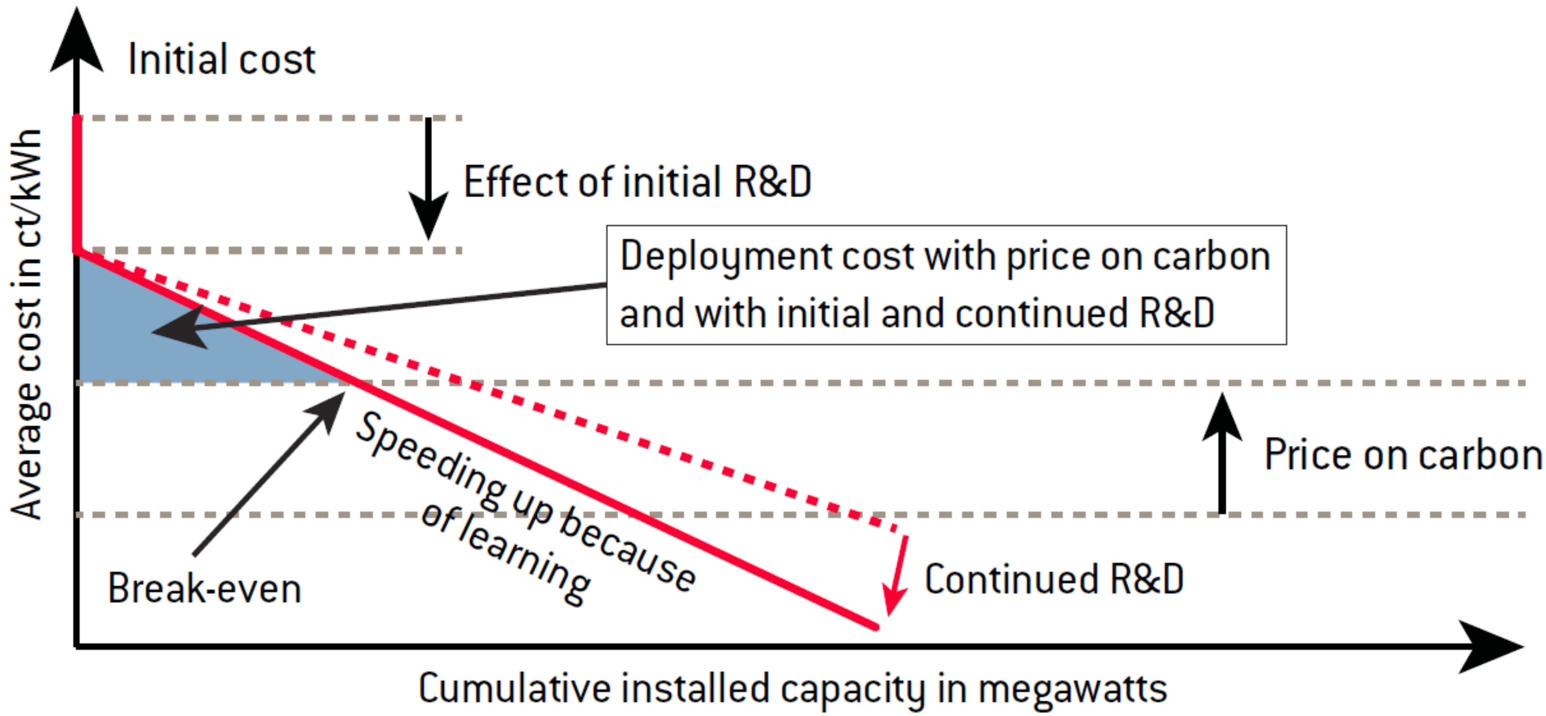
Figure 3: Estimated impact on the number of corresponding patents of an increase in German public RD&D for solar panels and wind turbines



Source: Zachmann *et al* (2014). Note: in both panels, black line: number of patents expected with no policy change; red line: number of patents expected with one standard-deviation higher RD&D spending after 2002.

Policies working together

Figure 5: Cost reduction for renewable energy technologies

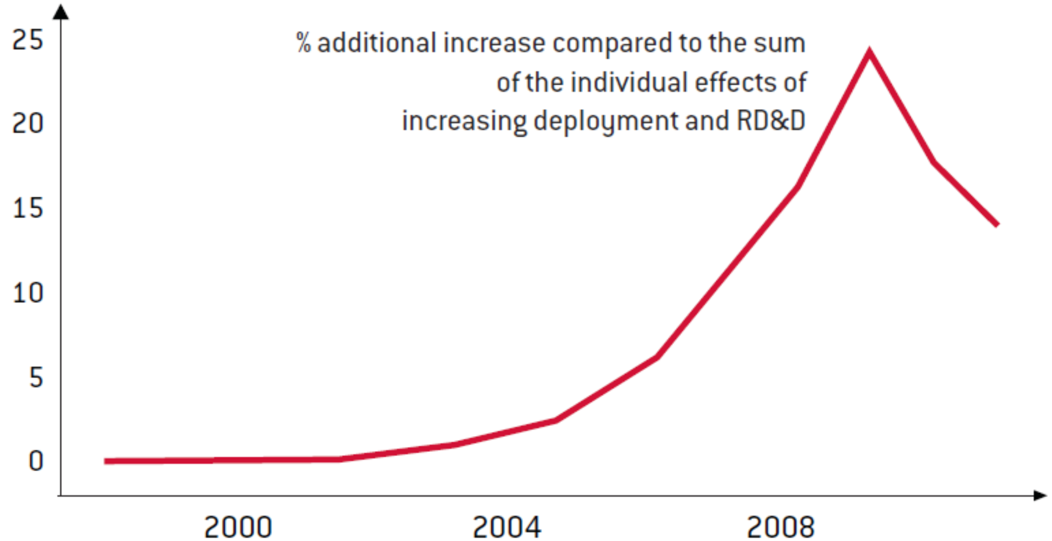


Source: Bruegel.

Timing and mix matter

- **There is a benefit in combining deployment & RD&D**
- **The benefit increases if deployment follows RD&D**

Figure 6: Wind turbines in Germany: estimated additional increase in patents from combining deployment and RD&D



Source: Zachmann *et al* (2014).

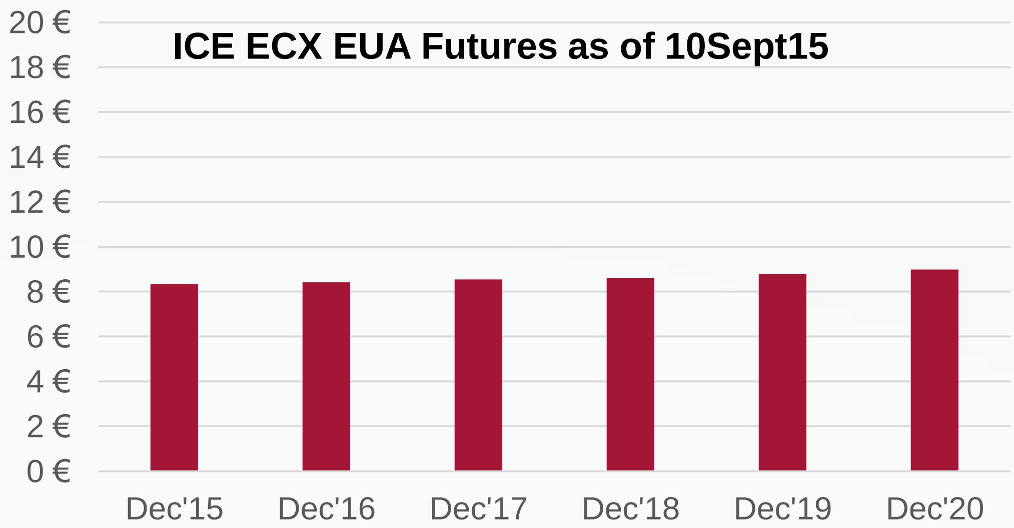
Four approaches for making technology support smarter

Introduction

Key policies to drive innovation in low-carbon technologies

Four approaches for making technology support smarter

1) Better Carbon Pricing



Markets expect no ‚meaningful' (€20⁺) carbon price this decade

- **Problem is not short-term oversupply, but lack of credibility of long-term pattern**
- **Bringing price up by creating short-term scarcity does not create an ‚investible' carbon price signal**

1) Better Carbon Pricing - Our proposal

- **We need long-term carbon price signals**

-> need to bind the hand of current and future; national and EU policy-makers

- **EIB shall sell guarantees on the 2030+ EUA price**
- **Each guarantee guarantees that one EUA can be sold to the EIB at a fixed price (e.g., €40)**

-> More low-carbon investments by hedged investors, today

-> income to the EIB

-> exposure of the EIB increases overall credibility of the EU ETS -> higher carbon prices today -> more low-carbon investments

2) More Europe

- **Cost savings in coordinating deplyoment policies**
  - ressources,
  - averaging,
  - sharing back-up,
  - …
- **Leverage EU size for creating ‚critical mass‘ in terms of public support to more technologies**

3) Both, RD&D and deployment are needed

- **In the past focus on deployment**

(2014: ~30 bn deployment; ~5 bn RD&D[1])

  - No impact on emissions
  - Limited impact on innovation
  - High cost

- **Renewables are crucial to keep 'Chinese coal underground'**

-> strategic innovation policy

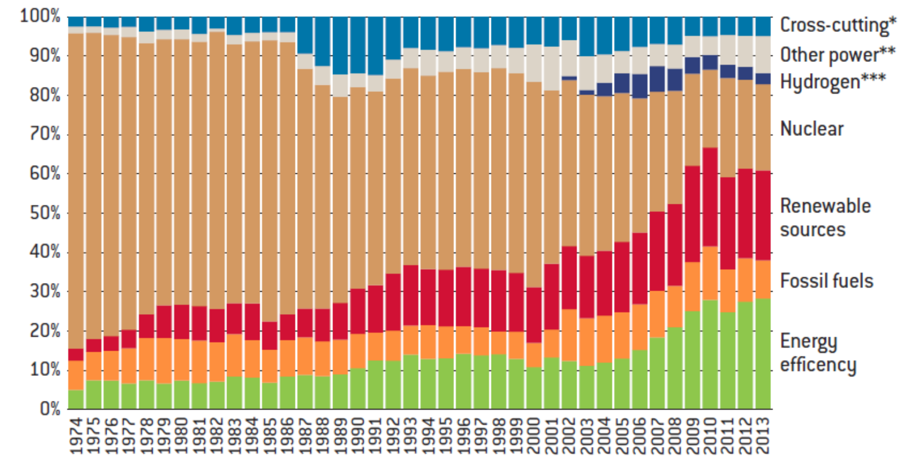
  - Deployment <u>and</u> R&D
  - <u>Technology specific</u>

[1] Wolff and Zachmann (forthcoming)

4) Move away from 'shot in the dark' approach

- Technology choice decisions intransparent
- Focus on individual technologies instead of system/portfolio choices

Figure 4: Share of energy RD&D spending by governments in OECD Europe by technology sector



Source: IEA (2015) *Estimated RD&D budgets by region*. Note: * = Other cross-cutting technologies/research; ** = Other power and storage technologies; *** = Hydrogen and fuel cells. OECD Europe = Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey, United Kingdom.

Proposal:

- Transparent evaluation process of support schemes for individual technologies:
  - Transparent Public Model
  - Stakeholders provide structured information on what their desired support to technology should achieve (peer reviewed)
  - Model to come up with cost-efficient and resilient patterns

-> guideline for policy-makers

Thank You

Technology availibility and decarbonisation cost

[% increase in total discounted mitigation costs (2015–2100) relative to default technology assumptions]			
No CCS	Nuclear phase out	Limited Solar/ Wind	Limited Bioenergy
138 (29–297) [N: 4]	7 (4–18) [N: 8]	6 (2–29) [N: 8]	64 (44–78) [N: 8]

IPCC (2014, WGIII)