Making low-carbon technology support smarter

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Introduction

Key policies to drive innovation in low-carbon technologies

Four approaches for making technology support smarter
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

![EU Exports to non-Annex I countries](chart)
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

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

- Solar patents
- Wind patents

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.
Figure 5: Cost reduction for renewable energy technologies

- **Initial cost**
- **Effect of initial R&D**
- **Deployment cost with price on carbon and with initial and continued R&D**
- **Speeding up because of learning**
- **Continued R&D**
- **Price on carbon**
- **Break-even**

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

% additional increase compared to the sum of the individual effects of increasing deployment and RD&D

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Four approaches for making technology support smarter
1) Better Carbon Pricing

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

Markets expect no ‘meaningful’ (€20+) carbon price this decade
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 deployment 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 and R&D
  - Technology specific

\(^1\) Wolff and Zachmann (forthcoming)
4) Move away from ‘shot in the dark’ approach

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

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 availability and decarbonisation cost

<table>
<thead>
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<th>No CCS</th>
<th>Nuclear phase out</th>
<th>Limited Solar/Wind</th>
<th>Limited Bioenergy</th>
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IPCC (2014, WGIII)