

# Making low-carbon technology support smarter

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# Agenda

## Introduction

**Who does green innovation?**

**Key policies to drive innovation in low-carbon technologies**

**Four approaches for making technology support smarter**

# Rational for supporting low-carbon innovation

- **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

# Who does green innovation?

## Introduction

### Who does green innovation?

Key policies to drive innovation in low-carbon technologies

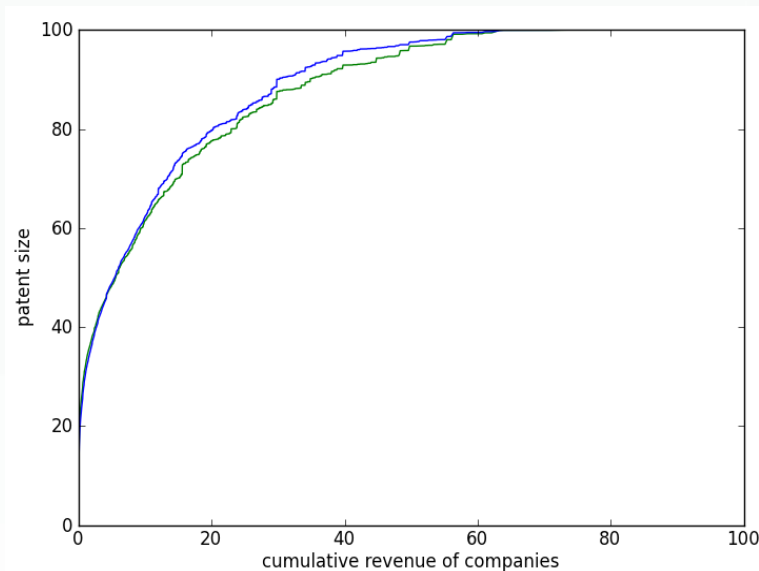
Four approaches for making technology support smarter

# Who does green innovation?

- 9% of patents by private companies in 2011 are 'green technology patents' [OECD definition].
- Same factors relevant for propensity to patent (sector, size, country)

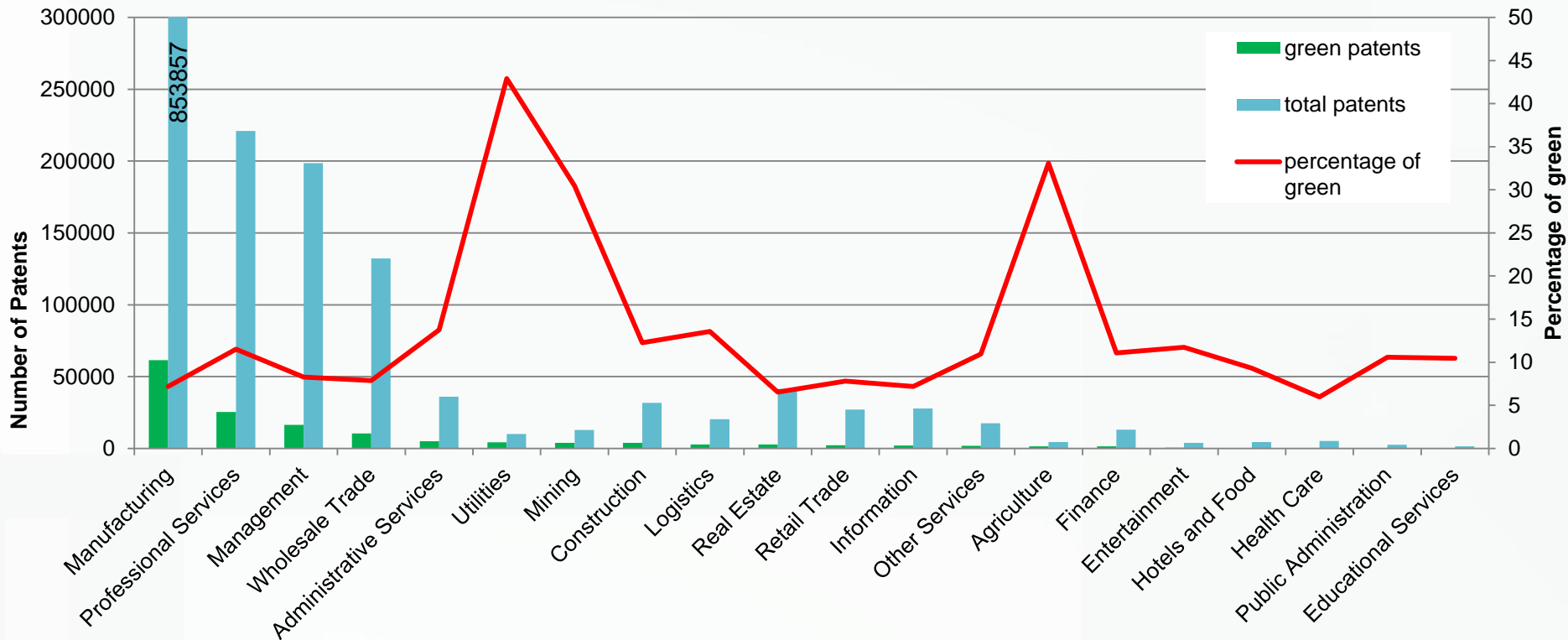
## By Size

- patenting is **not proportionate to the revenues** and employment of companies
- size-structure of companies doing 'green' patents is 'normal'



# By Sector

- The majority of the green patents are hold in the manufacturing sector
- The highest share of green patents is found in sectors less prone to innovate: Agriculture; Mining; Utilities



# Subject to Emission trading

Companies that fall under EU Emission Trading System feature a significantly higher share of 'green patents' (9.7%) than other companies (8.7%)

# Companies

- 20 big players responsible for 14 percent of the green patents
- 3 groups: **strong green**, **strong innovators**, **medium**

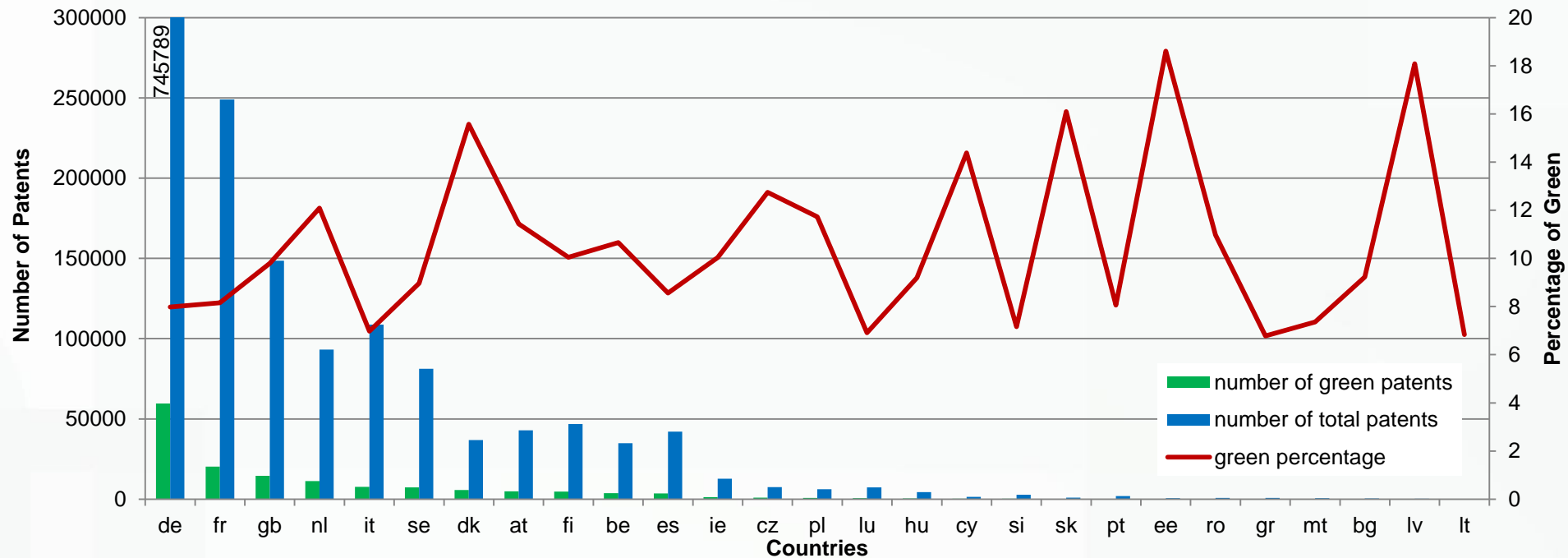
company_name	green patents	total patents	percentage of green
shell int bv	2318	6630	34
evonik degussa gmbh	1867	22018(1)	8
peugeot citroen automobiles sa	1332	9848(5)	13
osro gmbh	1219	3189	38
bmw ag	1098	8993(6)	12
vattenfall ab	1087	1614	67(4)
renault sas	1069	7422(7)	14
basf se	1009	1660	60(6)
l air liquide	952	3737	25
emitec ges fuer emissionstechnologie gmbh	901	1070	84(1)
akzo nobel nv	854	11920(2)	7
vestas wind systems as	844	1087	77(2)
bombardier transportation gmbh	815	1161	70(3)
novozymes as	740	2111	35
johnson matthey plc	732	1284	57(7)
polieri group srl	719	5706	12
zf friedrichshafen ag	688	10841(3)	6
continental ag	656	10791(4)	6
upmkymmene oyj	606	3193	18
umicore ag co kg	582	889	65(5)



# By country

- Denmark (16 percent) sticks out from the larger countries
- patenting-heavyweights Germany, France and Italy have a lower than average share of green patents.

## Number of Patents by Country



# Key policies to drive innovation in low-carbon technologies

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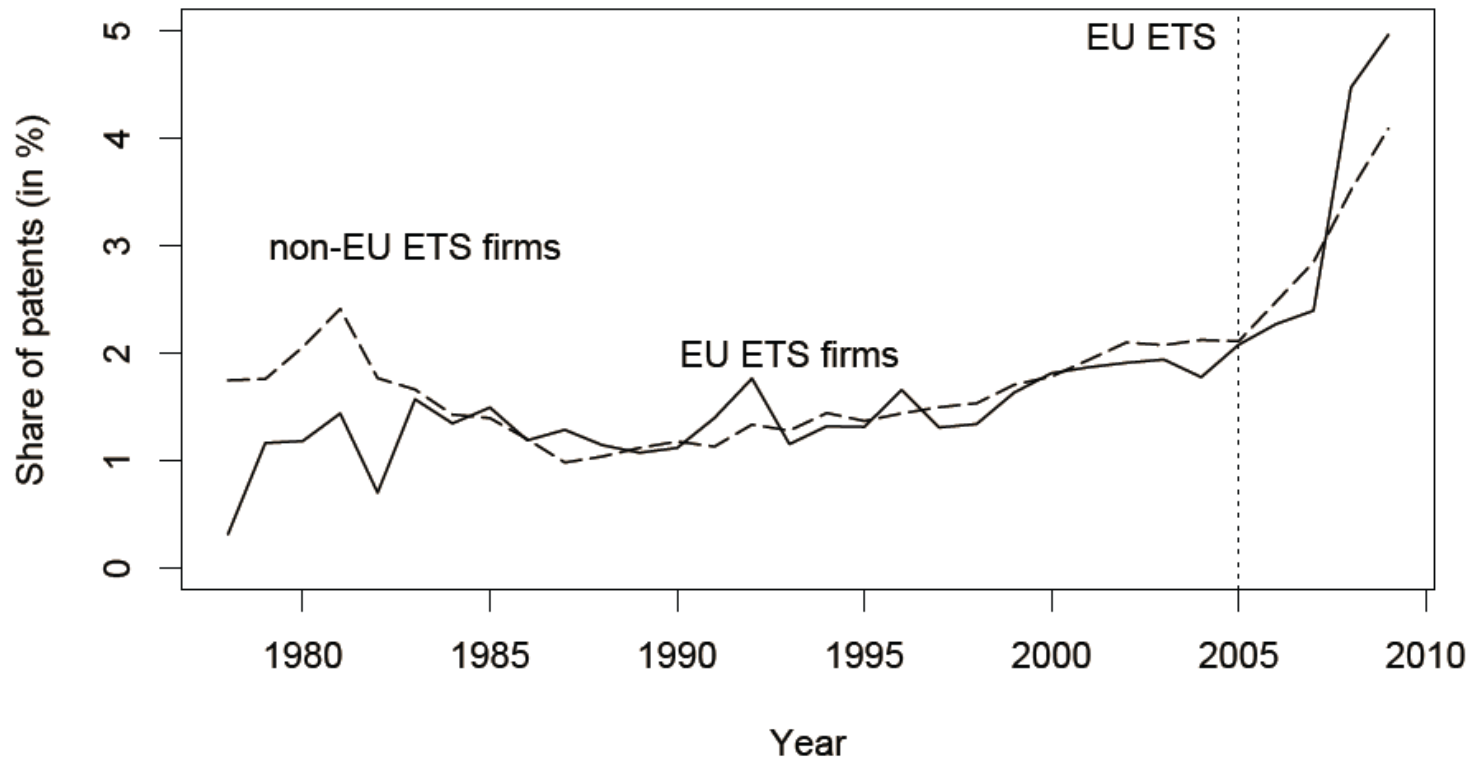
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# Pricing Carbon

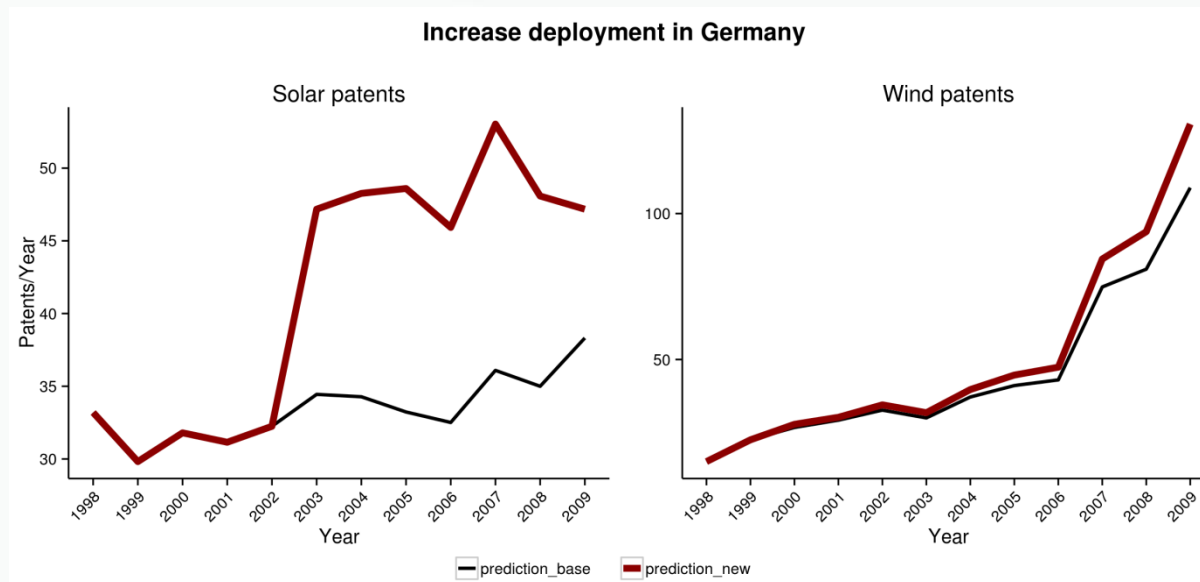
- Lift's all low-carbon boats
- Price signal should have long-term visibility



Calel and Dechezleprêtre (2013)

# Supporting deployment

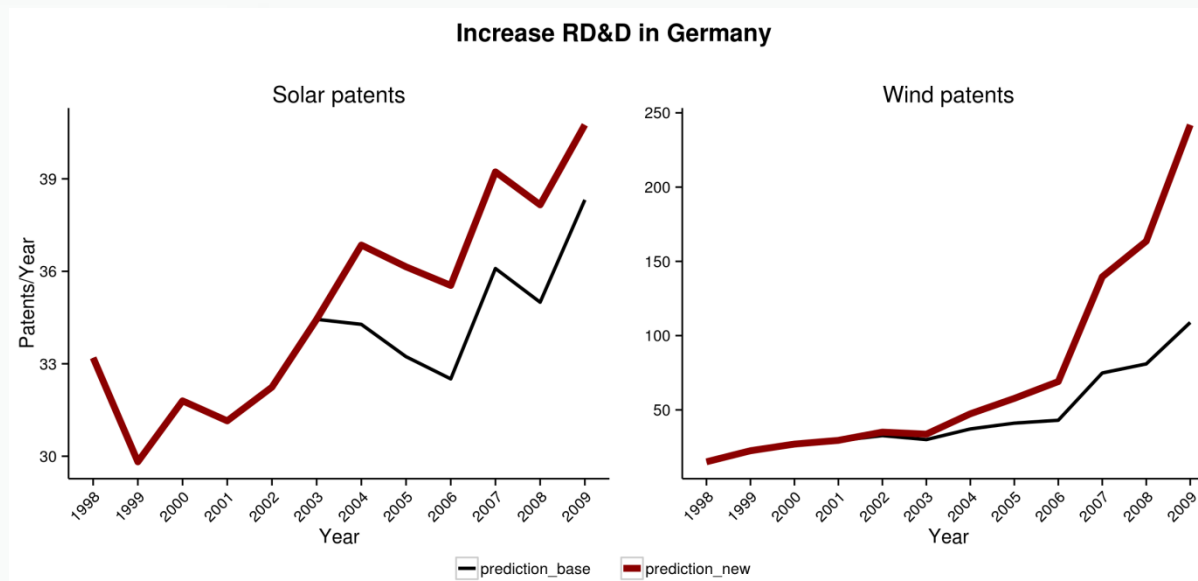
- Demand side of innovation
- Carrot for industry to innovate all-along the value chain



Zachmann, Serwaah, Peruzzi (2014)

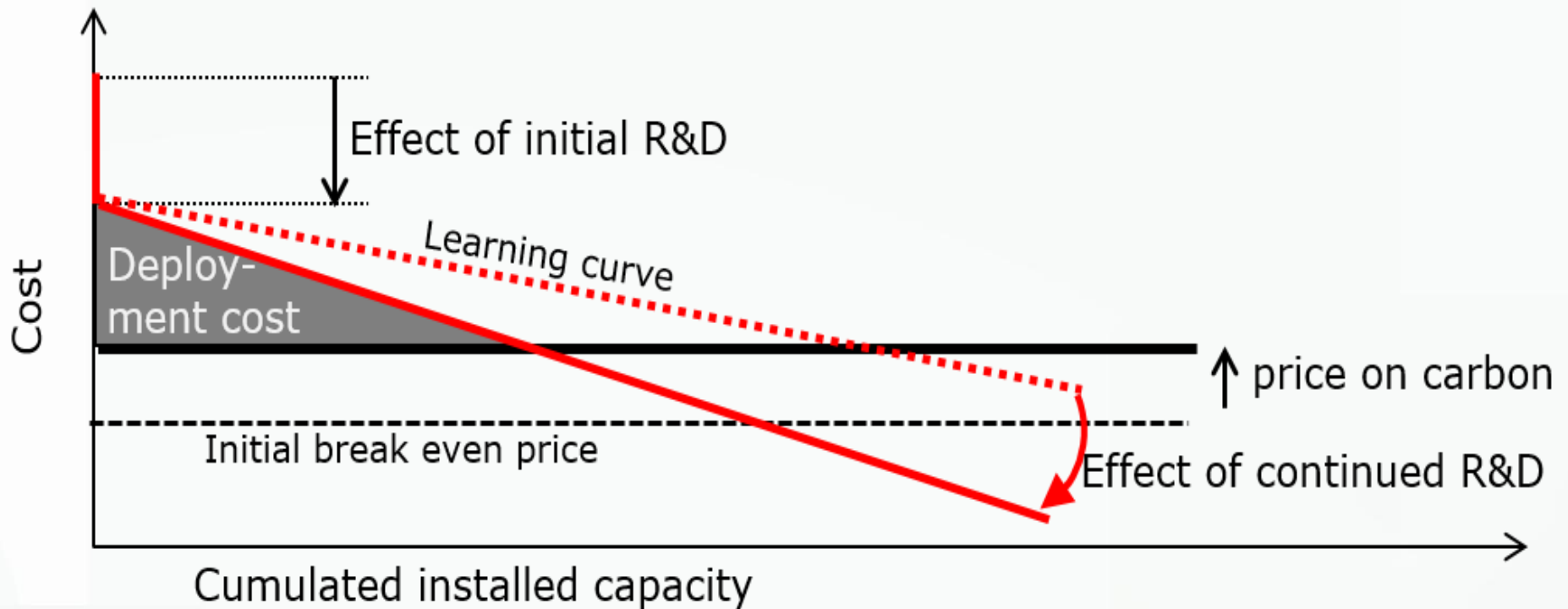
# Public RD&D spending, and support to private RD&D

- R&D funding targeted on supply side of innovation



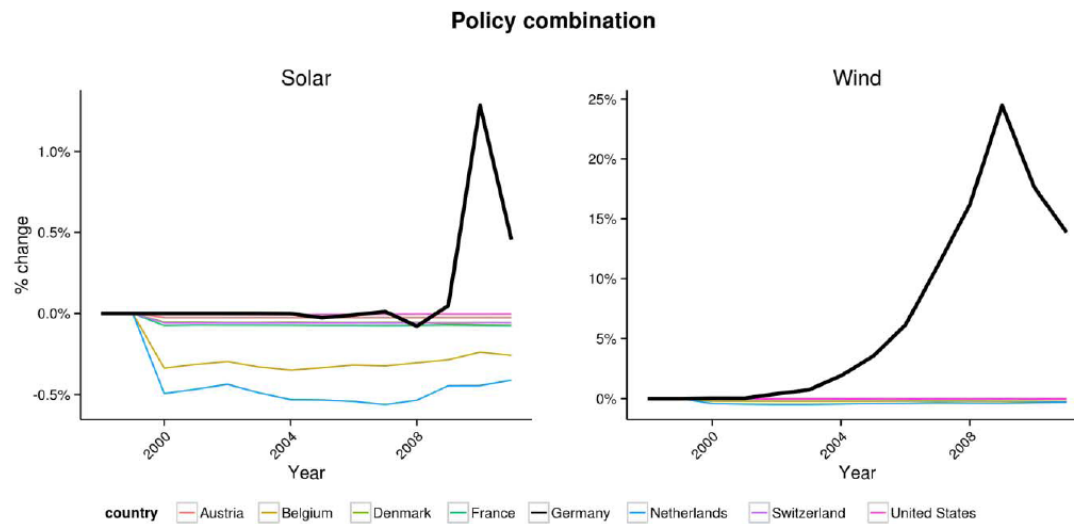
Zachmann, Serwaah, Peruzzi (2014)

# Policies working together



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

Figure 12: Predicted difference between a combined increase in deployment and RD&D on patenting in solar (left) and wind (right) in Germany to the sum of the individual effects



Zachmann, Serwaah, Peruzzi (2014)

# Four approaches for making technology support smarter

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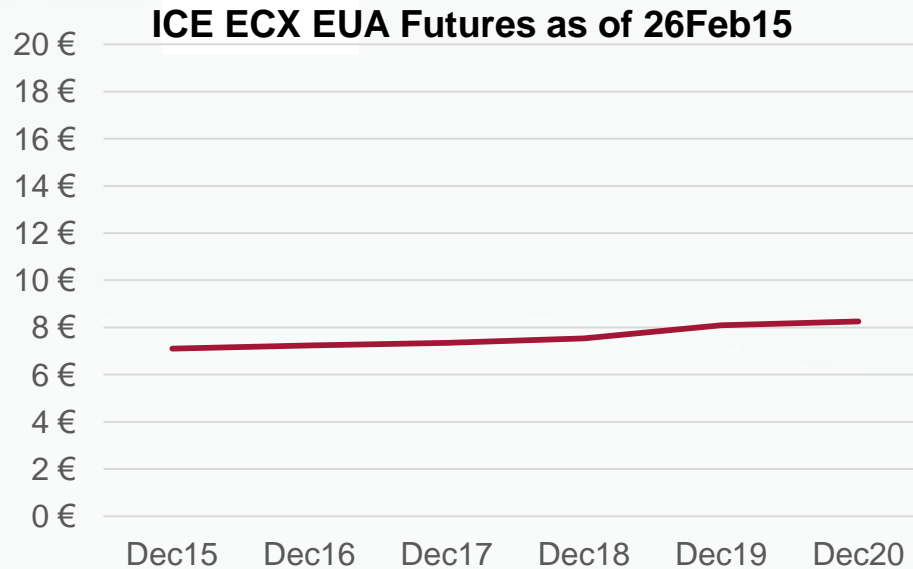
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# 1) Better Carbon Pricing



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 deployment policies (resources, 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

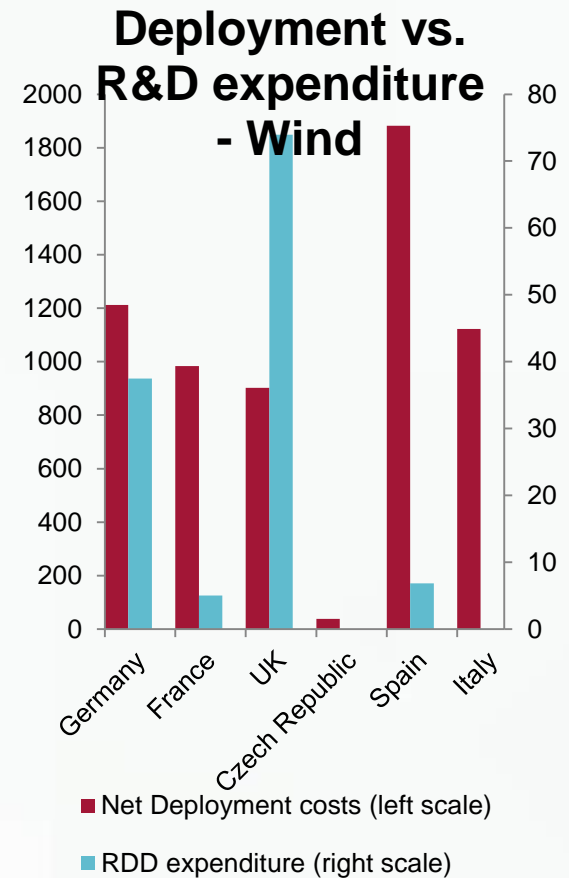
- In the past focus on deployment (20% by 2020)

- 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



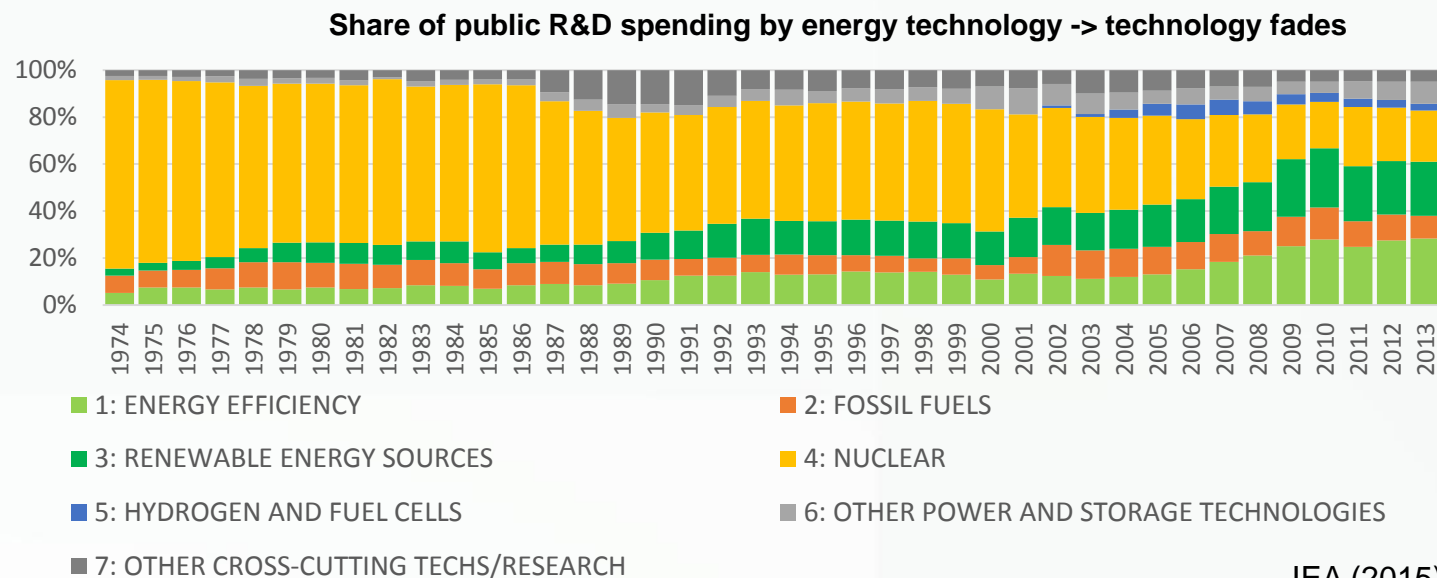
in million euros

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

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**