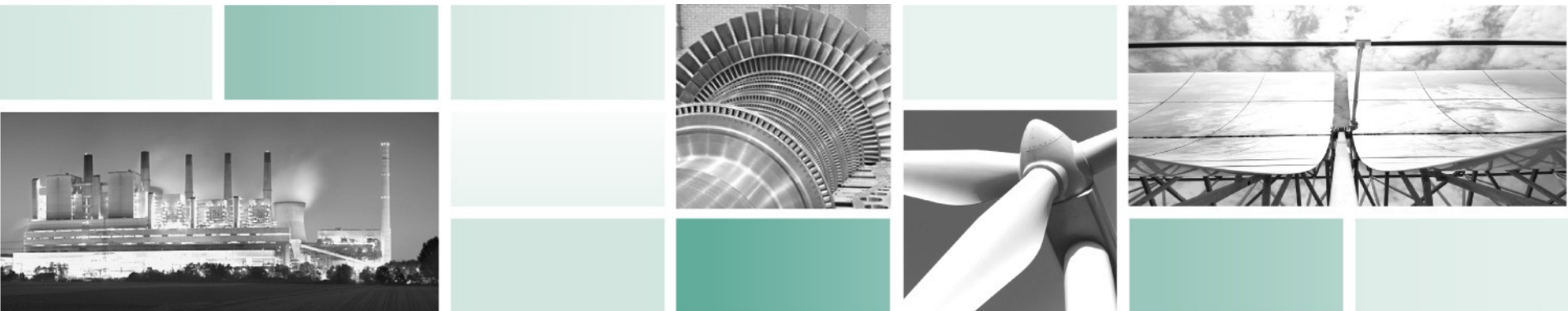


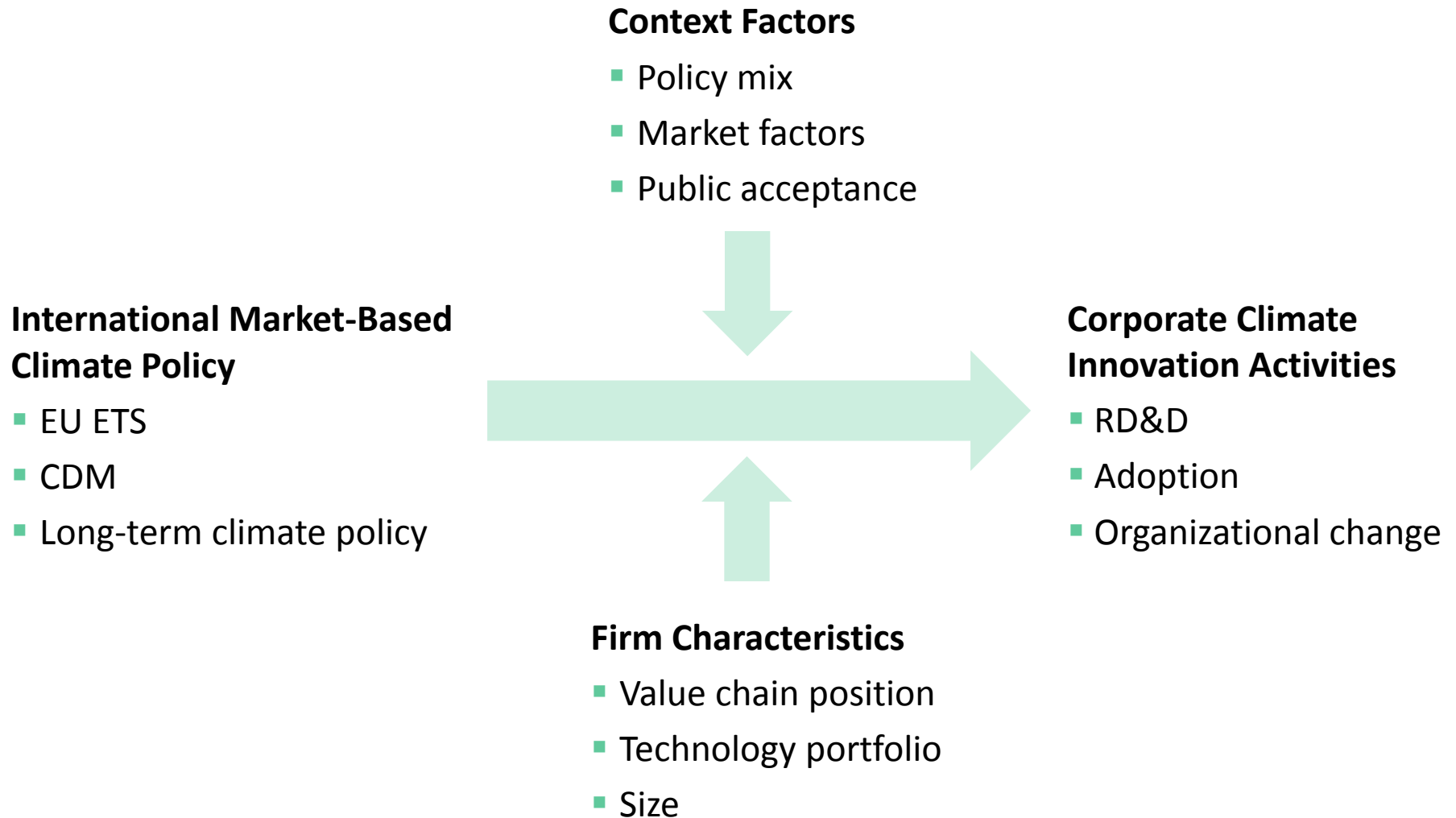
Corporate Climate Innovation Activities in Response to International Market-Based Climate Policies: *Findings for the Power Sector*

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How does our research framework look like?





Case study findings

How does the case sample look like?

Value Chain Position	Other Characteristics	# Cases	# Interviews
Power generators	Large	3	34
	Medium	4	
Technology Providers	Large (<i>with varying degrees of diversification</i>)	3	20
	CCS specialists	3	
	Biogas	2	
	Wind	2	
Project Developers / Consultants	Diversified incumbents	2	7
TOTAL		19	61

- Interviews took place from June 2008 – June 2009
- Interviewees from different functions: strategy, technology, sales, climate policy

Example 1: What triggered the significant increase in RD&D in CCS?

EU ETS strongly increased CCS RD&D activities of large-scale incumbents

EU ETS:

- Triggered strong RD&D increase
- Prospect of EU ETS continuation
- Full auctioning from 2013 onwards

Context factors:

- Prospects of stringent long-term climate policy and debates about introduction of CaC measures
- Increased public RD&D funding
- Lack of public acceptance for coal

Firm characteristics:

- Technology portfolio (core competencies and strategies) determine level & route
- High involvement of PG (incl. funding)

Exemplary Quotes:

"Emission trading is quite clearly the driver for R&D in CCS." [PG]

"The fear of 100% auctioning after 2012 has led to sharply increased interest from utilities." [TP]

"[.] for utilities the lack of acceptance for coal-fired power plants – their image problem – is an important reason to put money into CCS R&D." [TP]

"Coal is dead without CCS, [..] [We conduct] CCS research, since otherwise no long-term use of coal is possible due to the climate issue." [PG]

"[We have] not done much yet [..] the pressure on us is less because of our relatively new coal-fired power plants." [PG]

„[They chose IGCC] to to push [the sale of] their gas turbines." [PD]

Example 2: How and why do power generators shift towards renewables?

Vision change of most power generators towards renewables, followed by structural change, followed by a shift in the future portfolio due to LTCP, RES policy & EU ETS

Vision change:

- Interpretation of EU ETS and support for renewables as operationalization of overarching long-term targets (EU 2020) drives vision changes for 2020
- Great market / growth prospects
- Lack of public acceptance for coal and nuclear

Structural change:

- new units with own culture as consequence of vision changes

Portfolio shift:

- today's investments only materialize because of public renewables support

Exemplary Quotes:

"What does the instrumentalization of climate policy mean for [us]: how are we positioning ourselves in the future?".[PG]

"Until now, we have underutilized the opportunities [for renewables] which emerged from such a changed environment. [...] [We] coordinated corporate goals in agreement with EU targets." [PG]

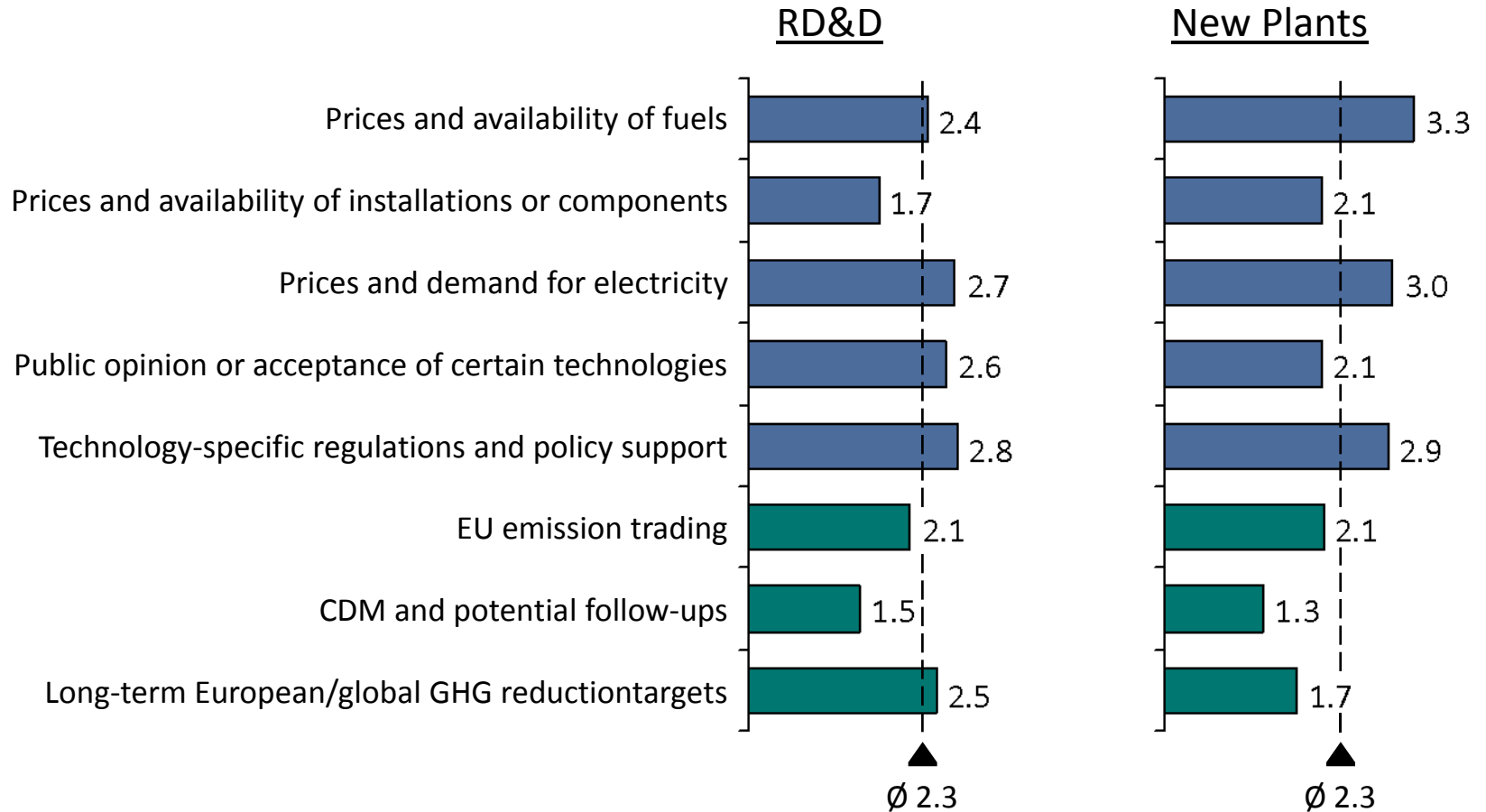
"All utilities [...] have established independent subsidiaries for renewables - with nice marketing names. [...] There is a different working environment [...] this is necessary as different know-how is required for renewable energies than was present in the utilities." [PD]

"Now we are looking much more at the portfolio effect. [...] Both long-term climate policy and emissions trading have contributed to this [...], but without [...] the price for CO₂ a company would not do that." [PG]



Selected preliminary survey findings

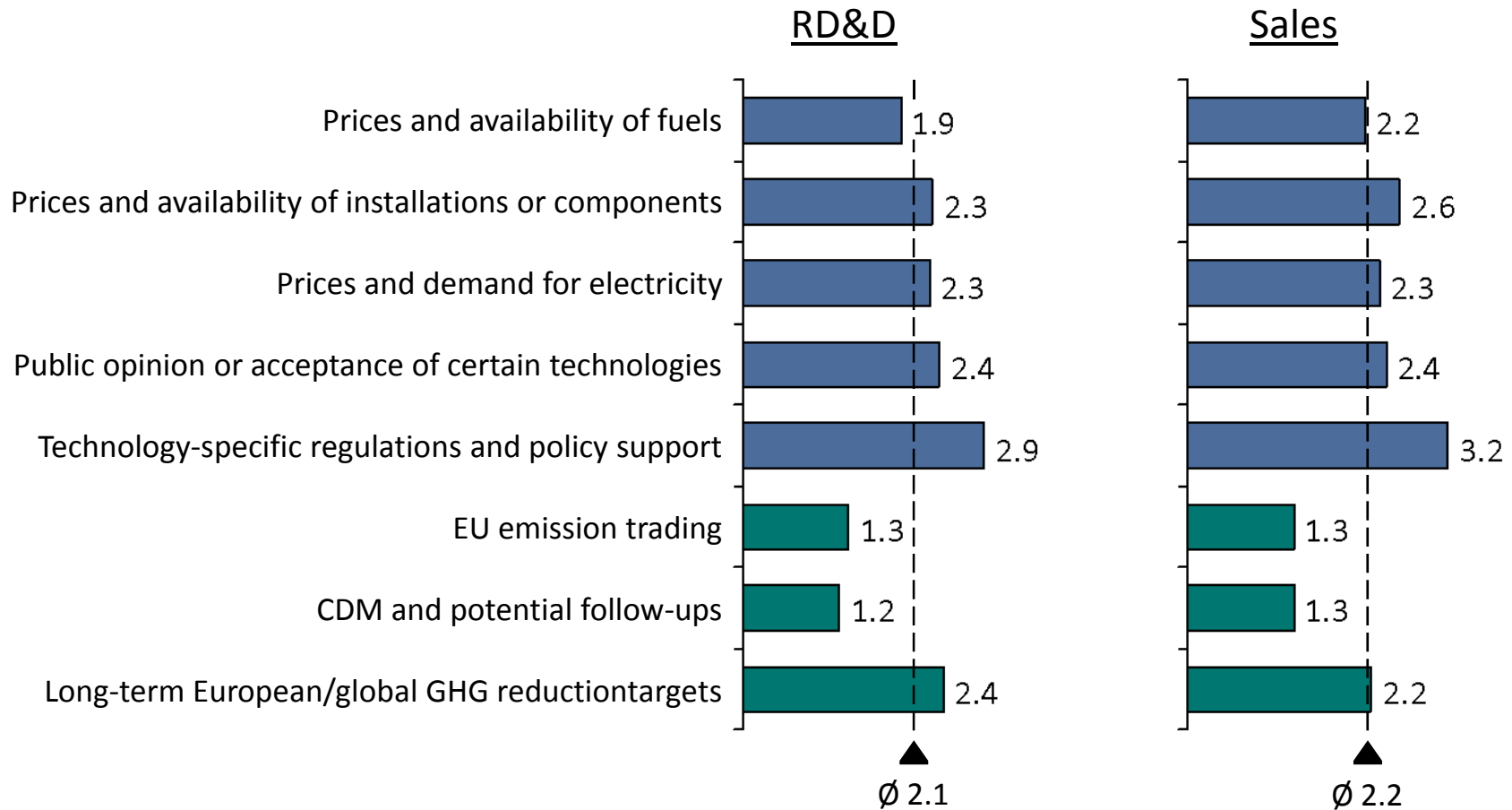
How important are the following factors for investment decisions of POWER GENERATORS regarding investments in RD&D and new plants?



4 = Very high relevance
0 = No relevance

- Current climate policy instruments have relatively limited importance
- Long-term targets are of relatively high importance for RD&D decisions

How important are the following factors for TECHNOLOGY PROVIDERS regarding their RD&D investment decisions and their sales?



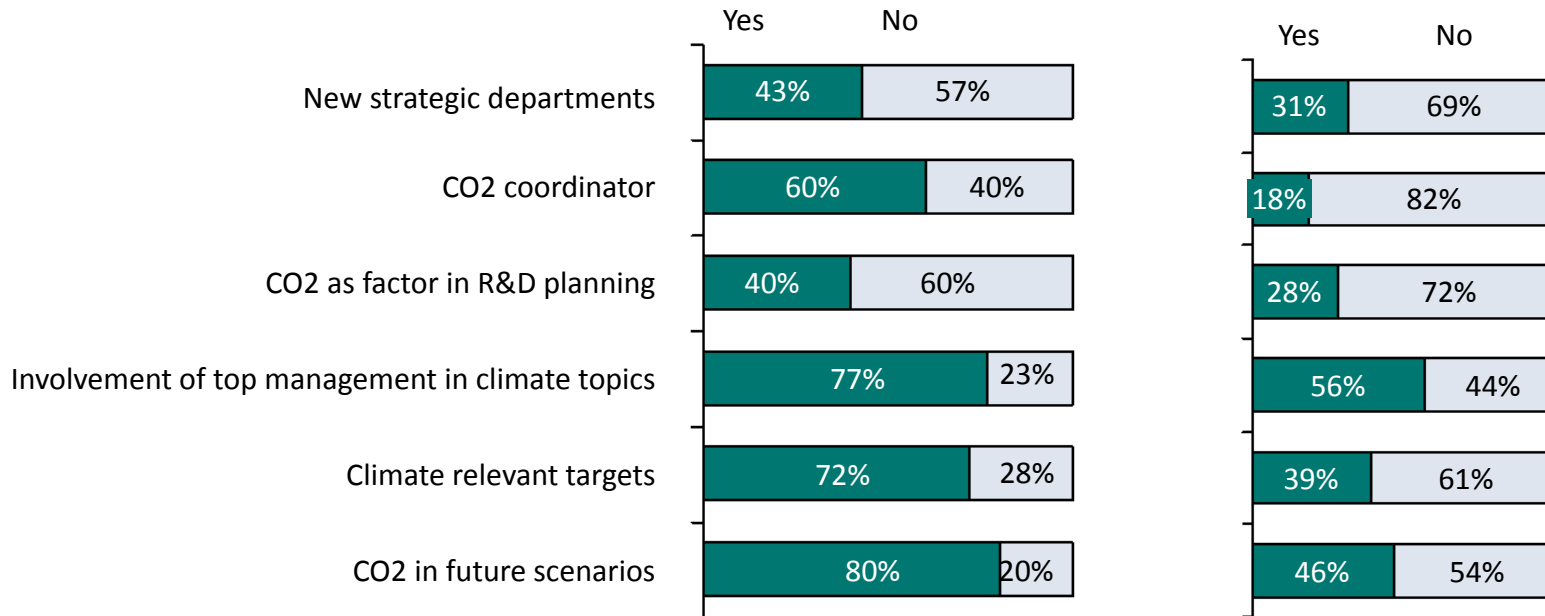
- Current climate policy measures are of an even more limited relevance
- Long-term targets do play an important role (esp. for RD&D)

4 = Very high relevance
0 = No relevance

To which extent has climate policy led to organizational change?

Power Generators

Technology Providers



- Power generators have adopted their organizations more to the climate topic than technology providers
- Vision related organizational change has also taken place within technology providers though to a lesser extent



Conclusions & policy recommendations

What are the main conclusions?

- Climate policy only one of many factors in corporate decision-making: due the lack in stringency and predictability and relatively greater importance of other factors so far limited effect on corporate climate innovation activities
- Climate policy induced innovation effects vary strongly among technologies, innovation dimensions, and firms
- But thanks to organizational change many companies are increasingly prepared to develop and diffuse low-carbon power generation technologies if climate policy becomes more stringent

What key policy recommendations can be derived from our research?

- Formulation of economy-wide political visions can serve as benchmark for firms which facilitates strategic reorientation
- Political visions need to be operationalized with aligned policies
- Need to complement market-based policies with other policies for RD&D, infrastructures, legitimacy building and, niche market creation
- Fundamental importance of credible, ambitious long-term climate policy, particularly for RD&D - ideally at a global level

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