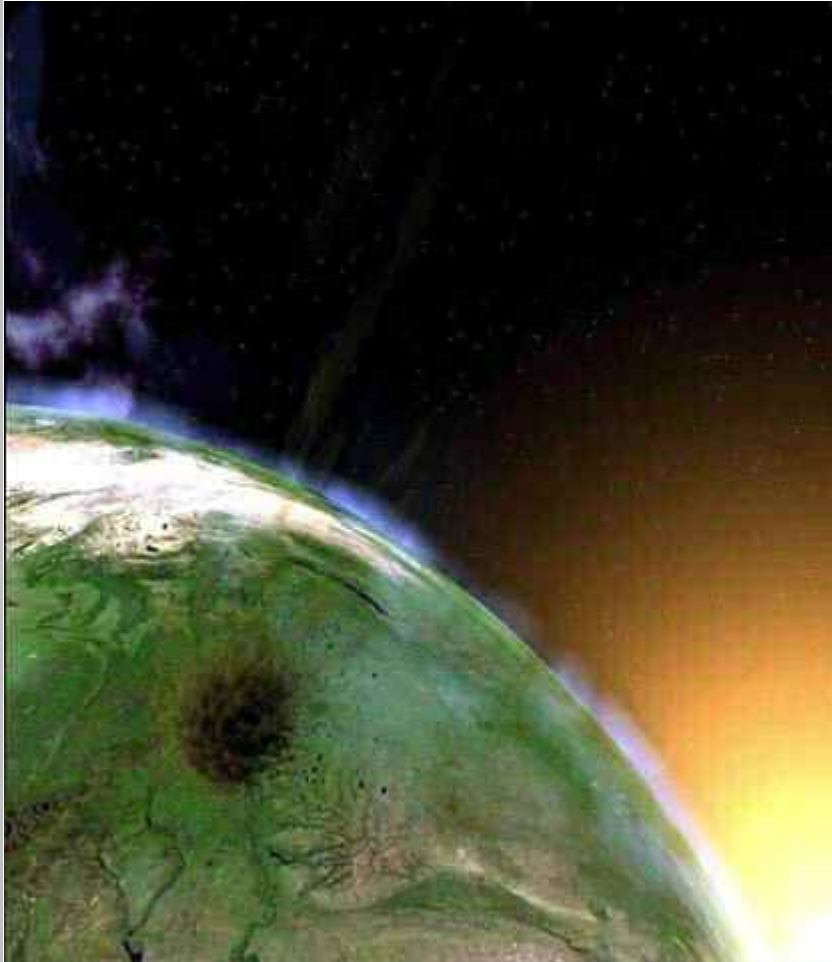


Brussels, May 21, 2007



McKinsey & Company

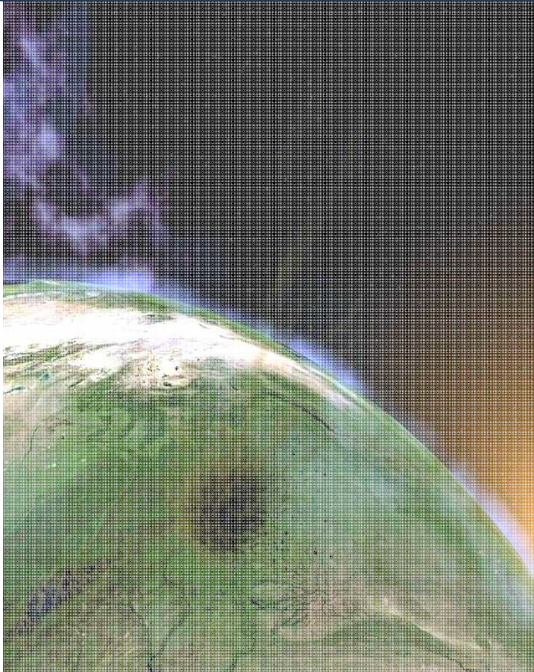
Competitive Effects

Dr. Christoph Grobbel

**3rd Meeting of ECCP Working Group
on Emissions Trading**

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Today's discussion

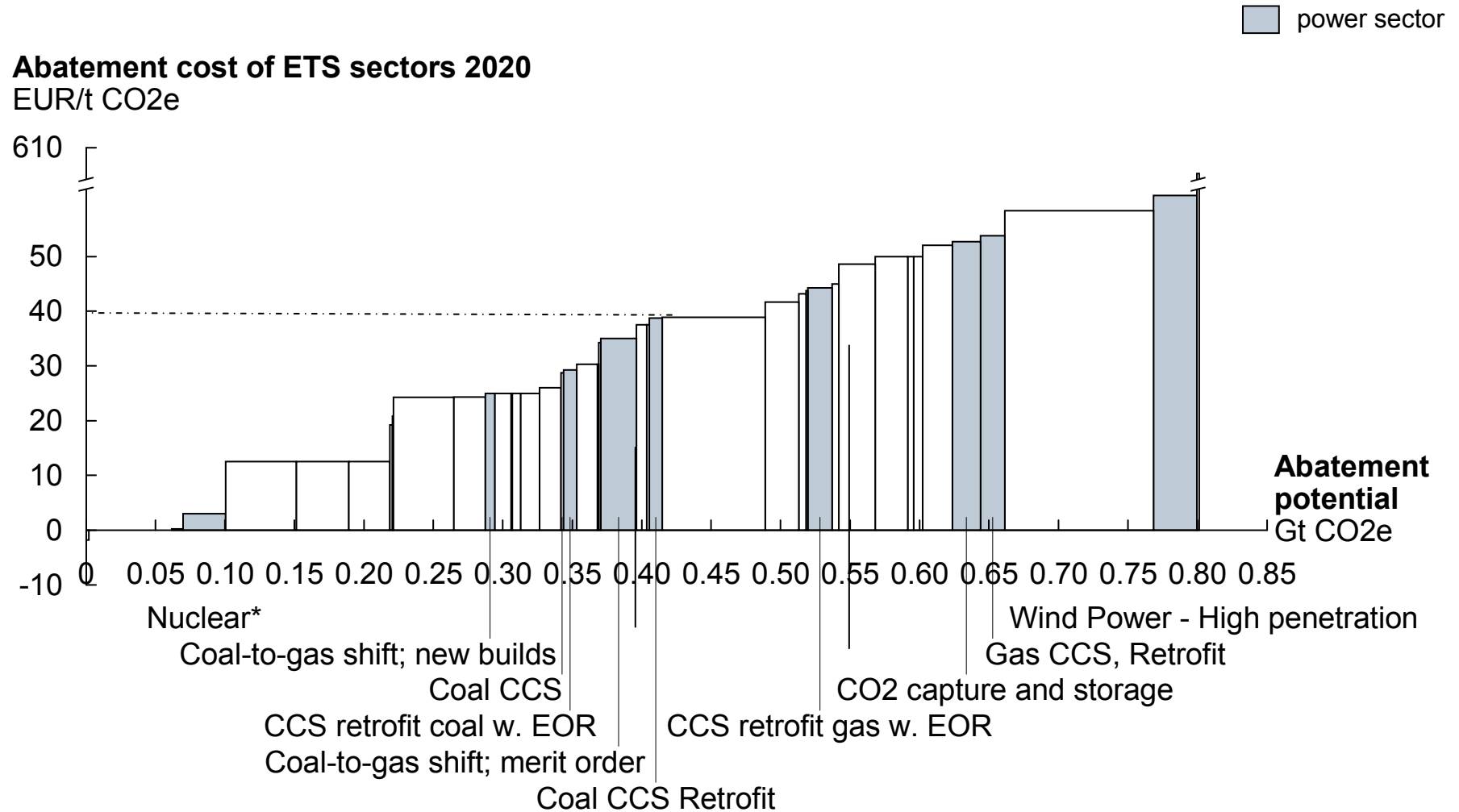


**Recap of fundamentals
in EU ETS market**

**Impact on competitiveness
of European industries**

Lessons learned

400 Mt abatement need within ETS could drive EUA prices up to 40 EUR in 2020

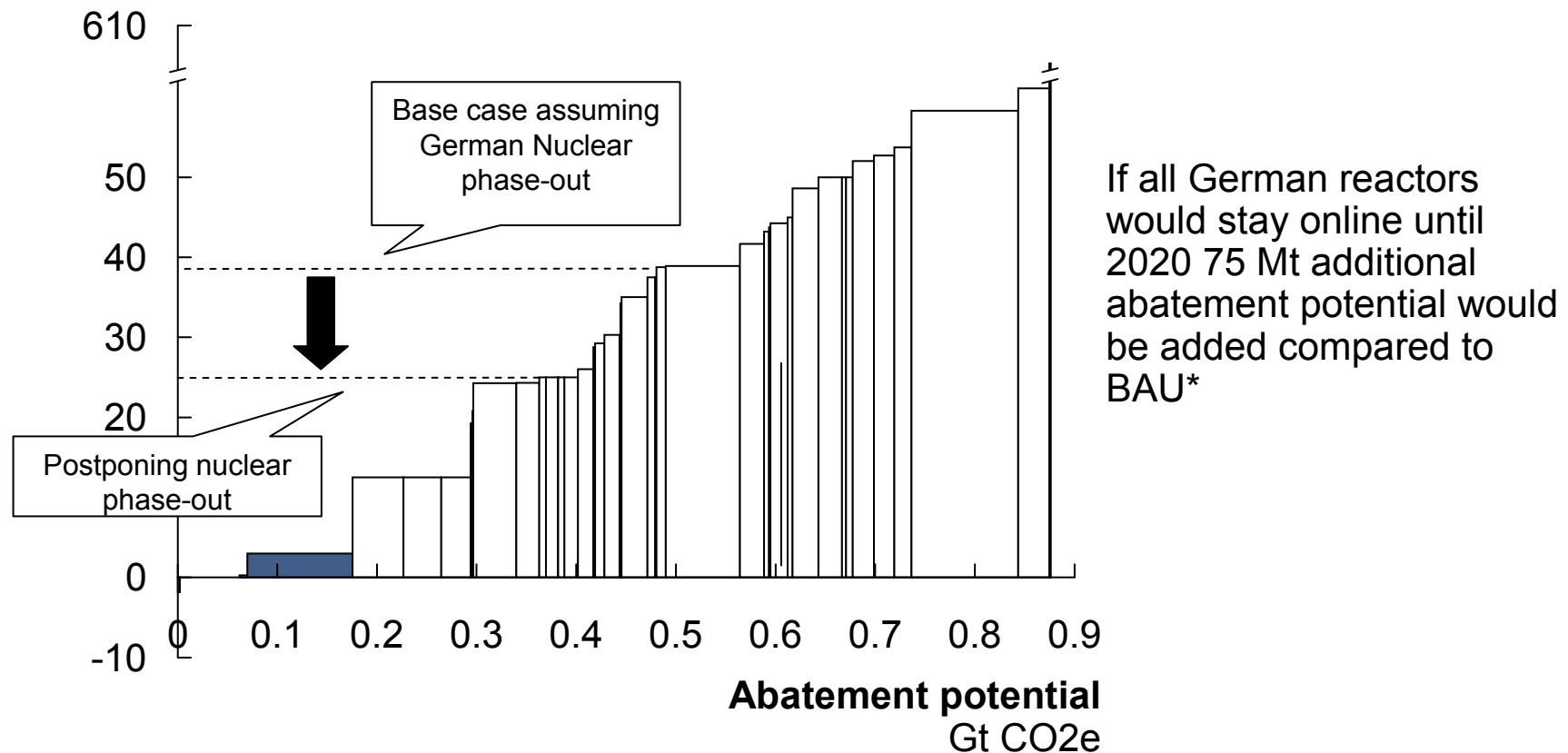


* Nuclear phase out in Germany and other European countries assumed as currently planned

Source: McKinsey

In an EU-only system postponing the Nuclear phase-out in Germany could drop 2020 EUA prices from around 40 to 25 EUR

Abatement cost of ETS sectors 2020
EUR/t CO₂e



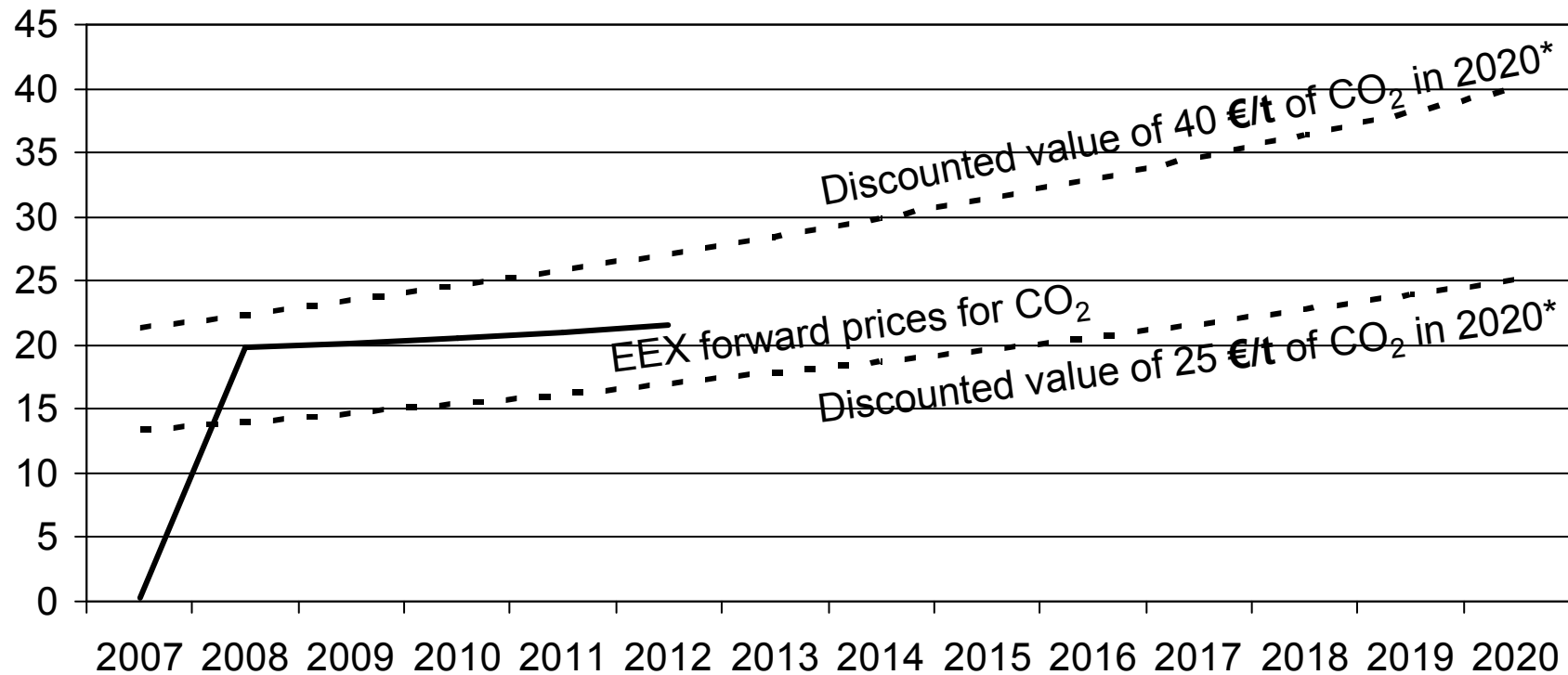
* BAU case sees 0.47 tonnes of CO₂e abatement per MWh. This assumes a 2:1 replacement by coal and gas

Source: McKinsey

Banking should set a floor for EUA prices at the discounted future abatement cost from 2008 onwards

Discounted 2020 abatement costs of 25-40 €/t vs. forward prices
Euro/t of CO₂

STATUS May 14, 2007



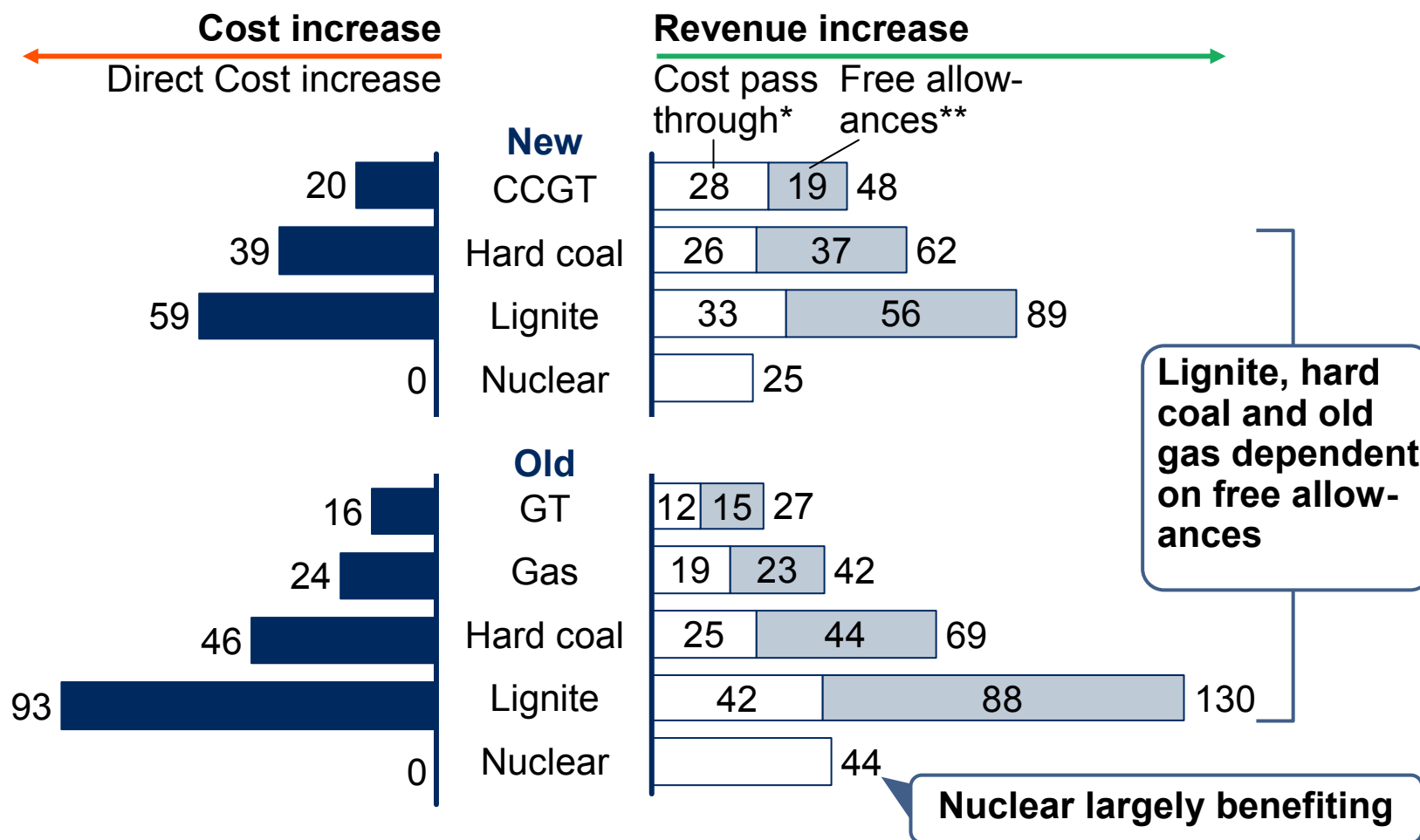
* Discounted at 5% p.a.; current implied discount rate at EEX until 2012 is 3.6% p.a. but long-term interest rates are higher

Source: McKinsey, EEX

Power plants generally profiting from EU ETS, but to very different extent

AVERAGE SHORT- AND MID-TERM IMPACT OF EU ETS ON POWER SECTOR

% of total costs



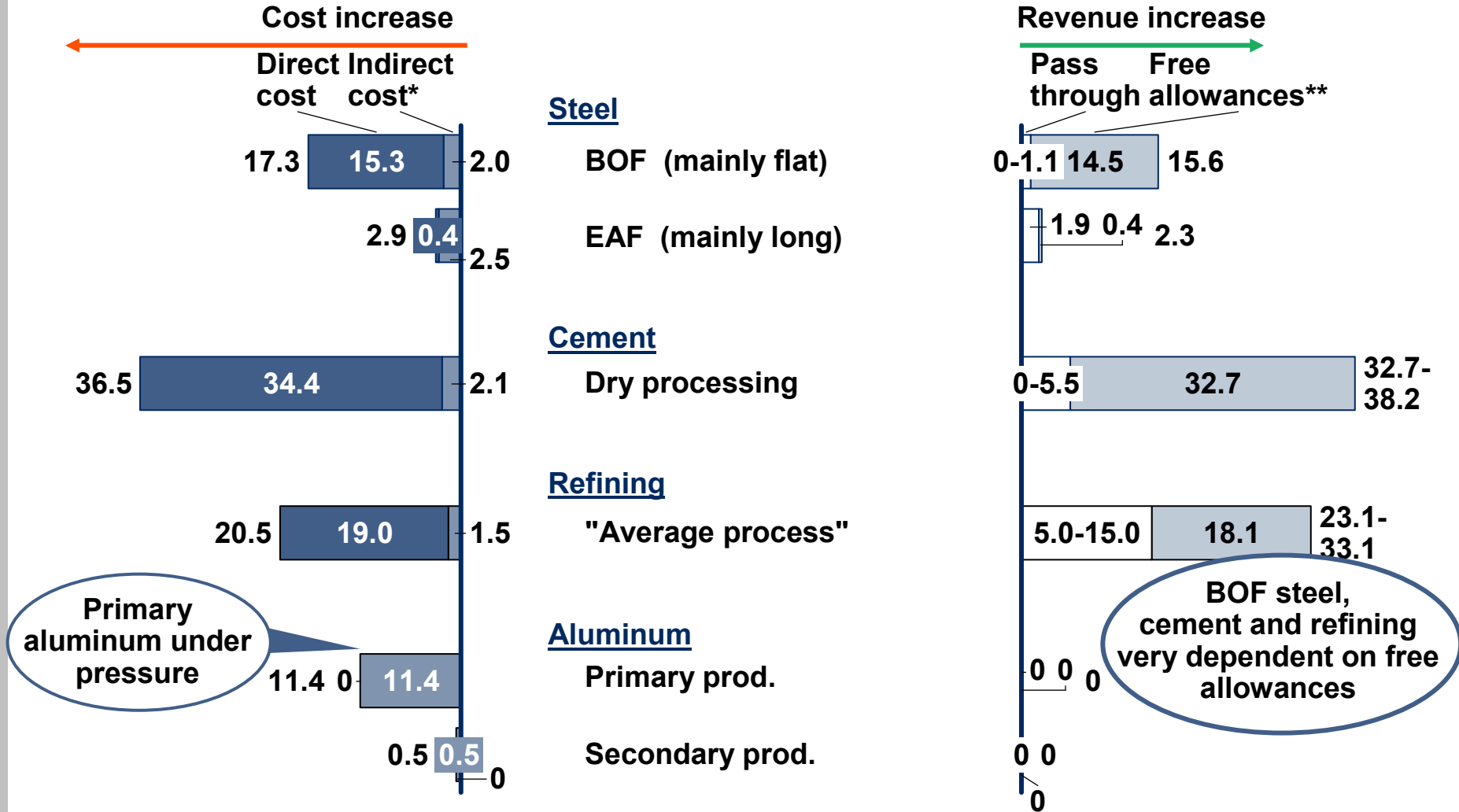
* Assuming short- and mid-term electricity price increase of 10 EUR/MWh for CO₂ price of 20 EUR/t

** At 95% free allocation relative to desired amount

Cost increase largely offset by revenue increases but incentive to shift marginal production abroad

AVERAGE SHORT- AND MID-TERM IMPACT OF EU ETS ON OTHER INDUSTRY SECTORS

% of total costs



* Assuming short- and mid-term electricity price increase of 10 EUR/MWh for CO2 price of 20 EUR/t

** At 95% free allocation relative to desired amount

Overview of allocation options

○ Fully priced in
 ● Not priced in

General design option*

Price-in?

<ul style="list-style-type: none"> • Grandfathering 	<ul style="list-style-type: none"> • Free allocation of allowances based on historic emissions in fixed base period 	
<ul style="list-style-type: none"> • Benchmarking 	<div style="display: flex; justify-content: space-between;"> <div data-bbox="660 518 1176 869"> <ul style="list-style-type: none"> • Product specific CO₂-efficiency benchmark • Fuel specific CO₂-efficiency benchmark </div> <div data-bbox="1176 646 1243 726" style="text-align: center;"> </div> <div data-bbox="1243 518 1758 869"> <ul style="list-style-type: none"> • Recent production • Historic production • Expected production • Capacity × utilization benchmark </div> </div>	**

<ul style="list-style-type: none"> • Auctioning 	<ul style="list-style-type: none"> • Auctioning without redistribution to affected industries • Auctioning with redistribution to affected industries 	

Additional issues

- **Special treatment of new entrants and closures?**
- **European or national solutions?**

* Combinations possible
 ** Price-in only of the difference between the benchmark and its own emissions
 *** 100% without ex-post correction, 0% with ex-post correction
 **** 100% without redistribution based on production/emissions; lower levels with redistribution based on production/emissions

Lessons learnt on emissions trading

McKINSEY PERSPECTIVE

- **Banking in combination with commitments on future emission reduction can effectively set a floor in CO₂ prices**
- **Competitiveness issues have to be addressed – not only from a P&L perspective, but as well from a production shift and GHG leakage perspective**
 - Option 1: Cross border taxation scheme
 - Option 2: Production based allocation with benchmarking OR auctioning with redistribution of the proceedings
 - Option 3: Global (sectoral) agreements
- **Allocation mechanism determines “pricing-in” of CO₂ allowance value**

Source: McKinsey