Linkage: regional focus
A technology providers perspective

Helle Juhler-Verdoner
VP Global Affairs, Alstom Power
Alstom Group: Three sectors

**Sales by Sector (proforma figures)**

**Power**
- €14 bn

**Grid**
- €3.5 bn (2009)
- 19%

**Transport**
- €6 bn
- 30%

Source: Alstom 2008/09

**Employees by Sector**

**Power**
- 50,000
- 52%

**Grid**
- 20,000
- 21%

**Transport**
- 26,500
- 27%

*Leadership in key markets and fast-growing technologies*

*Major supplier in 25% of worldwide installed base*

*Supplied 25% of metro/trams globally*
World leader in power generation infrastructure

Alstom supplies major equipment in 25% of the worldwide installed power generation capacity

- Global leader in integrated power plants
- Global leader in hydro power
- Global leader in air quality control systems
- Global leader in services for electricity utilities
Alstom Power:

✓ has a strategy based on providing ‘Clean Power Today’
✓ supports the 2 degrees target
✓ invests heavily in the development and deployment of:
  ✓ Energy efficient fossil fuel plants
  ✓ Renewable technologies (hydro, wind and tidal)
  ✓ Carbon capture and storage

Providing solutions for customers to face their needs – including the climate change challenge
A wide range of technologies necessary to cut energy-related CO\textsubscript{2} emissions substantially
Continued Alstom focus on technology and innovation

**Power**
- Improvement of power plant efficiency and flexibility
- Carbon Capture and Storage
- Renewables: extended range of onshore turbines; ocean energy, integration of renewables with pumped storage

**Transport**
- Validation of AGV and Prima II locomotive
- New tram train
- Signalling: development of ERTMS and CBTC

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**R&D spending***: quasi-doubling in 5 years

*Not including Alstom Grid figures*
What can incentivise massive investment?

Baseline

$ 270 trn

$ 750 bn/yr

“Blue Map”

$ 46 trn

2030

$ 1600 bn

2050

= 450ppm scenario
Carbon market – part of the solution

- Urgent need for global expansion of the carbon market to provide a strong and robust price on carbon emissions
- Little evidence that this will happen anytime soon
Investment decision for New PP over next 5 years
Cost of Electricity by type - Expected range

Only a very high carbon price can change this picture significantly
Building a diversified portfolio remains the most economically safe option
Economics of Carbon Capture and Storage

€/ tonne CO₂

Estimated costs of CCS

Public funding

Demo phase
Early commercial phase
Mature commercial phase

Source: McKinsey & Company "CCS – assessing the economics" for the cost numbers; policy implications drawn by ZEP
Conclusion

- A strong price on carbon through a global cap-and-trade system will incentivise low-carbon investments – but development is longer term.

- More regional developments can drive the development – creating an opportunity for global linking and creating more clarity on off-sets.

- Linking of regional systems and acceptance of off-sets in regional systems will provide a price signal for technology providers and utilities to pick-up on.

- The less a carbon market can deliver on incentives - the more need for alternative sources of funding and/or regulation for low-carbon investments to happen in time and at the scale needed.