Reducing Greenhouse Gas Emissions – Challenges for the Chemical Industry

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10.11.2017
Reduction of greenhouse gas emissions with increased production

Development since 1990
Index 1990 = 100%, BASF Group excl. oil and gas business

- Volume of sales product: +102%
- Absolute greenhouse gas emissions: −50.2%
- Specific greenhouse gas emissions: −75.4%
DECHHEMA Technology Study: Results of scenario calculations (w/o fuels production)

Analysis:
- 9 Chemicals accounting for 2/3rd of greenhouse gas emissions

Technological option:
- Alternative carbon feedstock
- Low carbon power supply
- Energy efficiency
- Power to heat
- Industrial symbiosis

**Opportunities and challenges for various scenarios by 2050 (without fuels applications)**

BAU: business-as-usual
Methane pyrolysis – a new source of H₂
Project outlook and financing aspects

Risks and project financing
• breakthrough process development
• carbon utilization in metallurgy
• industrial scale reference required
• CAPEX and OPEX support

Pilot Unit
~€20-40 million investment
(start-up ≥2020,
~1000 Nm³/h H₂,
~2 000 t/y carbon)

Reference/demonstration unit on commercial scale
~€100 million investment
(start-up ≥2024,
~20 000 Nm³/h H₂,
~40 000 t/y carbon)

Ongoing
R&D-Project funded by the German Ministry of Education and Research
July 2013- July 2017
Total R&D cost €25 million