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# Platform Climate Protection and Industry North-Rhine Westphalia

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A multi stakeholder process for the advancement of energy efficiency and low-carbon technologies in energy intensive industries

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- **Long term GHG targets (Paris Agreement, G7 Elmau, IPCC) show:**
  - industrialized countries need to achieve emission reductions by 80-95% by 2050
  - Developing countries have to follow soon afterwards
  - This will not be the end, further reductions will have to follow
- **This all means deep (fossil) decarbonisation of all parts of the energy system is necessary and needs efficiency plus X**
- **This means investment patterns as well as technology and innovation pathways have to be changed immediately, in all sectors**

# The importance of energy intensive materials producing industries (EPIs)

- High share in global GHG emissions (Industry >1/3, much of it is in energy intensive industries: 13% of all GHGs in EU 28)
- Global demand for materials is not likely to level off soon
- Mature industries often operating already not too far from physical optimum
- Significant technological change needed that might be radical for many companies and will need significant technology break throughs
- EPIs have long investment cycles of several decades for core assets → 2050 is virtually “tomorrow”
- Due to market & industry structures as well as political relevance EPIs are often not very innovative

**Highly  
relevant**

**High technical  
and innovation  
challenges**

**Difficult  
economic  
structures**

### Step 1: State Climate Protection Plan

- › Participatory process with more than 1200 stakeholders over 2 years
- › Working group on industry with 40 participants from companies, TAs and society
- › In parallel with five other groups
- › Joint development of climate protection scenarios for 2050
- › Development of – mid term - policies and measures (over 400 in the whole plan; one of which is Step 3)

### Step 2: Platform with 6 energy intensive sectors

- › Aim: identify LC-breakthrough technologies suitable for NRW industries and the role the state as a „cluster“ could play
- › Stepwise sectoral discussion rounds
- › Identification of research issues, sectoral innovation systems and necessary framework conditions

### Step 3: Low Carbon Research Centre (planned)

- › Institution to link industry with science, society and government
- › Develop joint roadmaps for decarbonisation and initiate concrete first R&D steps

Joint **scenario** building  
(envisioning vs. still  
conflicting ideas)

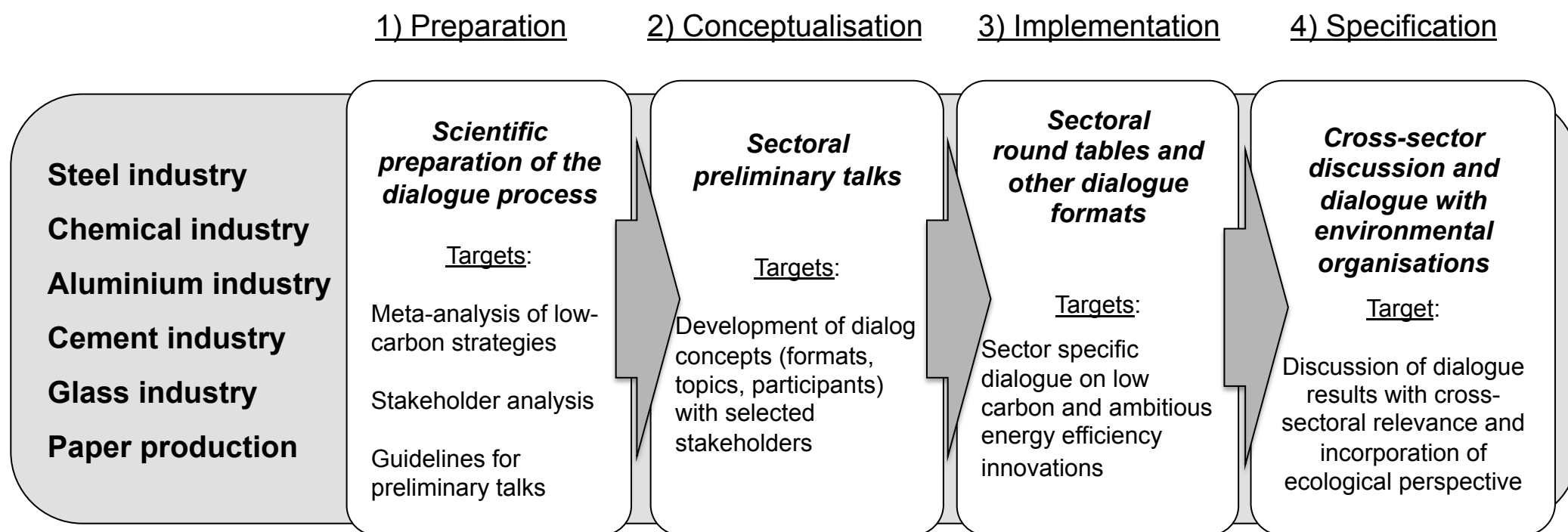


**Broadening  
discussion** and  
steps to  
implementation



(Possibly) development  
of sectoral **pathways/  
roadmaps** and  
**concrete steps**

- **Enable energy intensive industry to create low carbon visions**
- **By broadening discussion and bringing it into industries and companies**
- **Supporting supporters**
- **Identification of steps into the right direction**
- **Enable thinking about the „unthinkable“**
- **Take problems and reservations serious**



## ***1. Industry-specific constraints and conditions***

- Economic development prospects
- Specific NRW challenges and chances as opposed to national and European level

## ***2. Existing innovation system***

- Strategic factors with regard to research institutions and industry based innovation capacities
- Potential industry-specific and cross-industry research priorities for business and science in NRW

## ***3. Innovation agenda for NRW***

- Main low-carbon technologies for climate change mitigation paths of the North Rhine-Westphalia industry
- Derivation of necessary conditions and incentives for the implementation of the research priorities
- Derivation of possible next steps in developing an innovation strategy for NRW

# Some indications on innovation system in energy intensive sectors

## **Glass, paper, cement:**

- SMEs, often relatively old production stock, most companies owned by multinationals located outside the state
- Cement: some research capacities, however lack of funding for expensive research
- Glass, paper: most research elsewhere

## **Aluminum:**

- Companies are parts of multinationals, but significant research capacities in the state

## **Chemical industry**

- Highly disaggregated industry with very differentiated portfolio, highly research intensive, partly multinationals, some with headquarters in NRW

## **Steel industry**

- Highly concentrated, NRW/Duisburg centre of German steel making with significant amount of research capacities



- **Technologies discussed for further analysis**
- Potentials for the use of waste heat (e.g. batch pre heating)
- Demand side management / flexibilisation of electricity demand
- Use of renewable gases (e.g. bio gases) to substitute for natural gas
- How to cope with increasing shares of hydrogen in the gas grid (due to power to hydrogen) and other sources of variable gas qualities
- Electtification (e.g. electric furnaces / electric boosters for conventional furnaces / segmented melting)
- Value chain analysis for GHG emission reduction potentials
  
- **Innovation system issues:**
- No university research in the state left but company research
- Problems with funding of research projects for SME structured industry

- Integration of fluctuating renewable energies into electricity and gas grids
- Power to X (use of excess electricity for production of hydrogen, methane, methanol or other chemicals)
- Waste heat use of sources at different temperature levels

# How to engage industry in long term innovation and policy?

## Core targets achieved

- knowledge base among stakeholders in the field of low-carbon innovations was improved
- high degree of commitment in discussing and elaborating proposals for industry-specific innovation agendas
- highly productive discussion culture, by trust building among stakeholders that did not cooperate intensively before and by an awareness rising for different perspectives among the stakeholders.

## Problems for regional innovation strategies identified:

- long term perspective (e.g. until 2050) difficult to discuss and implement due to short/medium term focus of company R&D
- Many low carbon innovations seem to be too big to be pushed forward regionally and innovation systems are cross border
- Interesting innovations seem to be in industrial symbiosis for which a regional cluster of various industries could be an asset.

## Economic and technical structures of industries in the state limit innovation potentials

- Cement, glass, paper, are mainly SMEs partly owned by foreign multinationals
- Sector oriented university research should be (re-)strengthened
- Established industries benefit from existing assets make it more difficult to exploit more radical innovations

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**Thank you**  
**For your Attention**

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For further information:  
[www.wupperinst.org](http://www.wupperinst.org)

# Publications

## on the stakeholder process with industry in NRW

- <https://www.klimaschutz.nrw.de/english/>
- Lechtenböhmer, S., Espert, V., Knoop, K., Vilsmaier, U. (2016): From participatory processes to transdisciplinary research for regional sociotechnical sustainability transitions: The case of the Climate Protection Plan of the German state of North-Rhine Westphalia, Paper for the International Sustainability Transitions Conference 2016, September 6-9 2016, Wuppertal, Germany, 17p
- Espert, V., Lechtenböhmer, S., et al. (2016): Platform Climate Protection and Industry North-Rhine Westphalia – a multi stakeholder process for the advancement of energy efficiency and low-carbon technologies in energy intensive industries; ECEEE 2016 summer study
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- Lechtenböhmer, S., Schneider, C., Yetano Roche, M., Höller, S. (2015): Re-Industrialisation and Low-Carbon Economy—Can They Go Together? Results from Stakeholder-Based Scenarios for Energy-Intensive Industries in the German State of North Rhine Westphalia, *Energies* 2015, 8, p11404-11429; doi:10.3390/en81011404
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- Schneider, C., Lechtenböhmer, S., Höller, S. (2014): Re-industrialisation and low carbon economy – can they go together? Results from transdisciplinary scenarios for energy intensive industries; ECEEE 2014 summer study 2014, p. 515-528

# Publications

## on energy intensive processing industries

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- Åhman M., Nilsson L.J., and Johansson B., (2016). Global climate policy and deep decarbonization of energy-intensive industries, in press Climate Policy
- Wesseling, J. Lechtenböhmer, S., Åhman M., Nilsson L.J., Worrell, E., Coenen, L. (2016): How to decarbonise energy-intensive processing industries? Survey and conceptualisation of their specific innovation systems, Paper ID# 4-088-16, eceee industrial summer study 2016
- Åhman M., Nilsson L J, (2015) Decarbonising industry in the EU - climate, trade and industrial policy strategies In: Dupont, C. and S. Oberthür (eds.), Decarbonisation in the EU: internal policies and external strategies, Basingstoke, Hampshire: Palgrave MacMillan
- Lechtenböhmer S, Nilsson L.J., Åhman M., Schneider C: (2015): Decarbonising the energy intensive basic materials industry through electrification – implications for future EU electricity demand, Proceedings of the 10th Conference on Sustainable Development of Energy, Water and Environment Systems, SDEWES2015.0694, 1-16 (2015)

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