The Potential of German Power Plant Engineering for Climate Protection

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The SET – industrial association of plant engineering and industrial services

headquarters in Düsseldorf
President:
Dipl.-Ing. Klaus-Dieter Rennert
Managing director Dr. Reinhard Maass

Berlin office since 2017

180 member companies in plant engineering
57 member companies in industrial services

Representing 500,000 employees and 60 bn. € annual turnover worldwide
Representing 150,000 employees and 25 bn. € annual turnover in Germany

Regional distribution of companies within the SET family
Plant engineering and Industrial services share more than you might expect:

- Problem-solving expertise for increasing productivity and efficiency
- Common clients
- Customer loyalty is crucial for success in a price-sensitive market environment
- Competitiveness through sustainable concepts
Point of departure: Global perspective
The Paris Agreement and national obligations

- Paris Agreement in 2015 at COP21; in action since 2016
- Keeping global temperature rise below 2° C
- Pursuing efforts to limit temperature rise by 1.5° C
- Signatory states commit themselves to national GHG-reduction paths
- IPCC report 2018 calls for immediate actions in order to achieve goals

Source: Time 2018
Point of departure: Global perspective
The Paris Agreement and implementing national obligations

- German obligation to reduce GHG-emissions laid down in Climate protection plan (Klimaschutzplan) in 2016 by BMU

- 2020 goal not achieved

- 2030 goal binding under international / European law

- Clear reduction paths in all energy sectors

Point of departure: National perspective

German THG-emissions in t CO2e from 1990 - 2017

Political Point of departure: National perspective

• Reductions in energy sector identified as low hanging fruits in national reduction strategy

• Passivity and wait-and-see attitude in other sectors

• Establishment of the Commission for Growth, Structural Change and Employment in June 2018

• Various objectives, nevertheless coal power phase out main objective

• Agitated political environment

• Race-to-the-bottom for phase-out dates

• Yet, questions like secured energy supply remain unsolved

(1) Source: Federal Ministry of Economy and Energy
Economic Point of departure: Global perspective

- German phase-out discussion must be understood in a broader international context
- Coal power has slowed down compared to some years ago
- Yet, even a mere fraction of operating power plants offer business opportunities for maintenance and retro-fits.

Source: Global Coal Tracker – Coal power worldwide in MW – July 2018
Economic Point of departure: Global perspective

- German power plant engineering has been suffering from lack of political support
- International competitors have filled the void
Economic Point of departure: European perspective

- Even in Europe perspectives vary from country to country
- Domestic market has been declining
- Yet, other European countries might offer opportunities for German power plant engineering and technologies for emission-reduction
What to do?
Coming to terms with four realities

- Thermal power remains backbone of energy supply
- Keeping know-how in Germany
- Plurality of energy transitions
- Creating Business cases

- Exporting superior PPE technologies
- Securing stable market conditions
- Increasing flexibility and optimization Of existing plants
- Bringing advanced technologies into business
1. Thermal power as backbone of the energy system

- Thermal PP-fleet secures domestic energy supply
- Yet, low-utilization ratio and ancillary costs challenge operational profitability and require more maintenance
- Thus, requirements are increasing: increasing flexibility and efficiency
  - New materials
  - Part-load level of efficiency
  - Increasing load gradients
  - Fuel switch
  - Conversion
- Discussion about energy security is gaining momentum again
- Relying on neighbouring European countries is risky

Source: BDEW 2018
2. Keeping know-how in Germany

- 7th energy research program offers some improvements for implementing and developing new technologies
  - TRL-Levels 1 – 9
  - Support for technologies from TRL 7 onwards (energy technologies for decarbonization)

- But what about the status quo?
  - Considerate deteriorations compared to predecessor program in scope and volume
  - Support for material research has vanished
  - Blanking out the international dimension of securing know-how

3. „Plurality of energy transitions“

- A national perspective is too narrow for a successful contribution to climate protection
- German Sonderweg may lead to carbon leakage
- Technological pragmatism is required
- Embedding German climate policy into a global approach
- Strengthening German PPE in export
- Acknowledging potential in GHG-reduction in different energy systems

Source: ibd.
Example CCS: German *Sonderweg* again?

- Other countries successfully implement technologies like CCS
- In any scenario CCS required to achieve measurable GHG-reductions
- Yet, debate about social acceptance counterproductive
- Time is running out – reduction technologies must be implemented soon
- Political support needed
4. Business cases

- Technologies waiting for the take-off and market entry
- Yet, high regulatory burdens
- Business cases not possible under uncertain profitability conditions
- Business cases even less possible under uncertain political conditions hostile to investment
- **Political support is needed**
- **A secure framework is demanded**
**What can we do? What do we do?**

**SET-platform for structural change**

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**Generating growth – with people:**

- Defining a realistic time frame,
- Shaping the transformation process in regions affected by phase-out; efficiency and sustainability are crucial

**Managing structural change – with technologies**

- **Developing Key technologies** for securing energy transition (Energiewende)
  - Digitizing power plants, process plants and grids,
  - CHP and combined cycle,
  - Power-to-X-technologies, sector coupling
- Converting conventional power plants for flexibility

**Securing employment – with companies and research institutes**

- Linking research institutes / projects to industrial clusters keeping today’s strengths in mind. Member companies offer numerous possibilities.
And in a nutshell?

- Political support is needed
- Secure framework is demanded
- Clear energy research policy priorities are required
- Otherwise, we will be giving away valuable and significant potential for CO2-reduction and thus climate protection
Thank you for your attention

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