The VDI guideline series 4800
resource efficiency:
an approach for increasing resource efficiency with the aim of
conservation of natural resources in
the industrial sector

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Importance of the topic resource efficiency

• Resource efficiency = important objective in national and international environmental politics
• EU Commission has taken up the topic first in 2005; in 2011 with a flagship initiative under the Europe 2020 strategy
• The International Resource Panel of the United Nations Environment Programme (UNEP) worked in detail on topics like the use of water, land etc.
• In 2012 the German government adopted the German Resource Efficiency Programme (ProgRess)

Source: BMUB (2015)
• VDI is Europe’s biggest science and technology association, with more than 154,000 members

• In 2009, VDI decided to embrace resource efficiency as a cross-sectional topic; the objective = close terminological and definitional gaps by streamlining both the terminology and the basic methods of calculating and evaluating the resource efficiency of products, processes, services and companies

• In 2011, the Association of German Engineers (VDI) started working on a set of guidelines towards increased resource efficiency

• The draft version of the VDI 4800 Blatt 1 standard was released in July 2014
  https://www.vdi.de/technik/artikel/ressourceneffizienz-messbar-machen-7/
  http://www.vdi.eu/nc/guidelines/entwurf_vdi_4800_blatt_1-
  ressourceneffizienz_methodische_grundlagen_prinzipien_und_strategien/
### Methodical principles

**VDI 4800 Part 1 Resource Efficiency – Methodical Principles and Strategies**
Objectives, assessment framework, strategies for implementing resource efficiency measures

**VDI 4800 Part 2 Resource Efficiency – Assessment of Raw Materials Demand**
Cumulative Raw materials demand
Raw materials criticality
- Supply risk
- Vulnerability

**VDI 4800 Part 3 Resource Efficiency – Indicators for the Evaluation of Environmental Impact**
Ecological criteria

**VDI 4600 Cumulative Energy Demand**
Terms and calculation models
Examples (Part 1)

### Application

**VDI 4801 Resource Efficiency in Small and Medium-Sized Enterprises (SMEs)**
Strategies and procedures towards the efficient use of natural resources

Source: VDI 4800 Blatt 1 (in process, greenprint 24.06.2014)
The application of this standard helps to protect **natural resources**, especially:

- to reduce the use of raw materials,
- to reduce the use of land and
- to avoid their degradation,
- to reduce environmental pollution and thus
- to preserve the livelihoods of present and future generations

Source: VDI 4800 Blatt 1 (in process, greenprint 24.06.2014), pictures: https://pixabay.com
The Standard offers:

- a methodology for evaluating resource efficiency of products and product service systems
- assistance and recommendation to methodological decisions and rules
- strategies and measures to increase resource efficiency and to enable industry and service providers to identify potentials for improvements

- Optimising resource use is possible at all stages of a product life cycle chain and in the production system
The life cycle concept

Source: VDI 4800 Blatt 1 (in process, greenprint 24.06.2014)
Implementation for products and processes

Product Development process chain

- Task
  - Clarifying the task
  - Conceptual design
  - Embodyment design
  - Detailed design

Influencing processes

- Raw material production
- Product manufacturing
- Use or consumption
- Recycling/disposal

Product Life Cycle process chain

Source: adapted from Abele et al., 2005
The definition of Resource Efficiency

Resource Efficiency = \frac{\text{Benefit}}{\text{Effort}}

Product Function
Function unit

Benefit

Natural resources
Raw materials
Energy resources
Water
Surface/Soil
Air
Ecosystem service

Source: VDI 4800 Blatt 1 (in process, greenprint 24.06.2014)
• The VDI 4800 standard series represent the first published guideline set for companies and consultants to calculate, assess, evaluate and optimise the resource efficiency of processes, companies and products throughout their life cycles.

• Supplementary evaluations during the standard’s implementation will be needed to predict an absolute reduction in resource exploitation and consumption.

- Which relevance do such guidelines have?
- How is the acceptance of such guidelines?
- Do they have the potential to be adapted across Europe and beyond?
- How they may contribute to international regulations and standards?
Thanks for your Attention!

For further Questions, please contact:

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Sources Slide 2:

Sources Slide 3-9: