



# Validation of Carbon Footprints DF34 - Lausanne

DFGE • Institute for Energy - Ecology - Economy  
Kreitstr. 5 • 86926 Greifenberg  
Tel.: 08192 / 99 7 33 - 20  
Fax: 08192 / 99 7 33 - 29  
[www.dfge.de](http://www.dfge.de)



# Content

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- Scientific Background
- Carbon Footprinting
- Methodology
- Normative Basics



**Energy & Emissions**



**Technology Assessment**

**CO2-Account Analysis  
CO2-Inventory Analysis**

**Life Cycle Analysis**

**Consulting/Training**

**Strategy Consulting**



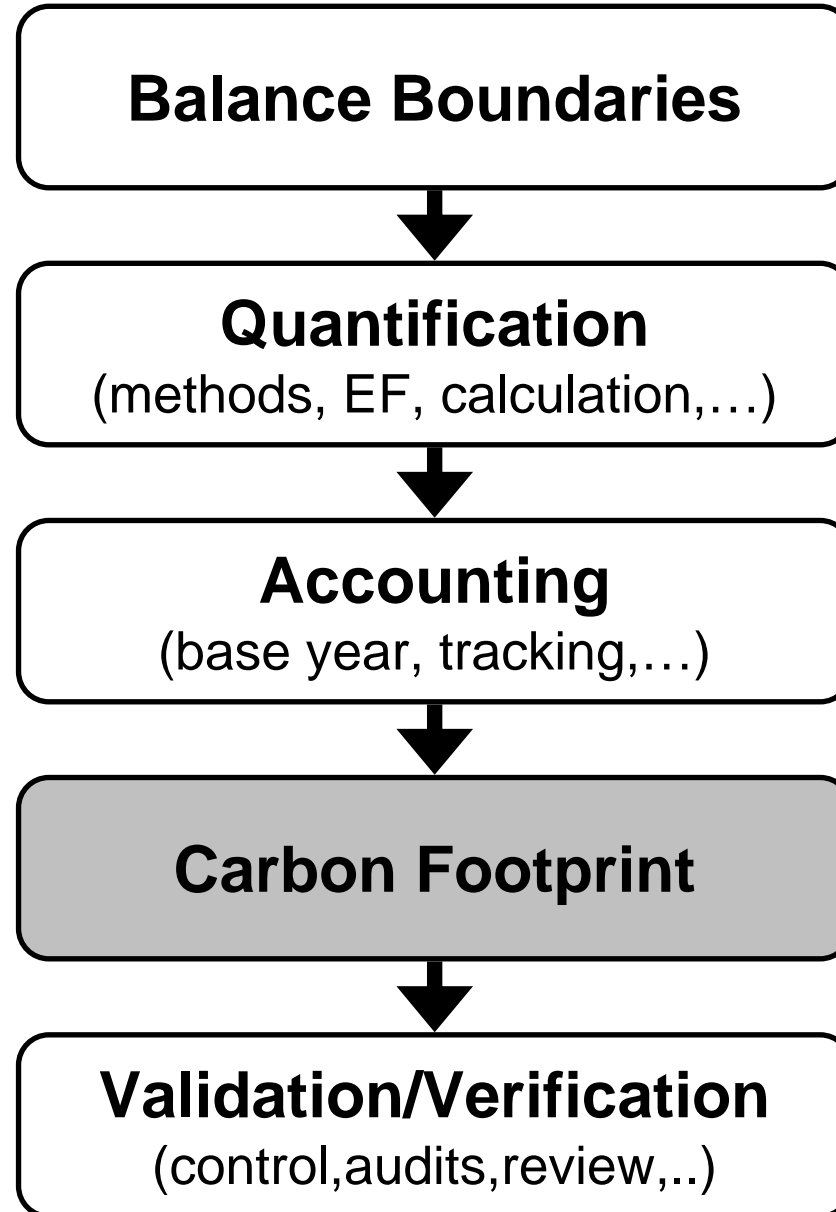
# 14 Years of Experience

- 2007**
- Forum „Voluntary Climate Protection“***
- With University of Appl. Sciences in Munich, several student research projects
- 2005**
- Conference „Value of the mobility“***
- With the Association of German Engineers (VDI) and University of Applied Sciences in Munich (ISSN 1863-0553),
  - Competence Center „Energy and Emissions“
- 2002**
- The sixth framework program of the European Union***
- 2000**
- ACCEPT: Ammonia Cracking for Clean Electric Power Technology***
- German ‚Verbundforschungsvorhaben‘***
- Life cycle analysis of different fibre reinforced materials in manufacture, usage and recycling (together with TU München, TU Braunschweig, Audi)
- 1999**
- Application and enhancement for evaluation***
- Holistic comparison of different energy storage systems and their application in the electric grid
  - Hydrogen infrastructure and –logistics, biogenous fuels
  - Ecological assessment of natural fibre reinforced components and thermoplastics for automotive parts (ISSN 0170-7299)
  - Primary energetic improvement of a self-sufficient hybrid car (ISBN 3-933283-16-7)
- 1997**
- Methodically basic principles for balancing of ecological data***
- Comparison of balancing methodologies
  - The Energy Cycle of Automotive Plastics (consultancy for European Commission)
  - Energetic optimized service life of energy-consuming products (DFG-Forschungsvorhaben)
- 1993**
- First studies for car industry***
- CED of BMW E1, Energy-/Emission Balance for automotive lightweight construction (Audi, BMW)



## Key Steps

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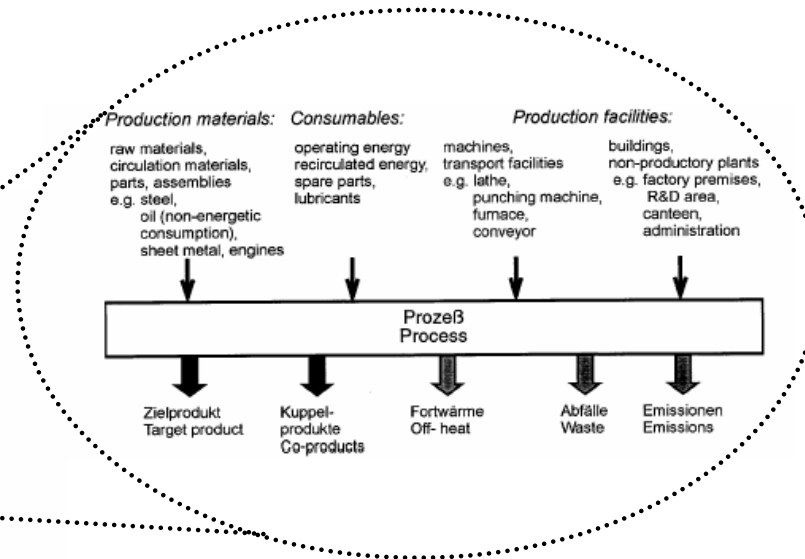
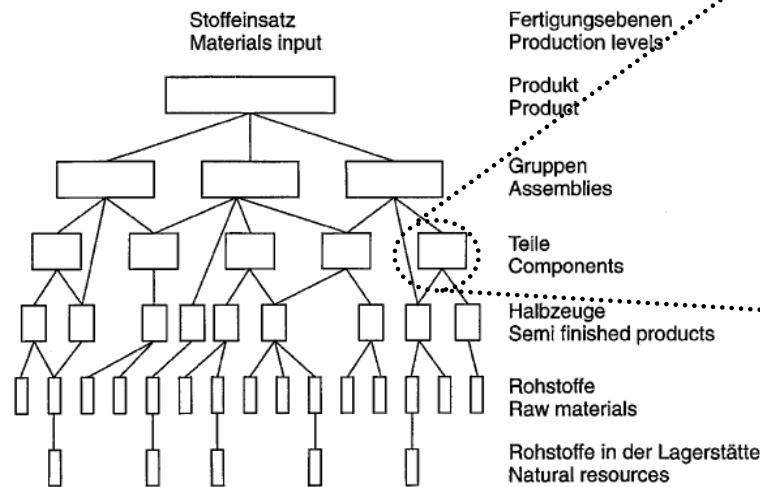




# Energy-/Emission Balance for Products and Services

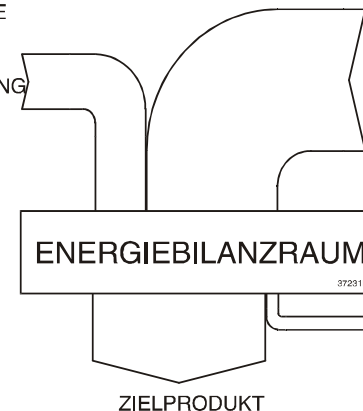
## Combined System Analysis

- Process Chain Analysis
- Input-Output Analysis



## Cumulative Energy Demand and Efficiency Indicators

NICHT-REGENERATIVE ENERGIE:  
ENERGIETRÄGER  
ANLAGENHERSTELLUNG  
FERTIGUNGS- UND  
BETRIEBSSTOFFE,  
ENTSORGUNG VON  
RESTSTOFFEN



$$KEA = KRA + KNRA$$

$$b = \frac{H_u}{KEA}$$

$$EF = \frac{H_u}{KNRA}$$



## Process (according ISO 14064)

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- Agreement
  - Assurance
  - Objectives
  - Criteria
  - Scope
- Development approach
- Assessment of systems and information
- Assessment against criteria
- Evaluation of assertion(s)
- Issuance of statement



# Implementation in your Company

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- Energy Consumption
  - Invoices, Balance Sheet
- Traffic & Logistic
  - Business Trip
  - Transport of goods
- Supply of Energy and Material
- Emission Factors
  - Survey with Univ. Appl. Sciences Munich
- Allocation
  - Administration

**→ Balance Boundaries**  
**→ Traceability**  
**→ Accuracy**  
**→ Conservative ass.**





# Normative Basics (I)

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- IPCC
- UNFCC/UNEP
- KYOTO Protocol
- International and National Laws & Regulations
- Institutions
  - WRI
  - GRI
  - DEFRA



## Normative Basics (II)

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- DIN EN ISO 14001 – Environmental Management Systems - Requirements
- DIN EN ISO 14004 – Environmental Management Systems – General Guidelines
- DIN EN ISO 14040 – Life Cycle Assessment (LCA)
- DIN EN ISO 14041 – LCA – Goal and Scope Definition
- DIN EN ISO 14031 – Environmental Performance Evaluation
- DIN EN ISO 14064 - Greenhouse gases
- VDI 4050 – Operational Indices for Environmental Management
- VDI 4600 – Cumulated Energy Demand



# Facts instead of Sentiments!

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## Contact

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Dr.-Ing. Thomas Fleissner  
E-Mail: [fleissner@dfge.de](mailto:fleissner@dfge.de)

Dipl.-Ing. (FH) Wolfgang Berger  
E-Mail: [berger@dfge.de](mailto:berger@dfge.de)

DFG-Energy  
Institute for Energy – Ecology - Economy  
Kreitstr. 5  
86926 Greifenberg  
Tel. +49 (0)8192 / 99 7 33 - 20  
Fax. +49 (0)8192 / 99 7 33 - 29  
[www.dfge.de](http://www.dfge.de)