

# The Prospects of Product Carbon Footprints in ERP Systems

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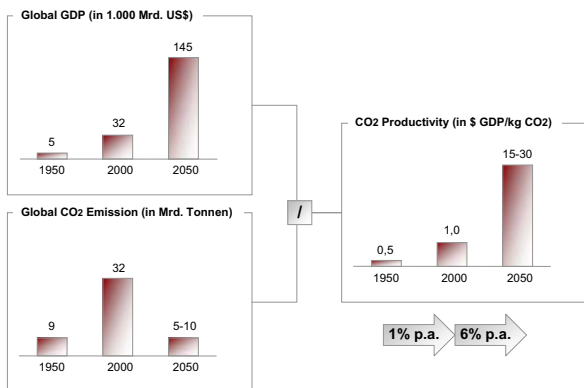


## Agenda

- Motivation
- State of Research
- Current Projects
- Outlook and Open Problems

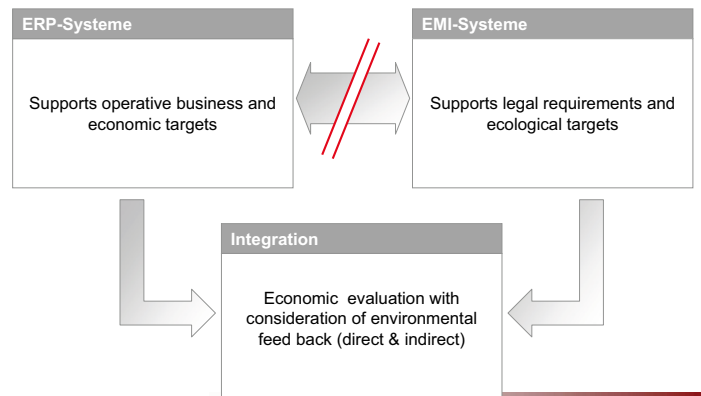


## Example: CO<sub>2</sub>-Productivity

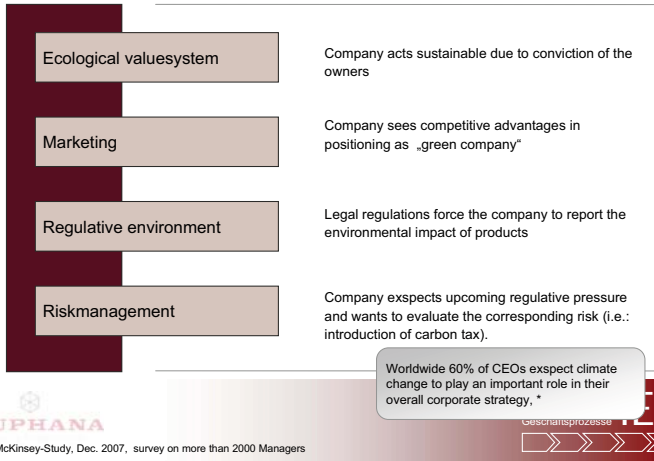


Quelle: Global Insight, IPCC, WRI, McKinsey


## Integration ERP und BUIS



## Relevance of ecological targets in ERP-Systems



## Carbon Footprint

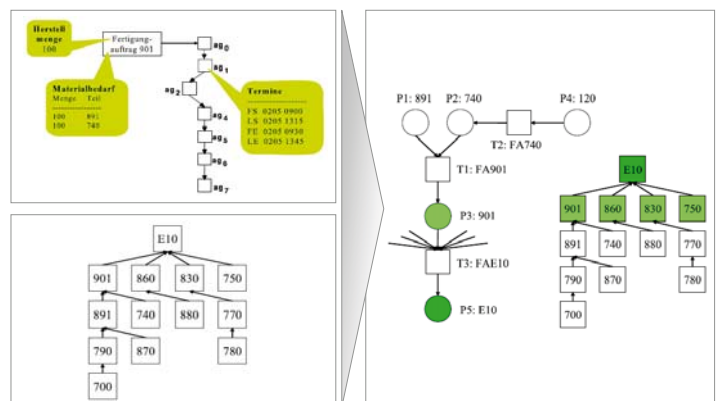
definition and goals	history	remarks
<ul style="list-style-type: none"> <li>Methodological approach to evaluate climate impact of products</li> <li>Volume of GHG-equivalent-emissions during the lifecycle of a product (cradle to grave)</li> <li>Compliance with ISO 14040 etc. announced</li> <li>Based on hybrid LCA</li> <li>Unit: kg</li> <li>Base of several product label projects (carbon trust, thema1)</li> </ul>	<ul style="list-style-type: none"> <li>Term „carbon footprint“ was introduced to scientific journals in 2006</li> <li>Standardization projects in UK, Germany</li> <li>Controvers discussion in LCA-community.</li> </ul> 	<ul style="list-style-type: none"> <li>Easy to communicate, sexy</li> <li>scalar value</li> <li>Covers only one single aspect of the environmental impact of a product.</li> </ul>



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## Integration of EMIS and PPS-Systems



## Completed projects with focus on ERP-Integration

### ECO Integral

- Development of a referencemodel for environmental management as part of ERP-Systems
- detailed modelling of data and processes
- Referencemodel was created as blueprint for software vendors

### OPUS

- Concepts for integrating environmental protection into order processing
- Concepts for new PPS-system, prototypical implementation on base of (small) ERP-vendor

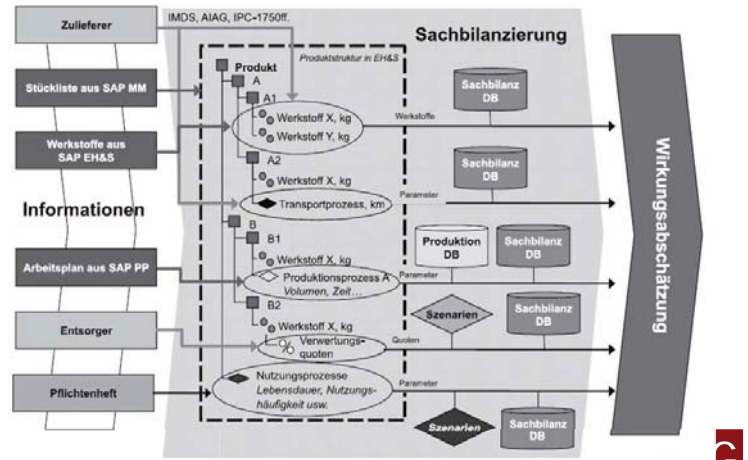
### CARE

- Concept for extending economic controlling by ecological key data
- One subproject about ERP/EMIS-Integration
- Essential result: specification PAS 1025

### INTUS / Intebis

- Consideration of instruments for environmental controlling
- study of expected organizational barriers in corresponding implementation projects
- development of suitable process modell

## Project Ecolo. PLM (TU Darmstadt & TechniData)



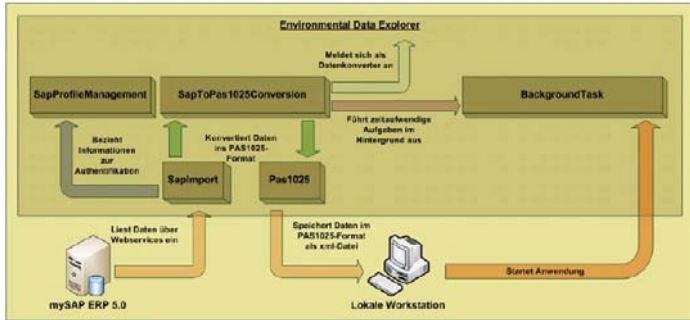
## Open problems (of mentioned projects)

- Bridging the semantic gap between ERP, EMIS and LCA-Databases is crucial for further automation**
- Data collection of substance data, transportation data and process data still causes large effort
- Material master data and substance master data in current projects are strongly connected, so environmental impacts of individual lots cannot be calculated
- Environmental impacts are used only in context of life cycle assessment, they are not used on strategical or operational level

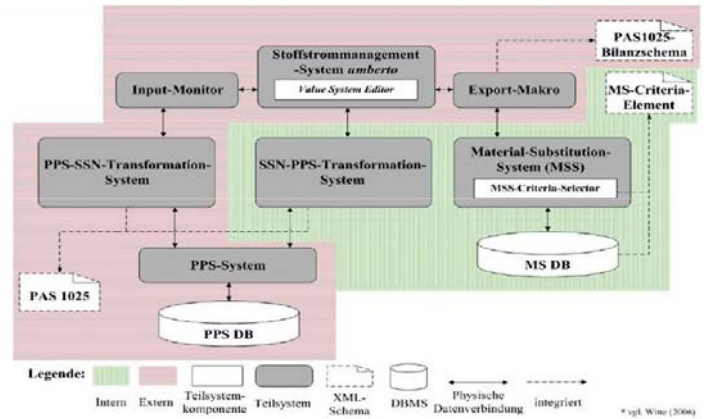
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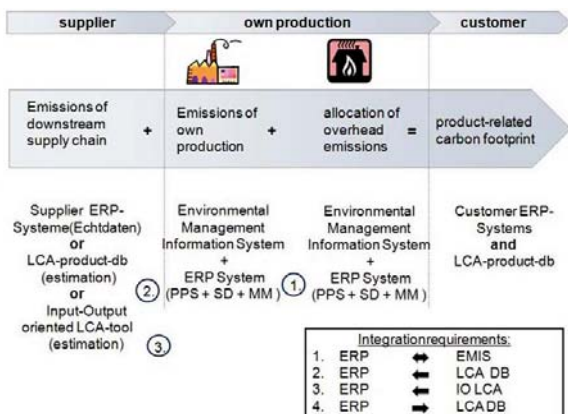
## Import von ERP in BUIS (Beispiel: SAP – Umberto)



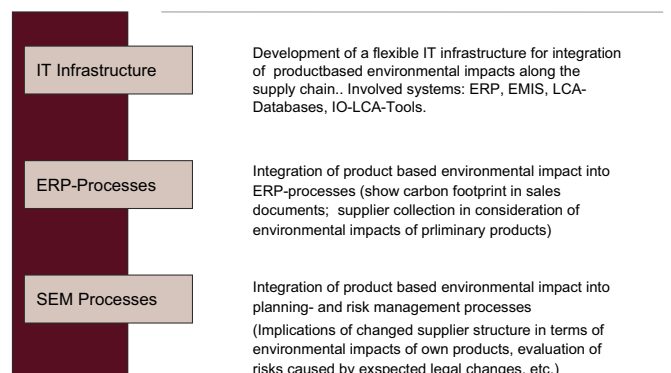
## Überführung von Stoffstromnetzen in PPS-Systeme



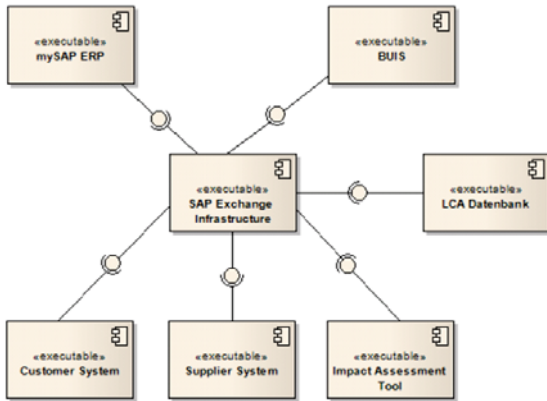
## Integration Requirements



## Research Objectives



## Systemarchitecture



## Current state

### Infrastructure

- Internal pilot study using carbon footprint (cradle to gate); implementation; implementation on base of SAP XI – in process
- Next step: development of prototype in cooperation with software vendors of ERP-systems, LCA-Tools and LCA productdatabases

### Integration of environmental impacts into ERP-Processes

- First concepts on base of case studies
- Next step: development of a prototype based on SAP XI and SAP ECC


### Integration of SEM-Processes

- First concepts (planning processes)
- Next step: Nächster Schritt: development of a prototype based on SAP XI and SAP ECC

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## Open Problems

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- How can we bridge the semantic gap between ERP system and Input Output based LCA Tool?
  - How can we bridge the semantic gap between ERP system and LCA databases?
  - How can we integrate environmental impacts into Enterprise Risk Management?