Promoting Material Flow Cost Accounting to Enable SMEs to Contribute to Sustainable Regional Development

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Agenda

• Motivation
• Regional facts & figures Baden-Württemberg
• Projects for regional development
  • bw!Sankey
  • bw!MFCA
• Material Flow Cost Accounting
• Concept Study MFCA in BW
  • Goal and Scope
  • Results
• Conclusion
Motivation

• Energy Efficiency
  • 20 associations
  • Agreed with German Federal Government
  • 500 energy efficiency networks [2]

• Material Efficiency
  • Environmental Innovation Program [6]

• Paris Agreement
  • BW commitment to GHG reduction

• Baden-Württemberg
  => Setting conditions for sustainable production
Facts and Figures Baden-Württemberg 2016 I

- Population 10.9 m
- GDP per capita 42 623 EUR
- Unemployment rate 3.1 %

- Per capita expenditures on research and development 193.4% (Germany 100%)

[1]

[Diagram showing sector distribution: Manufacturing 33%, Other industry 23%, Construction 5%, Trade, transportation and storage, accommodation, etc. 5%, Financial, insurance and real estate activities, professional service activities 23%, Public administration and other service activities, education and human health 18%, Agriculture, forestry and fishing 0%]
Facts and Figures Baden-Württemberg 2016 II

- First „green“ Minister President (Winfried Kretschmann) since 2011

- 2011 Foundation of Innovation and Technology Center (Umwelttechnik BW)

Forster environmental technology and Ressource Efficiency, Innovative SMES and technological excellence
Umwelttechnik BW

- Information
- Activities
- People
- Economy
- Science
- Politics

• Strategic project development
• Consulting
• Assistance for companies with main focus on SMEs

Offering

Events, national and international conferences, creation of working groups, operational support with funding programs
Projects for Sustainable Regional Development in Baden -Württemberg

The following projects were funded by the Federal State of Baden-Württemberg
Supporting SMEs I

Special software with free licenses for companies in Baden-Württemberg

**bw!Sankey**
- Depicting material, energy and value streams in the production

**bw!MFCA**
- Material Flow Cost Accounting According to ISO 14051

Trainings
Workshops
Assistance
Material Flow Cost Accounting (MFCA)

MFCA: Allocate all cost types also to losses

Disposal costs

Hidden costs

Material costs
Logistics costs
Production costs
Labour costs
Investment costs
Energy costs

........
Material Flow Cost Accounting (MFCA; ISO14051)

Material and Energy Flows

- Process 1: electricity: 2,063 kWh, raw material: 714 t, waste: 26 t
- Process 2: electricity: 2,662 kWh, waste: 76 t
- Process 3: electricity: 4,542 kWh, waste: 42 t, product: 570 t, waste: 144 t

Traditional Cost Accounting

- Process 1: electricity: 619 EUR, labor: 1,226 EUR, raw material: 8,288 EUR
- Process 3: electricity: 1,362 EUR, labor: 2,014 EUR, maintenance: 1,226 EUR, product: 17,301 EUR

MFCA


Finding the hidden costs of material losses
Example Metal Industry: Witzenmann

• Metal processing company in Pforzheim that started as a jewelry manufacturer

• Core competence: Managing Flexibility

• Witzenmann supplies customers from different industries with flexible metal components like metal hoses and bellows

• In 2013 Witzenmann had around 3 600 employees and sales of more than 500 million euros

Supporting SMEs II

• The aim is to develop a strategy for further fostering the use of Material Flow Cost Accounting (MFCA) to enable SMEs to benefit from using this method.

• Concept study for enhanced implementation of MFCA in Baden-Württemberg.

Evaluating the possibilities SMEs already have, how they are using them and which obstacles they meet. Different interview methods were used to receive information from producing SMEs in the region.
Aim: Further Enhancement of Software and Training Concept

(a) Questionnaire regarding Training

(b) Observation of Training

Aim: Overcoming Obstacles in Corporate Practice

(c) Expert Interviews

(d) Phone Interview of Enterprises

(e) Interview of Enterprises on-Site

Potential for Improvement

Obstacles

Measures

Concept aiming to foster widespread use of MFCA in Baden Württemberg
Mentioned obstacles

- Use too low and/or effort too high
- Lack of time
- Expertise is required
- Lack of support in the organizational structure
- Human factors
- No application available
- Problems with data collection
- Handling the software
- Applicability and complexity of the method
- Training success
Positive Preconditions for SMEs

• Management convinced of benefits from MFCA
• Time is allocated to MFCA work
• Required data is readily available
• Knowledge is built up and the aim is to make MFCA a continuous process
• Model of production processes available as basis
Suggested Measures

- Implementation and documentation of practical examples
- Operation and new content for the bw!MFCA software
- Initial workshop as a basis for decision making and starting point
- Supervision by external experts: hotline and project implementation
- Offer of target groups specific marketing material
- Starting points for further development of MFCA trainings

Frequency of nomination
## Cascade approach for action recommendations

<table>
<thead>
<tr>
<th>(potential) Users...</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>...Doesn’t know „MFCA“</td>
<td>Marketing material and results of showcases</td>
</tr>
<tr>
<td>...Know the concept „MFCA“</td>
<td>Methodical training, short documentation of the practical examples</td>
</tr>
<tr>
<td>...See MFCA as a chance and understand the concept</td>
<td>Software training, practical examples</td>
</tr>
<tr>
<td>...Wants invest time and money</td>
<td>Initial workshop, practical examples, hotline</td>
</tr>
<tr>
<td>...use bw!MFCA in company</td>
<td>Software development, sample models, hotline, project support</td>
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What can regional administration do?

➢ Promote practical examples through funding and strive for:

• Systematic documentation of practical examples
  • Transparent procedure
  • Increase benefit-to-expense ratio

• Practical examples of different industries
  • Anonymous but with real data
  • Known company but modified results

• Offering more support and funding for SMEs
  • MFCA-trainings
  • Online platform
  • Individualized in-house support
Conclusions

• Resource efficiency can contribute to sustainable development goals of regions.

• The efforts of Baden-Württemberg deliver results, but there are further potentials to accelerate this process.

• Companies see MFCA as a suitable tool, but are still meeting obstacles when implementing it.

• Extensive catalogue of measures was identified, referring to different areas of action, such as training, software, information material and support.

• The results are transferable to other regions that seek to improve resource efficiency of the local manufacturing trade.
Thanks for your attention!

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Source

• [6] https://www.umweltinnovationsprogramm.de/englisch