EFORWOOD
Sustainability Impact Assessment of the Forestry-Wood Chain

E F I

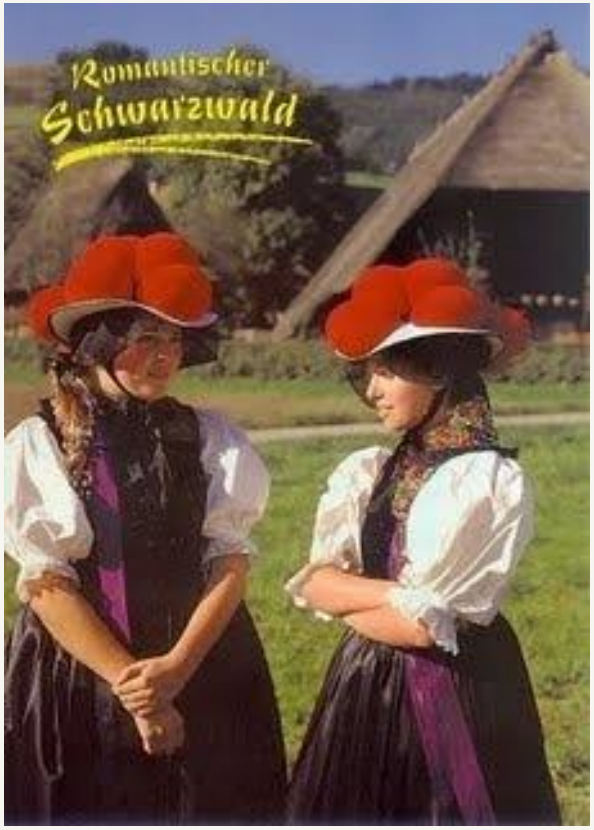
A Tool for Sustainability Impact Assessment (ToSIA) of forest-wood chains linked with a database of sustainability indicators collected within the EFORWOOD project

Marcus Lindner
T. Suominen, M. Savolainen, S. Zudin, D. Vötter,
W. Werhahn-Mees (EFI)
M. Roubalova, P. Kneblik, M. Cerny (IFER)
P. Verweij (Alterra)

EFORWOOD conference, 23-24 September 2009, Uppsala, Sweden

Introduction

- Once upon a time in the Black Forest,
  which is not always romantic ...



What kind of tool?

ToSIA is a tool to answer **WHAT IF? - questions**.

What if:

- new policies are introduced on energy / transport / recycling / habitat protection?
- wooden frames in houses are doubled?
- global market changes?
- oil price doubles?

ToSIA is a tool to answer **WHAT IF? - questions**.

What would happen if we stop managing all steep slopes in Baden-Württemberg?

Industrial activities and new policies are evaluated against their impact on Sustainable Development

What means Sustainable Development in our context?

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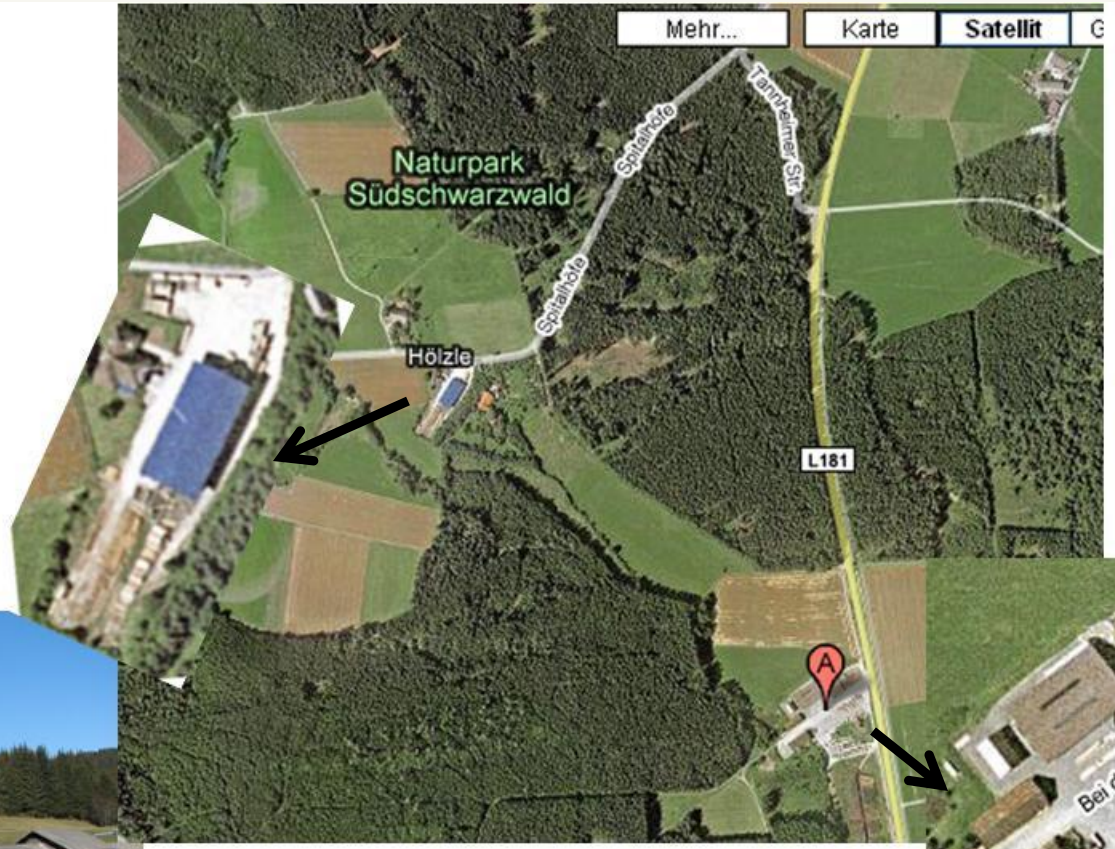
Environmentally friendly resource use

Fotos: Anne & Horst Helwig
www.helwig-naturfoto.de

What means Sustainable Development in our context?

Value added:

- Forest-based sector is important for the regional economy

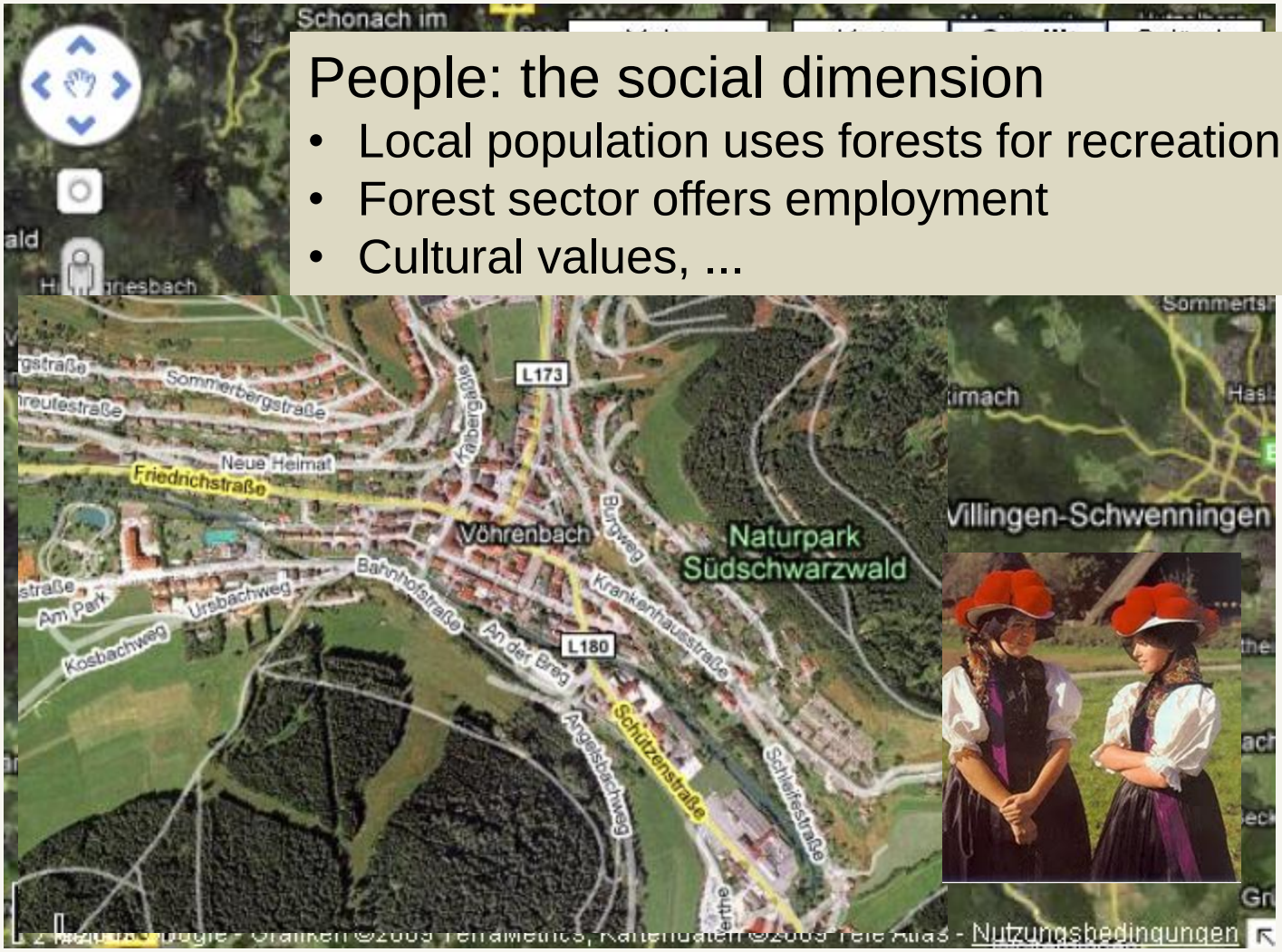


Sawmill Rombach, Black Forest
Foto: FVA-Baden-Württemberg
Department for Forest Utilisation

What means Sustainable Development in our context?

People: the social dimension

- Local population uses forests for recreation
- Forest sector offers employment
- Cultural values, ...



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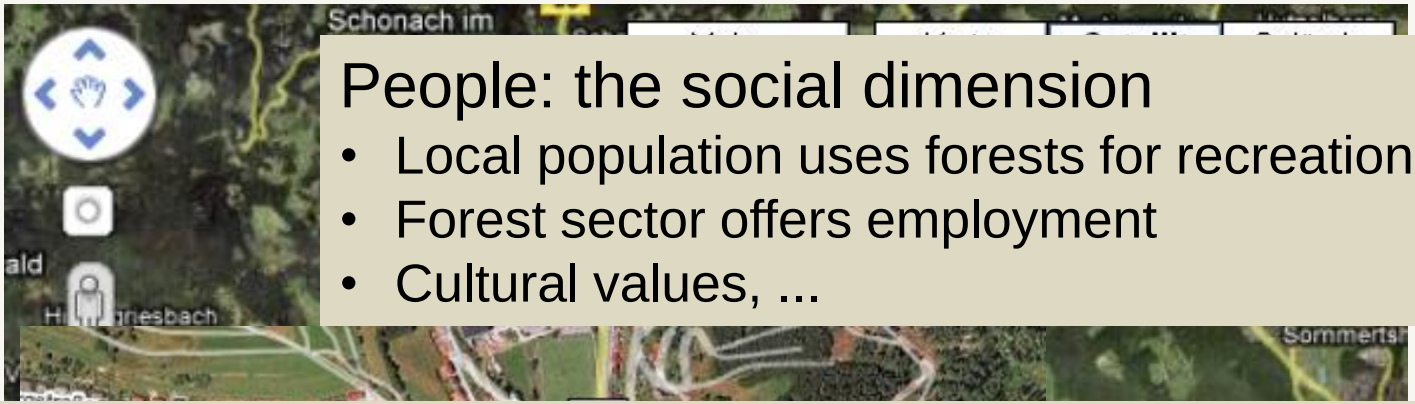


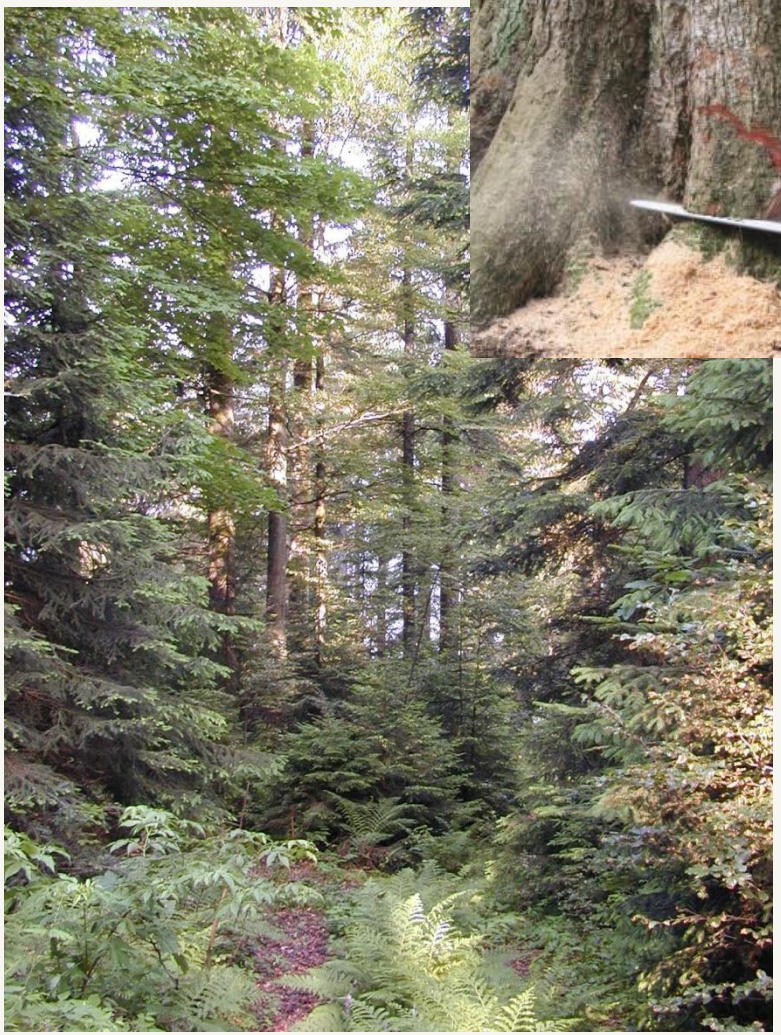
People: the social dimension

- Local population uses forests for recreation
- Forest sector offers employment
- Cultural values, ...

We want to avoid accidents as the one in the introduction.

But what are the consequences of changing the management in Baden-Württemberg on jobs and environment?

➢ ToSIA was designed to give answers to such questions!



Fotos: FVA Baden-Württemberg, Department of Forest Utilisation

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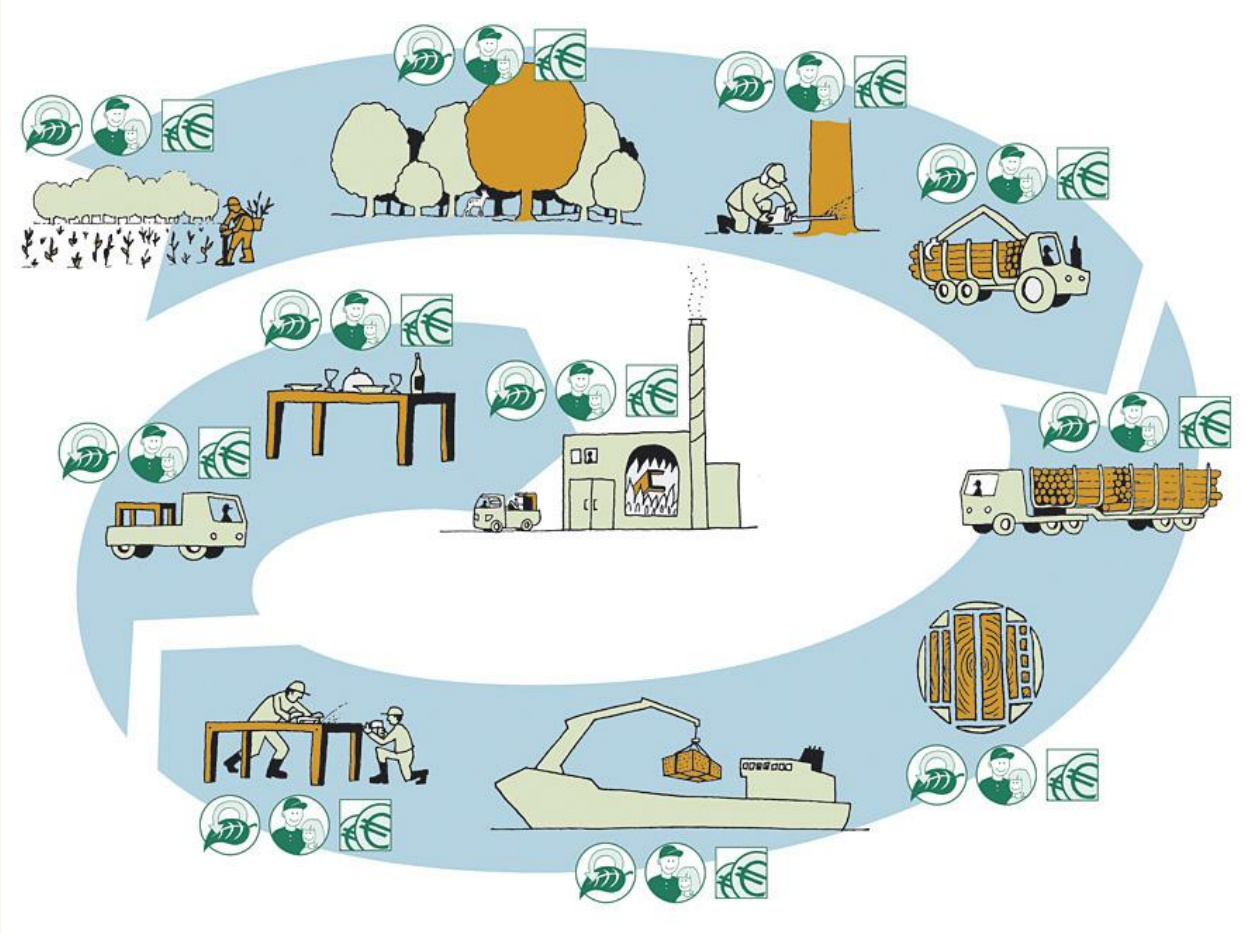
Sustainability Impact Assessment of the Forestry-Wood Chain

Fotos: FVA Baden-Württemberg, Department of Forest Utilisation

ToSIA approach to Sustainability Impact Assessment of Forest-Wood Chains



Forestry – Wood Chains

Indicators

- M2: Forest Resources Management — Processes
- M3: Forest to Industry Interactions — Processes
- M4: Processing manufacturing and Converting — Processes
- M5: Forest to Consumer Interactions — Processes

Forestry – wood chains

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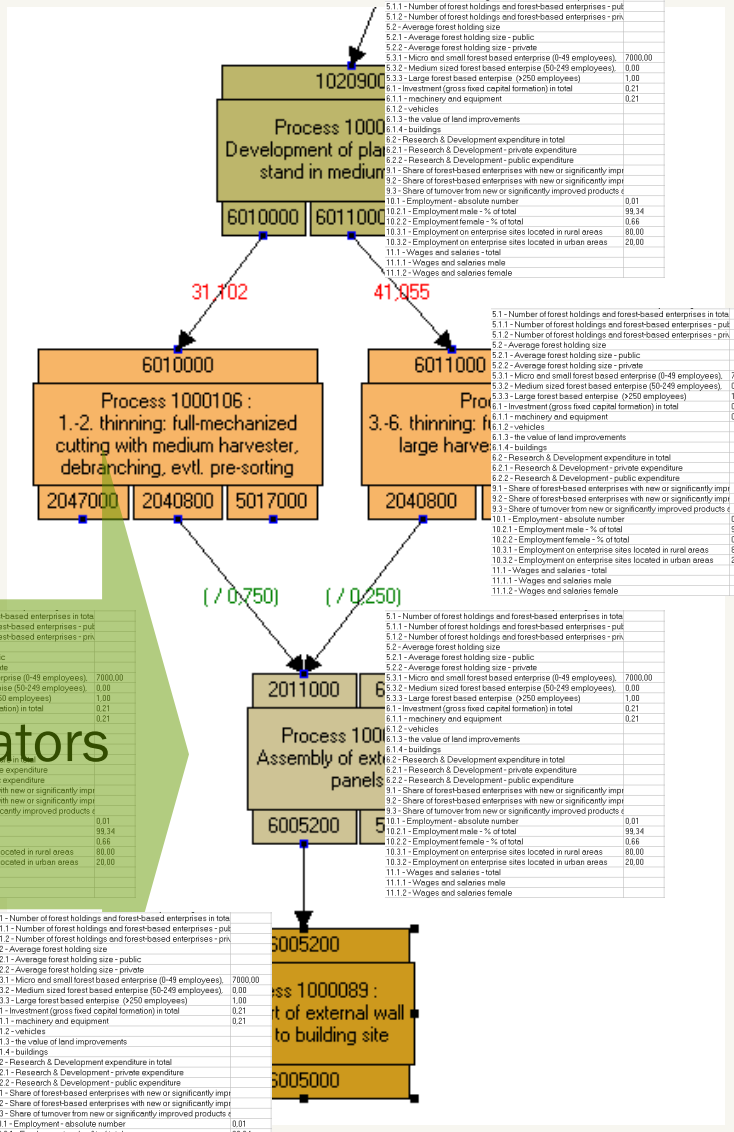
Sustainability Impact Assessment of the Forestry-Wood Chain

Forestry – Wood Chains



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Forestry – wood chains

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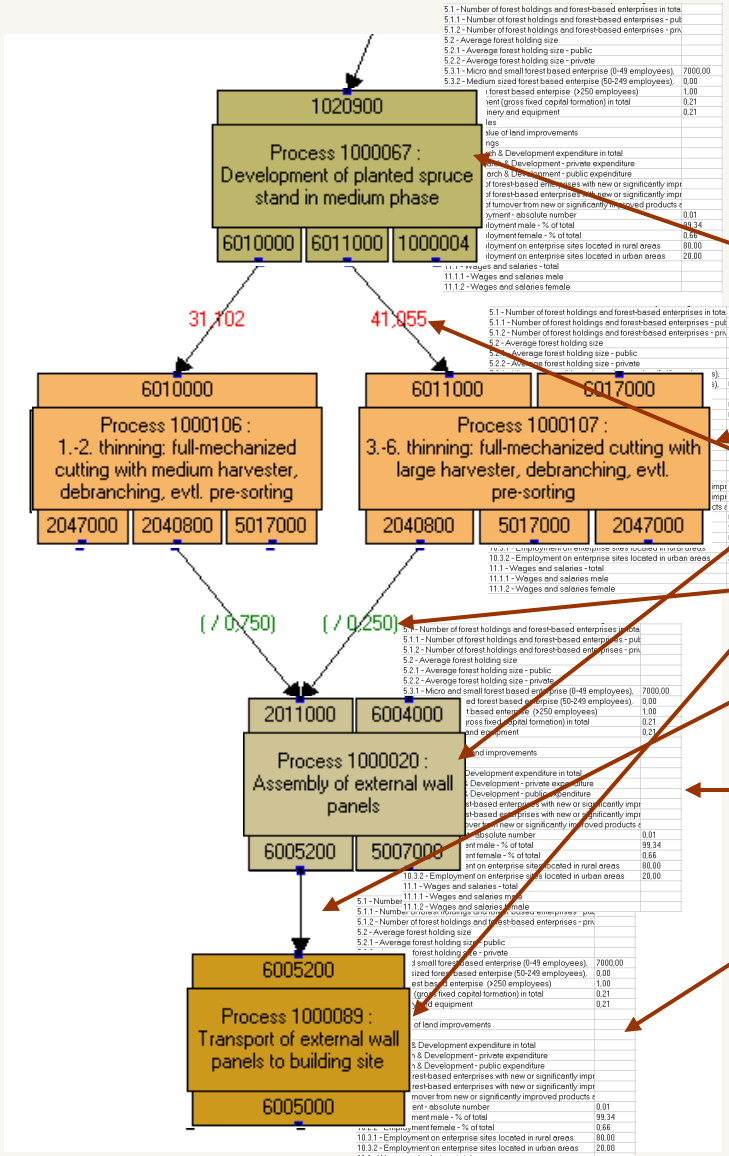
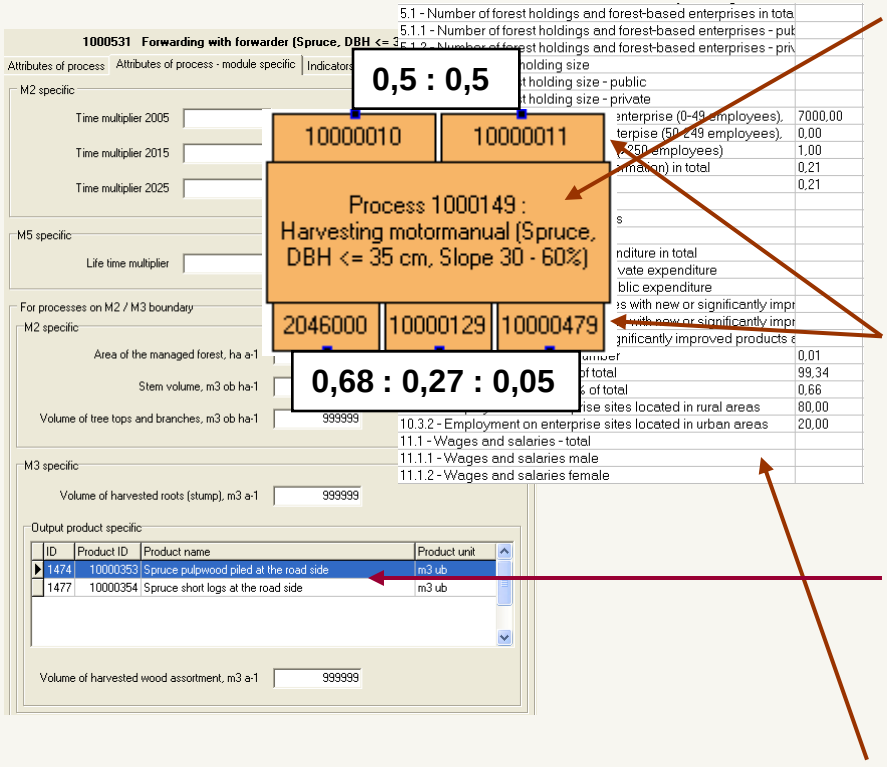
Main components of a FWC



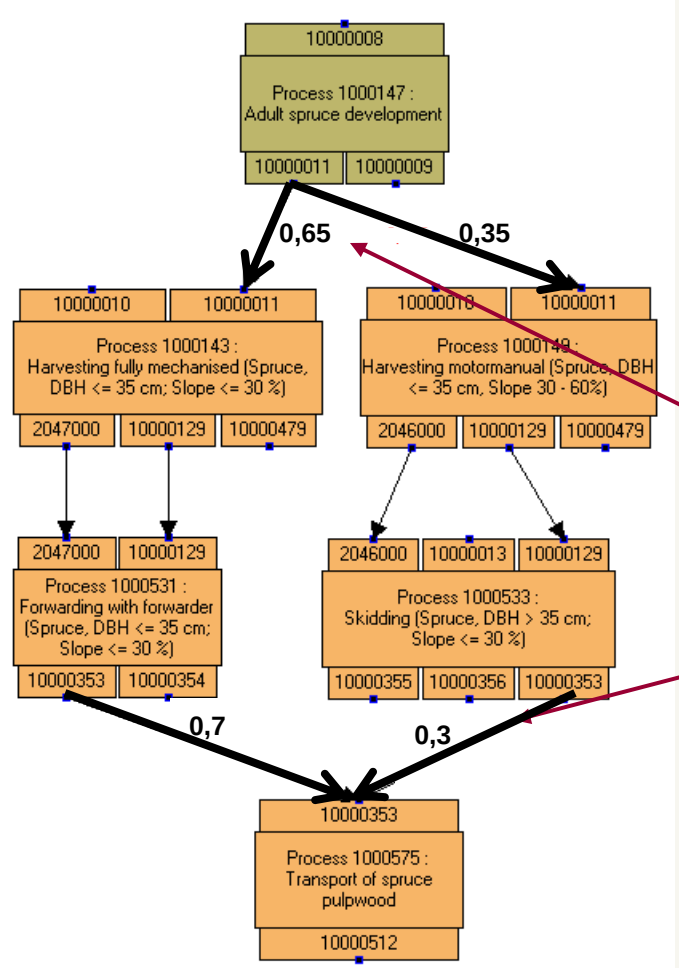
- Processes
- Topology / flow
- Indicators

Attributes of a process



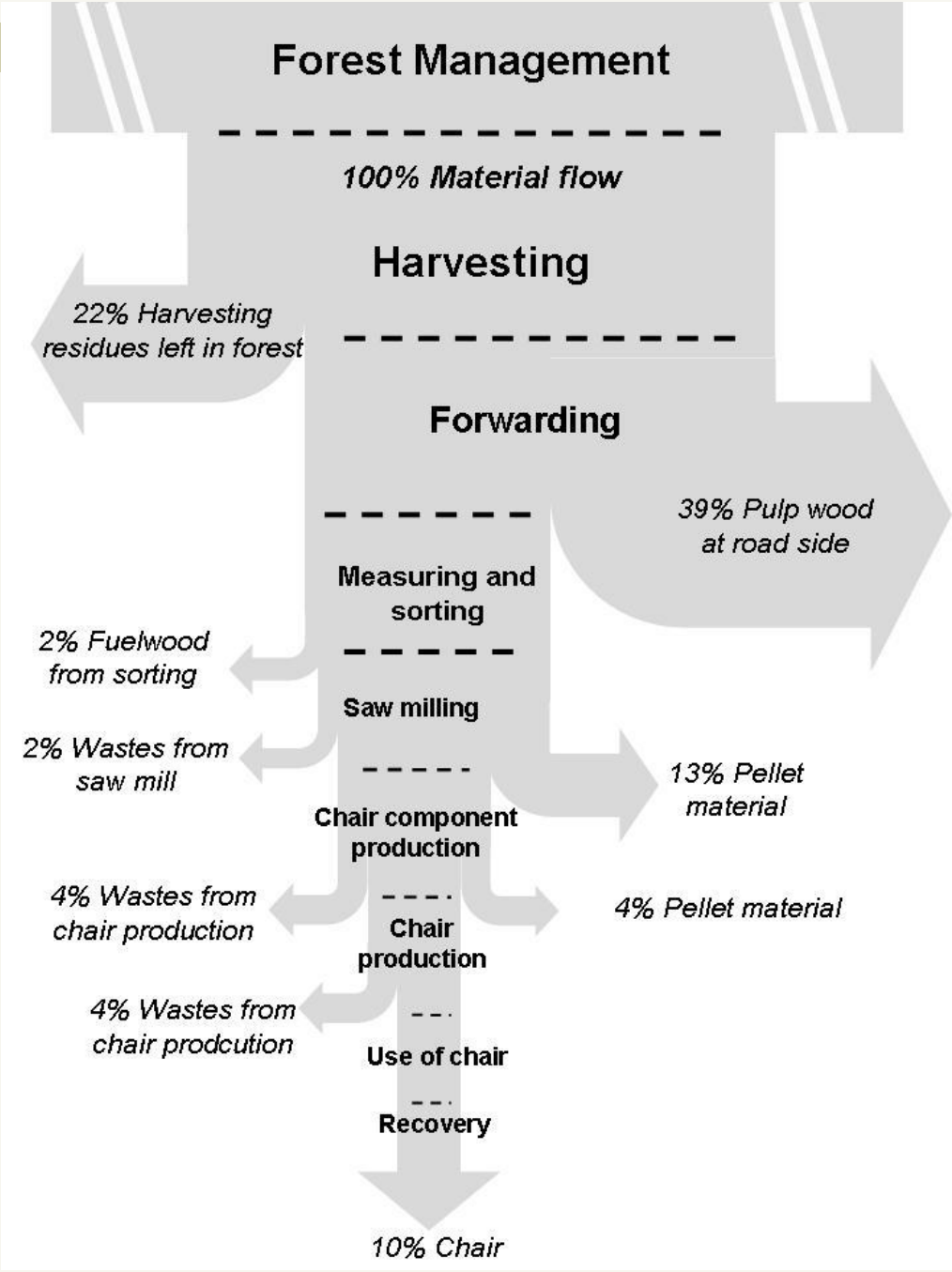
- Name, description, assumptions, geo-information, reporting unit
- Input / output products, shares, conversion factors
- Module specific attributes
- Indicators

Attributes of a topology

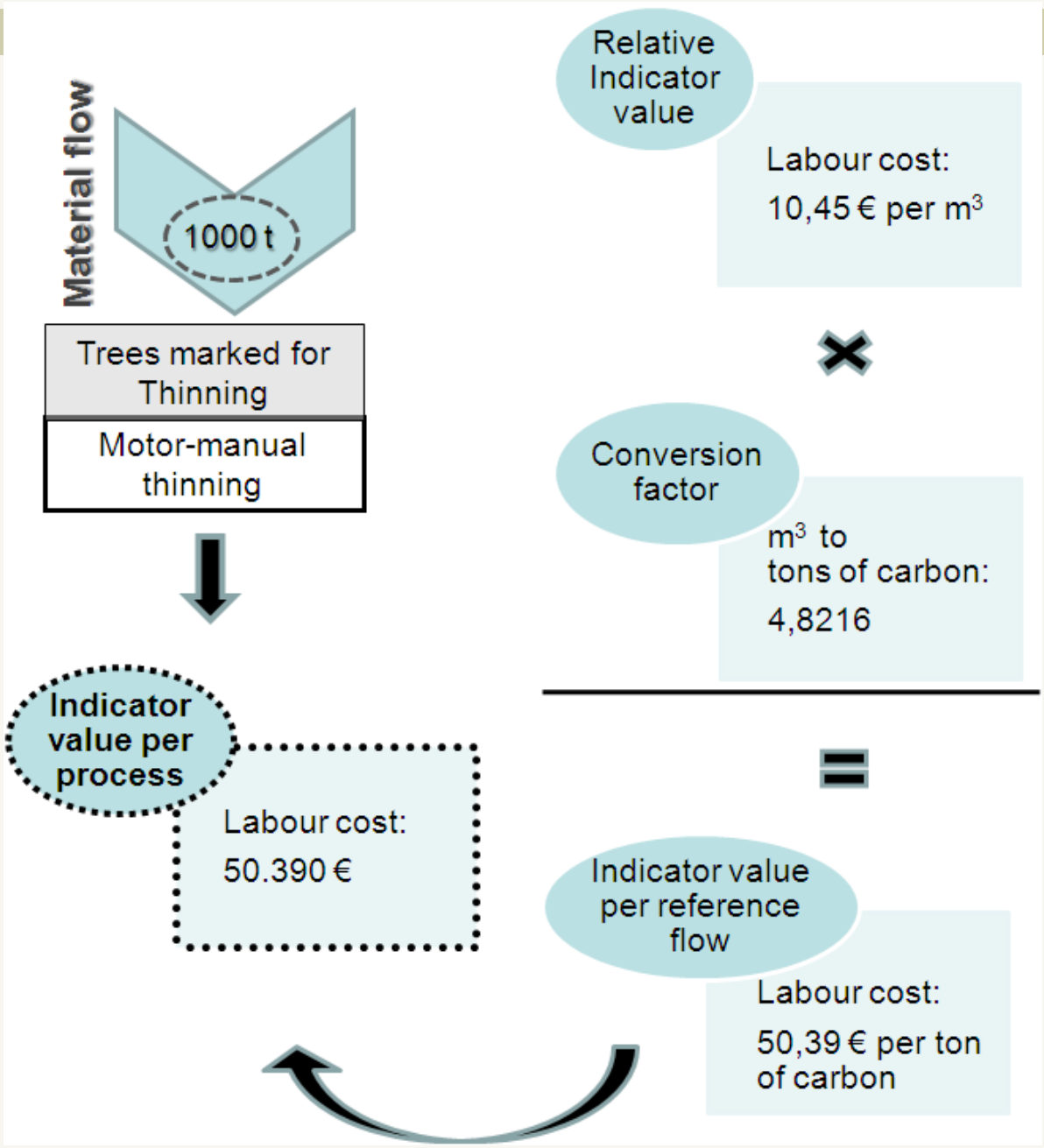


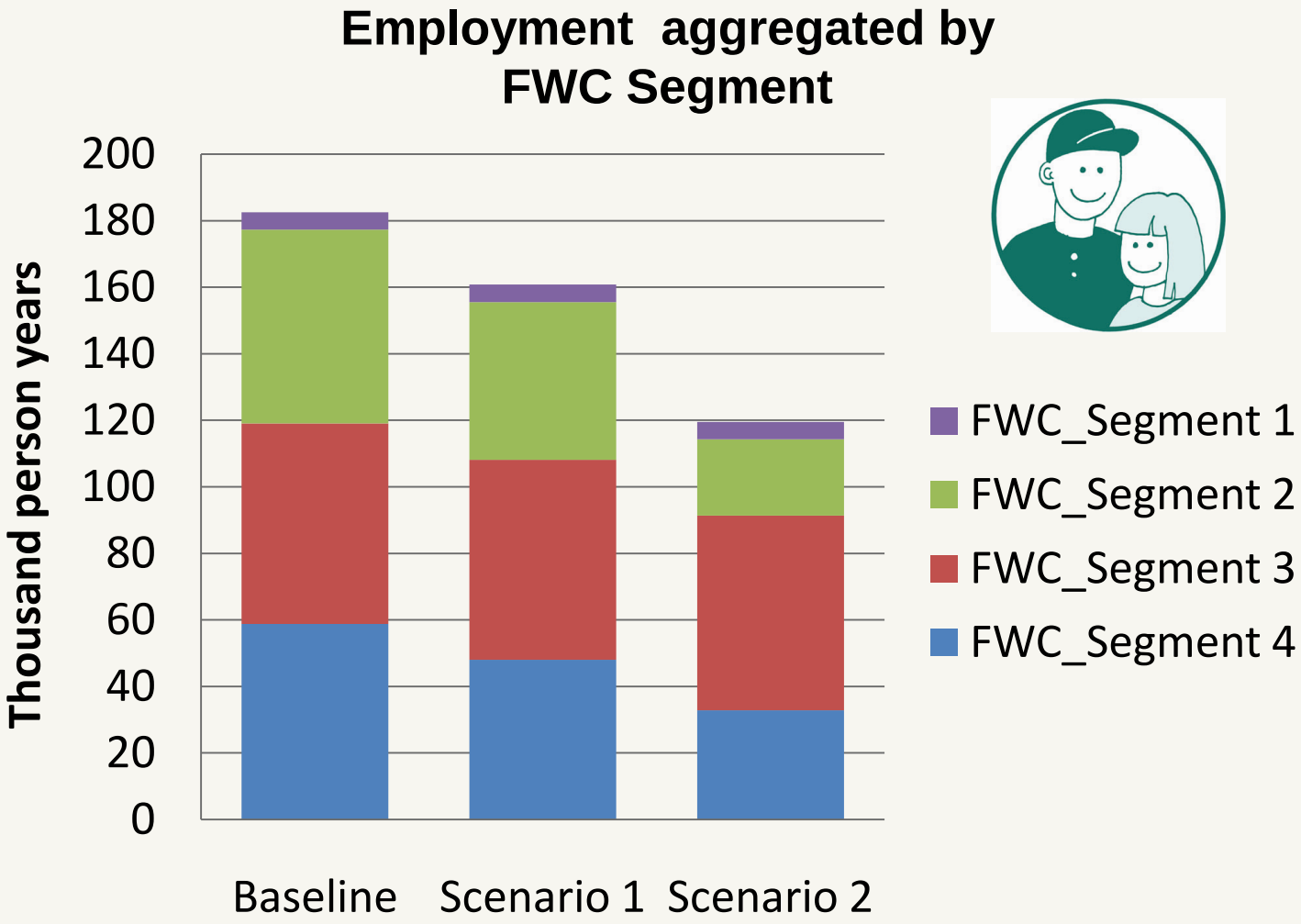
- Product split ratio
  - One to many
  - Many to one

All this information is used to calculate material flows along the FWC, ...



... to calculate sustainability indicator results ...



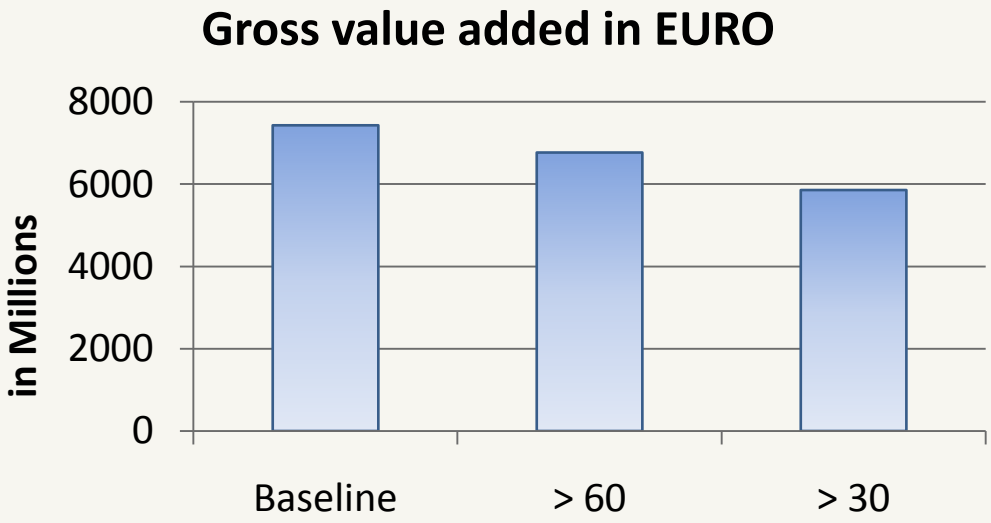


... and to aggregate indicator results along the FWC

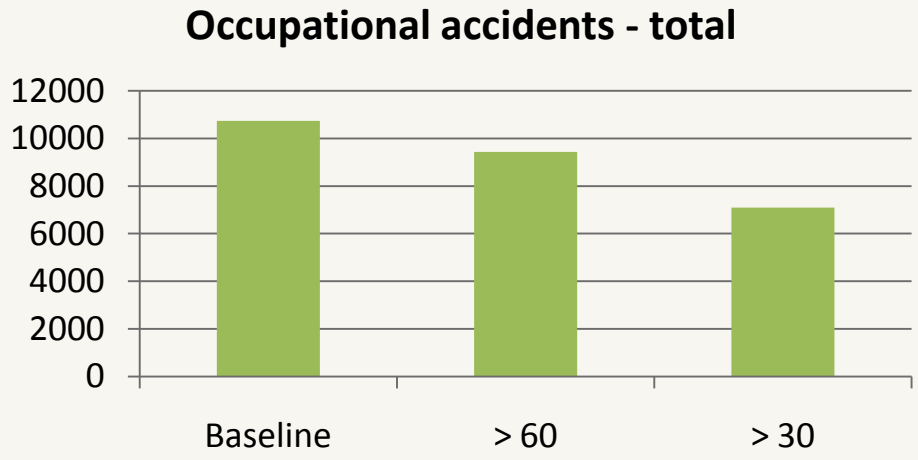
Selection of Sustainability Indicators

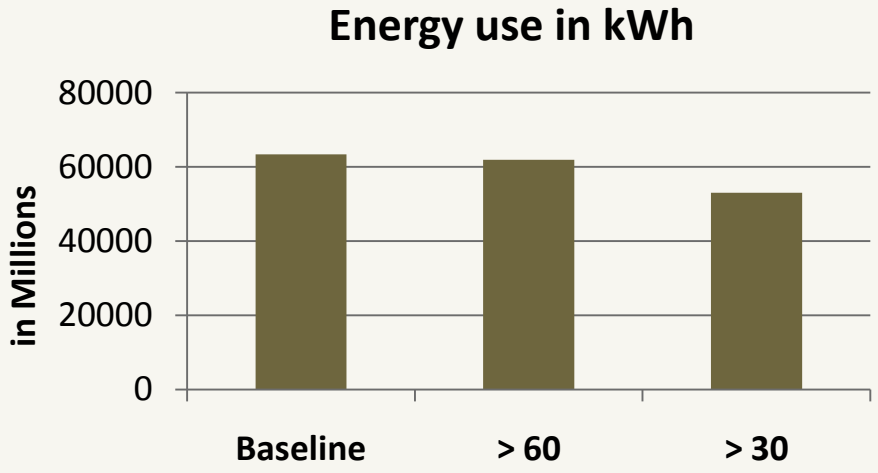
Economic	Environmental	Social
Gross value added	**Energy** generation and **use**	Employment
Production costs	GHG emissions & carbon stocks	Wages and salaries
Resource use	Transport distance and freight	**Occupational safety and health**
Total production	Biodiversity	
Productivity	Forest resources	

Results – absolute indicator values



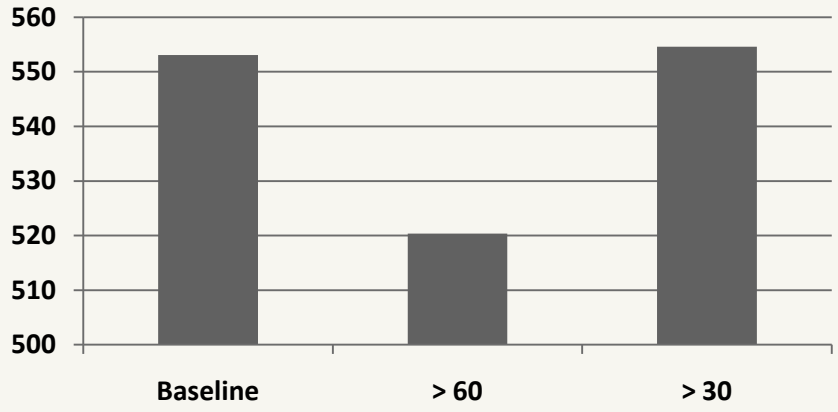
- Under the scenarios material flow decreases
- Absolute indicator values aggregated for the whole FWC decrease as well





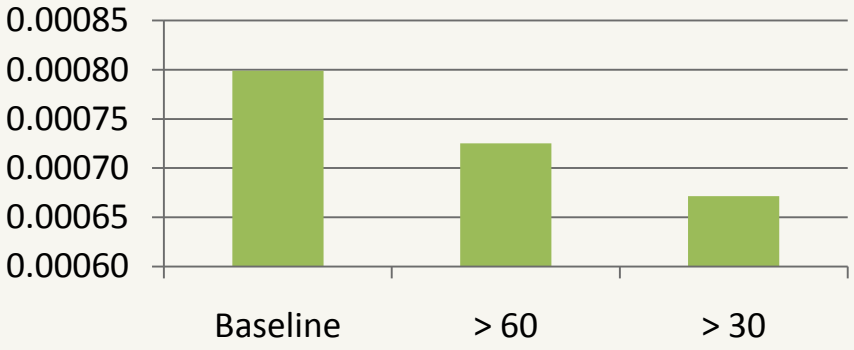
Results – relative indicator values

Gross value added in EURO- per m3 harvested

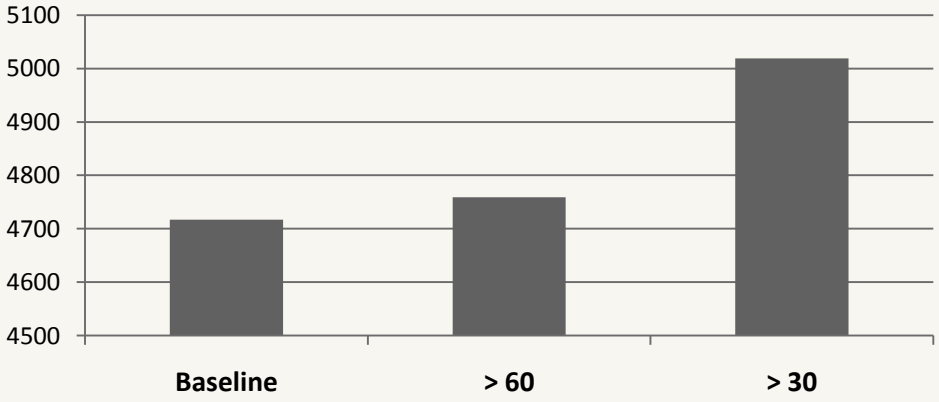


- Absolute indicator values relative to material flow
- Indicators behave differently in response to the set-aside scenarios

Occupational accidents - per m3 harvested



Energy use in kWh- per m3 harvested



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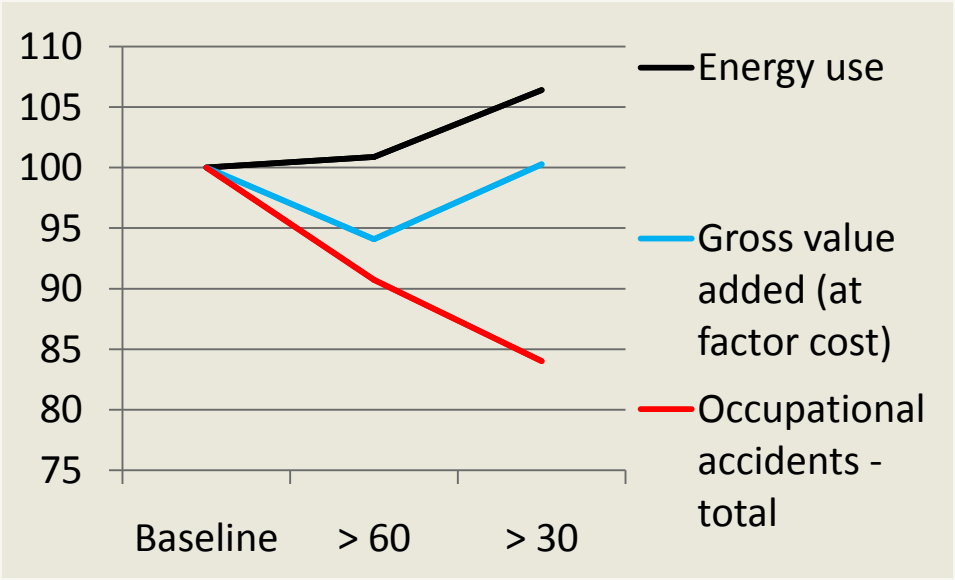
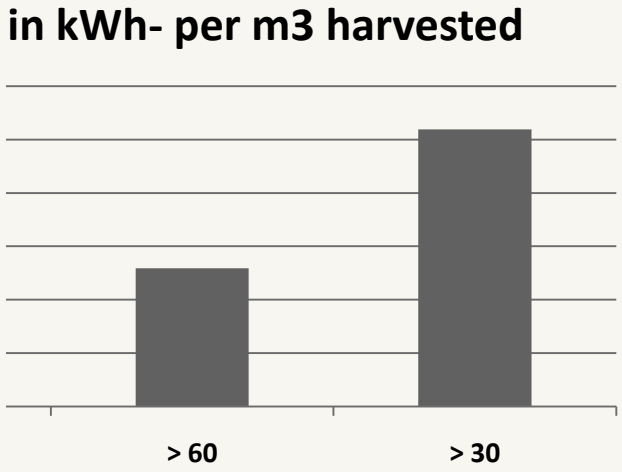
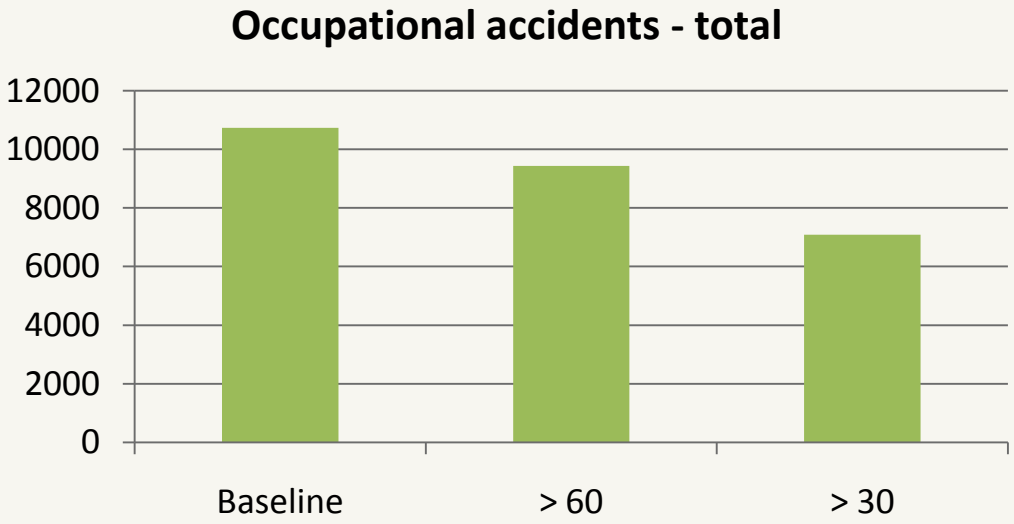
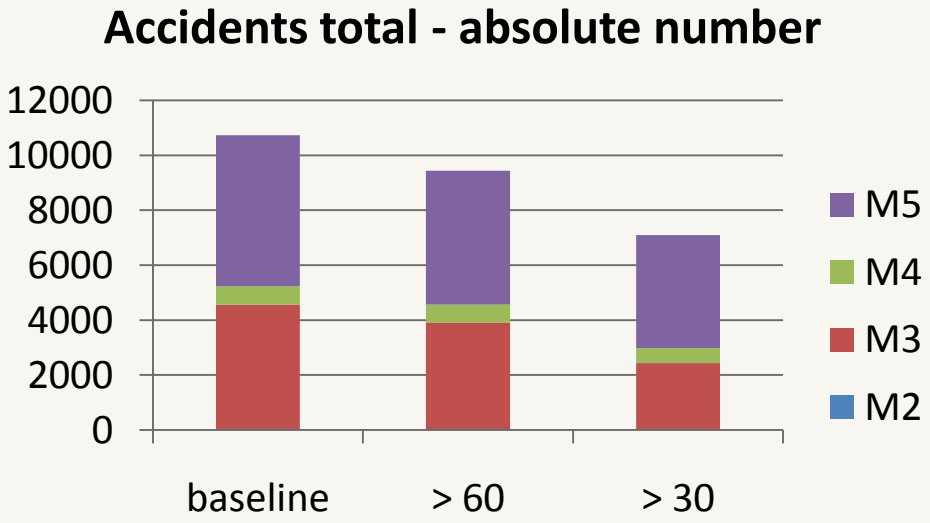
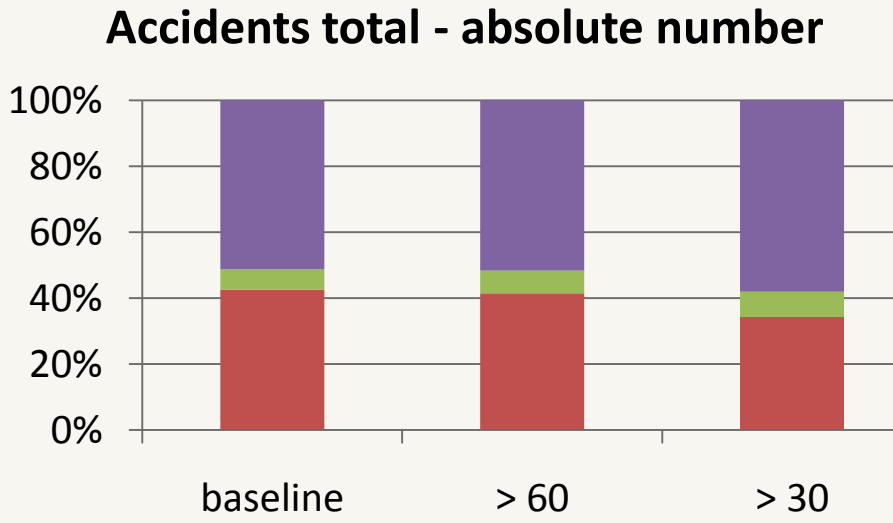




A closer look at accidents







Open questions

- Half of the accidents occur in the house construction
  - do we have realistic ”usage” of wooden houses in Baden-Württemberg (part of the production could be ”exported” to other parts of Germany)?
  - Estimating an accident rate for a process like this is extremely difficult
  - > such estimates need to be further verified!

Some comments on results interpretation

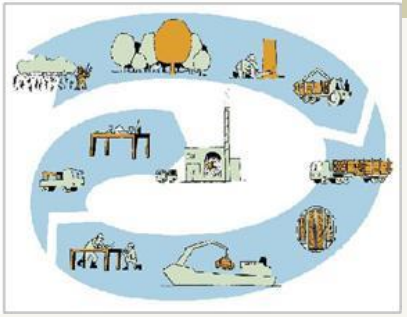
- In region-defined ToSIA applications, sustainability impacts from outside the region are neglected.
  - ➢ we only show material flows linked with import/export at the system boundary of the assessment
  - ➢ interpretation needs to consider that trade flows carry also a sustainability rucksack!

Interpretation of results

- No absolute answer to the question: Is this FWC sustainable?
- Comparing FWC alternatives shows **impacts** of external drivers **on sustainability**
- Are the trends in line with existing policies?
- Impacts may differ between indicators
- MCA/CBA evaluation modules are needed to rank FWC alternatives

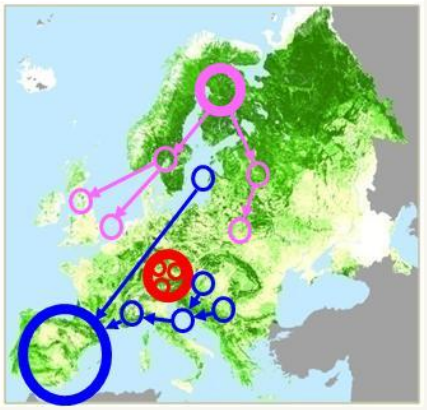
Reflections on EFORWOOD Data

(1) Single FWCs

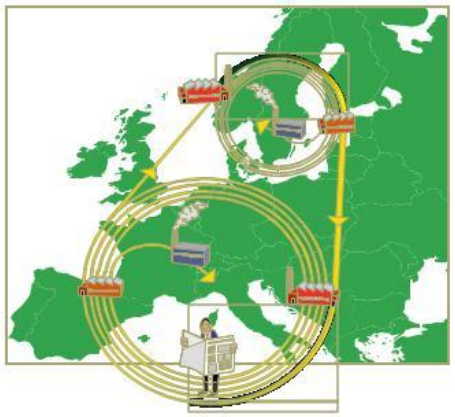


- A huge effort in Eforwood has been targeted towards collecting FWC parameters and sustainability indicator data
- The resulting data set will be a useful benchmark for any future sustainability assessment for the forest-based sector in Europe

(2) Case study FWCs



(3) European FWC



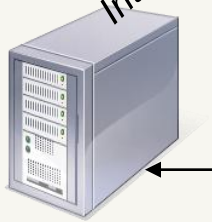
Project practice of providing data

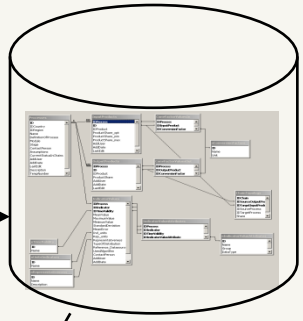
- Using the client
  - Small number of indicator values
  - Topology parameters
- Data exchange directly feeding database (handled at IFER)

CLIENT SERVER TECHNOLOGY

Clients
(module experts)

Internet connection





Application server
(IFER)

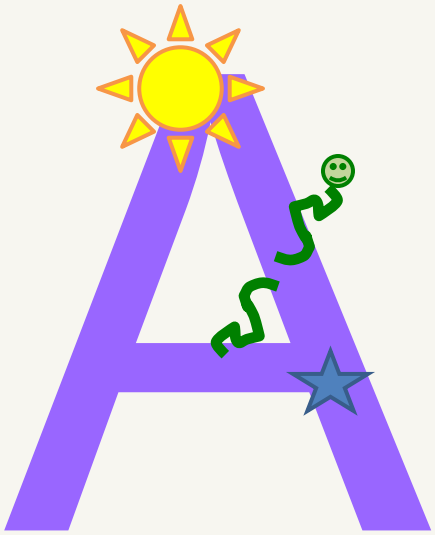
EFORWOOD Database
(IFER)

XML file

ToSIA, Scenarios…

What does it take to create a new application?

- Similar FWC
- Existing FWC
- New Scenario



What does it take to create a new application?

- Existing FWC
- New FWC

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ToSIA in Summary

- Quantitative and transparent approach to sustainability assessment
- ToSIA analyses trade-offs between different aspects of sustainability
- Flexible tool - users can select system boundaries, indicators, indicator weights ...
- Quality of assessment depends on quality of data

Thank you for your attention!

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This work was only possible through dedicated input from many colleagues...