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## Northern ToSIA – Sustainable forest resource management in the Northern Periphery

Assessing the Sustainability Impacts of Forest Management  
in Northern Europe – a Scottish Perspective  
Seminar, Aviemore, 20<sup>th</sup> May 2010



## Outline

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- ❑ Northern ToSIA project objectives
- ❑ Sustainability challenges in the Northern Periphery
- ❑ Assessing sustainability impacts with ToSIA

## Northern ToSIA objective

Long-term goal:  
Improving sustainable forest resource  
use in the Northern Periphery



Project objectives:

- To test and develop the ToSIA tool in regional and company case applications
- To develop the tool applicability and necessary instructions for use in the Northern Periphery
- To disseminate the tool and user experiences for the whole Northern Periphery area

## Sustainability Challenges in the Northern Periphery

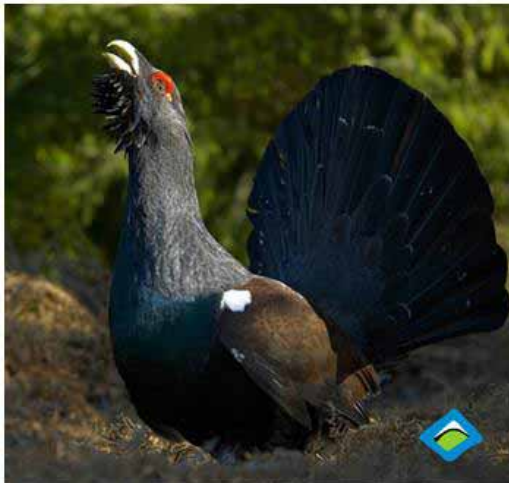
Environmentally friendly  
resource management

Securing social wellbeing  
in the region



Gällö in Jämtland, Sweden

## Environmentally friendly resource use



Fotos: Anne & Horst Helwig  
[www.helwig-naturfoto.de](http://www.helwig-naturfoto.de)







## People: the social dimension

- Recreational use increases in importance
- Forest sector offers employment
- Cultural values, ...

**Stora Enso to shut down two factories in Finland and one in Sweden - 1,400 jobs to go**

## Paper mill closure costs 250 jobs



**HELSINGIN SANOMAT**

[close window](#)

Residents of Kemijärvi staged their protest at the Stora Enso pulp mill on Thursday afternoon.

Photo:  
JAAKKO HEIKKILÄ



## Value added:

- Forest-based sector is important for the regional economy



Foto: FVA Baden-Württemberg,  
Department of Forest Utilisation



Gällö in Jämtland, Sweden



## The EFORWOOD Sustainability Impact Assessment Approach

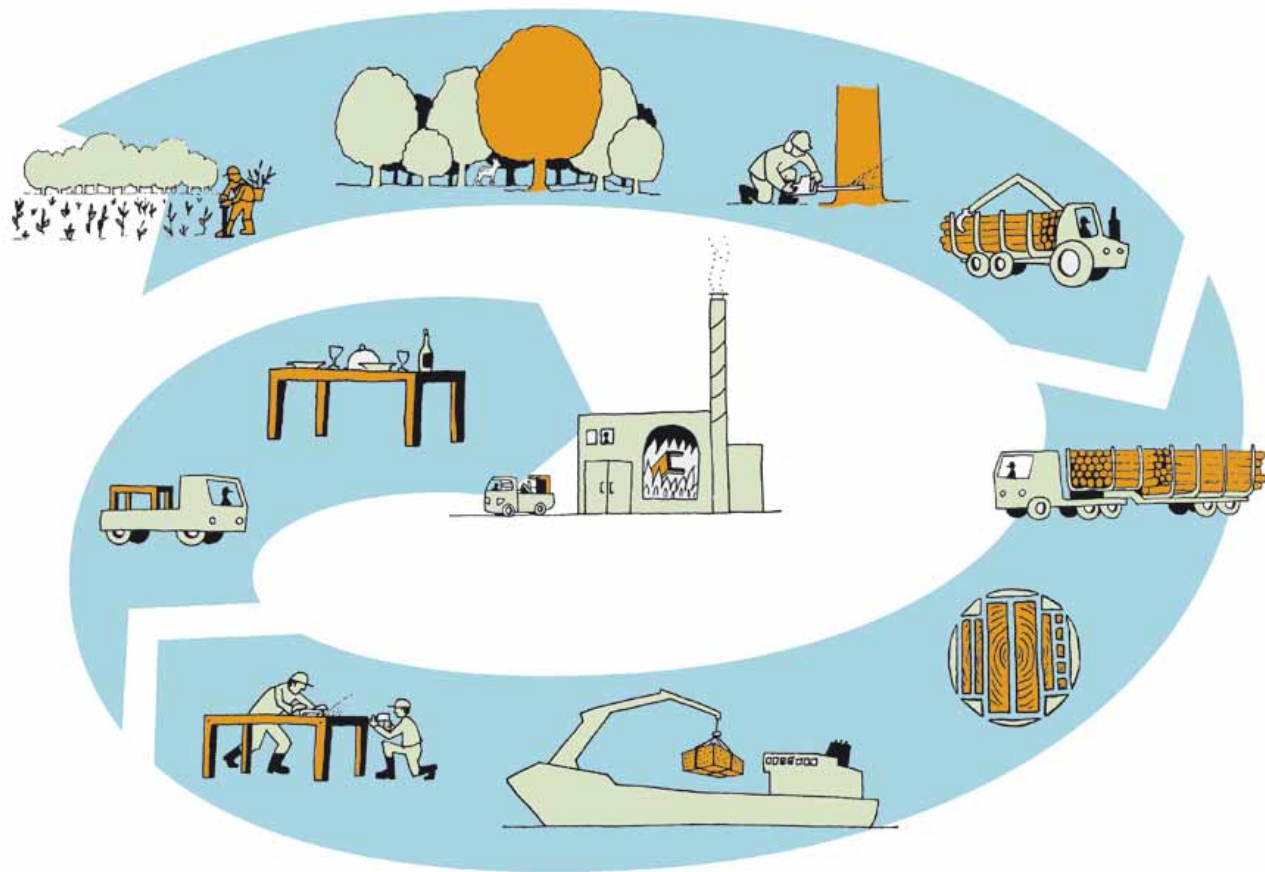
Marcus Lindner  
European Forest Institute (EFI)

*EFORWOOD (518128) review meeting, 17 March 2010, Brussels*

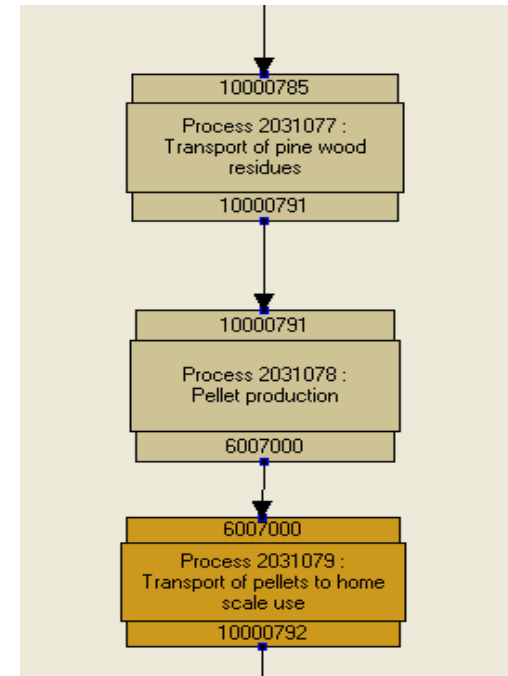
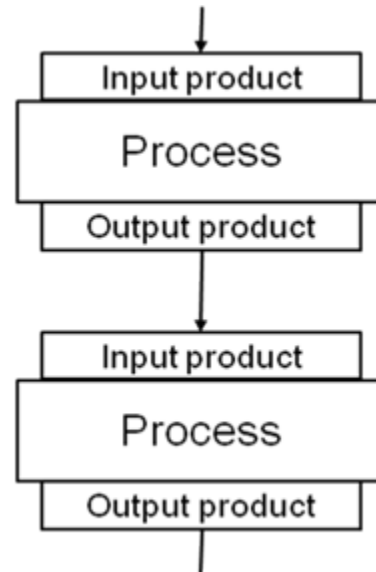
[www.eforwood.org](http://www.eforwood.org)







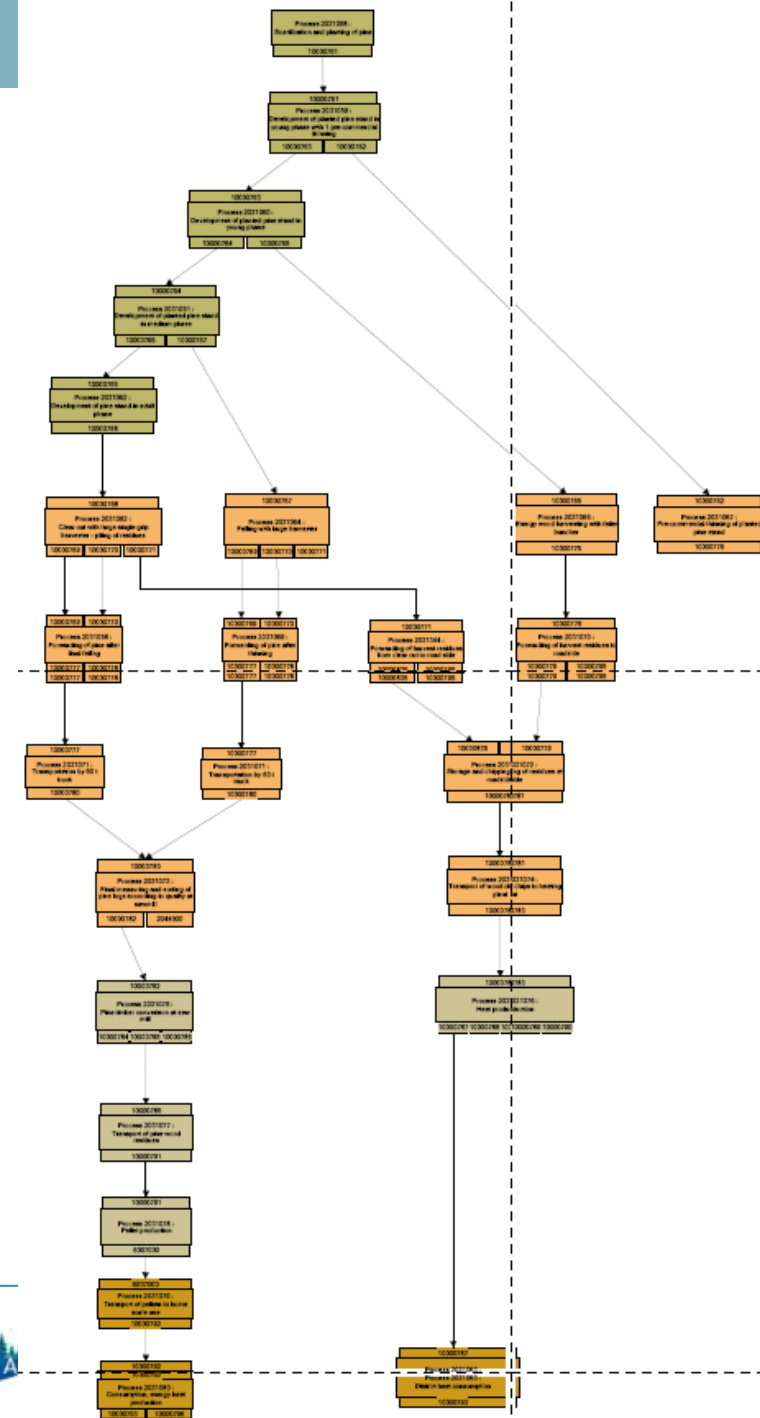
## Forest-Wood Chains (FWC): from tree regeneration to end-of life of wood products



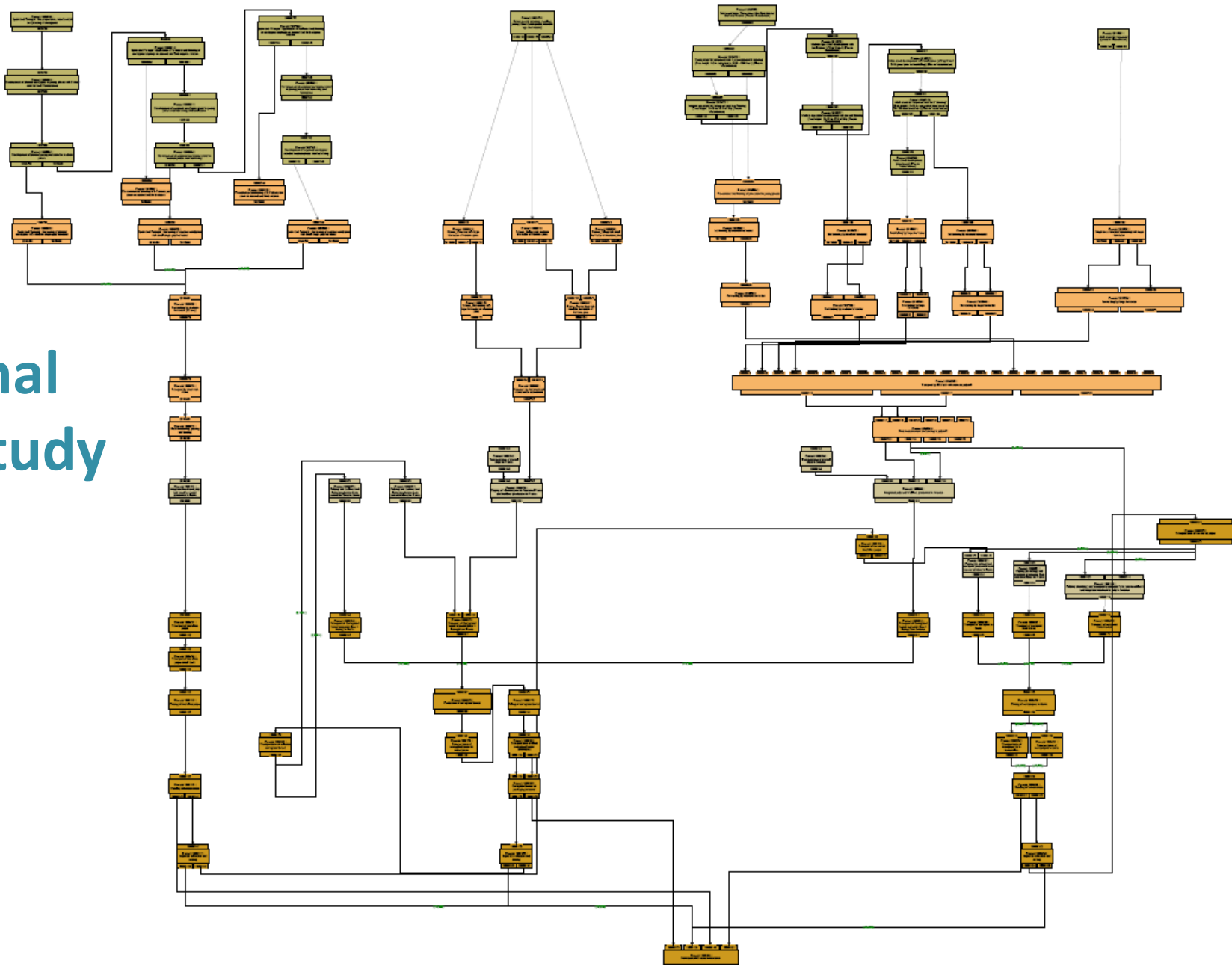
## Real world



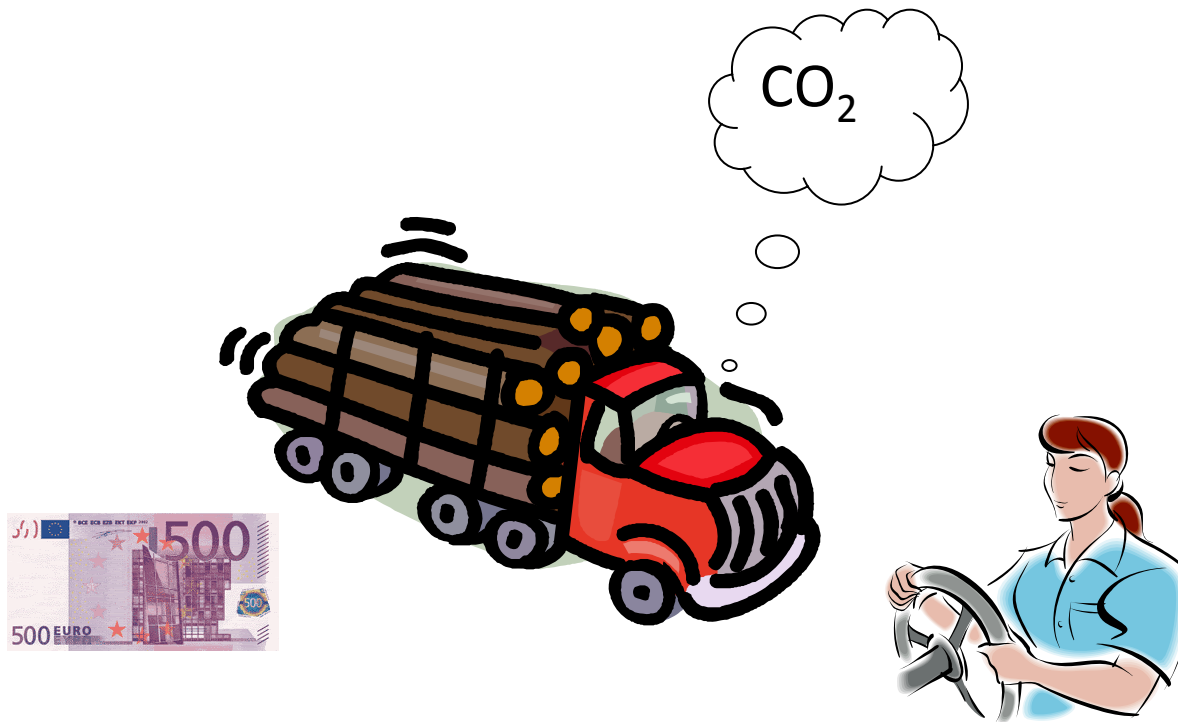
# Simple Forest Wood Chain Example



## Regional case study



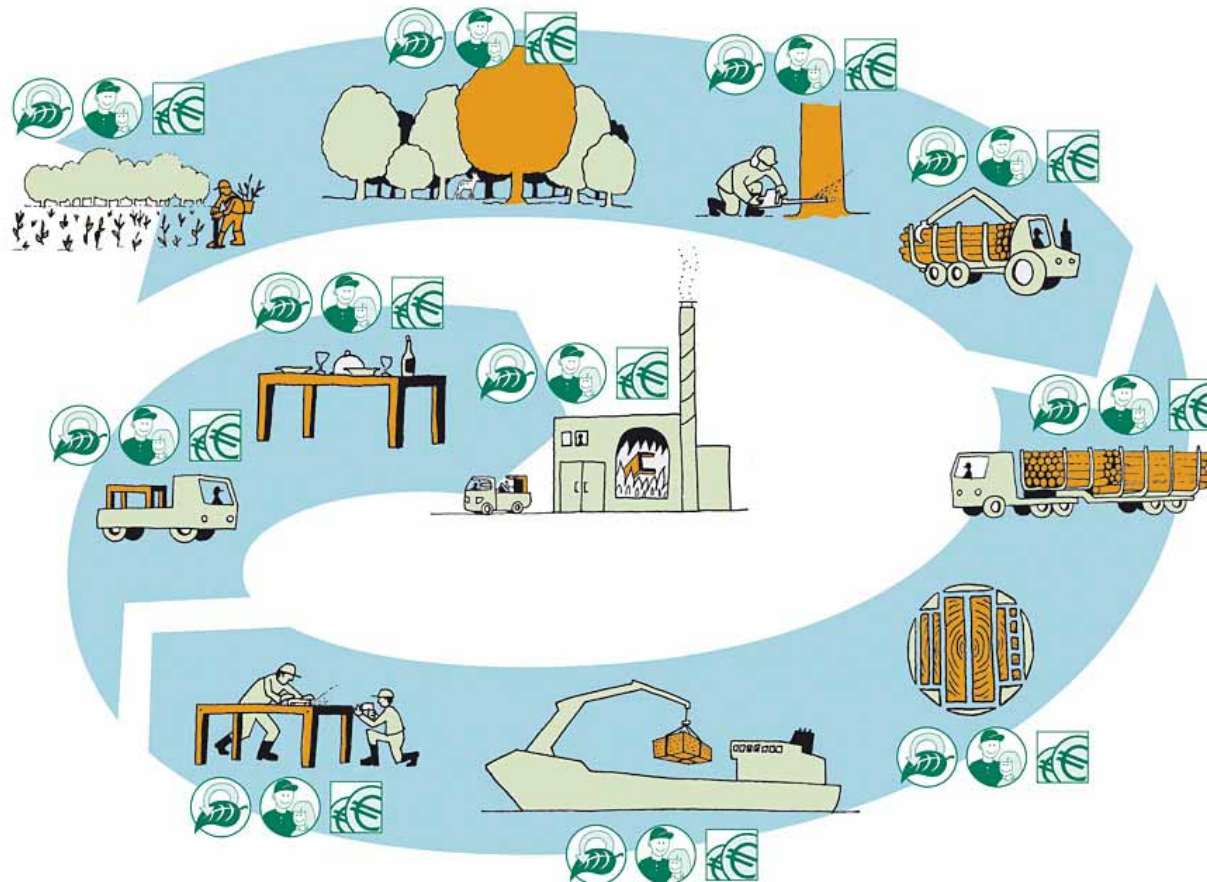




Every FWC process affects sustainability



# ToSIA links sustainability indicators to FWC processes



## Indicators

-  Environmental
-  Social
-  Economic



# Sustainability Indicators



## Economic

Gross value added  
Production costs  
Resource use  
Total production  
Labour productivity  
Investment, Research & Development  
Trade Balance  
Enterprise structure



## Environmental

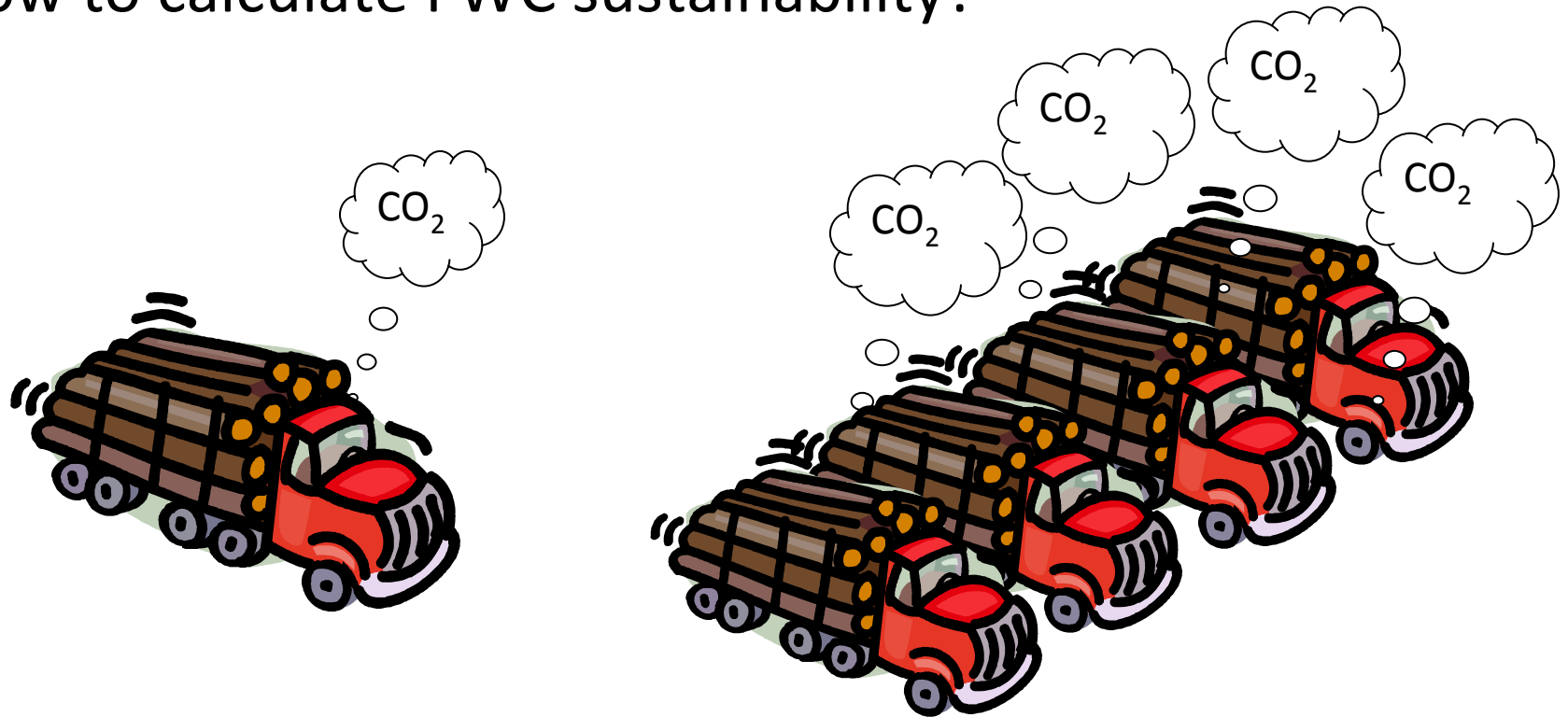
Energy generation and use  
GHG emissions & carbon stocks  
Transport distance and freight  
Forest biodiversity  
Forest resources  
Water and Air Pollution  
Generation of waste  
Forest Damage  
Soil condition  
Transport  
Water use



## Social

Employment  
Wages and salaries  
Occupational safety and health  
Education and Training  
Innovation  
Consumer behaviour & attitude  
Corporate social responsibility  
Provision of public forest services  
Wages and salaries  
Quality of employment

## How to calculate FWC sustainability?



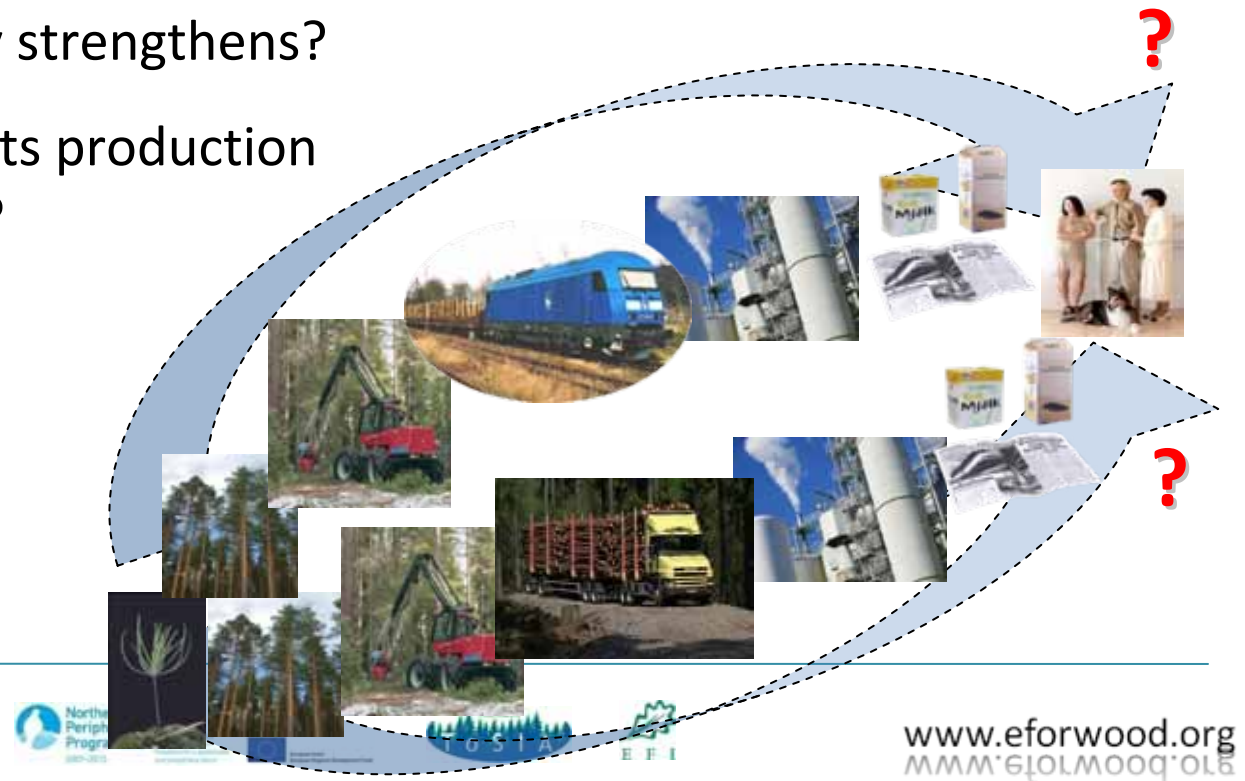
**Overall sustainability is quantified by multiplying relative sustainability impacts**



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

What if:

- ❖ Bioenergy use triples?
- ❖ Natura 2000 policy strengthens?
- ❖ Paper industry shifts production away from Europe?



# ToSIA

Welcome

Data Preparation

Chain runs

Comparison

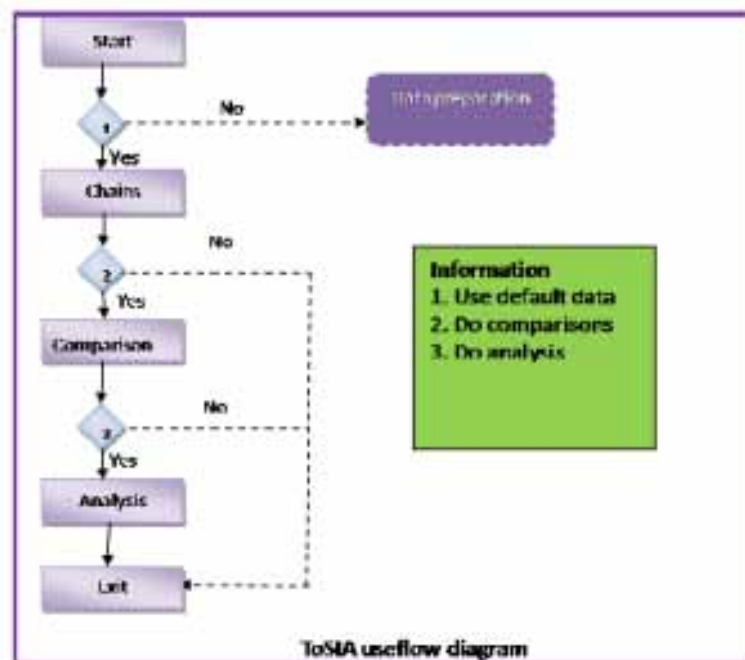
Analysis

About

## Welcome



This is ToSIA (Tool for Sustainability Impact Assessment), the decision support tool for forestry sector. With this tool forest-based industry, national and international policy makers and researchers can analyse the sustainability effects of changes due to deliberate actions (e.g. in policies or business activities) or due to external forces (e.g. climate change, global markets). ToSIA analyses environmental, economic, and social impacts of changes in forestry-wood production chains, using a consistent and harmonised framework from the forest to the end-of-life of final products. It allows user to analyse different kind of sustainability effects in a balanced way. The first versions of ToSIA are the products of the EFORWOOD project financed by the 6th Framework Program of the European Commission.



# ToSIA

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Data Preparation

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About

New run



Baseline2005



2025(A1)



X2025(A1, Bioenergy scenario)



Select chain:

Baden-Wurttemberg Ge...



Select year:

2005



Select reference future:

--



Select scenario:

--


☐ Reverse calculation

Calculate

Select visualisation

☒ Table
 ☐ Chart
 ☐ Flow

Save run

Clear Session

Skidding (B...	Skidding (B...	Skidding (B...	Skidding (S...	Skidding (S...	Skidding (S...	Skidding (S...	Tran
0,7	0,7	0,7	0,66	0,7	0,66	0,66	22,5
80,0	80,0	80,0	80,0	100,0	80,0	80,0	100,
20,0	20,0	20,0	20,0	0,0	20,0	20,0	0,0
208 778,45	262 945,11	607 932,44	1 508 632,68	2 253 963,83	744 759,25	2 998 099,43	661
207 400,51	261 209,67	603 920,09	1 498 675,71	2 239 087,67	739 843,84	2 998 099,43	514
1 377,94	1 735,44	4 012,35	9 956,98	14 876,16	4 915,41	19 787,46	121
63,02	63,02	54,8	63,02	54,8	63,02	54,8	95,1
17 561,35	21 148,76	20 358,32	24 211,8	17 529,67	23 660,75	21 398,42	15 5
1,25	1,39	2,81	8,81	9,71	2,89	12,22	4,28
1,25	1,39	2,81	8,81	9,71	2,89	12,22	4,24
0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,03

Indicator: 12.1.1 - Occupational accidents (non-fatal) - absolute numbers

Process: Skidding (Beech, DBH = 35 cm; Slope 30 - 60 %)

Module: M3 - Forest to industry interactions

Indicator result: 1,254 [absolute number]

Relative value: 0,000011 [absolute number/m3]

Flow amount: 118 930,528 [m3]

Datasource: Official statistics

Datasource note: Ministerium Landlicher Raum Baden-Wurttemberg, 2005

Algorithm: not available

Note: Ministerium Landlicher Raum Baden-Wurttemberg, 2005

Data quality: high



Indicator values by:

Shown Indicators:

☒ Process
 ☐ Module
 ☐ Chain

All



Welcome Data Preparation Chain runs Comparison Analysis About

- New run
- X BaWue\_Base2005 >
  - X BaWue\_Ref-A1\_2015 >
  - X BaWue\_Ref-A1\_2015\_bio >
  - X BaWue\_Ref-A1\_2025 >
  - X BaWue\_Ref-A1\_2025\_bio >

Runs to compare:

- BaWue\_Base2005 X
- BaWue\_Ref-A1\_2015 X
- BaWue\_Ref-A1\_2015\_bio X
- BaWue\_Ref-A1\_2025 X
- BaWue\_Ref-A1\_2025\_bio X

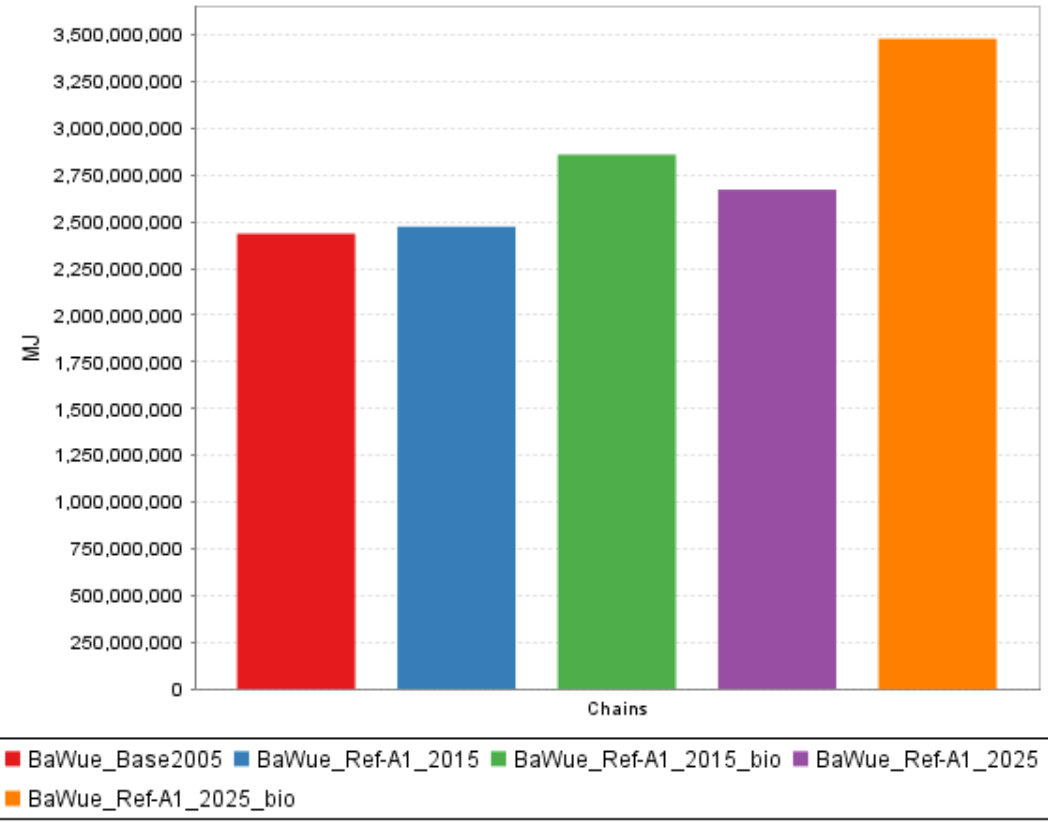
Compare

Clear Session

Select visualisation

☐ Table ☒ Chart

### "18.1.1.1 - On-site heat generation from renewables - residues from process - inputs [MJ]" per Chain



☒ BaWue\_Base2005 
 ☒ BaWue\_Ref-A1\_2015 
 ☒ BaWue\_Ref-A1\_2015\_bio 
 ☒ BaWue\_Ref-A1\_2025 
 ☒ BaWue\_Ref-A1\_2025\_bio

Select indicator:

18.1.1.1 - On-site heat generation from rene... ▼

Save Image



Tool for Sustainability Impact Assessment (ToSIA)

Welcome

Data Preparation

Chain runs

Comparison

Analysis

About

Select chain:

Baden-Wuerttemberg Gener... ▼

Select year:

2005 ▼

Select reference future:

-- ▼

Select scenario:

-- ▼

Discount rate

2 ▼ % ⓘ

Overview

Results

Parameters: ⓘ

NPV Components (EE)

Customize ⓘ

Product prices ⓘ

Sensitivity Analysis

Select visualization:

☒ Table
 ☐ Bar chart

Cost Benefit Analysis (CBA)

Direct costs corrected for distortions

Waste disamenity costs

Road transport accidents costs

Water pollution costs

Air emission costs

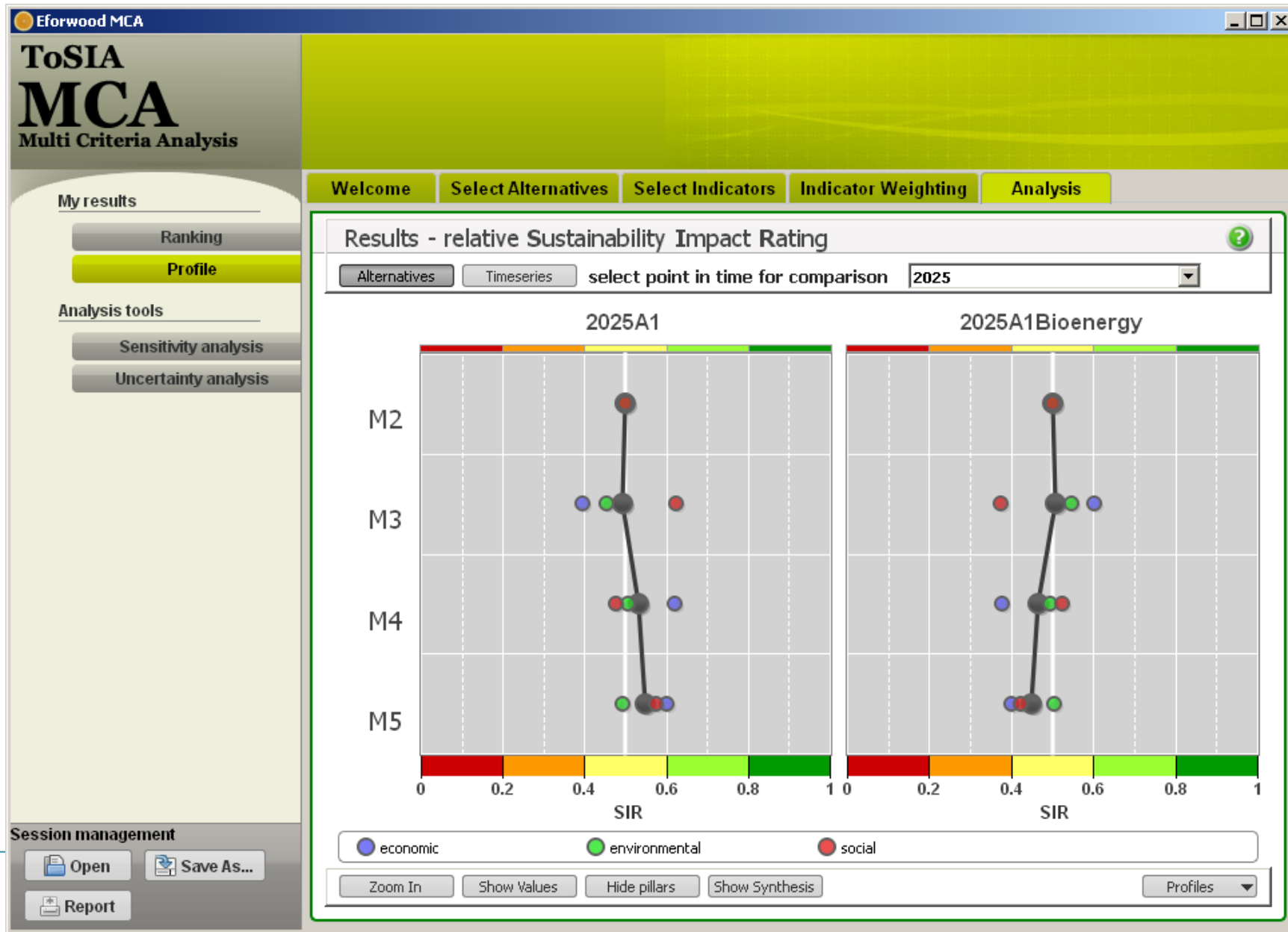
Direct benefits corrected for distortions

Biodiversity benefits

Carbon sequestration benefits

Forest recreation benefits

OK Cancel



# From EFORWOOD to Northern ToSIA



