



EUROPEAN FOREST INSTITUTE
CENTRAL-EAST EUROPEAN REGIONAL OFFICE – EFICEEC

Bernhard Wolfslehner, Patrick Huber & Manfred J. Lexer

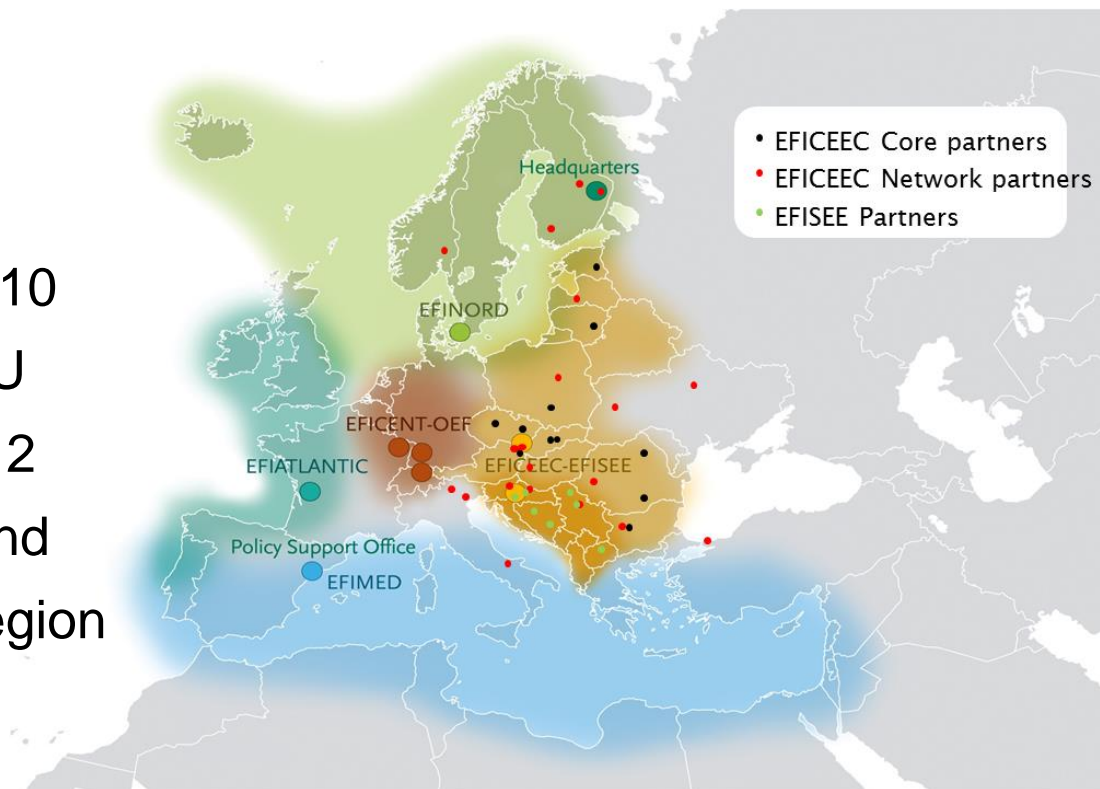
Smart use of small-diameter hardwood

A forestry-wood chain sustainability impact
assessment in Austria



EFI Regional Office for Central-Eastern European Countries (EFICEEC)

- following EFI decentralisation strategy into the regions
- EFICEEC launched in April 2010
- Head Office in Vienna at BOKU
- EFICEEC-EFISEE in Nov. 2012
- aims at stimulating research and collaboration in the CEE/SEE region



EFICEEC Core Partners



EFICEEC Funding





Content

- Introduction
- Method
- Results
- Conclusions

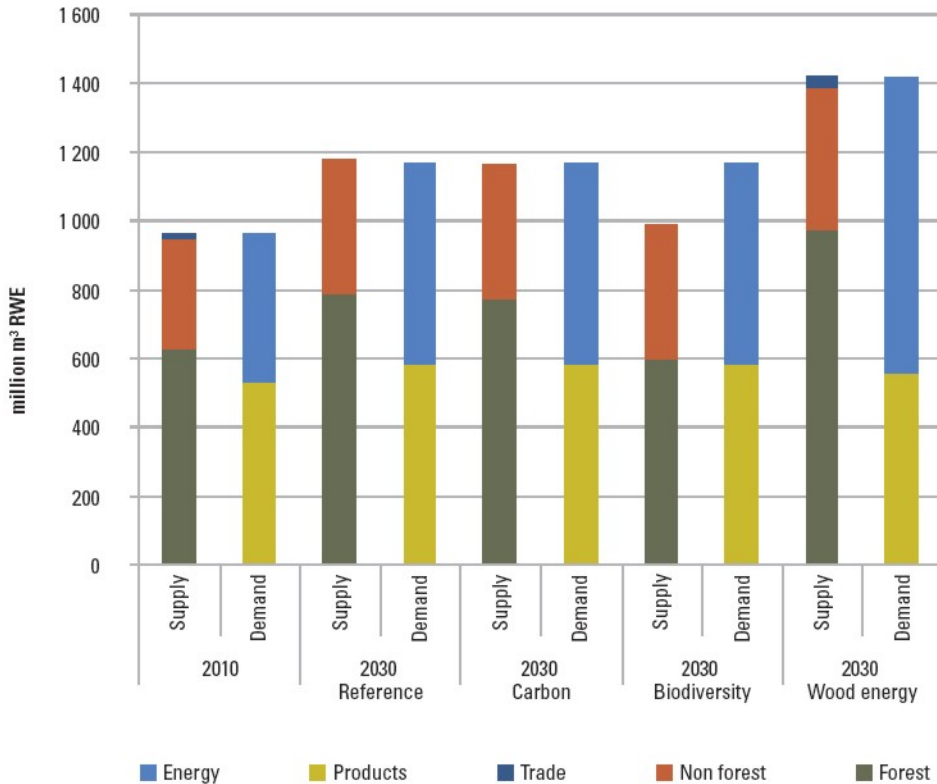




Introduction



media.economist.com



EFSOS, 2011

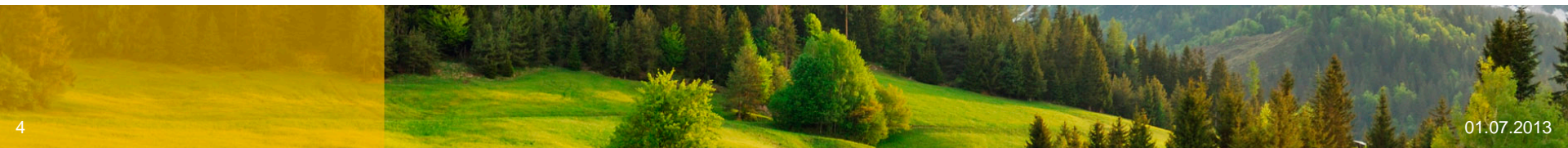
Climate change mitigation



Added value to FWC



www.techdudesblog.com



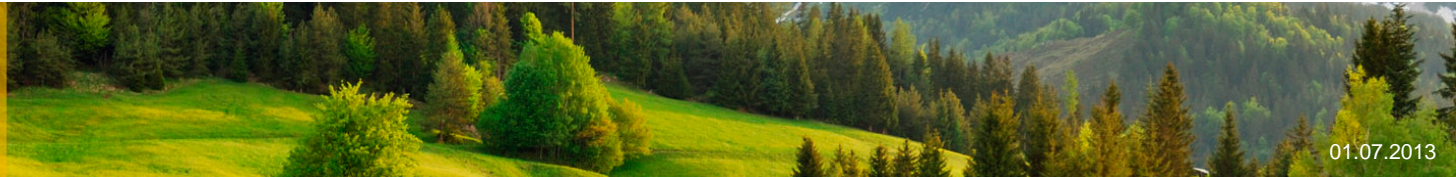


Arguments - Material use

- longer life span
- carbon storage & climate change mitigation
- value creation
- cascade use

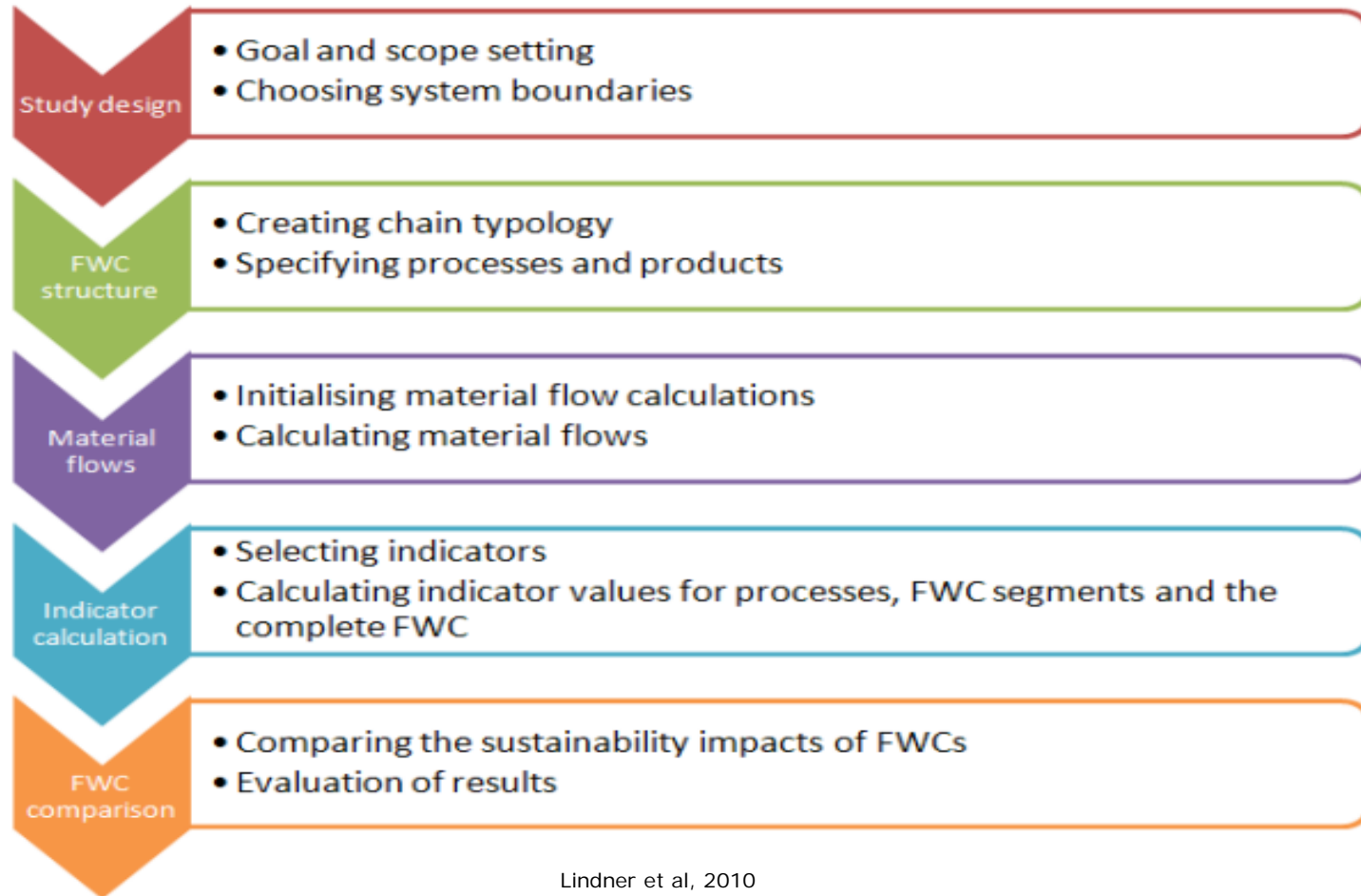


<http://i.imgur.com/g77tF.jpg>

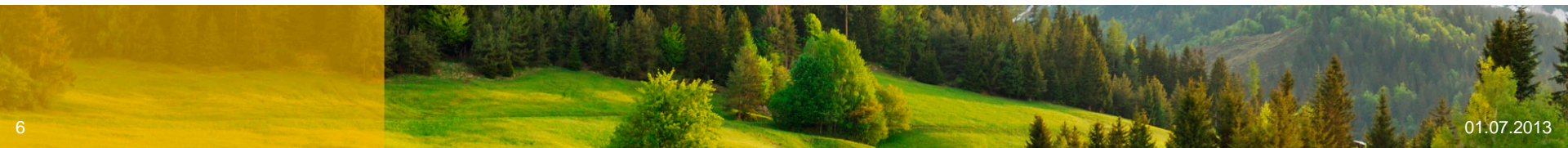




Sustainability Impact Assessment

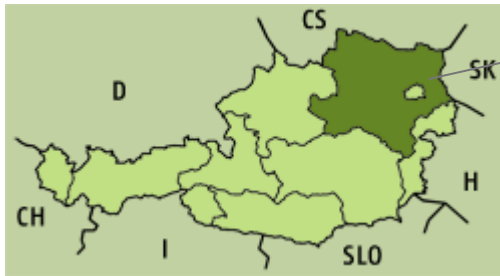


Lindner et al, 2010

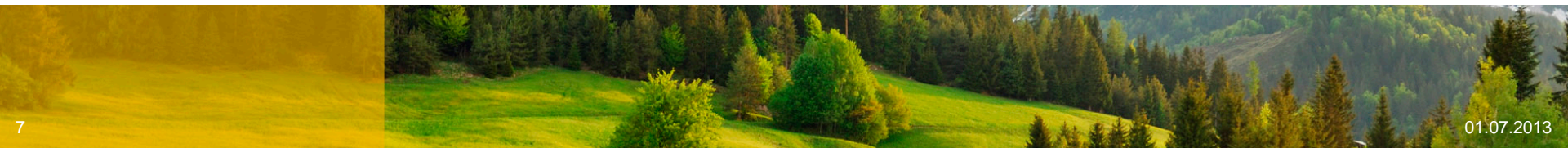




Study design

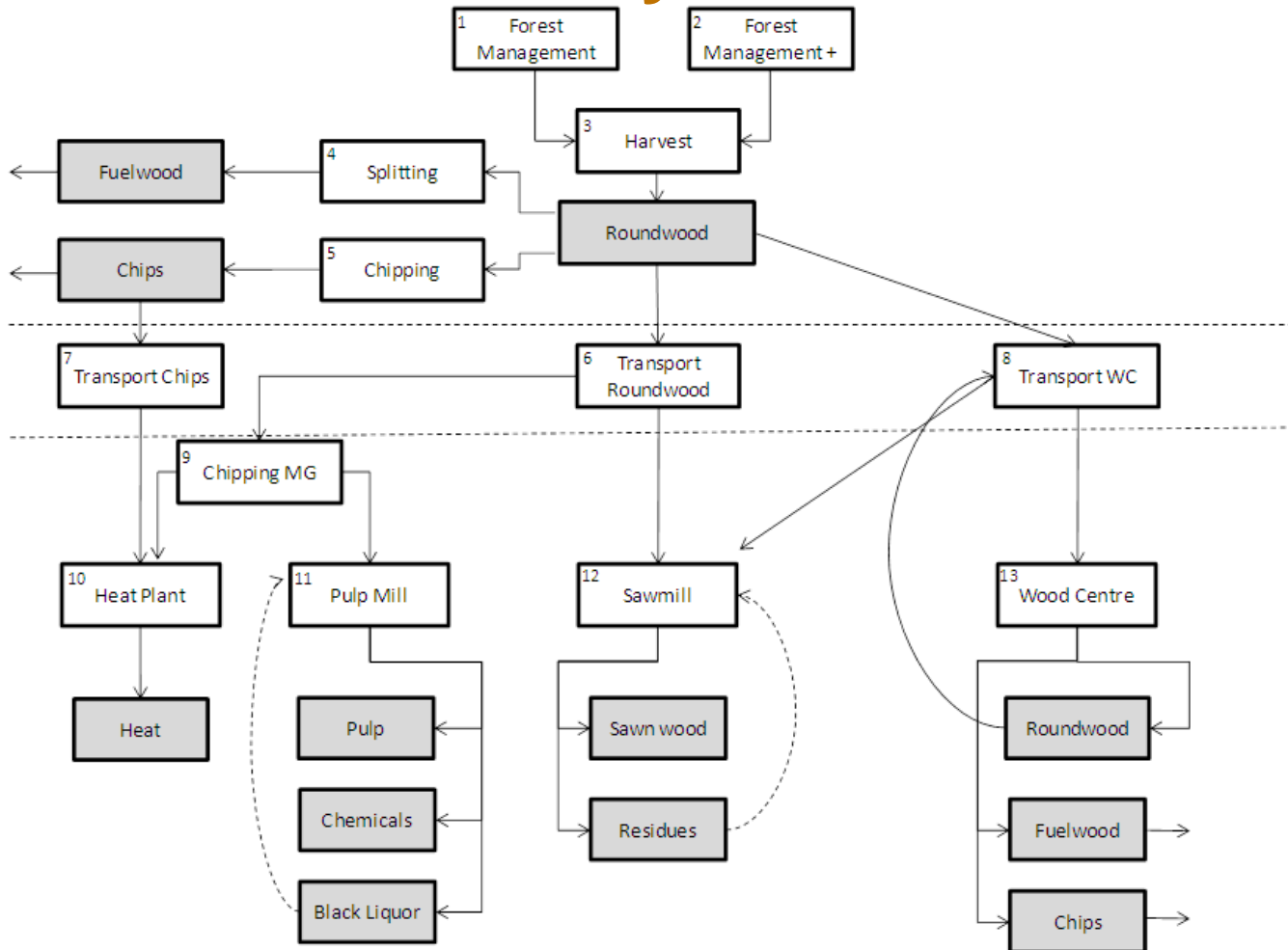


Area:	1.9 mio ha
Forest cover:	~ 40 % (i.e. 767.000 ha)
Growing stock:	220 mio m ³ o.b.
Annual increment:	8.2 m ³ o.b./ha
Annual fellings:	7.6 m ³ o.b./ha
Share of hardwood species:	~ 37 %





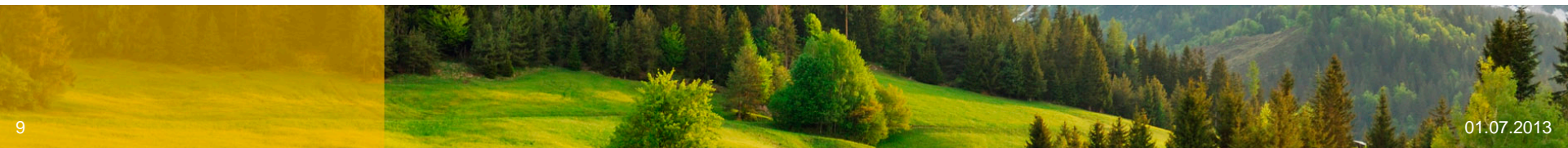
SDH Forestry Wood Chain - topology





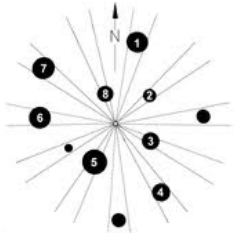
SDH Forestry Wood Chains in Lower Austria

FWC I	Producing fuelwood by the forest owner or entrepreneur
FWC II	Producing wood chips by the forest owner or entrepreneur
FWC III	Representing a local to regional special case of resorting and reshuffling of assortments at a central entrepreneurship
FWC IV	Using SDH for industrial heat production
FWC V	Producing pulp
FWC VI	Share of 20 % sawnwood + 80 % go to heat plant
FWC VII	Share of 50 % sawnwood + 50 % go to heat plant (pruning measures in forest management)





Material flows - National Forest Inventory



Period:

2000 - 2002

Age classes:

2 - 6

Thinning scenario

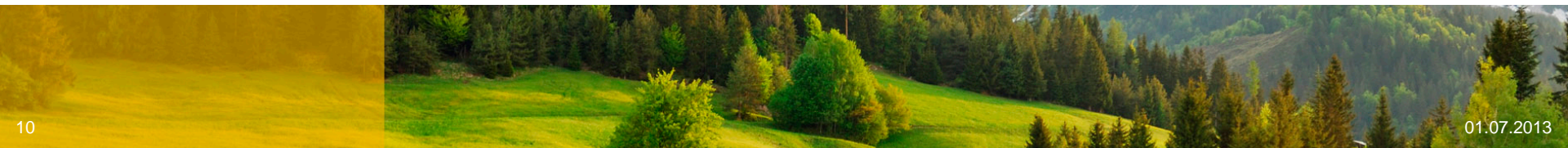
15 % volume of the age classes

5 + 6 (i.e. 61 – 100 years)

Annual yield

156.000 m³ u.b.

Species	Share (%)
Beech	66
Oak	20
Ash	8
Maple	6





Indicators

	Indicator	Definition
Economic	Gross Value Added	Measures the difference between value for the output and intermediate consumption at basic prices
	Production costs	Express average production cost per process incl. cost for raw materials, labour, energy and other productive and non-productive costs
Environmental	Energy use	Reflects the energy used, i.e. direct fuel use and electricity use, at process level
	Average Half-life in use	Expresses the mean value of product half-life time weighted with the respective material flow of a FWC indicating a time dimension for carbon storage in wood products built upon the Guidelines for National Greenhouse Gas Inventories
Social	Employment	Reflects the amount of working hours per production process
	Wages and salaries	Summarize the gross income for employees based on variable hourly rates for different employment qualities



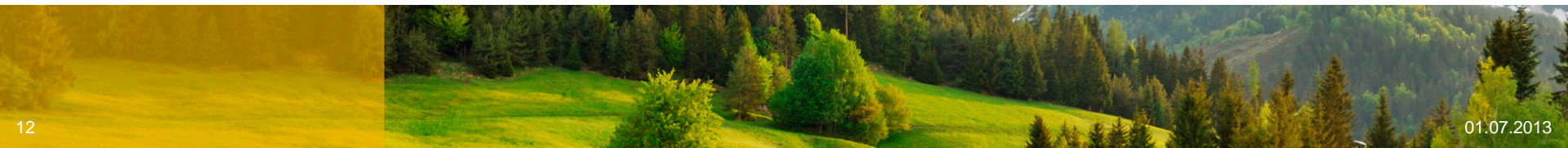
Indicator data

Process	Production cost €/m ³	Employment hrs/m ³	Wages & salaries €/m ³	Energy Use MJ/m ³
1	13.67	0.7805	7.6055	11.01
2	15.91	0.8046	7.7954	11.01
3	15.92	0.7200	6.4700	104.51
4	2.64	0.3125	2.4656	88.74
5	9.09	0.0505	0.3985	8.20
6	2.60	0.2024	0.3812	106.49
7	2.08	0.1916	0.3609	100.84
8	1.63	0.0755	0.2383	24.81
9	6.67	0.0303	0.2887	17.57
10	75.48	0.2594	1.4934	233.77
11	124.16	0.4244	0.1584	3045.17
12	275.32	0.0048	0.0316	1647.00
13	3.93	0.1190	0.8040	46.15

Product	Price (€/m ³)	Half-Life (years)
Fuelwood	80.50	1
Chips	60.99	1
Heat (in wood equivalents)	112.48	1
Pulp (in wood equivalents)	150.40	2
Sawn wood	350.00	35



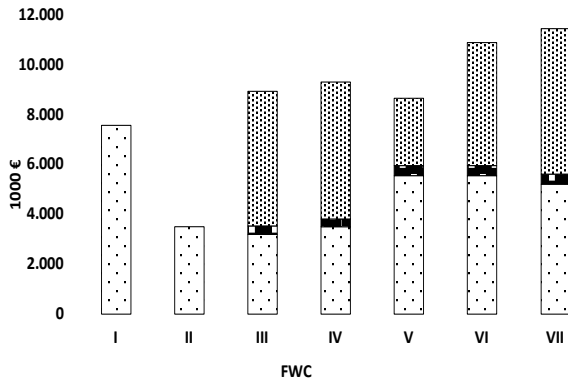
www.picturesof.net



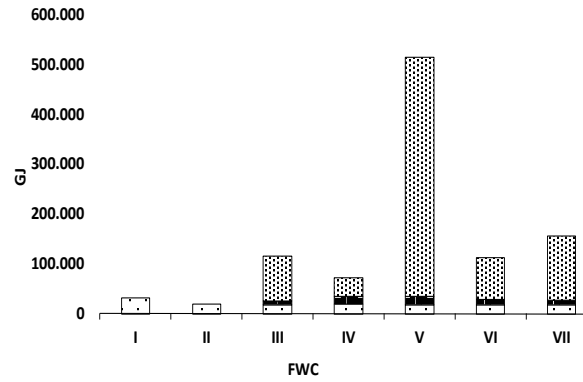


Results I

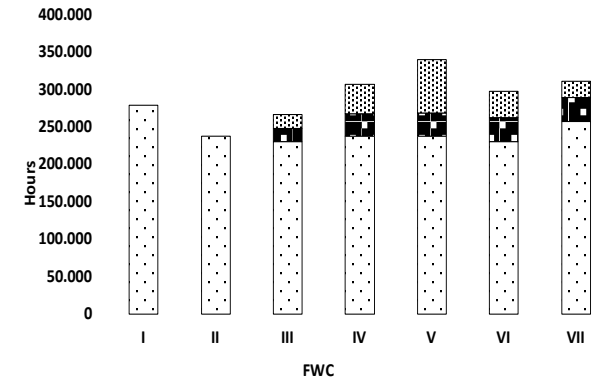
Gross Value Added



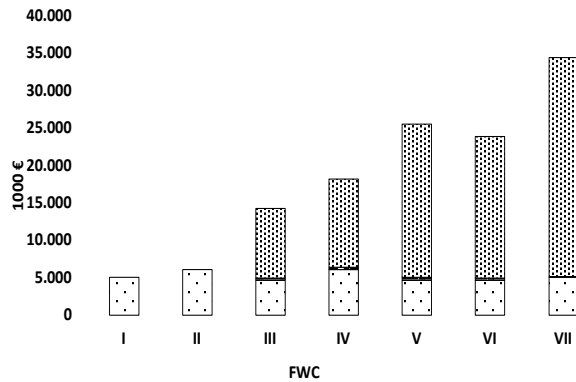
Energy Use



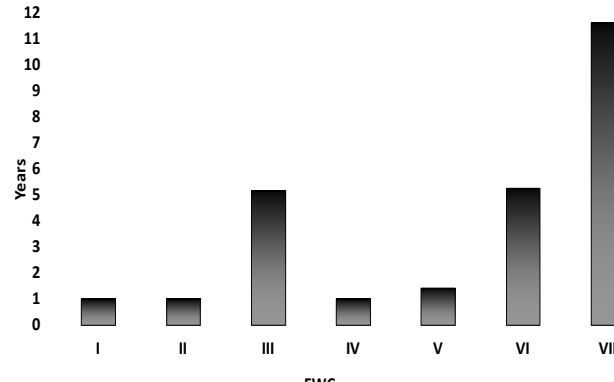
Employment



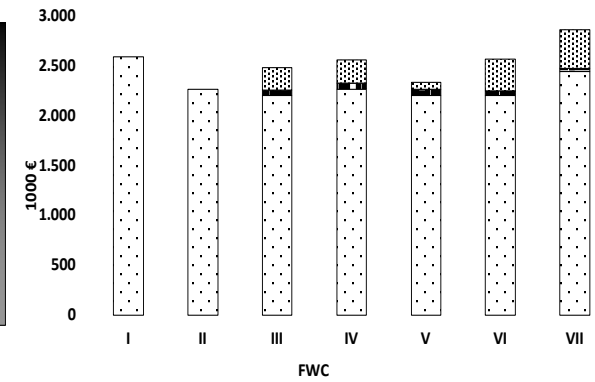
Production Cost



Average half life in use



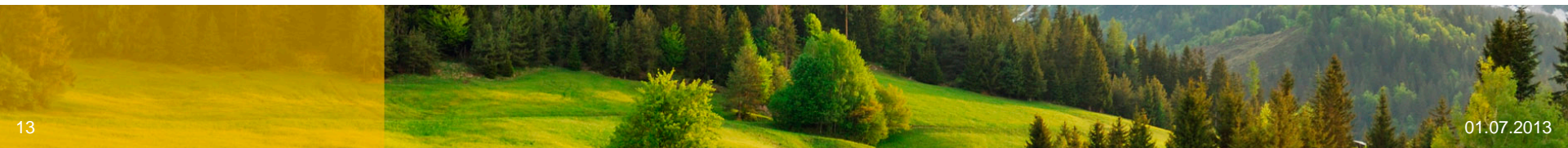
Wages & Salaries



Forest

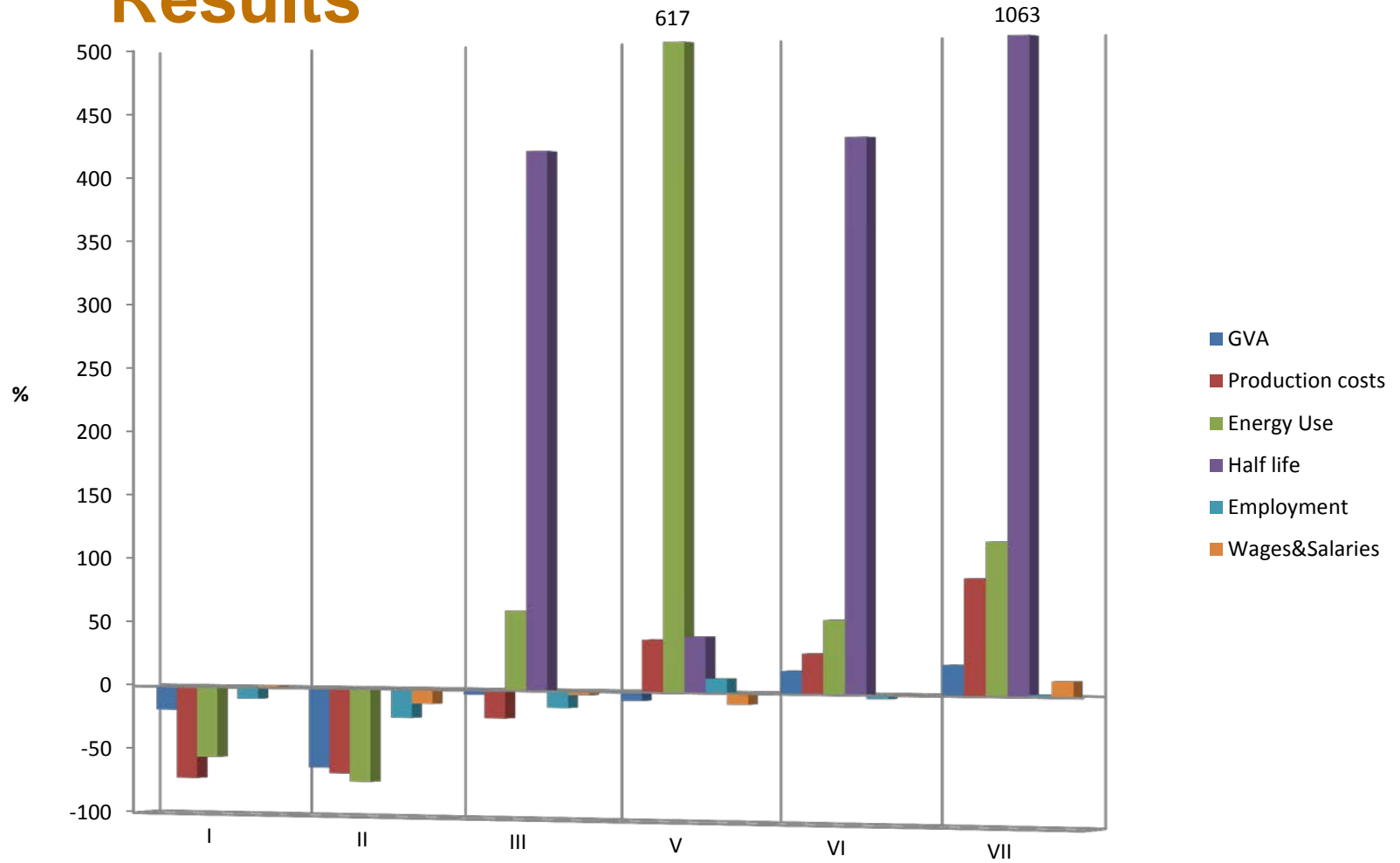
Transport

Industry





Results





Conclusions



Hardwood Top Layer

This layer is made of solid wood and gives you the look and feel of a real solid wood floor. This top layer has a finish which can range between oil or lacquer

Softwood or Plywood Core

The core area helps the flooring retain its shape and stability. A variety of materials such as plywood, softwood or HDF can be used for the mid core section.

Supporting Layer

This layer is key to providing stability to the board, giving a strong foundation for the flooring

<https://encrypted-tbn3.gstatic.com>



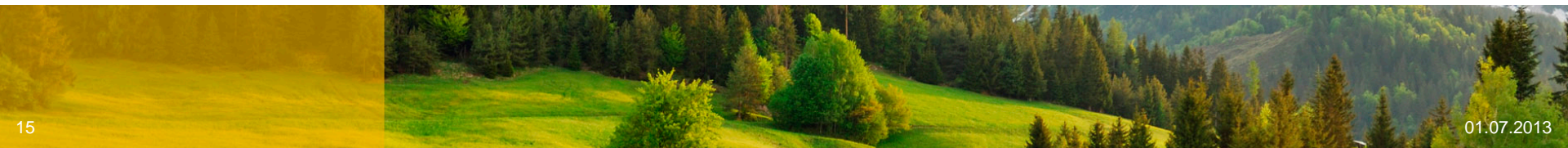
- improve sustainability performance of FWCs
- more balanced benefit sharing & value creation
- higher efficiency of wood consumption

Cascade use

Carbon storage

But:

- SDH chain logistic in the early innovation stage
- Wood mobilisation \Rightarrow fragmented forest ownership
- Competing supply and processing interactions





Acknowledgements

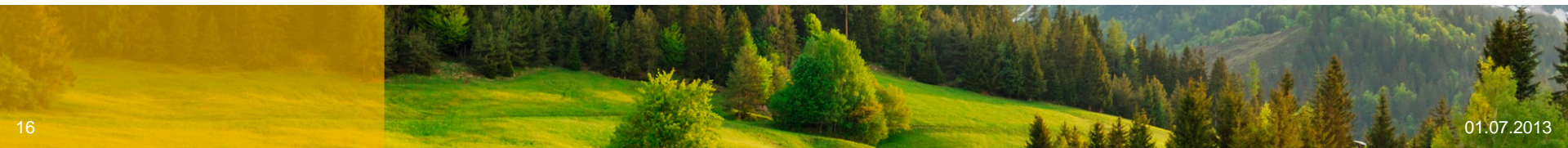
Alfred Teischinger
Christian Hansmann



Hermann Huber
Maximilian Pristovnik



Werner Rammer
Stefan Schörghuber





thank you

danke 謝謝 ngiyabonga
tesekkür ederim
спасибо Баярлалаа
faafetai lava
vinaka mersi barka welalin tack
dank je misaotra matondo paldies grazzi
hvala maururu koszonom
dziękuję
sukriya kop khun krap taiku
go raibh maith agat
obrigado meso sagolun
najs tuke
terima kasih
merci
chhorakaloutioun gratias ago gracies
sulpáy
djere dieuf tau mochchakkeram
mamnun
dankon aciü
akun
chokrame murakoze
tenki
xhвала
asante manana
obrigada
dankie
dhanyavad
gracie
sobodi
dekuji
diti madloba
kam sah hamida
rahmat
xixie
ευχαριστώ
diolch dhanyavadagalu shukriya merce мерси
trugarez
merci

