




European Forest Sector Outlook Study II – trade offs between mitigation and other forest functions

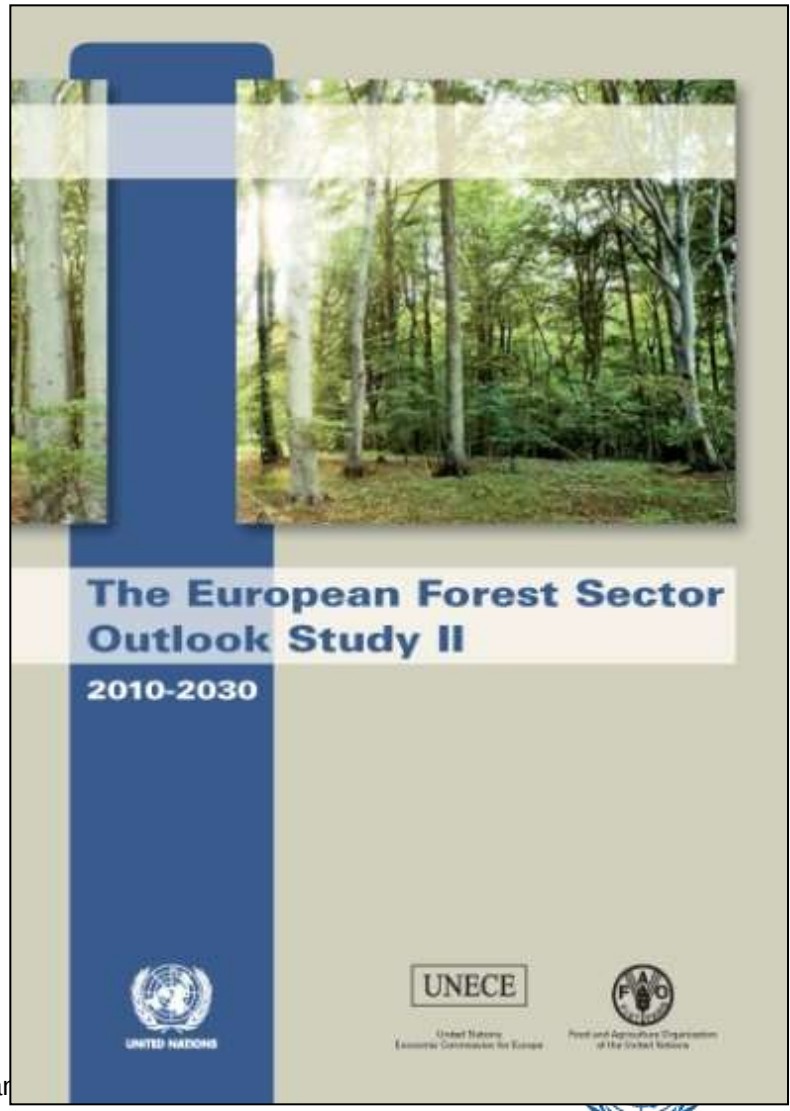
Mart-Jan Schelhaas

Core Team

- Mart-Jan Schelhaas (Alterra); Kit Prins, David Ellul (UN-ECE); Alex Moiseyev, Hans Verkerk, Marcus Lindner (EFI); Christoph Wildburger; Ragnar Jonsson (SLU); Anders Baudin (Linnaeus University); Udo Mantau, Ulrike Saal (University of Hamburg); Florian Steierer (FAO); Sabine Augustin (BAFU); Holger Weimar (Thünen Institute)
- Building on experience gained in many EU-projects, among others GHG-Europe

EFSOS II background

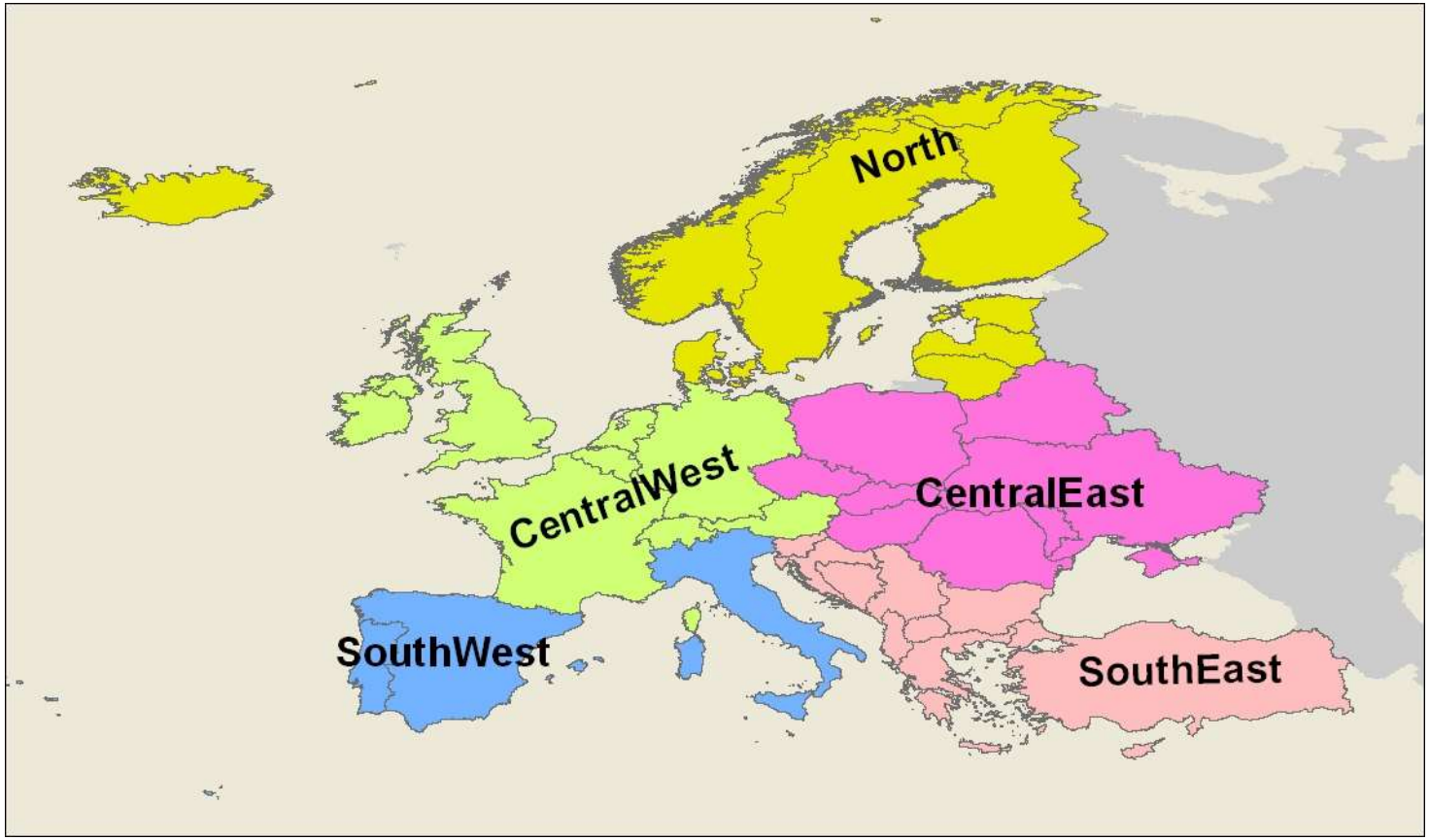
- Latest in a series of outlook studies commissioned by the UN-ECE/FAO Timber Committee since 1950
- Carried out by a Team of Specialists, consisting of a Core Team of independent researchers and country correspondents



EFSOS II methodology

- Structured around scenarios
  - One Reference scenario
  - Four Policy scenarios
- Implemented in modelling framework
- Sustainability assessment in the same way as in SoEF2011
- Detailed outcomes available on the web (www.unece.org/efsos2)

Geographic coverage



The policy challenges

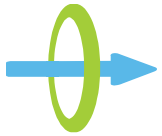
- How should the forest sector contribute to mitigating climate change?
- How can wood contribute to renewable energy supply?
- Adapting to climate change and protecting forests
- Protecting forest biodiversity: at what cost?
- Supplying renewable and competitive forest products to Europe and the world
- Achieving and demonstrating sustainability
- Developing appropriate policies and institutions

Methods Overview

	Wood Resource Balance		
Method	SUPPLY	DEMAND	Method
EFISCEN	Potential supply from forest	Demand for products	Econometric projections
EUwood	Supply of other woody biomass	Demand for wood energy	Trend projections
EFI-GTM	+/- GAP ?		

Scenarios

- Reference Scenario
  - *What if we continue business as usual?*



- Maximizing Biomass Carbon
  - *How much carbon could be stored?*

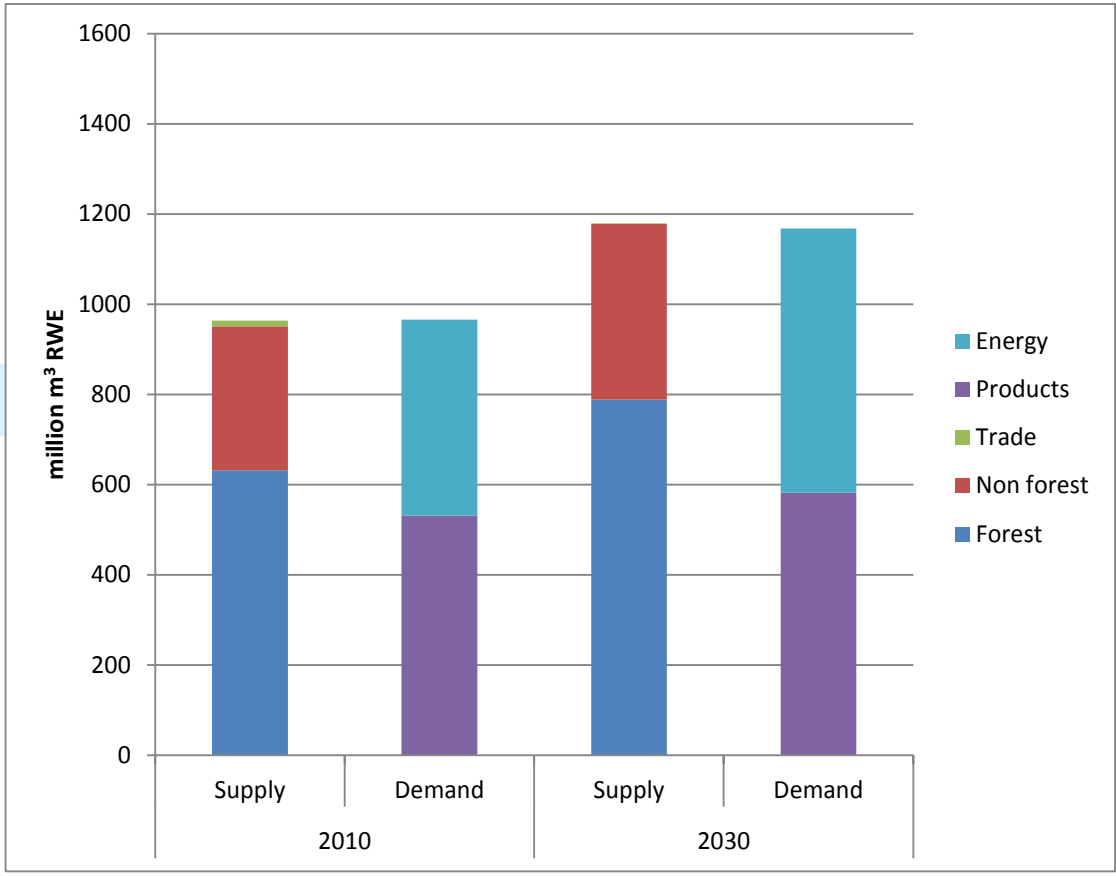
- Priority to Biodiversity
  - *What if we focus on preserving /enhancing biodiversity?*

- Promoting Wood Energy
  - *How to achieve the renewable energy targets?*

- Fostering innovation/Competitiveness
  - *What would a successful innovation strategy lead to?*

Reference Scenario

- Based on **IPCC B2** scenario
- A **gradually increasing demand for wood** over the coming 20 years, especially for energy
- **Increasing supply** including harvest residue extraction and non-forest sources
- **Expansion** of forest area **continues** (0.6 million ha/yr)



Maximising Biomass Carbon

- **Longer rotations** and **increased thinning share**
- **No reduction in supply**

- **Total increment** increases by 14.6%

- **Total growing stock** volume is 7.8% higher

- **Average C sink** is 0.67 tonnes C/ha/yr, +64%

- At some point, maximum **sequestration capacity will be reached** as increment decreases for older stands

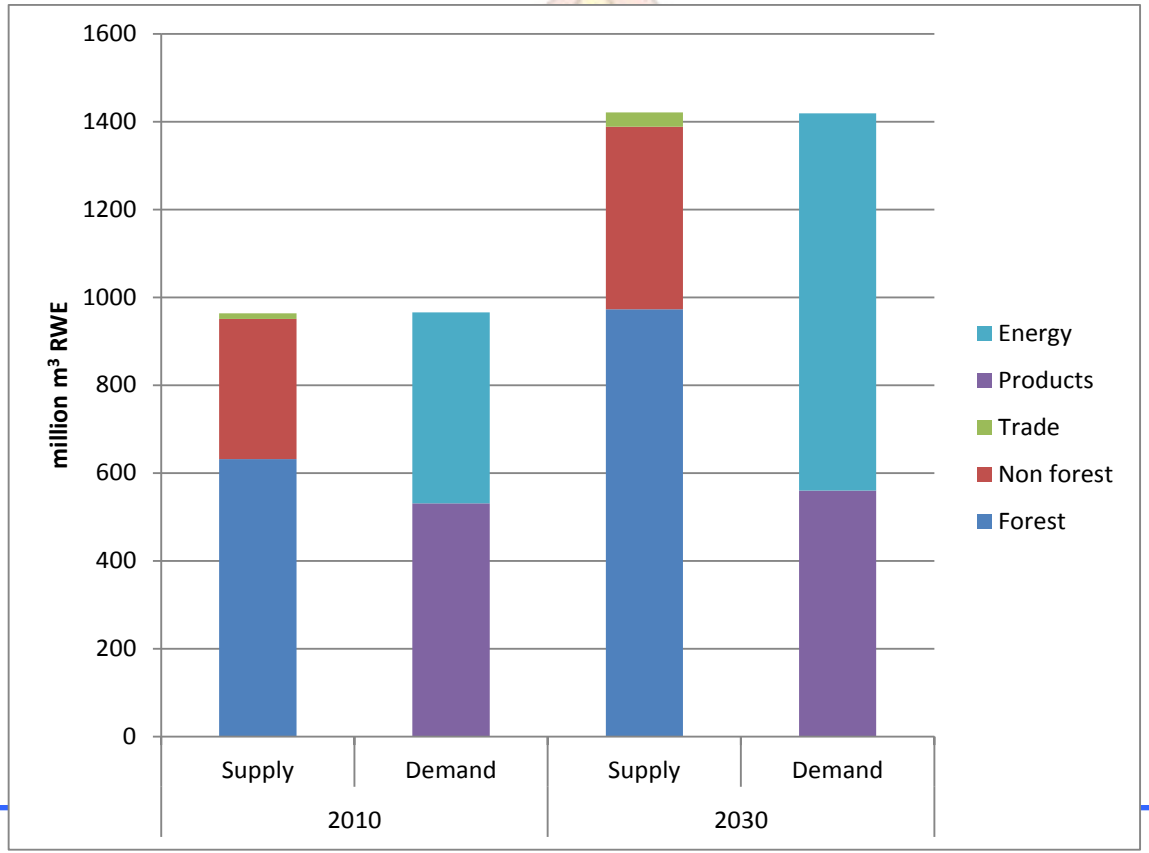
Priority to Biodiversity

- **Dedicated management** on 5% of current FAWS
- **Longer rotations** on remaining 95%, **no extraction of residues**

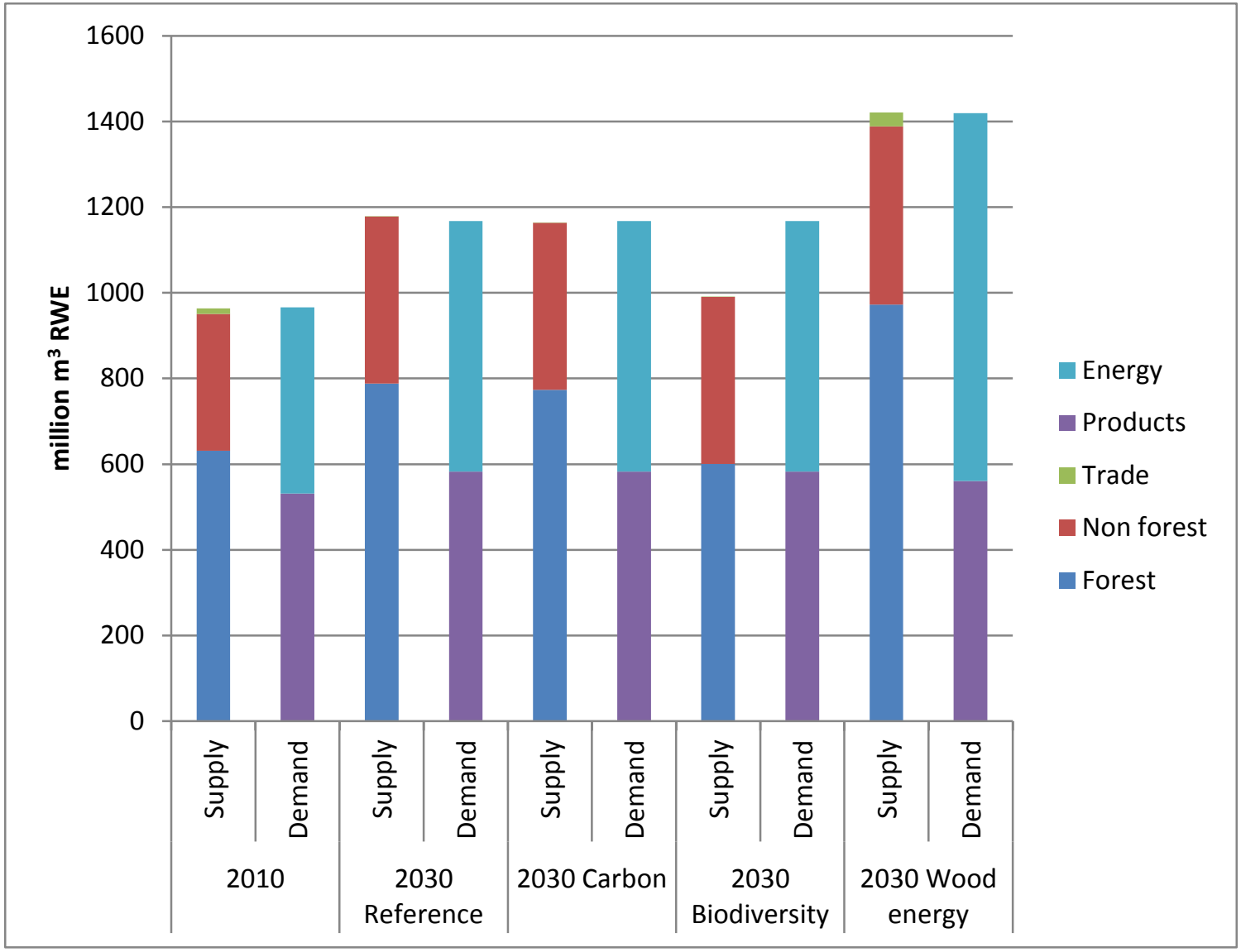
- **Wood supply decreases** by 12% compared to reference scenario
- The **growing stock** shows considerably higher **increase**
- A shift from younger to **older age-classes** is projected
- **Carbon stock** shows a significantly **positive trend**
- Amount of downed **deadwood** will grow

Promoting Wood Energy

- **To reach the targets, supply** would have to increase by **50%** by 2030
- **Forest residues supply and stumps** together would have a **seven fold increase**
- **Increased supply** from landscape care wood and post consumer wood.
- **Net imports** for other regions would also increase from **12 million m³ wood equivalent** in 2010 **to 33 million m³** in 2030
- **<u>Significant environmental, financial and institutional costs.</u>**



Supply and Demand in 2030



Scenarios in 2030 compared to reference

	Max carbon	Biodiv	Wood energy
FAWS	0%	**-5%**	0%
Growing stock	**8%**	8%	-1%
Increment	**15%**	7%	0%
Fellings	0%	**-12%**	2%
Residue extraction	**-15%**	**-100%**	**263%**
Deadwood (per ha FAWS)	-3%	3%	-4%
Product consumption	0%	?	-4%
Wood energy consumption	0%	?	**147%**
Sawlog prices	?	?	6%
Pulplog prices	?	?	15%
Product prices	?	?	3%

Stocking more carbon in the forest, or increase energy substitution?

Table 21: Carbon stocks and flows in the EFSOS scenarios, total Europe

		Unit	Reference		Maximising biomass carbon	Promoting wood energy
			2010	2030	2030	2030
Carbon stocks	Forest biomass	Tg C	11 508	13 214	14 130	13 100
	Forest soil	Tg C	14 892	15 238	15 319	14 994
Carbon flows	Change in forest biomass	Tg C/yr		85.3	131.1	79.6
	Change in forest soil	Tg C/yr		17.3	21.4	5.1
	Net change in HWP	Tg C/yr		18.2	18.2	17.6
Substitution effects	For non-renewable products	Tg C/yr	NA	NA	NA	NA
	For energy	Tg C/yr	61.6	83.0	83.0	121.7
Totals	Stock (forest only)	Tg C	26 400	28 452	29 449	28 093
	Flow (sequestration + substitution)	Tg C/yr		203.7	253.6	224.0

More work is needed for other factors and functions:

- Fire risk
- Storm risk
- Recreation
- Biodiversity effects
- Employment

Next steps:

- More consultation and fine-tuning with countries (data and similar national projections, scenario assumptions)
- Align with outlooks from other regions and sectors
- Quantification of uncertainties and risks
- Improved models and model framework

And of course natural disturbances should be part of the picture!

Conclusions

- Increased biomass carbon storage and biodiversity seem to go well together; also beneficial for recreation score. But increased disturbance risk
- The wood energy scenario means a drastic increase of harvest residue and stump removal; if not feasible, import from outside Europe is likely. Trade-off with biodiversity and carbon storage.
- Regional differences are important, no single optimal solution

Any burning questions?