



Assessing Bioenergy and its EU-wide Impacts

Newsletter 4 | 2014

The demand for bioenergy from forests is increasing. Ambitious policy targets demand even more and ever more effectively provided biomass from Europe's forests. INFRES develops innovative technological and business solutions for this.

The question that remains is: what about sustainability? Is there enough biomass available to satisfy ambitious renewable energy targets and still safeguard productive, environmental and social functions? Is it economically feasible?

These questions are assessed at European level for current biomass harvesting chains as of the year of 2010. In comparison to this baseline also the new INFRES developments will be assessed in terms of their sustainability and potential sustainability impacts are quantified at EU level.

Scope of chain

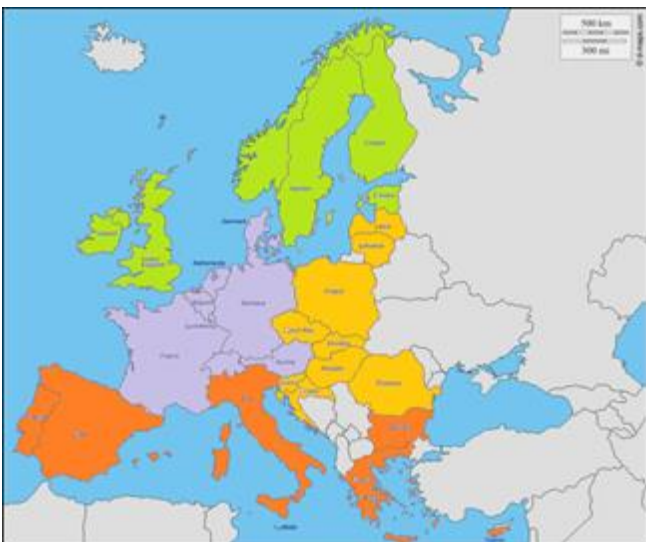
INFRES sustainability impact assessments compare differences between the business as usual situation and future technological innovation scenarios as developed within INFRES. Most of these innovations are aimed at forest operations, logistics and chipping procedures. INFRES thus covers the complete value chain from the forest to the incineration in the energy facilities.



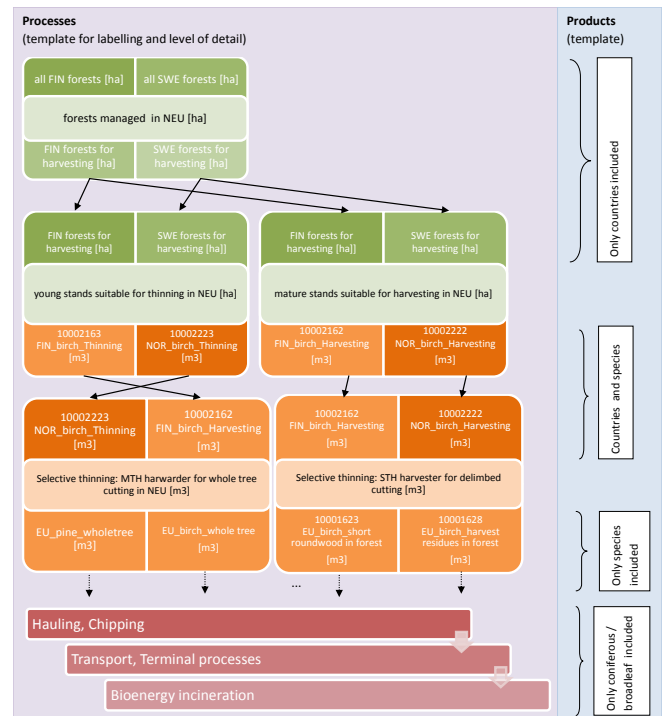
Modules and stages used in INRES for aggregated analysis

Module	Stage	Explanations
Forest Management	Full forest management cycle	No separation into age classes, stand structures and purposes.
Forest operations	Harvesting and processing	Including felling, processing, chipping, stump harvesting
	Forwarding	Including skidding, forwarding, hauling within the logging site to roadside or terminal
	Transport	From the forest (roadside or terminal) to terminal or industry or customer
	Millgate and Terminal operations	Reception, weighting, sorting, storing
Processing and Manufacturing	Recycling and Green Energy	
	Bioenergy production	Including heat and electricity
	Biofuel production	Liquid biofuels

Focus is only primary forest biomass (energy wood from early thinnings and final cut, harvest residues, stumps). Assessments are structured in logical units (=modules and stages) as described in the table above. Processes and products are schematically defined in a chain topology. For this a chain template was developed, describing typical processes and interlinking products. This template will be populated for each assessed European region, reflecting current and innovative technology alternatives.



Map of INFRES assessment regions and countries



INFRES value chain template

Processes covered describe forest management, harvesting, processing, extracting, facility and terminal operations and incineration for coniferous and broadleaved primary wood products. Secondary biomass (like saw dust, downgraded logs/ paper / timber) and recycling products are excluded.

Which regions are assessed?

The assessment is done for all of the EU at an aggregated level. While national data is entered for forest resources, operations and incineration are accessed in a more condensed way for four EU (enlarged) regions:

- **CEU:** Central EU (lavender): Germany, Austria, Benelux, Denmark, France, plus Switzerland
- **NEU:** Northern EU25 (green) Sweden, Finland, UK, Ireland, Estonia, plus Norway
- **SEU:** Southern EU2 (orange) Cyprus, Greece, Malta, Italy, Portugal, Spain, Bulgaria
- **EEU:** Eastern EU2 (yellow) Czech Republic, Hungary, Latvia, Lithuania, Poland, Slovak Republic, Slovenia, Croatia, Romania

Sustainability indicators

Impacts from different scenarios and for all European regions need to be comparable among each other. For this reason the same indicators and indicator definitions are chosen. Indicator values are calculated for each process, and aggregated per module and per chain alternative.

In INFRES the following economic, environmental and social indicators have been chosen:

Selected indicators for INFRES Sustainability Impact Assessment (SIA). Green indicators will be collected and communicated with INFRES sister projects LogistEC and Europruning. Additional blue indicators, marked with asterix, will not be calculated for all regions.*

Indicator ID	Full indicator name
1	(1) Gross Value Added (GVA)
2	(2) Production cost
7	(7) Production of goods and services
8	(8) Labour productivity
9*	(9) Share of forest-based enterprises with new / improved products or processes, and share of turnover
10	(10) Number of persons employed in total and by gender
11	(11) Wages and salaries
12*	(12) Occupational accidents and diseases
14	(14) Forest holdings and enterprises with third-party certified management and share of wood sourced from third-party certified sustainable production
15*	(15) Persons employed part-time, temporarily employed persons, and self-employed persons
16*	(16) Provision of public forest services
18	(18) Energy generation and energy use
19	(19) Greenhouse gas emissions and carbon stock
20	(20) Transport volume and distance
22	(22) Forest area and balance of increment and fellings
23*	(23) Soil condition as expressed by chemical soil properties and soil compaction
25	(25) Forest biodiversity
28*	(28) Foraging resources (animal husbandry stock)
31*	(31) Recreation and Aethetics
32*	(32) Biodiversity perception

Green indicators are part of a minimum set, which will be calculated for all INFRES chains. Blue indicators are extended indicators which will get calculated for selective regions and technologies, dependant on data availability.

INFRES will also calculate LCA indicators and include European Sustainability Indicators for solid biomass in case these should be decided by the European Parliament until the end of 2014.

Comparability with INFRES sister projects LogistEC (www.logistecproject.eu) and EUROPRUNING (www.europruning.eu) will be ensured by using comparable indicator sets across the projects.



Contact information

Dr. **Diana Tuomasjukka**, European Forest Institute (EFI), diana.tuomasjukka@efi.int,

tel. +358-10-7734320

Martina Roubalova, IFER, roubalova@ifer.cz .

INFRES Newsletter 4 - January 2014

The research of the INFRES project has received funding from the European Union Seventh Framework Programme (FP7/2012-2015) under grant agreement n°311881. The sole responsibility for the content of this flyer lies with the authors. It does not necessarily reflect the opinion of the European Communities. The European Commission is not responsible for any use that maybe made of the information contained therein.