EFORWOOD

Sustainability Impact Assessment of the Forestry - Wood Chain

Project no. 518128

EFORWOOD

Tools for Sustainability Impact Assessment

Instrument: IP

Thematic Priority: 6.3 Global Change and Ecosystems

Deliverable PD0.1.8
Roadshow status and results report

Due date of deliverable: Month 36
Actual submission date: Month 38

Start date of project: 011105
Duration: 4 years

Organisation name of lead contractor for this deliverable: KU, Forest & Landscape Denmark

Final version

Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)		
Dissemination Level		
PU	Public	
PP	Restricted to other programme participants (including the Commission Services)	PP
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Roadshow status and results report is the eighth report on stakeholder aspects of research undertaken by the EFORWOOD Tools for sustainability impact assessment of the forestry wood chain. The report was prepared Christian Gamborg, senior scientist at University of Copenhagen, Forest & Landscape. Input to the report made by Kaj Rosén, Marcus Lindner, Manfred Lexer, Bernhard Wolfslehner, Gert-Jan Nabuurs, Eric Arets and Ewald Rametsteiner is gratefully acknowledged.

Danish Centre for Forest, Landscape and Planning
Faculty of Life Sciences
University of Copenhagen
Rolighedsvej 23
DK- 1958 Frederiksberg
Denmark

Tel. +45 3533 1501
Fax +45 3533 1508
Email chg@life.ku.dk

Contents

1 Summary

This report gives a status and account of the so-called roadshow, i.e. bilaterial meetings with stakeholders and the results obtained. See also D0.1.7 Stakeholder Interaction Assessment for a description of the interaction process within EFORWOOD.

In the period November 2007 to October 2008, approx. 20 stakeholder organisations have been visited in 7 countries. The aim of the roadshow meetings is twofold: *a)* to increase awareness and understanding of project impacts, and *b)* get input/feedback on project developments (general + specialized). The target groups for roadshow are EU Commission, large industries, other FBS industry and associations, other decision/policy makers, as well significant non-industrial NGOs.

The "results" – i.e. the issues and concerns which have more or less consistently come up at the meetings raised during the meetings – of the roadshow are made use of *a)* internally as input and feedback in project (Modules) and *b)* externally such as FAQ on Portal.

In general, stakeholders visited have been positively interested in the EFORWOOD project but also expressed difficulties in getting an overview, and moreover, some reservations regarding the use of the tool. Main areas of discussion at meetings have been: To-SIA as a tool, indicators, MCA and scenarios.

2 Introduction

This report gives a status and account of the so-called roadshow ", i.e. bilaterial meetings with stakeholders and the results obtained. See also D0.1.7 Stakeholder Interaction Assessment for a description of the interaction process within EFORWOOD.

WP 0.1 ensures active and integrated stakeholder and user-groups participation in the SIA of the FWC to secure a continuous dialogue using best practice methods of involvement.

3 Status and results of roadshow

3.1 Roadshow in the context of stakeholder interaction

A "road show" is here defined as a smaller dedicated, targeted two-way discussion meeting with key persons from EFORWOOD and representatives of a certain end-user or other stakeholder, i.e. the target group for the meeting.

3.2 Aim and background of roadshow

The aim of the roadshow is to present and explain the idea and content of the EFORWOOD project to smaller groups of industry, decision makers, commission services and other significant non-industrial stakeholders. The road show should build on current levels of awareness and understanding.

The meetings should enable a more direct consultation and feedback on the general idea and outcomes of EFORWOOD, but also make room for discussion of more specialized issues (e.g. scenarios) or certain parts of the FWC if relevant.

The desired outcome of the road show is that key target groups have gained a better understanding of the EFORWOOD project and its achievements and feel that they have had a chance to present their knowledge and views. Moreover, it is hoped that potential users of the tools developed by EFORWOOD understand the boundaries of the tools.

As described in the Communication Strategy some stakeholders (CEPI, CEI-BOIS, CEPF) are *project internal* stakeholders, i.e. member of the EFORWOOD consortium, with a co-responsibility for the project outcome. Other stakeholders of the FWC are *project external* stakeholders, i.e. they are not a member of the consortium.

Primary stakeholders—project internal as well as external—include EU Commission services, FWC related industry (e.g. CEPI) and FWC related non-industrial stakeholders such as forest owners associations (e.g. CEPF) and non-governmental organisations active in and/or impacted by the FWC (e.g. IUCN).

A wider range of secondary stakeholders include relevant industry based associations along the forestry wood chain, NGOs (such as various European consumer organisations), wider research community, European legislators and politicians at various levels.

3.3 Meetings held

In the period November 2007 to October 2008, approx. European 20 stakeholder organisations have been visited in 10 countries mainly within industry (different parts of the FWC), decision makers at various levels, and NGOs, cf. Fig. 1.

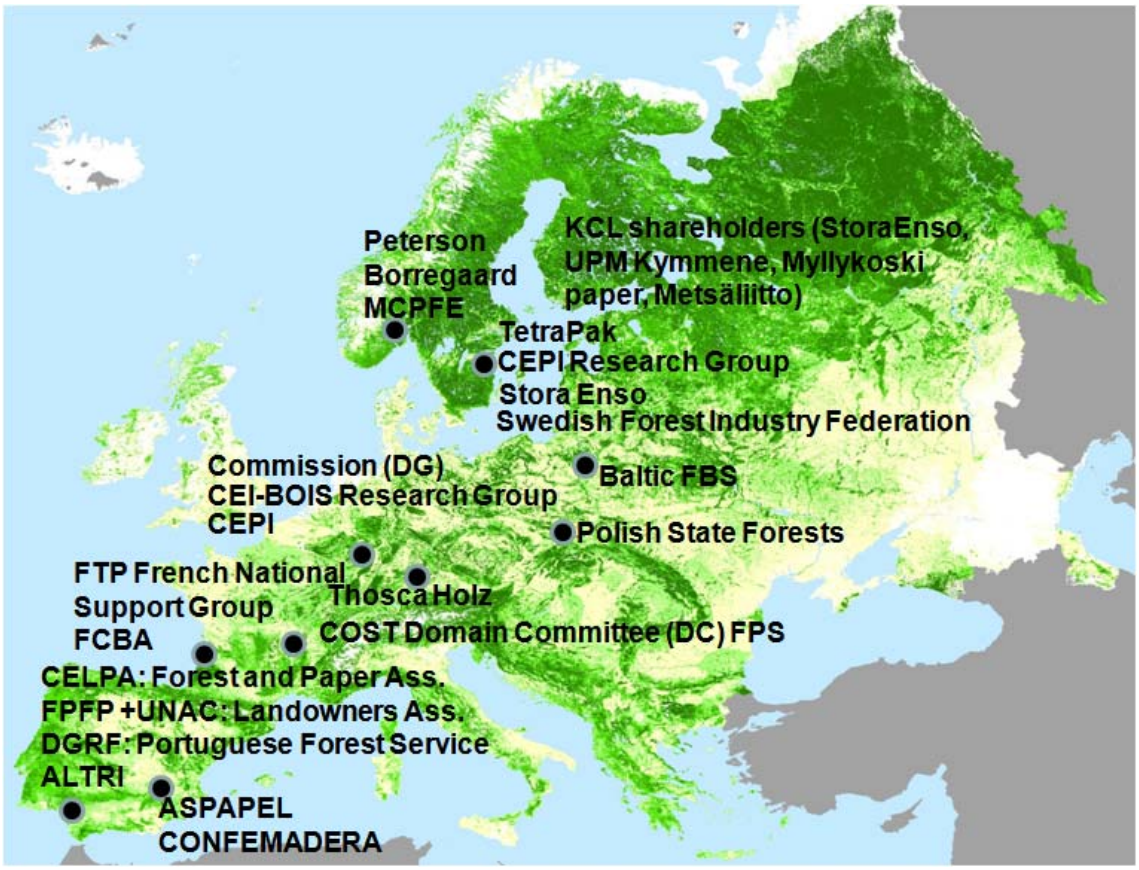

Figure 1. Roadshow meetings held November 2007 to October 2008.

In addition to the European stakeholder organisations, EFORWOOD was presented and discussed with 7 American organisations to get a non-european view of the approach taken by EFORWOOD. The American organisations were: Resources for the Future (RFF), USDA Forest Service, Agenda 2020 CTO Committee, American Forest and Paper Association (AF&PA), American Forest Foundation – Centre for Family Forests, National Council for Air and Stream Improvement (NCASI), and World Resources Institute (WRI).

For a full list of held meetings, please see Appendix 1.

Scheduled meetings include IUCN, WWF, regional politicians in Baden-Württenber, and Standing Forestry Commission,

3.4 Roadshow results and main issues raised

The "results" of the roadshow meetings are made use of *a)* internally as input and feedback in project (Modules) and *b)* externally such as FAQ on Portal.

In general, stakeholders visited have been interested in the EFORWOOD project but also expressed difficulties in getting an overview, and moreover, some reservations regarding the use of the tool.

In Table 1, some of the main issues raised during the meetings are listed: ToSIA as a tool, indicators, MCA and scenarios.

Table 1. Selected questions, issues and concerns (according to main topic, non-prioritised) raised during roadshow meeting

Topic	Questions, issues and concerns
ToSIA	• What will ToSIA look like – and what is it planned to do? • Who are the envisioned users of ToSIA? • Can ToSIA be used without expert help? • Can you compare different chains? • Is e.g. concrete/steel – in general substitution covered? • How are other materials than wood in products (e.g. plastic in packaging) handled? • How well does ToSIA reflect reality? • Who will be in charge of ToSIA; post-project maintenance and upgrading?
Indicators	• What kind of indicators are used? • How does the indicator set used in EFORWOOD compare with other sets (e.g. MCPFE)? • How are indicators consolidated? • Indicators used in ToSIA for comparisons of between FWCs should always cover the sensitive issues for both "lines" • How to handle import/export in relation to impacts?
MCA and CBA	• How do you compare/aggregate different indicators? • Who is determining the importance of indicator values? • How is subjective valuation handled? How transparent are the choices? • How are GHG emissions and carbon sequestration handled?
Scenarios	• What are scenarios, which areas? • How is the time aspect handled? • How to include external drivers (e.g. climate change, Chinese import) • FBS is global, not only European, how to take into account?
Other issues	• How is renewability reflected? • Misuse of results to discredit FBS (e.g. by locating "hot spots") • Use of results by policy makers to justify already decided policies (tweaking)

In the following sections, some of these issues will be presented in greater detail – as questions posed at the meetings, and ensuing discussions. Please note that some repetition in answers may occur, with slightly different wording – as response to differently phrased questions. These Q&A will be appear on the EFORWOOD portal in an edited form checked and cleared by project experts, and may be subject to change as the project develops.

3.4.1 Q&A related to ToSIA

What is ToSIA planned to do? ToSIA is a decision support tool producing as structured background material for analysis of proposed or likely changes. ToSIA is designed to answer 'what if' questions (e.g. changes in markets, changes to oil prices). These changes are reflected in changes in a sustainability index for the forestry wood chain or parts of the forestry wood chain..

What will ToSIA look like? ToSIA will come in two modes: ToSIA-FWC which will material flows in single/multiple FWCs and assess indicator values to indentified FWC-processes. ToSIA-FWC will include a module, ToSIA-E, to be used for analysis of indicator values, providing different possibilities for summarised indeces. ToSIA-E will allow for CBA (cost-benefit or cost efficiency) and MCA (multi-criteria). ToSIA-U will be a more demo kind of version. The actual user interface has not been developed yet, but will also be done in interaction with stakeholders.

Who will be the users of ToSIA? ToSIA will be provided in open source and could in principle be used by anybody. EFORWOOD is commissioned by the EU and intended for Commission or national authorities to use ToSIA when considering a new policy, as well as larger FBS companies (more for strategic purposes, not for deciding exclusively on e.g. new investments), industry confederations.

Can ToSIA be used in connection with public consultations? Technically speaking, yes. However, running the tool at a level required for informed decision making support requires external expert help to use it. The group mode in MCA (see below) could be used for comparing different stakeholder views.

Which concept definition of sustainability is used in EFORWOOD? The main point in EFORWOOD is not the actual definition, but to have a comprehensive set of indicators to cover the different dimensions of sustainability (ecological, economic and social aspects). The user's weighing/balancing of indicators in ToSIA will reflect the user's emphasis on aspects of sustainability.

Is it possible to make simulations, taking into account different sustainability criteria? ToSIA will have a set of guiding scenarios pre-defined which allows for some sort of "simulation" where impact with regard to selected indicators can be assessed – in relation to an alternative FWC.

Will the Commission know how to use it – Each commissioner has different objectives? It is not a "computer game" to be used on the spot by each desk officer. Expert/consultant help will be needed to use the tool for proper analyses (see question below). *If* it is to be taken further along the route of using it without consultant is a post-project question, which is in the process of being considered. Moreover, there is still the issue of collecting data for indicator values which is difficult.

Is concrete/steel substitution covered? It is not covered directly, but the impact of an increase in the use of wood or wood fibres is covered. Substitution questions are in a possible, subsequent project. The FBS is used to develop the methodology, well aware that for many the substitution question is important.

How is other material than wood in products handled? In the model, only wood and fibres are included. Recycling/land fill aspect is included.

If ToSIA evaluates internal changes (within one value chain), how can ToSIA be used to compare wood based products with products based on other materials (e.g. plastic or bricks/concrete), i.e. will ToSIA compare different sectors? EFORWOOD's focus is decision support in relation to improvements in sustainability within the FBS. Depends further on how the question is understood. *No*, you cannot compare different types of industry (e.g. wood and steel). EFORWOOD develops a methodology, which in time may be possible to apply to other sectors. However, different chains within the forest based sectors can be compared, but only if the different chains are comparable. For example: we want to compare different Spruce chains which differ in the management. Or it may be interesting to compare alternative bioenergy chains (which energy product is more sustainable: pellets or district heating?). However, comparing a beech chain and a pine chain in the same region or pine chain in Sweden and Spain respective sustainability is not meaningful. Sustainability impact assessment makes sense when you assess impacts of technological or policy drivers within comparable system boundaries.

What decisions are to be made with the help of the tool? ToSIA is a decision support tool producing a structured background material for analysis of proposed or likely changes. ToSIA is designed to answer 'what if' questions (e.g. changes in markets, changes to oil prices). These changes are reflected in changes in a sustainability index for the forestry wood chain or parts thereoff .

What about horizontal EU standards on building materials? See answer above. EFORWOOD could be of assistance by getting their specialists to 'balance' the picture at relevant meetings, subject to representatives of relevant partners to do this. In relation to the issue of recyclability of material, which was reported to be a tenet of e.g. steel, it depends on how recycled is defined.

Will ToSIA expose "weak" points of the Forest Based Sector? Yes, can be used to locate "hot spots". But as SIA is required by the EU before a new policy is introduced, ToSIA could actually be an advantage for FBS. EFORWOOD produces a SIA tool, and in other "sister" projects, such as SENSOR, and SEAMLESS, SIA tools for land-use and the agricultural sector are being developed.

Who is ToSIA intended for? The tool has been commissioned by the EU commission, as following 2002, any new policy to be introduced should be assessed for sustainability impact. Besides commission desk officers, the tool could also be used by the forest based sector itself, e.g. industry associations, larger companies and NGOs. The model will be available as open source, in principle for everyone to apply. However, after the 4 years of the project lifetime, the tool should be able to be run with the aid of an expert consultant for doing actual analyses such as MCA or CBA. In addition there will also be possibilities of using the web based demo version or of partial models.

What is put into the model? ToSIA need input of the following: definition of system boundaries for an analyses FWC; processes identified for a FWC, products identified for the FWC.

Will ToSIA compare different chains? Depends on how the question is understood. *No*, it is not possible to compare different types of industry (e.g. wood and steel) within this project. *Yes,* but only if the different chains are comparable. For example: we want to compare different Spruce chains which differ in the management. Or it may be interesting to compare alternative bioenergy chains (which energy product is more sustainable: pellets or district heating)? You can assess the sustainability of FWCs, also if they are not directly comparable (e.g. beech chain and pine chain in the same region or pine chain in Sweden and Spain). However, comparing their respective sustainability is not meaningful. Sustainability impact assessment makes sense when you assess impacts of technological or policy drivers within comparable system boundaries.

How can an industry (e.g.) organisation use ToSIA? ToSIA will come in two modes: ToSIA-FWC which will assess material flows in single/multiple FWCs and indicator values. ToSIA-FWC will include a module,ToSIA-E, which will allow for analysis using CBA (cost-benefit or cost efficiency) and MCA (multi-criteria) and for prioritising, weighing, analysing and summarising indicator values. ToSIA-U will be a more demo kind of web based version. Except for the ToSIA-U, expert help is in principle needed to run the model.

What about the rest of the world – only part of the picture looking at Europe ; what is more sustainable/better European or imported products – does it make sense to talk about European FWC as the FBS consists of local to global players? In EFORWOOD the focus is on the European FWC as a systems boundary. See also answer on import/export. However, the method is general and could in principle be applied anywhere in the world, as long as system boundaries are defined.

Is ToSIA possible to use outside Europe? ToSIA is general, and scalable. However the chain structures and database are set up for Europe in the current project. However, nothing prevents definition of FWCs and creations of data bases for regions outside Europe.

How are import/export issues handled? E.g. What about the environmental impact of exported products (Europe net export of wood* products) *E.g. raw material is imported from outside Europe, product is made in Europe and then exported outside Europe? It would seem that by importing raw material (e.g. pulp), the potential negative effects

would not be subscribed to the European FWC. So, seen in isolation there would be a difference between sustainable production and consumption. However, through the indicators the effects are being taken into account. The focus is on changes in the European FWC, and analyses are being done on the external effects using a general trade model (EFI-GTM) which can be used to analyse the effect of e.g. Russian tax, as input to the model.

How are imports/exports outside Europe handled? It would seem that by important raw material (e.g. pulp), the potential negative effects would not be subscribed to the European FWC. So, seen in isolation there would be a difference between sustainable production and consumption. Through the indicators the effects are being taken into account. It is a question of system boundaries. In EFORWOOD the focus is on changes in the European FWC, and analyses are being done on the external effects using a general trade model (EFI-GTM) which can be used to analyse the effect of e.g. Russian tax.

Where in the EU commission is use of ToSIA envisioned? The tool has been commissioned by the EU commission (DG Research), as following 2002, any new policy to be introduced should be assessed for sustainability impact, thus potential use in for example DG Environment, DG Agri, DG Enterprise.

Can ToSIA be applied on a national level? It is possible. In EFORWOOD, a regional case, Baden Württenberg in Germany is currently pursued. As part of the European FWC analysis, ToSIA will be applied at the country level for all EU countries. For a separate country-level study specific data are needed to characterize all relevant chains with ensuing aggregation and simplification (to some degree) of the processes (cf. in the European FWC, the aim is to cover 60-80% of the material flow).

Would companies in the FBS use the tool? Also larger FBS companies (more for strategic purposes, not for exclusively deciding on e.g. new investments – and for doing their analyses of potential policy changes or checking on results and assumptions from EU commission and other FWC stakeholders), industry confederations are seen as potential users.

What is understood by the European FWC? EFORWOOD works with EU 25 plus Norway and Switzerland (Romania and Bulgaria are not included) as a systems boundary for European FWC. EFORWOOD aims at covering 60-80% of the mass flows within this defined system.

What kind of data input is required of the user? It is clear that using the tool relies heavily on data related to indicator values and mass flows and value chains. A selected set of data are in the tool (see also scenarios) but additional data may well be needed for a specific part of the chain or a certain perspective or resolution.

Will ToSIA compare different chains? Not likely because of great difficulties in getting the same type of data. Moreover, what might be an issue for paper production in Spain (e.g. water) may not be so in Finland. The aim is to compare within a chain – given changes e.g. in transport policy or in bioenergy subsidies.

Will EFORWOOD by locating 'hot spots' lead to exposing the Forest Based Sector (FBS) to other sectors – before foreseen new part (beyond the four year EFORWOOD project) about comparing competing materials? FBS sector is exposed anyway. The aim is to improve transparency and to be able to document e.g. "use of forests as a resource is better" and be able to specify why, how and with regard to what.

Is data reliability checked, and is data updating foreseen? Using the data in ToSIA is a way of picking inconsistencies and errors in data sets. The update of data is not fully decided upon in the project. In many instances, reliance is on data which anyway is regularly updated (e.g. through national inventories).

What kind of ToSIA interface will be available – for whom? Two types of ToSIAs are foreseen: ToSIA FWC (basic data part) including ToSIA-E (analysis part to new policies or new processes) and ToSIA-U (more limited, demo type). Most parts of ToSIA will be open source, some models might be developed under a license. However, expert support to use the tools after the initial 4 years of the project must be expected. The EU Commission has funded 13 mill. Euros out of a total of 20 mill. Euros. The commercialisation of ToSIA is not been put up for discussion within the Consortium or with the Commission yet.

How well does the model reflect reality? The question is whether the aim is too ambitious, also trying to cover economic and social as well as ecological aspects. ToSIA tries to be realistic in covering the whole FWC and not just one part and taking into account all three pillars of sustainability. Other EU Integrated Projects also work with developing sustainability impact assessment as all EU policies should be analysed/assessed according to sustainability impact, regarding e.g. land use (SENSOR) + and agriculture (SEAMLESS).

Will different users get different results running the tool? Potentially yes. In essence, different users may well have different values/interests resulting in different indicator priorities (e.g. in comparing two chains, what is more important? Economical or environmental issues? Production cost or employment effect?) Multi-criteria analysis (MCA) – which is used as an analytical part of ToSIA – is designed to gather stakeholder and expert preferences in terms of (a) importance of indicators, and (b) the indicator values of specific FWCs. MCA allows to transfer indicators measured on different scales to a uni-dimension "preference" scale which then makes it possible to synthesize the transformed indicator values for the overall holistic comparison of decision alternatives.

Who will be in charge of ToSIA and how will post-project upgrading and maintenance be handled? Most of ToSIA is open source (except for some parts where commercial software/models might be included). Use of ToSIA will require expert help for doing analyses. It is not decided yet who will be in charge of that. Other EU Integrated Projects also work with developing sustainability impact assessment as all EU policies should be analysed/assessed according to sustainability impact, regarding e.g. land use (SENSOR) + and agriculture (SEAMLESS).

Can ToSIA evaluate the impact on traditional sawn timber chain when energy prices increase elsewhere in Europe (= competition for raw material) linked to energy poli-

cies (e.g. subsidies EU wide or nationally)? See answer above on comparing chains, and see answer on MCA (which is more sustainable, particle boards or bioenergy – depends on perspective).

Is it possible to change mathematical models in the tool? There are no models embedded directly in the tool. It is possible for the user to use own e.g. growth models to come up with data for growing stocks or use own inventory data. Data protocols for all indicators (and sub-indicators) are specified.

Are there any SME's involved, and if not, why? SME's are not directly involved in the project as single partners but represented through the Pan-European confederations (CEPI, CEI-BOIS and CEPF) to avoid a too large and unmanageable consortium.

Will ToSIA be used to compare production value chains for competing materials/industrial sectors? Not within the project lifetime. However, a natural further step for a subsequent project is to expand the methodology developed to other sectors.

How is the issue of renewability reflected in ToSIA (as against e.g. recyclability)*?* The renewability of wood as compared to other materials; e.g. steel and concrete, is a main positive aspect, which could also well be reflected in the relative weighing. This aspect is maybe not at the moment fully reflected in indicators. In the indicator on GHG the aspect comes in. Work needs to be done on how to reflect renewability in more than the GHG aspect.

Can ToSIA be used for "green washing" (or the opposite) by industry or pressure groups, e.g. will users be able to define their own scenarios – and thus manipulate by e.g. not taking fully into account e.g. global aspects? ToSIA (as a result of the 4 year EFORWOOD project) will be restricted to the scenarios chosen in EFORWOOD but can be used dynamically along response functions. Abuse can be made, however a single ToSIA run needs to be analysed for assumptions (see on ToSIA + MCA).

Who will own ToSIA – IPR? The tool is open source – as far as possible. During the project time ToSIA is "owned" by the partners of the project consortium. What will happen after EFORWOOD has ended is discussed within the project at the moment. The tool is based open source and will as far as possible be available for free to any user. However expert help will probably be needed before the tool is further developed to into a more user friendly version.

Is the tool flexible enough to allow for "special analyses". E.g can TOSIA be run for the French forest-based sector? Yes, at least if you are prepared to feed it with the necessary data for the specific Forestry-wood chains that you would like to design. ToSIA will include a data base, which, however, not might be enough for your purposes.

How will future improvements and developments be handled? The matter is discussed within the project consortium at the moment. Some kind of joint responsibility/activity among interested partners will most probably be developed. EFI will be the leading partner in the future development of ToSIA.

3.4.2 Q&A related to indicators

What kinds of indicator are used – is the set of indicators generic? Indicators for all three pillars of sustainability – in relation to the whole forestry wood chain (FWC) – are used (10 environmental, 9 economic and 8 social indicators, see Table 2). The indicators have been chosen with due reference to and consideration of all relevant indicator development processes on sustainability indicators in the EU, in particular the EU sustainable development indicators and the EU Sustainability Impact Assessment Guidelines. The FWC indicator development process also took sector specific indicator sets into account, most notably those for sustainable forest management (MCPFE criteria and indicators) and EU rural development. The large majority of indicators is generic in the sense that these indicators are not sector-specific, but generally valid and applicable across different sectors and industries (e.g. indicators on trade balance, employment, or energy generation and use). A few indicators, particularly on forestry (such as forest biodiversity), are sector specific.

Table 2. Economic, social and environmental FWC Sustainability indicators used in EFORWOOD

FWC sustainability dimension	Indicators	
Economic	*(1)*	*Gross value added*
	(2)	*Production cost*
	(3)	*Trade balance*
	(4)	*Resource use, incl. recycled material*
	(5)	*Forest sector enterprise structure*
	(6)	*Investment and research & development*
	(7)	*Total production*
	(8)	*Productivity*
	(9)	*Innovation*
Social	*(10)*	*Employment*
	(11)	*Wages and salaries*
	(12)	*Occupational safety and health*
	(13)	*Education and Training*
	(14)	*Corporate social responsibility*
	(15)	*Quality of employment*
	(16)	*Provision of public forest services*
	(17)	*Consumer behaviour and attitudes*
Environmental	*(18)*	*Energy generation and use*
	(19)	*Greenhouse gas emissions and carbon stock*
	(20)	*Transport*
	(21)	*Water use*
	(22)	*Forest resources*
	(23)	*Soil condition*
	(24)	*Water and air pollution*
	(25)	*Forest biodiversity*
	(26)	*Forest damage*
	(27)	*Generation of waste*

How general are the indicators (in relation to other materials' possible indicators and as a lot of standardisation work is going on related to the wood based industry)? The large majority of indicators are general in the sense that these indicators are not sector-specific, but valid and applicable across different sectors and industries. A few indicators, particularly on forestry (such as forest biodiversity), are sector specific. Standardization work usually standardise product or process specifications in detail and are considerably more specific than the indicators.

How are sub-indicators defined? Sub-indicators are defined according to one of the main 27 indicators. Each indicator has a number of sub-indicators (e.g. for the indicator "employment", there are sub-indicators for the gender aspects, thus including male and female employment or for "biodiversity" sub-indicators include deadwood and species distribution). For each sub-indicators data collection protocols are specified. Currently 162 sub-indicators have been specified.

Do all indicators have the same unit? No. Some indicators are e.g. in euros/m3, some in m3/ha etc. One indicator value cannot directly be compared with the value of a different indicator. To evaluate across indicators, ToSIA allows for either using Cost-Benefit Analysis (CBA) putting all values on a uniform monetary scale or Multi-Criteria Analysis (MCA) making comparison possible through the use of elicited preferences.

How is quality of data determined, and what is the reliability of data? Data is collected on the basis of agreed and detailed "data collection protocols" for the indicators by specific experts. These experts also have to specify data quality and data reliability. Some data is obtained through national and international statistics, in which case data specifications are internationally harmonised or standardised. Depending on the indicator in question, data reliability varies. For instance, data on resource use or total production is deemed more reliable than data on education and training, or soil condition.

How are indicators consolidated? The indicators are used as specified and results shown for each of the indicator. For a range of indicators, values are converted into material flow in the TOSIA model. Indicators are consolidated in two specific analysis tools within TOSIA, i.e the CBA (Cost Benefit Analysis) and MCA (Multi-criteria Analysis) tools. In CBA all indicator values are converted and thereby consolidated into €. In MCA indicator values are weighted by the user or user groups, based on their respective perception of importance of indicators.

How are differences in countries with regard to e.g. classification systems handled? Data is collected on the basis of agreed and detailed "data collection protocols", which have been elaborated for each indicator by a team of experts from different countries. These experts had to ensure classification compatibility and/or ways to convert between different classifications. Data to is obtained through national and international statistics are based on classification systems that are already internationally harmonised or standardised.

3.4.3 Q&A related to MCA and CBA

How will you compare and aggregate different indicators (with different units as well)? For this task multi-criteria tools will be applied. Multi-criteria analysis (MCA) is designed to gather stakeholder and expert preferences in terms of (a) importance of indicators, and (b) the indicator values of specific FWCs. MCA allows to transfer indicators measured on different scales to a uni-dimensional preference scale which then makes it possible to aggregate the transformed indicator values for the overall holistic comparison of decision alternatives. This aggregation can be done partially, for instance, within Modules of a FWC, or within sustainability pilars.

What are they main purposes of Multi-Criteria Analysis in EFORWOOD?
Multi-criteria analysis (MCA) is a set of methods designed to support decision-making by (i) taking explicit account of multiple, conflicting indicators, criteria or objectives, (ii) structuring a decision problem where the focus is on the comparison of a finite num-

ber of alternatives, (iii) identifying most preferable options among alternative courses by means of sustainability indicators, (iv) providing a formal model for such problems that can serve as a focus for discussion, and (v) offering a process that leads to rational, justifiable, and explainable decisions.

How can you handle the subjective valuation*?* In a multi-stakeholder setting, stakeholders may have different interests and values leading to different perceptions of indicators and indicator values. MCA provides the formal interface for eliciting preferences and values of actors involved in a decision making process. Participation supported by multi-criteria methods in sustainability impact assessment is essential to improve the capacity to understand complex issues. Moreover it helps to increase credibility of decision making and trust in decisions. In case no agreement is found contrasting opinions are documented and made transparent. For a given background (e.g., a regional case study) MCA may reveal overall differences in stakeholder perspectives in a consistent and transparent manner. The MCA software component of ToSIA will hence not support computational decision-making but prepare the decision environment for analysis, exchange and negotiation (e.g., how changes in weights may change the overall preferability of an alternative). It is important to note that values and interests of stakeholders and decision makers in comparing alternative FWCs in different regions may vary. Thus, there is no single "true" weighting scheme for indicators.

Who is judging the importance of indicators? In general, the user(s) by giving weights to indicator either valid for the whole FWC or specific for each phase of the FWC (e.g., forest management, harvesting and transport, wood processing, or purchase). The MCA software module within ToSIA is designed to support single user mode as well as a group mode where a stakeholder panel can analyse a FWC simultaneously. Because values of stakeholders and decision makers are involved there is *not one single true answer*. If a user is interested how his preferences may affect the assessment of FWCs he may set the relative importance of indicators. In a participative assessment environment stakeholders may produce "their" own reference profile for indicators and indicator values and compare it to those of other stakeholders. This comparison then may be used in finding a compromise solution.

What is the difference between single user mode and group mode in the MCA? There are two modes foreseen in the EFORWOOD MCA software**?** In single user mode, only one set of preferences is considered, whereas in group mode, a multitude of users' preference sets are included, allowing for comparison among sets of preferences and aiding e.g. negotiation between different stakeholders. The MCA workshop on the regional case of Baden-Württemberg served as an example of a multiple stakeholder/user way of determining and aggregating weights, making the underlying scoring explicit. Such type of workshops may be used to build up some commonly agreed weights (1) to discuss from, and (2) to compare against.

How important is a difference between alternatives with regard to an indicator (e.g. production costs)? The importance of a difference can be assessed via MCA in ToSIA by means of preference functions. The user is asked whether to accept a default setting based on an expert enquiry or to define a personalized preference function by stating indifference and strict preference for a difference of e.g. productions costs.

What happens when a run is done of a selected FWC, and different users get different results? The MCA software within ToSIA supports comparison of users´ preference profiles both in a Delphi style (i.e., comparing one´s judgement against the group opinion and adjusting or confirming your vote) and in a group analysis. The latter item is to identify consensus and disconsensus among MCA participants and builds the ground for further discussion and negotiation on indicator weights, significances of indicator performances and ranking of alternatives.

How are MCA results stored/presented to the user? A report is automatically produced, giving main results and preference ranges etc. In this report it will also be stated if the user is applying an unbalanced set of indicators to compare the sustainability impact of e.g. a certain policies on alternative FWCs.

Different user groups may use the results – how to get balanced user groups? There is not one definitive answer from the tool. There is not an objective measure of when a user group is 'balanced'. Building balanced user groups lies in the responsibility of the facilitator/negotiator. Yet, ToSIA may support a distinct analysis per interest group and hence serve as tool to document specific interests in a multi-stakeholder dialogue.

Are regional differences in e.g. harvesting in Northern and Southern Europe taken into account? Yes, there are regional parameters which are mostly covered by data within the database. Yet, there could also be differences regarding region-specific preferences. Typically, those "regional specifics" will be unveiled in case-to-case applications in any of the given regions. In the software, default preference settings which are based on expert enquiry can be applied in a case-specific manner.

How is CBA included as an analytical tool in TOSIA?Cost benefit analysis is a technique for the assessment of the relative desirability of competing alternatives. In the context of the EFORWOOD project, cost-benefit isused to evaluate the overall sustainability impact of different policy measures on the forestry wood chains. The assessment involves the comparison of the status quo (baseline case) to one or more alternatives considering the incremental differences between the baseline case and the alternatives. The CBA compares the costs and benefits measured in monetary terms.

How is the social perspective taken into account in CBA? In the framework of the EFORWOOD project, the social perspective on the cost-benefit analysis is taken as the benchmark. A social CBA attempts to assess the overall impact of a project improving the welfare of the society as a whole, rather than of the (private) agents that implement the project. Whenever the implementation of a certain project has an impact on the environment representing positive or negative externalities, these external effects must be taken into consideration, in addition to the effects on marketed goods and values, in the process of project evaluation. The changes in the quality or quantity of environmental and conventional goods and services produce changes in social benefits associated with their consumption, which should be accounted for in the CBA.

How are emissions (such as GHG) and carbon sequestration handled? Whenever the implementation of a certain project has an impact on the environment representing posi-

tive or negative externalities, these external effects must be taken into consideration in the process of project evaluation. The externalities considered for the purposes of the CBA included e.g. GHG and non-GHG emissions, and carbon sequestration.

3.4.4 Q&A related to scenarios

What are scenarios in EFORWOOD? A scenario – as used in EFORWOOD – is neither a prediction nor a forecast, but is used to create a consistent image of a future. A set of scenarios aims to describe divergent futures against two so-called reference futures (i.e. 'benchmark' scenarios with dynamics, but without major policy interventions), derived from the IPCC A1 and B2 scenarios. Scenarios encompass a significant portion of the underlying uncertainties in the main driving forces. These drivers cover a wide range of key characteristics such as demographic change, economic development, and technological change. Different "storylines" are used – which assume a distinctly different direction for future developments. However, a scenario does not claim or aim to be a prediction. Conclusions should not be drawn from these storylines; nor are they advocated views of EFORWOOD on the future of European forest and forest industry. The scenarios cannot be used to assess a single product's future.

What kind of changes will be looked at in EFORWOOD? Currently, four scenarios are being developed, dealing with changes in: 1) "Policy" (bioenergy), 2) "Planet" (nature conservation), 3) "People" (consumption and lifestyle), and 4) "Production" (technological development). These are applied to the three regional cases, and to the one European scale Forest Wood Chain (FWC). One scenario will be applied per case. ToSIA is tested on various scenarios. Effects on sustainability of a selected scenario will be evaluated against a "Reference future". The two Reference futures used in EFORWOOD are neither a prediction nor a forecast, but are used to create a consistent image of a future. The reference futures encompass a significant portion of underlying uncertainties in the main driving forces. These drivers cover a wide range of key characteristics such as demographic change, economic development, and technological change.

Which scenarios are being developed? Currently, four scenarios are being developed, dealing with changes in: 1) "Policy" (bioenergy), 2) "Planet" (nature conservation), 3) "People" (consumption and lifestyle), and 4) "Production" (technological development). These are applied to respectively Baden-Wurttemberg, EU, Iberia, and Northern Sweden. ToSIA is tested on various scenarios.

How is the time aspect handled within the scenarios? In relation to sustainability impact assessment, the time aspect is important. Depending on the chosen time horizon the type of management/harvesting schemes may well be changed or the markets may change; e.g. to more global supply. The dynamic models underlying the data generated and supplied to the Tosia database, have taken into account time dynamics. Thus, these dynamics are covered when indicator values are generated for 2015. 2025 and (in case of forests) 20250.

Is expansion of EU included, e.g. in relation to forestry potential and effects on markets? EFORWOOD works with EU 25 plus Norway and Switzerland (Cyprus and Malta are not included). Again, it is a systems boundary issue. The scenarios provide results for 2005, 2015 and 2025 where other countries may well be included. Trade changes that may occur because of future EU expansion are not included

What about economic drivers – in relation to changed capacity in Europe. It is not only a question of flow of material, but of capital. E.g. changes in China? The storyline sketch a certain world where either there is a more free trade of goods and capital (A1) or a world that is more depending on its own region (B2). This is the only degree we can handle such dynamic relations between countries. These general assumptions result in a degree of dependence on Europe's own resource.

The scenarios in ToSIA seem valid, but are they mutually exclusive? In the running of ToSIA, the scenarios are treated as exclusive even though in some areas (e.g. bioenergy and technology) drivers are overlapping. The idea is to single out effects of e.g. a nature conservation framework policy such as Natura 2000. Here there would be a need for investigating overlap and feedback functions from different scenarios.

The reference futures are in some respects extremes, but in others not (e.g. both assume stronger or weaker economic growth) – what about economic recession? The reference futures are set as a baseline to 'test' the tool/approach. They do not pretend to be all encompassing or realistically predicting.

Is it realistic to expect a certain stakeholder to build scenarios – what does it take? As the tool stands now it will require expert help (to e.g. define forestry wood chains and processes and set data protocols and get data).

4 Conclusions

The roadshows, i.e. bilateral meetings with stakeholders at their premises have been successful in helping to (i) communicate the project to key stakeholders, (ii) explore concerns and views related to EFORWOOD, and (iii) get feedback on key project elements, in particular ToSIA, indicators, MCA and scenarios.

The plan is to continue until 2009 (after which EFORWOOD products become more or less "fixed", and input/feedback cannot be considered).

The second phase of the roadshow has started, inviting written feedback, comments on indicators and, especially, scenarios from roadshow participants.

5 References

PD0.1.2 Stakeholder procedures and consultation plan, 2006.
EFORWOOD Communication Plan ver. 11, 2008.

Annex 1 List of roadshow meetings (Nov 2007–Oct 2008)

Meetings held

Date	Place	Company/ Organisation	Meeting particpants	EFORWOOD participants
30/10 2007	Hoesbach, Germany	THOSCA Holz FTP CEPI	Thosca Holz/FTP: Vilhelm Vorher (Managing Director, Thosca Holz, FTP Project Director) - wilhelm.vorher@thoscaholz.com CEPI: Bernard de Galembert (Forestry and Research Director) – b.degalembert@cepi.org	Kaj Rosén Gero Becker Christian Gamborg
02/11 2007	Stockholm, Sweden	Stora Enso	Stora Enso: Jim Weinbauer (Senior Vice President) - Jim.Weinbauer@storaenso.com Ragnar Fridberg - Ragnar.U.Friberg@storaenso.com *Heikki Rissanen - Heikki.Rissanen@storaenso.com *Anna-Liisa Myllynen - Anna-Liisa.Myllynen@storaenso.com	Kaj Rosén Carl Olsmats Christian Gamborg
07/11 2007	Uppsala, Sweden	Swedish Forest Industry Federation, Products Committee	Swedish Forest Industry Federation: *Ingrid Haglind Ingrid.Haglind@forestindustries.se (+ 15 members of the committee)	Kaj Rosén
21/1 2008	Brussels, Belgium	CEPI	RESEARCH GROUP CEPI: *Marco Mensink (Energy and Environment Director) –m.mensink@cepi.org *Bernard de Galambert (Forestry and Research Director) – b.degalembert@cepi.org	Kaj Rosén Arie Hoijemeier
12/2 2008	Oslo, Norway	MCPFE Peterson Borregaard	*MCPFE: Arne Ivar Sletnes (Head of Liason Unit, Oslo) - Arne-Ivar.Sletnes@lmd.dep.no Berit Hauger Lindstad (Policy adviser) - berit.lindstad@umb.no *Peterson: Per Arne Syrrist (Vice President, Chairman national FTP) – per.syrrist@peterson.no Borregaard: Jorn Syvertsen (Vice President) – jorn.syvertsen@borregaard.com	Kaj Rosén Birger Solberg Christian Gamborg
3/4 2008	Warsaw, Poland	General Directorate of State Forests	*General Directorate of State Forest: Marian Pigan (Deputy Director General Marketing & Development)- m.pigan@lasy.gov.pl Tomasz Wójcik (Head of International Cooperation Department) – t.wojcik@lasy.gov.pl	Kaj Rosén Dariusz Zastoci Christian Gamborg

			Grzegorz ´Slezak – g.slezak@lasy.gov.pl	
22/4 2008	Lisbon, Portugal	ALTRI Portuguese Forest Service UNAC FPFP CELPA	Altrid/Silvicaima : Henk Feith - hfeith@caima.pt + Luís Leal – LLeal@caima.pt + Marques Pinho MPinho@caima.pt Portuguese Forest service: Conceição Ferreira - concferreira@dgrf.min-agricultura.pt - + Cristina Santos - c.santos@dgrf.min-agricultura.pt UNAC: Nuno Mendes Calado (General Secretary) – nunocalado.unac@mail.telepac.pt FPFP (Federation of Landowners Association): Raquel Onofre – raquel.onofre@fpfp.pt Forest and Paper Association (CEL=PA): Armando Goes (General Secretary) - armando.goes@celpa.pt	Kaj Rosén Margarida Tomé Arie Hoijemeier Christian Gamborg
23/4 2008	Madrid, Spain	CONFEMADERA FEDERMEUBLE	*CONFEMADERA (Spanish Association for Wood Industry, except paper products): Francesc de Paula Pons Alfonso (Secretary General) – fpons@confemadera.es Beatriz del Castillo Parra (Technical Director) – b.castillo@confemadera.es Laura Martín Linares (Technology and Environment Department) – l.mlinares@confemadera.es	Kaj Rosén Arie Hoijemeier Christian Gamborg
23/4 2008	Madrid, Spain	ASPAPEL	*ASPAPEL: (Spanish Association of Pulp and Paper Manufacturers): Carlos Reinoso (Director General) c.reinoso@aspapel.es, José Causi Rielo (Forest Director) – j.causi@aspapel.es	Kaj Rosén Arie Hoijemeier Christian Gamborg
23/5 2008	Lund, Sweden	TetraPak	*Tetra Pak International: Lena Dahl (Forest Policy Officer) – Lena Dahl (Forest Policy Officer) – lena.dahl@tetrapak.com Mario Abreu (Director, Environment) – Mario.abreu@tetrapak.com	Kaj Rosén Christian Gamborg
26/5 2008	Stockholm, Sweden	CEPI Research Group	(information from Kaj Rosén)	Kaj Rosén Anne von Schenk
2/7 2008	Brussels, Belgium	CEI-BOIS Research Group	CEI-BOIS Research Group: Filip de Jaeger (Secretary General, CEI-BOIS) – fillip.de.jaeger@cei-bois.org Jan Lagerström (Research Director, Skogsindustrierne) – jan.lagerstrom@skogsindustrierne.org Jouku Silén (Vice President, R & D Business Development, StoraEnso Timber) – jouku.silen@storaenso.com Pekka Peura (Director, R&D, UPM-Kymmene Wood) – pekka.peura@upm-kymmene.com Markku Lehtonen (Director, R&D, Finnish Forest Industries Federation) – markku.lehtonen@forestindustries.fi	Kaj Rosén Christian Gamborg

21/8 2008	Riga, Latvia	Baltic FWC stake-holders	Dagnis Dubrovskis (Dean, Latvia University of Agriculture, Forest faculty) - dagnis.dubrovskis@llu.lv Andrejs Domkins (Director, Forest and Wood Products Research and Development Institute) - Andrejs.domkins@e-koks.lv Ilva Konstantinova (Deputy director of department, State Forest Service) – ilva@vmd.gov.lv Janis Upitis (Analyst, Latvian forest industry federation) - janis.upitis@latvianwood.lv Maris Kibermanis (Analyst, SJSC "Latvia State Forests") - m.kibermanis@lvm.lv Anita Baumane (Head of Strategy Department, Ministry of Agriculture Forest Policy Department) - anita.baumane@zm.gov.lv Janis Birgelis (Director, Ministry of Agriculture Forest Policy Department) - janis.birgelis@zm.gov.lv Arnis Muiznieks (Chairmen of the Board, Latvian Forest Owners' Association) - info@mezaipasnieki.lv	Marcus Lindner Ansis Actins Christian Gamborg
10/9 2008	Vienna, Austria	COST Domain Committee (DC) on Forests, their Products and Services (FPS)	DC national representatives from 34 members' states	Jean-Michel Carnus
8/9 2008	Washington DC, USA	Resources for the future (RFF)	Roger Sedjo, RFF, Sedjo@rff.org	Kaj Rosén
10/9 2008	Washington DC, USA	Agenda 2020, CTO Committee hosted by AF&PA (American Forest and Paper Association)	Betsy Davis, AF&PA, Betsy_Davies@afandpa.org Patrice Mangin, patrice_mangin@uqtr.ca World Nieh, US Forest Service, wnieh@fs.fed.us Joe LeBlanc, Smurfit-Stone, JLEBLANC@SMURFIT.COM Al Lucier, National Council for Air and Stream Improvement Inc. (NCASI), alucier@ncasi.org Dean Benjamin, NewPage, dean.benjamin@newpagecorp.com Rob Doudrick, US Forest Service, rdoudrick@fs.fed.us John Cowie, AF&PA, john_cowie@afandpa.org Rudine Antes, Aracruz Cellulose, rantes@aracruz.com.br Mark Watkins (Chair), Mead Westvaco, mark.watkins@meadwestvaco.com Larry Montague, TAPPI, lmontague@tappi.org Chris Doherty, ThermoChem Recovery Intl. ; Ronald Rousseau, Georgia Universtiy, ronald.rousseau@che.gatech.edu Markku Karlsson; UPM-Kymmene, markku.karlsson@upm-kymmene.com Jim Matheson, Parsons & Whittmore,	Kaj Rosén

			Jmatheson@pw-inc.com Jay Gregory, Longview Fibre, ljgregory@longfibre.com Harry Cullinan, Auburn University, cullinan@eng.auburn.edu	
10/9 2008	Washington DC, USA	American Forest Foundation, Centre for Family Forests	Bob Simpson, bsimpson@forestfoundation.org	Kaj Rosén
10/9 2008	Washington DC, USA	NCASI, National Council for Air and Stream Improvement	Al Lucier, alucier@ncasi.org	Kaj Rosén
11/9 2008	Washington DC, USA	World Resources Institute, WRI	Lars Laestadius, larsl@wri.org Shally Venugopal, svenugopal@wri.org Liz Marshal, lmarshal@wri.org Richard Waite, rwaite@wri.org John Fimsdore, john.fimsdore@wri.org Muhan Cheng, muhan.cheng@wri.org Christian Layke, Christian.layke@wri.org Matthew Steil, msteil@wri.org Maria Khalid, mkhalid@wri.org Duna Krechowicz, dkrechowicz@wri.org Florence Daviet (not at the meeting), fdaviet@wri.org	Kaj Rosén
15/9 2008	Finland	KCL shareholders (StoraEnso, UPM Kymmene, Myllykoski paper, Metsäliitto)		Marcus Lindner
1/10 2008	Brussels, Belgium	Commission Services	Astrid Kaemena, DG RTD (Project Officer EFORWOOD, astrid.kaemena@ec.europea.eu Viviane Andre, DG ENV, viviane.andre@ec.europea.eu Hartmut Barth, DG RTD, hartmut.barth@ec.europea.eu Ana Suarez Meyer, DG ENV ana.suarez-meyer@ec.europea.eu Giuliana Torta, DG ENV, guiliana.torta@ec.europea.eu Alexandra Vakrou, DG ENV, alexandra.vakrou@ec.europea.eu Tomasz Oszako, DG RTD, thomasz.oszako@ec.europea.eu Jeremy Wall, DG ENTR, jeremy.wall@ec.europea.eu	Kaj Rosén Marcus Lindner Eric Arets Manfred Lexer Christian Gamborg
2/10	Stockholm	Swedish Forest Industry Federation, Research Committee	Carl Hellström (info@ele.nu) Greta Fossum, (greta.fossum@skogsindustrierna.org) Göran Bengtsson (goran.bengtsson@storaenso.com) Lagerström, Jan (jan.lagerstrom@skogsindustrierna.org) Karin Emilsson (karin.emilsson@sodra.se) Kristina Säfsten (kristina.safsten@m-real.com)	Kaj Rosén

			Margareta Öhrn (margareta.ohrn@billerud.com) **Mikael Eliasson (Mikael.Eliasson@setragroup.se)** **Örjan Pettersson (orjan.petterson@sca.com)** **Linda Eriksson (linda.eriksson@skogsindustrierna.org)**	
6/10 2008	**Bordeaux, France**	**FTP French National Support Group**	**FCBA** **Pôle Industries Bois Construction**	**Jean-Michel Carnus** **Christian Gamborg**