INDUFOR

EUROPEAN CONFEDERATION OF WOODWORKING INDUSTRIES (CEI-Bois)

ROADMAP 2010 FOR THE EUROPEAN WOODWORKING INDUSTRIES

INDUFOR WORK PACKAGES

1.1 ENVIRONMENTAL CATALOGUE
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Final Summary Report

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ABBREVIATIONS AND ACRONYMS

%	percent
AC-10	Accession countries (to EU)
AEIM	Spanish Association of Wood Importers
AFPA	American Forest & Paper Association
AFTA	Asean Free Trade Area
AHEC	American Hardwood Exporters Association
AIMMP	Associaçao das Industrias de Madeira e Mobiliario de Portugal
AP	Acidification potential
APA	Engineered Wood Products Association
APC	American Plastics Council
APME	Association of Plastics Manufacturers in Europe
APMR	Romanian Furniture Manufacturers' Association
ARD	Afforestation, Reforestation and avoided Deforestation
ASFOR	Exploitation Transport and Primary Wood Processing
ATIBT	Association Technique Internationale des Bois Tropicaux
ATL	Accelerated Tariff Liberalisation
BAT	Best available technology
BFH Hamburg	Bundesforschungsanstalt für Forst- und Holzwirtschaft, Hamburg, Germany
BRE	Building Research Establishment
BRIK	Forestry Industry Revitalisation Body of Indonesia
BUWAL	Bundesamt für Umwelt, Wald und Landschaft (Switzerland)
BWF	British Woodworking Federation
C	carbon
C&I	Criteria and Indicators
C&L	Certification and Labelling
CBD	Convention on Biological Diversity
CDM	Clean Development Mechanism
CE	Communaute Europeenne
CEI-Bois	Confederation of European Woodworking Industries
CEPF	Confederation of European Forest Owners
CEPI	Confederation of European Paper Industries
CERU	Certified Emission Reduction Unit
CHP	Combined heat and power
CICI	International Conference on Contribution of Criteria and Indicators for SFM
CIF	Cost, insurance, freight
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CITPA	International Confederation of Paper and Board Converters in Europe
CML	Institute of Environmental Sciences (affiliated to the Leiden University, the Netherlands)
CNDB	Comité Nationale du Développement du Bois
CO_2	Carbon dioxide
CoC	Chain of custody
COM	Conference of the Ministers
COP	Conference of the parties
COP-9	The ninth Conference of the Parties of Kyoto Protocol
CPF	Collaborative Partnership on Forests
CRTA	WTO Committee on Regional Trade Agreements
CSA	Canadian Standards Association
CSD	Commission on Sustainable Development (United Nations)
CTBA	Centre Technique du Bois et Ameublement
CTE	Committee on Trade and Environment of WTO
DG	Directorate General of the EU
DIY	Do-it-yourself
DTI	Department of Trade and Industry, UK
EC	European Community
ECE	Economic Commission for Europe
ECVM	European Council of Vinyl Manufacturers

EEA	European Economic Area
EFI	European Forest Institute
EFSOS	European Forest Sector Outlook Studies (of UNECE/FAO)
EMAS	Environmental Management and Auditing Scheme
EMPA	Eidgenössische Materialprüfungs- und Forschungsanstalt (Switzerland)
EMS	Environmental Management System
EN	European Norms
ENGO	Environmental Non-governmental Organisation
EOS	European Organsation of Sawmillers
EP	Eutrophication potential
EPF	European Panel Federation
ETC	European Timber Council
ETH	Eidgenössische Technische Hochschule Zürich
EU	European Union
EU-15	European Union, with 15 member countries
EU-25	European Union, with 25 member countries
EUR	Euro
EU-WWI	European Union Woodworking Industry
FAGOSZ	Hungarian Federation of Forestry and Wood Industries
FAO	Food and Agriculture Organisation of the United Nations
FAWS	Forest available for wood supply
FBI	Forest-based industry
FB-IND	Forest-based industry (EU)
FCCC	Framework Convention on Climate Change
FDI	Foreign Direct Investment
FEBO	European Timber Trade Association
FEFPEB	European Federation of Wood Packaging Producers
FEIC	European Federation of Plywood Industry
FLEGT	Forest Law Enforcement, Governance and Trade
FOB	Free on board
FOP	Forest Products and Economic Division (of FAO)
FRA	Forest resource assessment
FSC	Forest Stewardship Council
G-8	Group of Eight (leading economies)
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GEF	Global Environment Facility
GFPM	Global Forest Products Model
GFRA	Global Forest Resources Assessment
GHG	Greenhouse gas
GNP	Gross National Product
GPA	Plurilateral Government Procurement Agreement
GWP	Global / greenhouse warming potential
GZS	Slovenian Wood Processing Association (Gospodarska Zbornica Slovenije)
h/t	work hour per ton
ha	Hectare = 10 000 square meters
HWP	Harvested wood products
ICCI	International Conference on C&I for Sustainable Forest Management
IEA	International Energy Agency
IFC	International Finance Corporation
IFF	Intergovernmental Forum on Forests
IHPA	International Hardwood Products Association
ILO	International Labour Organisation
INGO	International Non-Governmental Organisations
IPCC	Intergovernmental Panel on Climate Change
IPF	Intergovernmental Panel on Forests
IPP	Integrated Product Policy
IPR	Institute of Public Relations
ISO	International Standardisation Organisation
ITC	International Trade Centre

ITTA	International Tropical Timber Agreement
ITTC	International Tropical Timber Council
ITTO	International Tropical Timber Organisation
IUCN	World Conservation Union
IUFRO	International Union of Forestry Research Organisation
IVAM	Research and Consultancy on Sustainability (affiliated to the University of Amsterdam, the Netherlands)
IWPA	International Wood Products Association
JI	Joint Implementation
JPC	Jaakko Pöyry Consulting
JPMC	Jaakko Pöyry Management Consulting
KCL	Keskuslaboratorio – Central laboratoriet
Kg	Kilogram
KgC	Kilograms of carbon
KP	Kyoto Protocol
LCA	Life cycle analysis
LULUCF	Land-use, land-use change and forestry
m	meter
m^2	Square meter
m^3	Cubic meter
MBI	Market Based Instruments
MBOC	Maison Bois Outils Concept
MDF	Medium density fibreboard
MEA	Multilateral Environmental Agreement
MFN	Most Favoured Nation
Mill.	million
MOU	Memorandum of Understanding
NAI	Net annual increment
NFP	National forestry program
NGO	Non-Governmental Organisation
NHLA	National Hardwood Lumber Association
NIC	Newly Industrialised Countries
NOM	Nature oriented management
NO_x	Nitrogen oxides
NTB	Non-Tariff Barrier
NTC	Nordic Timber Council
NTFP	Non-timber forest product
NTM	Non-tariff measure
NWFP	Non-wood forest product
O_2	Oxygen
OECD	Organisation for Economic Co-operation and Development
P&C	Principles and Criteria
PE	Poly Ethylene
PEFC	Pan-European Certification Scheme, more recently: Programme for the Endorsement of Forest Certification Schemes
PEOLG	Pan European Operational Level Guidelines
PGA	Plurilateral Agreement on Government Procurement
PIRA	PIRA International, UK
POCP	Photo-chemical ozone creation potential
PPM	Production and processing method
PR	Public relations
PRCA	Public Relations Consultants Association
PS	Poly styrene
PVC	Polyvinyl chloride
R&D	Research and development
RES	Renewable energy sources
RES-E	Renewable energy sources for electricity
RIL	Reduced impact logging
RTS	Building Information Foundation
RWE	Roundwood equivalent

SBSTA	Subsidiary Body for Scientific and Technological Advice
SFI	Sustainable Forests Initiative
SFM	Sustainable forest management
SGS	Société General de Surveillance SA
SME	Small and medium-sized enterprise
SPS	Sanitary and Phytosanitary Measures, WTO Agreement
SPWP	Secondary Processed Wood Products
SWOT	Strengths, weaknesses, opportunities and threats
TBT	Technical Barriers to Trade, WTO Agreement
TC	Tons of carbon
TgC	Tera-grams of carbon
TNC	Trans-national corporation
TOR	Terms of reference
TRAINS	Trade Analysis and Information System, of UNCTAD
TRIM	Trade Related Investment Measures
TRIP	Trade-Related Aspects of Intellectual Property Rights
TTJ	Timber Trade Journal
UK	United Kingdom
UN	United Nations
UNCSD	United Nations Committee on Sustainable Development
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests
UR	Uruguay Round
USA (US)	United States of America
USD	United States Dollar
US-EPA	United States Environmental Protection Agency
USTR	Office of US Trade Representative
VAT	Value Added tax
WB	World Bank
Wfg	Wood. for good
WFSE	World Forest, Society and Economy (of EFI)
VLC	Verification of legal compliance with national laws
VLO	Verification of legal origin
WP	Work package
WPN	Wood Promotion Network
WSSD	World Summit on Sustainable Development
WTO	World Trade Organization
WWF	World Wide Fund for Nature
WWI	Woodworking Industry

EXECUTIVE SUMMARY

The structure of the Executive Summary follows the presentations given on Key Conclusions in various Project meetings. They first describe an ideal situation on each area of concern in 2010, and then explain the key messages based on Indufor's research on Work Packages, and complete the assessment with associated risks and opportunities for the European Woodworking Industries (WWI). Finally, action proposals are given on how the WWI could capitalise on observed potentials. The issue of hierarchy and subsidiarity of various actions is addressed with a clear matrix where actions in hierarchical order are subjected to various actors (industries, CEI-Bois, national authorities, the EU). By definition, the principle of devolving actions to the lowest practical level is encouraged.

PART A

1. CONCLUSIONS ON WORK PACKAGE 1.1 ENVIRONMENTAL CATALOGUE

1.1 Policy Linkages

Ideal Situation 2010:

The woodworking industry of the EU:
1. Is guided by a set of coherent policies which encourage increased consumption of sustainably produced, safe wood products;
2. Due policy recognition has been awarded to woodworking industry for its potential to yield economic and social benefits, and to contribute to environmental conservation;
3. Decision-makers have sufficient information in an easy-to-use format on the environmental impacts of the woodworking industry and wood products;
4. The industry itself has become a major player in shaping and managing the policy networks.

Key Messages:

I. Woodworking and forestry sectors are increasingly influenced by fragmentary single-issue policies, and face a risk of becoming over-burdened with conflicting and adverse regulatory instruments not recognising the sustainability benefits of the value chain.

Explanatory comments:

- Global, EU-level and national policies are becoming more inter-linked in the environmental and social fields, which represent a challenge for influencing them by the European woodworking industry.
- Global environmental agenda such as sustainable development, the environment (climate, soil, water), health and safety (chemicals), etc. are setting stricter regulations for the woodworking industry - without a proper consultation in most cases.
- On economic and social front, policies are more locally driven, but the EU internal market rules, competition policies, energy and transport policies, etc. affect the woodworking and forest sectors on regional basis. This implies that initiatives to promote the development of the woodworking industry may face EU policy constraints in spite of the fact that at national and local level support can be mobilised.

II. Woodworking industry's key target should be to integrate the concept of sustainable value chain assessment into national and EU policies in order to avoid adverse regulations.

Explanatory comments:

- The current environmental and energy policies and regulations lack a sustainable development vision, what will work against the woodworking industry.
- Woodworking industries' interest is to rationally utilise the value-addition potential of wood raw material and this goal should not be sacrificed e.g. for bio-energy reasons, because energy policy goals can be achieved through the promotion of the value chain of wood industry.
- EU and its Member States will maintain a decentralised approach to promote sustainable forest management and the multifunctional role of forests; this is likely to add constraints to industry's wood supply in an open market economy in many countries.
- Production aspects of sustainable forest management are not duly considered from the industry point of view, even though it affects the entire value chain.
- Environmental labelling and EMAS/EMS are the most broadly applied voluntary policy instruments which affect wood products processing and trade; sector-specific schemes would better guide the industry. WWI should propose a programme in the framework of EU's new thematic strategy on the sustainable use of natural resources.

Risks:

- Cross-cutting strategies may not take into account sector's concerns through consultation, and the WWI may not find right mechanisms of influence.
- Overly complex policy networks emerge with conflicting objectives; influencing such policies is difficult and the woodworking industry will have to struggle to effectively communicate the "right" developmental signals.
- Strategic planning of the woodworking industry becomes more uncertain.
- The EU Forestry Strategy has not met expectations in securing a consistent and accepted policy backing for the wood supply. As a weak instrument, it leaves room for restrictive new policies to emerge from the environmental and land use fronts.
- Policies may become disproportionately restrictive for woodworking sector (e.g. on chemicals, health and safety) if the industry is not duly consulted.

Opportunities:

- By complying with EU's strict regulations, the woodworking industry can create new competitive edge over its non-European rivals.
- Policies can stimulate product development ahead of market requirements (formaldehyde, CO2 emissions, preservative treatment, etc.); in this way the regulatory signals can be interpreted in anticipation of the consumer reaction, which often dovetail e.g. health recommendations.
- Current policy formulation (e.g. EU's new recycling strategy and thematic strategy on the sustainable use of natural resources) can be influenced with provision of appropriate information on woodworking sector's economic, social, and ecological impacts, if up-to-date and disseminated in an easily understandable format.
- Key leverage points will have to be identified to gain the critical political mass to back such initiatives.

Action Proposals

First priority:

1. Prepare a comprehensive policy inventory with impact assessment on the effects on woodworking industries (levels: global-regional-country).
2. Improve transparency of policy design and interpret conflicts-of-interests, which can be identified through regular stakeholder consultations; CEI-Bois's role is to convene such meetings and convey relevant communications to policy-makers.
3. Seek presence and active participation in policy-formulation (propose WWI sector programme on EU's strategy on the sustainable use of natural resources), establish a new body if necessary for this purpose (e.g. WWI policy advisory group).

Second priority:

4. Monitor continuously policy processes and influence proactively emerging issues.
5. Generate information and argumentation on the woodworking industry's capabilities to support triple-bottom-line sustainable development (economic-social-environmental).
6. DG Enterprise is recommended to evaluate and continue work on the EU Forest-Based Industries (FBI) linking with Elements of Roadmap 2010.

Subsidiarity:

Action Proposals	**Responsibility**			
	EU	**National authorities**	**Industry**	**CEI-Bois**
First priority:				
1. Policy inventory, impact assessment on WWI		**Support**	**Support**	**Lead**
2. Bring transparency, sort out conflicts-of-interests in policy design	**Lead**	**Lead**		**Support**
3. New initiatives for policy-formulation		**Support**	**Support**	**Lead**
Second priority:				
4. Proactively influence emerging policy issues		**Support**	**Support**	**Lead**
5. WWI in triple-bottom-line sustainable development		**Support**	**Support**	**Lead**
6. EU Forest-Based Industries work linked with Roadmap 2010	**Support**			**Lead**

1.2 Climate Change and Wood Products

Ideal Situation 2010:

The woodworking industry of the EU:
1. Manufactures high-quality wood products and longer-serving building solutions that enable consumers and specifiers to capture the potential climate benefits;
2. Policy-makers are fully aware of the positive role of the woodworking industry sector in mitigating climate change;
3. Discerning consumers respond by using more wood products that are clearly identified and labelled for their climate-friendliness;
4. Industry can demonstrate measurable improvements in the mitigation of climate change.

Key Messages:

International community's determination to control climate change may represent a tangible opportunity for the woodworking sector because the potential forest-based remedies are intertwined with the entire value chain and life cycle of wood products. Should Kyoto Protocol fail, the environment should be kept as a key issue with proper argumentation by the industry.

Explanatory Comments:

- Forest sinks and sequestration of carbon can be manipulated with forest management.
- In wood processing, products with low energy use and high thermal efficiency contribute positively to national energy and carbon balances. Self-generation of energy from residues and use of wood biomass offer long-term benefits in meeting climate change restrictions.
- In consumption, long-term product sinks and recyclable goods engage consumers to multiply the beneficial climate effects of wood products, provided that substitution of other materials with wood becomes a policy objective.
- Understanding the wood products value-chain and the extension of product life cycle is needed among policy makers.
- Prolonged uncertainty over the Kyoto Protocol would necessitate the development of supplementary social, environmental and LCA arguments in the absence of international recognition for CO_2 benefits.

Risks:

- There is wide variation between countries on how much of the forest carbon is stored in the growing stock, products and soil.
- There is a risk that differing national interests lead to such rules of the game that act as disincentive for wood product use.
- Longer timber rotations and mature stands stock more carbon than intensively managed forests: if this becomes a policy objective, it could lead to reduced wood supply.
- Forest sinks may "overplay" the role of product sinks - simplistic interpretations should be avoided in order to have a balanced view of both types of sinks.
- Carbon sink projects under the Clean Development Mechanism could lead to unjustified subsidies for developing country producers. This could reduce the competitiveness of the European woodworking industry.

- There are four different methods in calculating wood product carbon in the national Carbon Accounts: countries have preferences but uncertainty of benefits to industry and trade remains to be investigated.
- Kyoto Protocol does not (yet) award carbon credits for product sinks, nor is the substitution effect of wood products recognised. There are two risks - risk of missing out product sinks from the rules and that the emerging rules will work against wood products use.
- Kyoto Protocol's ratification rests in the hands of Russia.

Opportunities:

- Most product carbon in the EU is stored in building and construction (80%), and sawnwood is the most important product sink - a proven fact that could be communicated by producers, e.g. on product labels.
- Stock-management of product carbon is a potential "smart" tool to control net emissions. This should be integrated in the policy objectives of climate change mitigation
- Harvested wood products are likely to become accounted for in Kyoto Protocol's second commitment period (2012 onwards) and the rules could promote wood use.
- The international community should adopt the stock change approach including international trade in accounting wood product carbon. This would probably best encourage the continuous increase of wood consumption and trade for carbon's sake; industry and consumers, exporters and importers have a common interest under this approach to promote wood product use.

Action Proposals:

First priority:

1. Prepare the necessary arguments to fight the competing materials sectors' lobby against the wood sector in climate issues (sinks in particular). If Kyoto Protocol fails, start preparing alternative arguments for the wood products in the absence of CO_2 from LCA and other environmental comparisons.
2. Develop supporting arguments from WWI's benefits on local development, income generation, etc. if environmental issues get watered-down.
3. Monitor the development of the bio-energy sector: bio-energy use increases demand for waste and residues, but is also competing for fibre flows with reconstituted panels; develop the concept of the optimal fibre allocation for sustainable development and collect evidence through case studies.
4. Influence the climate negotiation process: (1) to account product sinks in national carbon accounts, (2) to duly consider substitution benefits and stock change accounting method for wood products. This would require preparation of adequate supporting information for both purposes.

Second priority:

5. Monitor the implementation of the Clean Development Mechanism and Joint Implementation in the developing and transition countries, where sinks can act as subsidies for increasing wood production.

6. Develop a diagnostic carbon forestry information system or a portal focusing on existing data sources: keep the woodworking sector informed on the policy process and desirable industry positions.
7. Create awareness about the fact that also competing materials would gain a lot from capturing some of the wood's environmental properties: promote joint product development, assess climate impacts of material combinations.
8. Develop simple calculation examples to demonstrate climate impacts of using more and better quality wood products extending their service lives and sink roles.

Subsidiarity:

Action Proposals	**Responsibility**			
	EU	**National authorities**	**Industry**	**CEI-Bois**
First priority:				
1. Influence the climate negotiations	**Lead**	**Support**		**Support**
2. Develop climate change arguments (with or without Kyoto Protocol)		**Lead**	**Support**	**Support**
3. Develop climate change arguments of WWI's benefits for sustainable development			**Support**	**Lead**
4. Monitor the development of bio-energy sector	**Support**	**Support**	**Lead**	
Second priority:				
5. Monitor CDM and JI implementation	**Support**	**Lead**		
6. Carbon forestry information service		**Support**		**Lead**
7. Material combinations in the light of climate impacts			**Lead**	**Support**
8. Demonstration of climate impacts of improved wood products properties		**Lead**	**Support**	

1.3 Environmental Benchmarking between Wood Products and Substitutes

Ideal Situation 2010:

The woodworking industry of the EU:

1. Has adequate information on the life-cycle environmental impacts of wood products compared with potential substitutes;
2. Excels over competing materials in independent comparative environmental impact assessments prepared for key end uses;
3. Is itself considered an environmental benchmark against competing materials industries for the "green" engineering properties of wood products for versatile applications, where environmental impacts can be tackled more flexibly than with competing materials;
4. Has fully integrated environmental criteria into product development (eco-design, green product development).
5. Communicates effectively its leading position through scorecards on key benchmarks.

Key Messages:

Measured on a wide range of key environmental criteria, wood outperforms competing materials in most consumer-oriented building and construction applications. However, wood becomes the preferred choice only if consumers want. Price and utility will continue to guide purchasing.

Explanatory Comments:

- Wood's environmental fundamentals are solid:
  - renewable, recyclable, low on waste (bio-degradable)
  - can be claimed to have nearly a closed material cycle
  - the industry relies mainly on renewable energy
  - smallest emitter of CO_2 during the product lifecycle
  - best net energy consumption (can be negative for many applications)
- Overall wood has the lowest environmental burden compared to substitutes
- The consumer does not care, unless price is right

Risks:

- A major fear is that the wood industry and forestry sectors have already invested a lot on the assumption that the climate issue, CO2, and certification are issues that would pay off. Big risk scenario is that the consumers drop all these, and only price and utility will guide purchasing.
- Despite the solid fundamentals, the WWI may under-perform in communicating its benchmarks vis-à-vis competitors due to internal reasons. Growth rates and profitability of the industry, its level of concentration, visible and perceived environmental problems, and regulatory ties all affect industry's ability to advocate for its "greenness".
- Competing industries produce biased LCA research which work against wood product use.
- Consumers and other stakeholders may fail to distinguish between a true benchmarking statement and an unfounded environmental claim.
- Wood as a material generally lacks the systemic support of building regulations, codes and standards - it is difficult to capitalise on sustainability, safety and other positive factors. Technical criteria and performance-based regulations overrule greenness and sustainability.
- Perceived environmental concerns with wood are primarily related to sustainable forest management (material procurement), the secondary threat is on chemicals and adhesives (final products). Only the latter can be directly compared with competing materials on quantified criteria, while e.g. mining and sustainable forest management are not easily comparable.

Opportunities:

- Establish new alliances through consultation and communication on wood's environmental superiority with the consumers, specifiers, retailers and NGOs which requires adequate information in understandable form (in their language and through their own info channels and networks).

- Choice of media is the key opportunity:
  - Consumers are best informed through housing and DIY magazines and specialist TV shows, and environmental scorecards.
  - Specifiers can be collectively reached through media channels, special events, training programs and networks targeted at professionals.
- It is possible to establish partnerships with NGOs for promoting wood use from sustainable forestry as a common agenda. But more benchmarking and life cycle assessments are needed to get this message more accepted by the green movement.

Action Proposals I. (on Consumers):

First priority:

1. Empower the education system to teach the younger generation on wood's renewability, recyclability, low rates of waste (which is bio-degradable) and climatic benefits.
2. Produce illustrative rankings (scorecards) of materials per product (house, chair, door, window, panel sheet, flooring, etc.) as these are better perceived than measurements per ton, per m^3, etc.

Second priority:

3. Launching of "Climate-friendly, low-energy wood product families". Product conceptualisation and benchmarks need to be done in collaboration between manufacturers, material experts and retailers to ensure effectiveness and acceptance in trade.
4. Educate retail chains sales staff to communicate benchmarks in favour of wood in layman's language and through scorecards.

Action Proposals II. (on Specifiers and NGOs):

First priority:

1. Provide with an easy-access database for architects, authorities, retailers, etc. for building material sourcing based on environmental benchmarking data.
2. Launch of "Climate-friendly houses and building systems" in collaboration with finished wooden house industry and architects.
3. Train experts to comply with needs of consumer engagement and supervision in wood building.
4. Persuade NGOs and other pressure groups into alliances with the woodworking industry on the basis of environmental benchmarking.

Second priority:

5. Add more specific technical information on service lives, recovery and re-use of wooden building materials into product information.
6. Encourage the use of LCA to support new product eco-design, "green" product development.
7. Review and monitor existing databases on environmental impacts of building materials for possible biases against wood.

8. Compare and communicate wood's energy and carbon balances in houses and building products vis-à-vis competitive materials.

Subsidiarity:

Action Proposals	Responsibility			
	EU	National authorities	Industry	CEI-Bois
First priority:				
1. Empowering the education system		**Lead**	**Support**	**Support**
2. Producing illustrative rankings (environmental scorecards)		**Lead**	**Lead**	**Support**
Second priority:				
3. Launching of "Climate-friendly, low-energy wood product families"			**Lead**	
4. Educate retail chains to better communicate on wood's benefits			**Lead**	**Support**

1.4 Sustainability Debate and Wood Products

Ideal Situation 2010:

The woodworking industry of the EU:

1. Is considered a leader industry in motivating the public to change their consumption patterns in favour of more sustainable products;
2. Is demonstrating how the triple-bottom-line sustainability can be achieved and continuously improved (measured in terms of economic viability, environmental friendliness and social responsibility);
3. Has the best environmental and social reporting practice (as a part of regular annual reporting) among the basic industries.

Key Messages:

Woodworking industry should aim at establishing a broad coalition with the consumers, trade and the environmental groups of the society towards sustainable development and consumption. Without a concerted effort by the woodworking industry, however, media risks to the sector's image may materialise and hinder such coalition.

Explanatory Comments:

- Between the 1992 Earth Summit and 2002 World Summit for Sustainable Development, a new consensus has evolved on addressing the economic, ecological and social dimensions of sustainable development in parallel - there is now less polarisation between the three groups of interests.
- Much of the early excitement within the WWI about the environment was based on a fear/benefit expectation. The fear factor was about being positioned as anti-environmental,

and the benefit expectation was about collecting "green premiums" or boost sales. In reality, both penalties and benefits have been moderate.
- Economically viable woodworking industry is better equipped to improve the environmental and social impacts on local level, than vice versa.
- Forests and related industry can make unique contributions to sustainable development. Competing materials' fundamentals of sustainability fall short of wood's performance.
- Actions taken by non-forestry sectors (particularly in the tropics) threaten to harm WWI's public image.

Risks:

- Waste management and water protection, variable forest management standards, biodiversity and landscape conservation, fire and forest damage, social pressures (labour and rural development), cost escalation in energy and transportation pose risks for the sustainability record of the EU woodworking industries.
- Certification rules will be tightened with higher wood cost for the industry. This entails a risk of losing more productive forest area to conservation, which would be an additional hurdle for wood supply. Higher wood cost will encourage more imports, whose sustainability and legality the industry is liable to demonstrate.
- Turf-fighting between FSC and PEFC continues, casting a doubtful image for woodworking industries as there are no similar pressures in substitutes.
- Other industries clearing the forests in the developing countries (mining, cash crops) may tarnish the reputation of the EU woodworking industry indirectly through negative environmental publicity.
- Trade intermediaries, who sell imported wood materials to WWI, still commonly ignore demands for legality and certification.

Opportunities:

- Sustainable consumption patterns, good governance, curbing of illegal trade can be addressed: improvements are still possible even though CEI-Bois members have a high starting level (national differences will be gradually removed).
- Transparent sustainability reporting (economic, environmental, social) and PR are essential tools for convincing the stakeholders (and institutional investors).
- Widening adoption of forest certification becomes a baseline requirement, where Europe has the lead. This can have a positive impact on the competitiveness of the EU industries.
- Developing countries are eligible of receiving technical assistance and funding for building the capacities in sustainable development. There is also room for direct transfer of technical expertise, which would help to avoid sustainability backlash in trading with these countries.

Action Proposals:

First priority:

1. Effective communications strategy for the woodworking industry on sustainability while making the weaknesses of other competing sectors transparent.
2. Develop a sustainability-reporting template and a scorecard for the woodworking industry.

3. Forging and forcing convergence between certification systems; to contribute to establishment of appropriate minimum requirements for certification systems.

Second priority:

4. Carry out a major study on sustainability impacts of the woodworking industries focusing on the value chain concept in order to produce an effective tool for lobbying.
5. Seek political and scientific weight to back the woodworking industry's sustainability record.

Subsidiarity:

Action Proposals	Responsibility			
	EU	National authorities	Industry	CEI-Bois
First priority:				
1. Sustainability reporting template and a scorecard			**Support**	**Lead**
2. Convergence between certification systems			**Lead**	**Support**
3. Effective communications strategy	**Support**	**Support**	**Lead**	
Second priority:				
4. Study on sustainability impacts of the woodworking industries	**Lead**			**Support**

PART B

2. CONCLUSIONS ON WORK PACKAGE 1.2 WOOD SUPPLY

2.1 Forest Resources: Ideal Situation 2010

1. Entry of the 10 accession countries has improved efficiency of EU-25 wood raw material market and improved the sustainable forest management status.
2. Extension of EU forest area has allowed expansion of multiple uses of forests: this enables efficient utilisation patterns in production forests, sufficient areas left to conservation, energy and environmental service forests, as well as reserves to scenic-recreational purposes in a regionally balanced way.
3. Wood raw material production potential, cost efficiency of wood production, health of ecosystems, level of bio-diversity, and positive climate impact of the EU forests have improved.
4. European forest resource base continues to grow with (mainly) national policy guidance. Subsidies have only been allowed to guide reforestation in regions where industrial, environmental and social (rural development) needs justify them.

Key Message, Forestry

"Entry of 10 new members into EU increases forest area available for wood supply (FAWS) by 31.8 %, and increases the stock of mature forests – as well as carbon sinks – even more significantly. Accession offers opportunities to sector policy, and allows convergence of policies, governance and sustainable management practices"

Explanatory Comments:

- Particularly Poland and Romania have extensive under-utilised forests.
- Impact of accession is stronger in logs than in pulpwood.
- **AC-10 has a high average wood volume per hectare.**
- Restitution and privatisation of forests will be a natural incentive to intensify forestry and add value in processing in accession countries.
- As family-owned forest holdings become more common (35 %), new policies and extension will have to meet new challenges.

2.2 Opportunities in Forestry

- Harmonisation process of the accession countries' forestry with the EU-15 could stimulate foreign direct investments into wood processing.
- WWI of EU-15 can participate in supply chains and inject FDI and technology transfer, and thus strengthen their international competitiveness .
- Increased energy conversion from wood means that the demand-supply balance will be reached at a higher volume. Scale economy and new value creation opportunities emerge.
- Carbon sinks in accession countries offer opportunities in future's carbon-constrained economy through Joint Implementation projects with EU-15.
- Accession country forests can be more fully utilised for high-quality products, thus raising local living standards and offering long-term development options with lower investment risks than previously.

2.3 Risks in Forestry

- Cashing-in on accession countries' forest resources through extensive roundwood exports would result in market turbulence for WWI.
- Poor investment climate, e.g. due to legality problems, could contribute to unsustainable "forest-mining" particularly in private forests, and would slow down value-addition and investment possibilities for WWI.
- Perceived forest value remains low if roundwood prices stay low. This may form a disincentive for management and supply. Low-cost resource base would pose a threat for the competitiveness of the EU-15 WWI.
- Extensive use of wood for energy may induce a shift towards shorter rotations, smaller dimensions or other management regimes, which may not serve best the WWI.

2.4 Wood Supply: Ideal Situation 2010

1. Wood raw material glut is avoided and intra-EU trade is market driven without barriers to trade. Extra-EU trade on wood and recycled fibre serves as a buffer.
2. Equilibrium in wood demand and supply has been reached on a higher level. Competition between wood processing and energy uses do not pose a threat for WWI in operational or development sense.
3. Improved technology in forest inventory, planning, logging, transport and processing ensures productivity growth and environmental efficiency in EU-25.
4. WWI has used the opportunity to optimise wood fibre flows within the region, and enjoys a relatively secure supply situation without undue fluctuations.
5. Large processing centres and clusters are fed by state-of-the-art fibre supply systems. Rural development opportunities have been captured.
6. Post-consumer wood recycling systems have been established as part of the industrial fibre supply system and as part of communal waste management systems.

Key Message 1, Wood Supply

"EU is well positioned to innovate in sustainable development based on forests. The increasing forest resource base in a major end-use market represents a strategic asset, with sustained wood supply combined with efficient recycling, multiple-use forestry and innovative WWI."

Explanatory Comments:

- EU can be a model in balancing the society's diverse demands on the forestry sector – without a healthy fibre supply this is not achievable.
- There are no imminent physical or economic risks in securing the long-term availability of wood fibre for dynamic industrial processing.
- Higher than the world average fibre cost has been compensated by high productivity, efficient technology and product innovations. This needs to be maintained.
- Environmental demands continue to rise in EU, absorbing a part of the forest base; availability of redundant agricultural land partly compensates.

Key Message 2, Wood Supply

"The key wood supply issue in EU is managing the abundance of the resource – not shortage – in a way which meets the multiple needs of society. Optimisation of the value adding potential of the region's wood resource, under sustainable forest management, is the objective."

Explanatory Comments:

- Adequate supply will require that the role of forests under different ownership regimes is recognised in policies.
- If the resource is perceived abundant, likelihood of sub-optimal utilisation grows.
- Due consideration should be given to identification of product value chains, and waste and residue flows, not suited for industrial processing.
- Bio-energy sector should focus on the latter together with recovered wood.
- Maximum value principle is valid: process into products first, recycle to the limit as second, and convert to energy only in the end of the cycle.

Key Message 3, Wood Supply

"Extra-EU wood raw material trade will increasingly complement local supply. Imports from low cost fibre baskets will capture a limited market share. Comprehensive assessment is needed on import flows of energy wood and its impact on climate change and trade in carbon offsets."

Explanatory Comments:

- Next decade will bring into stream new wood raw material baskets from fast-growing regions (Oceania, Latin America), for which initial revenue streams are generated through log or wood chip exports.
- These exports will supply the regional shortages like that in China as long as its own plantation wood resource matures, and until the domestic demand for industrial processing picks up, on supplier side.

2.5 Opportunities in Wood Supply

- WWI of EU is innovative in product development, which allows it to pay a higher price for wood raw material than the industry in low-cost regions.
- Particularly in the accession countries, there are unutilised opportunities to optimise the wood raw material value chain through new investments and technology.
- If the hierarchy of the value chains can operate in the markets without major failures (subsidies, undue taxation, etc.), the WWI of EU would remain as one of the key value addition mechanisms for wood raw material.
- Optimisation of wood fibre flows between wood-based industry and energy conversion would allocate the "primary" wood into WWI products; and allocate recovered wood from "secondary" sources for bio-energy.

2.6 Risks in Wood Supply

- WWI of EU may become under pressure from imported wood products made in low-cost regions on the same technical and quality standards. Competition will reduce the wood-paying capability of the WWI of EU.
- The wood bio-mass energy sector of EU is increasingly subsidised to meet the Kyoto targets, so it does not enter into fair competition over wood raw material.
- Dilemma: less fibre is available for WWI, for which it should pay less in order to stay cost-competitive against extra-regional competitors. Locally, the energy sector's wood paying capability is artificially high due to subsidies.
- It is likely that plantation timber will permanently take over a larger share of industrial wood supply in standardised wood industry products.
- Margins on the forest producer side will get thinner, so forest values in Europe will fall, indicating lower incentive for wood production.
- WWI of EU may relocate increasing production capacity abroad to grasp the low-cost wood, and more of European forests become economically redundant.

2.7 Bio-energy: Ideal Situation 2010

1. EU-25 forests have the potential to supply their part of the targeted 12 % share of energy from Renewable Energy Sources (RES), without very severe adverse impacts on WWI.
2. A regionally optimised breakdown between forest residues, post-consumer recovered wood and industrial wood by-product has been established to supply the demand specified by the RES target. Europe's wood resources are in a more efficient use.
3. Active technology transfer is taking place between the front-runners and slow adopters of RES, benefiting the EU in levelling off wide country-to-country differences.
4. Intensification of post-consumer wood recovery for energy has resulted in faster turnaround of wood products in the marketplace.

Key Message, Bio-energy

"Adaptation to expansion of bio-energy sector does not pose an immediate threat to the WWI of EU, from wood supply point of view. Better integration of bio-energy with WWI operating concepts need to be explored"

Explanatory Comments:

- Focus will be on intensive recovery and use of forest residues and new crops.
- There is less room for expansion in post-consumer wood waste and WWI residues, which are already in quite efficient use.
- Price rise in primary wood and industrial residues is imminent but will have a fairly neutral impact on the WWI sector as a whole.
- Sawmills and plywood mills will find stronger demand for their by-products.
- Integrated enterprises can best adapt to bio-energy use targets. Cost pressures due to bio-energy demand will most affect particleboard, MDF and the pulp and paper sector.

2.8 Opportunities in Bio-energy

- WWI can capture additional business opportunities through the wood bio-energy trade (know-how in wood procurement, collection of wood for energy conversion, processing waste flows, and green certificate sales).
- WWI would in many cases be better able to respond to mandatory recycling rules, by allocating discarded products for "secondary" use in generation of bio-energy.
- Post-consumer bio-energy contents can be made a new marketing argument for wood products.
- WWI should effectively become a partner in the bio-energy sector, instead of a disadvantaged competitor.
- WWI's image and environmental importance are enhanced through bio-energy benefits and collaboration with green energy developers.

2.9 Risks in Bio-energy

- The optimal path of creating Value Added through wood processing will be sacrificed if wood energy generation is maximised.
- Carbon sequestration services may lead to subsidies for forest conservation and an incentive for not harvesting mature stands, which will be undesirable from the WWI point of view.
- Large-scale wood energy chip imports from fast-growing regions could cause market disturbances in the European wood raw material market.
- Prices, dimensions, and quality of primary wood raw material available in the market may go beyond WWI tolerance due to fast expanding bio-energy use.

2.10 Action Proposals for Forestry

1. Seek a closer co-operation between the EU-15 and accession countries on the levels of forest authorities and associations of WWI.
2. Advocate adoption of EU-wide sustainable, site-adapted multiple-use forestry, with a transparent market economy and elimination of policy failures.
3. Contribute to the accession countries' political consensus on the importance of forests and WWI in the unification of an even larger Europe of the future.
4. Harmonise accession countries' forest inventory and forest information systems with those of EU-15 through technology transfer programs in order to improve the basis for monitoring EU-wide progress in forest policy and implementation.
5. Develop guidelines on harvesting and thinning regimes, as well as forest residue collection; both from the point of view of WWI and RES supply.
6. Strengthen the EU's role in forestry to ensure the future wood supply for WWI in the region.

2.11 Action Proposals in Wood Supply

1. Convince policy makers to duly consider the sustainability benefits of the value adding opportunities of the WWI as the primary wood raw material user.
2. Monitor global wood fibre flows for industrial and energy uses and assess their implications for the EU WWI raw material situation.
3. Assess the likelihood and magnitude of climate change-related subsidies for the bio-energy sectors in the key forestry regions and their impacts on the fibre supply of the European WWI.
4. Monitor and assess energy taxation and transportation policies and their potential impacts on raw material supplies to WWI and bio-energy sectors.
5. Map out potential mega-sites for WWI development and disseminate this information to encourage public and private investment for their development.
6. Action Proposal in Bio-Energy
7. Develop WWI's internal guiding mechanisms as one of the biggest providers of renewable energy (optimal allocation model for use of wood and wood products). Make bio-energy an integrated business component of the WWI.
8. Study the possibilities to improve energy conversion from WWI waste and intensify wood waste collection systems.

9. Develop and propose cost-sharing mechanisms with the bio-energy sector in the supply of energy wood from primary and secondary sources.

PART C

3. CONCLUSIONS ON WORK PACKAGE 5.1 PERCEPTION ANALYSES

Why wood has under-performed in the marketplace despite its superior environmental credentials? Some answers are in the following:

- Wood's environmental advantages have been taken for granted by the woodworking industries and have not yet been capitalised.
- The basic positive attitude towards wood among consumers has been considered sufficient to ensure high level of wood utilisation.
- Environmental aspects come third, fourth or fifth in purchasing decision making.
- Consumers have not reacted to environmental advantages because the woodworking industries have not sufficiently promoted environmental advantage.
- Environmental concerns on forests throw a shadow on wood products.

Therefore, a more concerted effort is needed by the industry itself in particular. Four action areas are proposed:

I Awareness-Raising (emphasis area)
II Technical/Product Development
III Wood Products Distribution
IV Regulatory Work (covered in detail by WP 4.2)

Competence throughout the wood value chain must be developed in all areas.

Main Target Groups:

- General public (women and the young in particular)
- NGOs
- Specifiers (the whole construction chain)
- Authorities
- Woodworking Industry itself (if not a target group, a strong partner in campaigns and other actions)

Awareness-raising and technical/product development concern all main target groups, while distribution and regulatory work efforts are limited to some of them. Building with wood focuses on structural wood uses such as framing, floor bearing structures, partitions, cladding and roof structures.

Building with Wood activities should cover all action areas of the Roadmap, while Living with Wood activities are more limited to awareness-raising. Living with wood focuses on wood uses such as flooring, interior walls and ceilings, furniture, cabinetwork, stairs, garden items, etc. Builders' joinery and carpentry is a transitional end-use category between building and living with wood concepts, comprising e.g. windows, doors, fixtures, wall elements, etc.

Since countries are at different phases of wood promotion, they need different tools and elements for national campaigns. The more advanced the phase is, the more tools are needed.

Matching the Action Areas and Target Groups:

Target groups	**Awareness Raising**	Technical/ Prod. Dev.	Distribution	Regulatory Work
General Public	X	X	X	
NGOs	X	X		
Specifiers	X	X	X	X
Authorities	(X)	X		X

Matching the Action Areas with the two Concepts:

Subsectors	**Awareness Raising**	Technical/ Prod. Dev.	Distribution	Regulatory Work
Building with Wood	X	X	X	X
Living with Wood	X		(X)	

Matching the Action Areas with the Phases of Promotion:

Phases	**Awareness Raising**	Technical/ Prod. Dev.	Distribution	Regulatory Work
Start-up, great hassle (new markets)	X			
Strong promotion (trust on market forces)	X	X	X	
Addresing bottlenecks (Nordic, UK)	(X)	X	X	X

Risks:

- **General public:** Loosing competition to other materials because of negative environmental image due to forestry issues, old-fashioned product image, weak marketing and distribution compared to competing sectors. The young and women: failure to talk their language.
- **NGOs:** Environmentally negative messages on forestry and wood (destruction of forests, illegal logging)
- **Specifiers:** Preference and easier use of other materials, failure to convince specifiers of technical developments

- **Distribution:** Lack of capacity and incentives to propose and sell wood for construction
- **Authorities:** Technical and legal barriers, failing standards
- **Public funding:** Failing to fund sufficient R&D
- **All actors:** Lack of necessary competence

Action Area I: Awareness-Raising:

Ideal Situation (in the EU):

Perception of Wood in the EU in 2010:
1. The consumers acknowledge that modern and environmentally friendly wood products are easily available at competitive prices. They find technical expertise and specialists to help them in using more wood;
2. The professionals work with technically advanced and standardised wood products, which are used cost-efficiently in living and construction;
3. Public authorities recognise environmental, social and economic benefits and promote increased wood utilisation.

Key Messages on Awareness-Raising among the General Public:

- The tool is the industry's European-level "one voice" campaigning, but each campaign being planned for a specific country/situation
- Target the young and women (because "we" are middle-aged men):
    - Know consumer and women's organisations, youth culture, etc.
    - Select media tools accordingly (words, pictures, etc.)
- Environmental messages to the public must answer to emotional or ideological perceptions. Messages can relate e.g. to quality, experience, lifestyle, price and "greening" forestry.
- Environmental perceptions on wood are at different stages in different parts of Europe
- A key challenge is that although perceptions are fairly positive on wood, the image of wood is not eminent enough to grasp consumers attention and spur purchasing decisions
- Social issues, such as local economies and employment, and sustainable development should be used to improve the perceptions on wood utilisation

Key Messages on Awareness-Raising among the Specifiers:

- Architects, construction engineers, developers, building contractors, procurers of materials, etc.
- Have key role in construction material decision-making
- It is essential that they know wood, its properties and find wood easy to use, need more information on wood (schooling, education, training)
- Messages should contain technical facts by product and by end-use
- CEI-Bois can facilitate training activities, education, preparation of toolboxes, etc.
- To get more information on specifiers' perception, employ them (i.e. use their services, make them work for CEI-Bois)

Key Messages on Awareness-Raising among the NGOs:

- Need stronger action; direct dialogue by industry and organisation representatives, such as CEI-Bois.

- No use to bother with campaigns since different views are often based on differences in values.
- Find common interests, such as carbon sinks, promotion of SFM, bio-energy, etc.
- Example: British Woodworking Federation-Greenpeace backing wooden windows in the UK

Key Messages on Awareness-Raising among the Authorities:

- Environmental benefits of wood product use
- Sustainability impacts of the wood-working industry value chain
- Regulatory work and advocacy
- Alignment of the interests of policy makers and the wood-working industry

Ideal Situation (in New Markets):

Perception of Wood in New Markets in 2010:

1. The environmental and social benefits of the woodworking industry justify public funding for promotion campaigns and ensure continued political commitment;
2. Domestic wood utilisation is increased;
3. Current roundwood flows from Eastern Europe to Western Europe will have diminished and/or turned into product flows and this has been achieved in conditions of a strong domestic wood culture.

Key Messages on Awareness-Raising in New Markets:

To increase consumers' demand for wood products:

- Wood is sustainable luxury material

To achieve political support from local authorities:

- Wood is a domestically available raw material for construction, and its value chain generates employment and contributes to rural development
- Wood is environmentally friendly material and it contributes positively to reduction of greenhouse gases

Technical/Product Development:

Ideal Situation:

Wood's Technical Potential in Full Use in 2010:

1. Specifiers find easy answers to technical questions when choosing wood;
2. Each sub-sector provides more and more standardised products or product families and systems and services;
3. Research results are incorporated into architects' and engineers' education, and published widely:
4. Competing materials will be used more and more together with wood (e.g. joint window manufacturers' organisation Eurowindoor);
5. A higher standard of production quality in wood construction has been secured, including voluntary internal/external supervision of the enterprises, and setting up "quality pools" to facilitate SMEs.

Key Messages on Technical/Product Development:

- CEI-Bois' role is at the highest level advocacy/program preparation in cooperation with the research community to ensure sufficient public/private funding and access of wood research to this funding
- ERA-Wood Initiative as industry-led umbrella project in research
- Innovawood Portal, gateway to technical information
- Several national research programs: e.g. Finland's National Technology Agency Tekes finances wood-related research programmes on wood technology and R&D, furniture design and wood construction
- COST E37: Sustainability Through New Technologies For Enhanced Wood Durability: a new four-year, 21 countries concerted research action to develop quality assurance and performance classification of 'modified wood and wood products' as alternatives to wood treated with traditional wood preservatives

Wood Products Distribution:

Ideal Situation:

Wood Products' Ease of Use in 2010:
1. Consumer-friendly timber frame housing packages are easy to find and buy, with service; 2. Sales staff has incentives to sell wood, and sufficient training to explain wood's benefits for customers; 3. Consumers and house-builders with positive attitude towards wood find it easy to realise their dream; as easy as when building with other materials; 4. Producers have merged in response to mergers of major customers (e.g. large house-builders in the UK).

Action proposals on distribution:

- Industry should take action at European level to promote the development of efficient production and distribution systems (full-service wood shopping centres)
- Industry should develop "easy to sell" products, since competence of vendors is presently out of the industry's control (e.g. big DIY-chains)

Regulatory Work:

Ideal Situation:

Wood's Regulatory Status in 2010:
Use of wood is as easy as use of any other material in those applications where wood's performance meets regulatory demands.

Action proposals to remove regulatory obstacles:

- Help authorities recognise and remove performance-based, institutional, economical and technical wood utilisation barriers
- The industry to keep up with legislative requirements in construction, prove wood's abilities to meet performance criteria
- Ensure that new regulations do not become bottlenecks to the development of the industry

1. INTRODUCTION

1.1 Background

In 1998-99, CEI-Bois and DG Enterprise of the European Commission had a SWOT study made to evaluate the competitiveness of the woodworking industries in the EU. In the analysis of quantitative competitiveness, the study looked at the cost structure of (new) mills on the optimal location in the EU and elsewhere considering various factors and industries. The qualitative analysis concentrated on such parameters as know-how, standards, quality, wood policy, technology, environmental return, synergies, and labour structure. As a result, the SWOT analysis was used as a basis for the policy formulation, which was followed by CEI-Bois and the forest-based industries unit of the European Commission.

Earlier study was somewhat narrow in its scope. The following aspects are examples of areas that were not covered in depth or at all:

- structural issues of the industry and related dynamics
- trends in the competitiveness factors
- financial integration
- energy, particularly bioenergy
- environmental issues

These are important issues, which will have a major impact on the future sectoral strategies and would benefit full consideration in the proposed study. Competitiveness was analysed in a cross-sectoral context and the dynamic aspects were not considered apparently due to insufficient data.

Recent changes in corporate ownership and capacity, however, have brought upon changes in the industry structure. A time has become for an updated analysis on key factors and challenges affecting the European wood products industry. In March 2003, CEI-Bois launched an invitation of proposals for this work.

The objectives of the planned assignment were defined as follows:

- to describe the ideal position for the European wood products industry in relation to competing regions and substituting sectors
- to produce an up-to-date analysis on key factors and challenges affecting the European wood products industry
- to identify strategic opportunities for the European wood products industry
- to produce an action programme for the European wood products industry towards 2010

After receiving the proposals, the Steering Group of the CEI-Bois project “Roadmap 2010 for the European Woodworking Industries” decided to divide the consultancy inputs of the study between three consultants, i.e. Timwood, Jaakko Pöyry and Indufor. In the meeting held on June 4, 2003 in Brussels, the Steering Group of the project met the consultants and clarified its expectations related to the results of the various Work Packages. It was agreed, that Indufor implement Work Packages 1.1, 1.2 and 5.1.

1.2 Purpose of the Descriptive Summary Report

Both Steering Group and Project Group have expressed their satisfaction on the substantive contents and analysis presented by Indufor in the Powerpoint versions of the relevant three Work Packages. At the same time, it has been more explicitly suggested that the above mentioned presentations as such are not sufficient to ensure a wide comprehension and dissemination of the valuable factual argumentation on wood's environmental benefits among stakeholders. Therefore, it was strongly advised that the Consultant team prepare a supporting Word-document to maximise the benefit of the Work Packages to the members of CEI-Bois, as well as to wider audiences across Europe.

1.3 Structure of the Report

The three Work Packages capture a wide range of contemporary issues affecting the future of the European Woodworking Industries. While the first Work Package 1.1 addresses several environmental issues from both quantitative and qualitative points of view, the second Work Package 1.2 relies much more on statistically quantified data. On the contrary, the third Work Package 5.1 is dealing with perceptions among consumers and wood users, which is largely covered on qualitative terms only.

Therefore, it is fair to say that the three Work Packages produce fairly diverse packages of conclusions and recommendations. It is hoped that this type of multi-factor assessment be most productive for the woodworking industries in defending their positions in the fiercely competitive world markets for building materials and home decoration.

PART A

2. WORK PACKAGE 1.1: ENVIRONMENTAL CATALOGUE

2.1 Overview of Policy Linkages

Continuous environmental improvement is an essential and consistent goal on various levels of the policy guidance spread over the European woodworking industry. It has been realised that there needs to be policy mechanisms on three influencing levels:

1. Tools for creating the right economic and legal framework:
   - regulation
   - taxes and subsidies
   - voluntary agreements and standardisation
   - public procurement legislation
   - other legislation

2. Tools for promoting the application of lifecycle thinking:
   - making lifecycle information and interpretative tools available
   - environmental management systems
   - product design obligations

3. Tools for giving consumers the information to decide:
   - environmental labelling

Only by means of assuring progress on all three influencing levels, the policy guidance can become a positive force for change, and not a constraint as it is often perceived.

Starting from the global level, there are international conventions dealing with numerous single-issue policies, the most relevant of which for the sector are perhaps Convention on Biological Diversity (CBD) and UN Framework Convention on Climate Change (UNFCCC) (Table 2.1).

Observations:

- Wood supplies and industry are regulated through several instruments
- Regulation covers both trade, environmental and social aspects
- The lack of a holistic approach to forest management will emphasise the role of environmental regulation (notably CBD)

Table 2.1 International Regime Related to Woodworking Industries

Existing international conventions	Linkages with woodworking industries
Convention on Biological Diversity (CBD)	Genetic resources, ecosystems, sustainable use of biodiversity → Availability and cost of raw material
UN Framework Convention on Climate Change (UNFCCC)	Emissions reduction, forest and wood products sinks, energy supply → Raw material availability competitiveness of EU industry, product demand
WTO Agreements	International trade tariff and non-tariff barriers, subsidies investments → Market access, competition
ILO Conventions	Workers' rights, indigenous people → Industry obligations, competitiveness
International Tropical Timber Agreement (ITTA)	Tropical timber and timber products supply and demand → Market transparency, competitiveness

2.1.1 Some Pertinent EU Policies for WWI

2.1.1.1 EU Forestry Strategy

The EU Forestry Strategy (Communication of the … 1997) is constructed in the form of a framework agreement, and the actual forest policies will be decided nationally in the Member States. Some salient points relevant to sustainable use of forests are the following:

- The contribution at Community level for sustainable forest management and the multifunctional role of forests, protection of forests, development and maintenance of rural areas, forest heritage, biological diversity, climate change, use of wood as a renewable source of energy etc., while avoiding market-distorting measures;
- The need to improve co-ordination, communication and co-operation in all policy areas with relevance to the forest sector within the Commission, between the Commission and the Member States, as well as between the Member States;
- The promotion of the use of wood and non-wood forest products from sustainably managed forests as environmentally friendly products in line with the rules of the open market;
- The contribution of forestry and forest-based industries to income, employment and other elements affecting the quality of life, whilst recognising the close connection between these two areas which influences their competitiveness and economic viability;
- The need for better integration of forests and forest products in all sectoral common policies, like the Common Agricultural Policy, the Environment, Energy, Trade, Industry, Research, Internal Market and Development Co-operation policies, in order to take into account both the contribution of forests and forest products to other policies and the impacts of other policies on forests and forest products, with the aim of guaranteeing the required consistency of a holistic approach towards sustainable forest management.

Since 1998, the EU Forestry Strategy has not fully met expectations, and some countries are dubious on its coverage, e.g. on certification and promotion of wood as energy source.

European Parliament has released a Communication on the State of the Competitiveness of the EU forest-based industries (FBI), some excerpts of which are in the following:

"The forest-based industry should become a model sector in the field of sustainable development"; therefore, the European Parliament:

- Stresses the importance in regional policy of SMEs working in forestry and forest-based industries, and recommends that the Commission investigate the available Community regional policy tools for increasing the opportunities in the forest-based industries to create employment in thinly-populated areas as cost-effectively as possible;
- Calls in its own policy-making, to pay attention to the significant role of forests and wooden products in binding and storing carbon;
- Recalls that the EU FB-IND are the largest industrial users of wood-based bio-energy in the Community,
- Recalls the excellent properties of wood as a construction material and urges the Community to promote its use;
- Recalls the importance of the rapid and correct implementation of the Construction Products Directive;
- Recalls that Parliament has requested the Commission to submit an effective action plan to combat environmental and social dumping in relation to imports of timber into the EU, and in view of the importance of the elimination of barriers to trade for European woodworking products, to work towards the harmonisation of international standards, certification and tests, as well as their mutual recognition;
- Considers that the countries of Central and Eastern Europe have a great deal of potential in the timber-processing and related industries; the EU must consider the social consequences of the relocation of business to countries of Central and Eastern Europe.

2.1.1.2 EU Construction Products Directive

Construction Directive states the six essential requirements for building materials:

- Mechanical strength and stability
- Safety in case of fire
- Hygiene, health and the environment
- Safety in use
- Protection against noise
- Energy economy and heat retention

Compliance with compulsory CE marking will have to be ensured.

2.1.1.3 EU White Paper on Renewable Sources of Energy

EU has set a target to produce 12% of energy from renewables by 2010, and the greatest growth potential is on biomass (which is to triple its contribution), but not forgetting wind, solar thermal etc. other renewable forms of energy. Major benefits are to be achieved from

meeting the Kyoto-agreed CO_2 limits, improved security of decentralised energy supply, employment in the supply chains of biomass in rural areas, and know-how for exports to other regions. It is understood that the objective cannot be reached without some sort of subsidies to renewable energy. Incentives are being offered in the form of e.g. flexible depreciation of bio-energy investments, public and private green/energy funds, start-up subsidies, consumers support to buy related equipment and services and so on. More specific means of achieving the overarching target are listed below (EU energy policy impacts…, 2000):

Promotion of renewables:

- liquid biofuels for transport up from 0.3% to 2%
- production of landfill gas or biogas from farms and food industry is encouraged
- co-firing of renewables with coal, new district heating networks, upgraded solid biofuels: pellets, chips, residues from forests and paper and wood industry
- EU strategy to promote co-generation of heat and power (to be doubled by 2010)

Household energy rationalisation and greening:

- high efficiency windows, solar facades, blinds, solar energy systems integrated in building construction
- encourage the use of timber in construction for its low intrinsic energy content
- building permit systems to reflect greener energy solutions

Some well-founded fears have been expressed by the WWI, that there may be substantial price increases for wood raw material (in most favourable estimation 5-13%), which in turn would result in higher end product prices, and erode their competitiveness against substitutes. Some empirical evidence has been received on such trend around Europe: in 2002, 15-50% price hikes were reported in sawdust and wood chips exports from Austria to Italy. Prices for coniferous logs also went up by 23-35% between the same countries. Raw material suppliers shift from WWI to electricity plants in France, bypassing the wood products value chain. MDF and particle board mill closures have been reported in Sweden and Denmark, at least partly due to the surging of wood chip prices. In Finland, the price difference of sawmill chips between pulp mill and energy plant use has been narrowing, and it is merely EUR 2/m^3 in some locations where both users co-exist on adjacent or nearby sites. More intense competition for wood chips is starting to take place, and this will attach more importance to quality classification of chips yield from the sawmills.

2.1.1.4 EU Thematic Strategy on Sustainable Use of Natural Resources

This new strategy in-the-making (aka EU Resources Strategy) aims to develop a Community approach for:

- identifying and assessing the impacts of resource use on the various environment media (air, water, soil) and on bio-diversity and human health
- addressing scarcity where relevant
- preparing and reviewing policies that influence resource use and its associated environmental impacts

In short, it helps to define what existing policies are coherent in terms of integrating economic, social and environmental objectives into a balanced match. Approach is the following: **knowledge gathering ⇨ policy assessment ⇨ policy integration**.

Work under way includes the following:

- an estimate of materials and waste streams in the Community, including imports and exports, for example by using material flow analysis
- a review of the efficiency of policy measures and the impact of subsidies relating to natural resources and waste
- establishment of goals and targets for resource efficiency and the diminished use of resources, de-coupling the link between economic growth and negative environmental impacts
- promotion of extraction and production methods and techniques to encourage eco-efficiency and the sustainable use of raw materials, energy, water and other resources
- development and implementation of a broad range of instruments including research, technology transfer, market-based and economic instruments, programmes of best practice and indicators of resource efficiency.

Resources Strategy is currently open for public consultation and inputs. One such input could be initiated by CEI-Bois, i.e. testing the woodworking industry sector's applicability for the new strategy. Some other sectors have already taken this step to ensure their compatibility with Resources Strategy. *(Source: Towards a Thematic Strategy…, 2003)*

2.1.1.5 Integrated Product Policy (IPP)

IPP has two focal areas:

1. Setting the framework conditions for continuous environmental improvement of all products;
2. Identifying and promoting products with the greatest potential for environmental improvement.

Areas of action in framework conditions are:

Taxes and subsidies:

- Adjusting the prices through taxes and subsidies to better reflect the environmental impacts of products
- Minimum tax rates to all energy products
- Environmental taxes preferred over VAT change
- Elimination of environmentally negative subsidies

Voluntary environmental agreements and standardisation

Making lifecycle thinking and interpretative tools more accessible:

- Members develop databases on lifecycle data
- EC: facilitate exchange, good use and interpretation
- Linkage with UNEP Lifecycle Initiative

Environmental management systems:

- EMAS re-orientation from processes to products, guidelines 2004

Product design obligations:

- Eco-design of energy-using products
- Communication to the public (environmental reporting)

Public procurement (which accounts for 16% of GDP in the EU):

- Extent of greener public procurement surveyed (2003)
- Assess the potential impact on the environment
- Members to draw action plans, EU to provide with handbooks, product criteria database, web site, etc.

Greener corporate purchasing:

- EMAS or similar, environmental labelling, transparency, reporting

Environmental labelling:

EU Eco-label (see next chapter), EU Energy Label, Environmental Product Declarations

2.1.1.6 EU Eco-label

Eco-labelling is a voluntary method for the certification and labelling of environmental performance (= overall environmental preference of a product on the basis of lifecycle considerations). The EU Eco-label (EU Flower, see logo) scheme was established in 1993, comprehensively revised in 2000, and became part of the Integrated Product Policy (IPP). It helps consumers distinguish more environmentally friendly products and services, encourage their further development, production, marketing and use. It is presently awarded to 21 product groups (several hundred individual products), including hard floor coverings, tissue and copying and graphic paper: criteria for furniture under development. New priority products for future include printing papers, DIY products, packaging, building components, to name a few.

Future directions:

- Reinforced stakeholder participation
- The creation of the EU Eco-labelling Board
- Reduced fees for SMEs and developing country members
- Cooperation with the national Eco-label schemes
- Information dissemination
- Traders and retailers to apply directly for their brand products
- Possibility for non-EU producers to apply directly (imports)

2.1.1.7 FLEGT

EU has established an Action Plan for Forest Law Enforcement, Governance and Trade, known as FLEGT. A short description follows:

- Focus is on governance, capacity building, demand-side measures to reduce illegal timber use
- Verification of legality in harvesting before exports to the EU
- Voluntary licensing scheme
- Guidance to public procurement
- Private sector: promotion of voluntary codes of conduct
- Consideration of legality in due diligence by banks and other financing institutions
- Implication for imported wood raw material supply and competitiveness of producers
- Promotes removal of skewed market signals and rewarding responsible producers

FLEGT emphasises partnerships between exporting countries and importing countries on issues such as improving governance. It also aims at using trade channels to reinforce law enforcement in exporter country by urging importers and public procurement agencies to demand for certificates of legality on all wood purchased. (UNECE/FAO, 2003)

2.1.1.8 European Transport Policy 2010

Needs of changing the current patterns of goods and materials transportation are derived from the rationalisation needs:

- In the EU, 44% of goods are transported by road, 41% by short sea freight, but only 8% by rail and 4% by inland waterways
- Transport efficiency shows the opposite: for one kilometre, one litre of fuel carries 50 tonnes of goods on road, 97 tonnes on rail, 127 tonnes on inland waterways
- Congestion creates local resistance in certain key arteries (blockades of truck traffic)
- Need to shift balance rationally between modes of transport
- From road to rail and sea and inter-modal freight

Drivers of change for transports from the European economic point of view are the following:

- Move from “stock” economy to “flow” economy
- Just-in-time and revolving stock production systems
- Private car traffic and heavy cargo vehicles grow fast
- Accession countries have “abandoned” rail development
- Poor rail systems connectivity between West-East Europe
- Explosive growth of road traffic in frontier regions

Three alternative approaches to curb the road traffic:

- A: Moderate road transport growth through pricing alone
- B: (A) + revitalise other modes through quality, logistics, technology up-grading (not infrastructure)
- C: (A + B) + investments in road networks + policy changes

Major policy interventions:

- Economic policies, production systems
- Urban and land-use planning
- Competition policy (opening up of competition on national railways)

Practical measures:

- Revitalise rail networks, dedicated goods rail networks
- "Oiling" the road transport links (Trans-European network)
- Promote sea and inland waterway transports (motorways of the sea, container carriers, barges, port activities)
- Inter-operability and technical harmonisation to support inter-modal transports, particularly for containers

2.1.2 Conclusions on Policy Linkages

A rapidly increasing number of policies and instruments is emerging, and they have a clear emphasis on sustainability, particularly on the environment. Productive aspects of SFM are not, however, duly recognised.

1. Goal of WWI is to ensure that the cross-cutting policy-making processes take better and earlier into account the sectoral considerations
2. Subsidiary principles should apply: who is best placed to do what?
3. CEI-Bois is foreseen to play a key role in "policing the policies" on behalf of WWI
4. Opportunity: wood's increased use can be justified by many current European policies: promoting sustainable development, combating climate change, increasing and improving the quality of life, creating jobs in rural areas, supporting small and medium-sized enterprises etc.

2.2 Climate Change and Wood Products

2.2.1 Role of Forestry in Climate and Carbon Issues

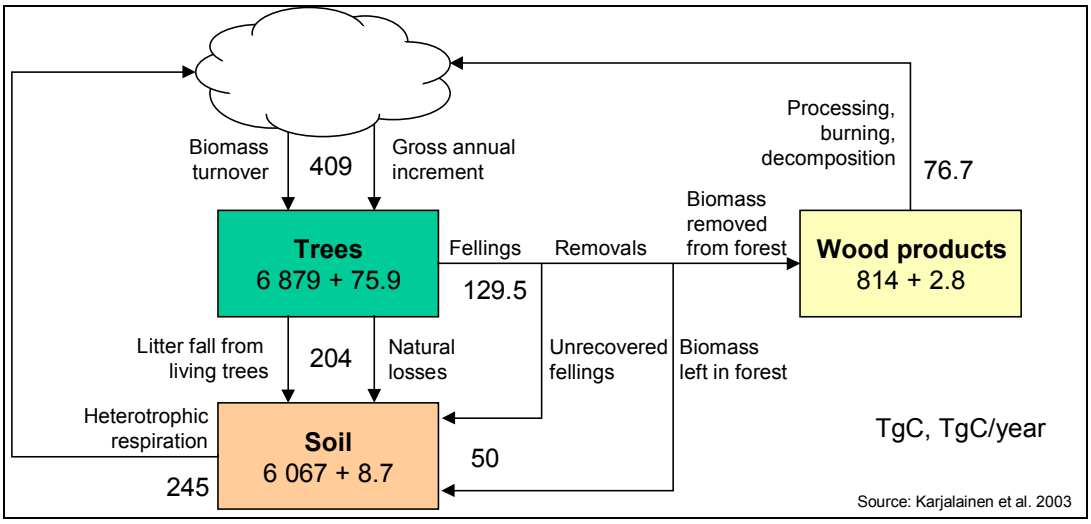
Climate change will have a fundamental impact on the production and consumption systems, including those involving wood products. A high political priority has been attached to the climate issue, as it affects all of the humankind. The responses to mitigate climate change will be felt in the use of raw materials, production processes, energy supply, waste management and finally, among consumers. The climate issues felt in various activity areas of woodworking industry have been compiled in Table 2.2.

Table 2.2 Climate Change Linkages with Forestry Sector

Activity	Issue
Forestry	Sinks, emissions
Processing and by-products	Energy use, emissions
Use of products	Sinks
Reuse of products as raw material	Duration of sinks
Energy use of products	Energy substitution
Disposal of products (dumps)	Emissions

Forests hold about 80% of the carbon fixed in the living biomass. Carbon storage depends on age, density, species, composition, etc. Stem-wood accounts for 65-75% of the total tree biomass carbon. In the boreal and temperate zone about 80% of carbon is fixed in soils, in the tropical zone 80% is fixed in vegetation. Impact of harvesting on soil carbon is less known than on tree biomass. Soil carbon loss after harvesting is probably lower than 30-40% (an often cited figure). Soil carbon can be increased with fertilisation (from 3% to 100%) depending on the site and species mix. Data on carbon "budgets" of 27 countries in consolidated in Figure 2.1.

Figure 2.1 Carbon Budget of 27 Countries in 1995-2000



2.2.2 Carbon Dilemma of Wood Products

Forest management and utilisation lead to lower carbon stocks and hence more emissions of CO_2 compared with fully stocked mature stands. Longer timber rotations sequester more carbon over their existence but may remain carbon neutral for much of their mature age due to respiration and decaying, which release carbon. Dilemma consequently comes from the following:

- Forest management can positively contribute to reduced carbon concentration in the atmosphere, as it intensifies the rate at which (faster) growing trees absorb carbon from the atmosphere;
- Younger trees are more efficient carbon sequesters due to their faster growth, low respiration and decay;
- These contributions are perversely interpreted as leakage under the Kyoto Protocol's current interpretation.

Product carbon (in Harvested Wood Products or HWP) is not recognised as a valid carbon credit, nor is the substitution effect associated with greater production of wood products from more intensive forest management. Therefore, a key mutual benefit from forest management and increased utilisation of wood products fall astray:

- Intensive forest management produces more timber used in the market and thereby stocked in wood products (positive leakage)

All three following ways can be drawn on in the forestry sector to mitigate carbon emissions:

- Increasing stocking carbon in vegetation
- Increasing product carbon in storage
- Substituting fossil fuel usage by means of:
  - Promotion of bio-energy
  - Substitution of fossil fuel-intensive alternatives with wood products

But Kyoto Protocol (in its current form, waiting to be ratified) recognises only vegetation carbon and energy substitution effects, and ignores the rest of wood's services for climate change mitigation. It is foreseen that COP-9 (Milan) will be able to decide on (i) Good Practice Guide for LULUCF and (ii) treatment of sinks under CDM. The current negotiation text is only 27 pages (down from 270) (text to be found FCCC/SBSTA/2003/L.13 dated June 12, 2003). A considerable degree of consensus building has taken place during the 6 months run-up to COP-9.

What adds up in confusion is the fact that there appears to be lack of scientific information on deciding for either of the four proposed carbon accounting methods Harvested Wood Products (HWP):

1. Carbon is released when wood is harvested
2. Atmospheric flows of carbon
3. Change in carbon stocks without international trade
4. Change in carbon stocks with international trade

While the estimation approaches may give the same results at a global level, by countries the results differ significantly depending on the role of trade.

What is already known for sure is that HWPs will not be in the Kyoto Protocol mechanisms/activities during the first commitment period (2008-2012) but are likely to be during the second onwards. It would be advisable to countries to start using the STOCK change method in the national carbon accounts for UNFCCC reporting to gain experience and see what can be learned. This would prepare ground for agreeing about the subject later on (2005-2006).

There are two main questions to be agreed upon: (i) how to deal with non-permanence for which solutions are temporary CERUs or insurance; the solution may be a combination of both, and (ii) how to address sustainable development and environmental impacts. CDM financing will be slow and expensive process. The first round of applications received 13 projects of which 6 were rejected and 6 were returned for further information (no sink projects at this stage). The transaction costs will remain very high.

There are possibilities to influence the outcome on HWP negotiation process. Appropriate action would be taken by providing the secretariat relevant studies and information on the subject. The secretariat TOR on HWP issue also requests them to assess socio-economic and environmental impacts as well as impacts on developing countries. Both are issues, where very little data is available to support decision-making. UNFCCC secretariat has finalised a technical paper on the subject of HWPs, which is in peer review.

The world's leading wood producer countries are pondering how they should deal with product carbon. The HWP Appendix in Good Practice Guide for accounting LULUCF emissions is not offering a clear rule for countries for how to deal with HWP carbon. It provides a basis for countries in their national accounts to include HWP carbon using a method they consider appropriate in their conditions.

Canada has proposed a special workshop on HWP to be held some time in 2004, and remains undecided on the issue until that. New Zealand is advocating for FLOW approach (exported emissions would be accounted in the importer's accounts) but they may not be fully aware of consequences for trade (discouragement). The US is advocating for PRODUCTION approach but they may be open for the STOCK approach as well. The latter would probably be the most balanced, and it is likely to promote use of wood products (as long as HWP consumption continues to grow in export markets). This method is, however, problematic for Japan where consumption is already going down.

A key factor in the assessment of alternative methods is how bio-energy is accounted when discarded HWPs are re-used for energy. If such emissions remain neutral, this would be an argument for FLOW approach and reduce possible resistance from importers' side. Treating bio-energy neutral derives from the fact that carbon was first sequestered into the tree and the product, before it was released to the atmosphere after the service life.

There is a wide variation between countries on how much carbon is stored in wood products, in comparison with e.g. growing stock of trees and forestland soil. Product carbon content has also variables such as decay and service lives, which vary between end uses, wood species, and countries (due to climate and consumption patterns). Based on research in Europe (Eggers, 2002), most of the product carbon is fixed within building and construction, and civil works (together 56%). Also joinery and maintenance products for building and construction are significant with a 23% share of product carbon. Furniture and fittings take up an 8% share, while the rest (13%) is split between short service life products like packaging and wrapping papers, wood for fuel or for short time use at building sites. As a rule, the long service span uses contain 88% of product carbon, while the remaining 12% stay in short service span products. An example of carbon stocks in different housing units is given in Table 2.3.

Table 2.3 Carbon Stocks in Housing

Unit	Carbon Content
House	10-25 tC/house
Wooden window	25 kgC/window
Parquet, wooden flooring	5 kgC/m^2
Furniture	1 tC/household
Household	12-30 tC

Source: Frühwald, 2001

2.2.3 Conclusions on Carbon in Wood Products from WWI Point of View

1. Carbon contained in forest products is mainly an issue for mechanical wood industry, which produces log service life products (in contrast with paper industry)
2. The climate impacts of sawnwood are particularly favourable
3. Construction use is the most important element (> 80%) for carbon sinks

4. Service life is the central factor for quantity and development of carbon stock
5. Estimates concerning product service lives are only rough estimates and decay functions are also approximations
6. HWP stock management is a significant tool to reduce net emissions but it should be assessed together with forest management

Product carbon represents a major opportunity for mechanical wood industries for winning both the consumers' and policy-makers' sympathies. By means of the selection of appropriate carbon accounting measure on national level, and by promoting wood products to consumers on climate-related criteria, the two stakeholder aspirations become mutually supportive. The goal for both would then be increased production and use of wood products to substitute non-wood alternatives.

Kyoto Protocol and its flexible mechanisms are likely to increase forest resources and wood production, especially in developing and transition economies; therefore sinks will act as an economic subsidy for wood production. This will inevitably have an impact on volume and price of future wood supplies. The recent COP-9 of Milan decided to limit the share of forestry projects to 1% of the industrialised countries' emission reductions. This put effectively a cap on using the forestry CDM tools and also lessened the potential impacts of Kyoto Protocol on forestry development and timber markets.

Replacement of fossil fuels with bio-energy increases demand for roundwood and by-products. It can bring additional income to wood industry, especially where no market presently exists for wood residues. This development is positive as such, but it also bears risks on wood price and availability in the future. The cause of concern in WWI will be on the impacts bio-energy will have on competitiveness of the industry. Subsidised bio-energy sector would be in a politically favoured position to pay higher prices for roundwood to the detriment of the WWI.

Competing industries will continue to advocate possible threats and negative impacts of sinks in wood products, as this is perceived an issue threatening to work in favour of wood and against substitutes.

There have also been concerns that UNFCCC might carbon choose accounting methods, which discourage consumption of wood products. This question is currently being resolved in a manner that is satisfactory to the WWI, and it is expected to empower the WWI to gain a significant potential impact on trade in wood products globally.

The best ways of using carbon sinks in wood products in climate policy would involve the following rationale:

A Increased use of wood products:

- The more wood products used instead of substitutes, the more positive effect on carbon balance (verifiable)
- The more fossil fuels are replaced with bio-energy and small-sized roundwood, the more demand for wood residues is created (verified)

B Increasing the quantity of carbon contained product use:

- The better raw material, the more durable products
- The better products, the longer use
- The more processed products, often the more longer use
- The more reuse, the longer period for sinks

C But also, the more (often) a wood product replaces another material, the more often the environmental benefit is gained.

2.2.4 Elements for Wood Industry Action Plan on Climate

The following areas of action can be singled out for the WWI taking a concerted effort to capture the best advantages out of climate change related work:

I. Influencing the EU and international climate negotiation processes
II. Market promotion and communication
III. Monitoring and reporting
IV. Research

Under the first item, in terms of climate negotiations:

1. Carbon stored in wood products should be included in national reporting on the Kyoto commitments
2. Sinks should be calculated using the stock-change approach through which the consuming countries can benefit from the carbon stocks of wood products in use in meeting their Kyoto commitments
3. Approaches and methods to estimate carbon stocks in wood products should be duly harmonised
4. Sinks in wood products and use for energy after their service lives should be appropriately considered in EU and national-level regulation
5. Policies to promote bio-mass energy should duly consider wood product sector's need for raw material
6. Sinks in wood products need to be recognised as part of production – consumption chain which is based on sustainable forest management (linked with SFM certification)

Proper accounting of carbon in wood products is in the common interests of all exporters and large producers. If accounting methods lead to promotion of wood use, no major conflicts exist between producer and consumer countries. EU DG-Environment has established a Working Group on Forests and Related Sinks, and it could be influenced to feed these ideas to the EU Climate Change Work Program. Wood has a good chance to become integrated to the right policy set-up in the right moment.

Under the second item, in relation to markets, two action levels are identified:

1. Industry-wide market promotion campaigns:

Target groups: decision-makers, consumers, public procurement (municipalities and states), trade; run targeted campaigns (e.g. environment or climate change programmes at municipal

level). Identify "big" common messages, and insert country-specific special characteristics. Ensure the fullest possible co-operation between CEI-Bois, EOS, EPF, FEIC, etc.

2. Company actions:

Integrate climate impacts into environmental declarations and reports; apply harmonised environmental reporting practices.

Concerning the third item:

WWI should consider a possible revision of classification and reporting systems in order to meet the needs of estimating and monitoring climate impacts of wood products:

- Trade statistics of wood products
- Statistics on building and construction activity
- Energy statistics
- Waste disposal statistics

And concerning the fourth item:

Problems of current research include:

- Current information grossly inadequate
- Present information fragmented and difficult to digest
- Basic knowledge missing
- Objectives of current research are often unclear

So, comparative research is needed on:

- New lifecycle analysis (LCA) of climate impacts of wood products and substitutes
- End uses, service lives, recovery and reuse of wood products after use, and generation and use of bio-energy, energy and carbon balance of buildings with different materials, etc.

And, synthesis and interpretation are needed to support political decision-making:

- Results to be converted into a form which would facilitate decision-making at policy level

2.3 Environmental Benchmarking between Wood Products and Substitutes

2.3.1 Competitive Positions between Materials

It should be emphasised that most visibly in non-European countries, many of the most destructive methods in the forests are carried out by non-forestry sectors such as mining, cattle ranching and cash-crops like palm oil industry. They are often attaching a negative stigma on the forestry sector and trade, reflections of which may be felt by EU-WWI through imported timber. In comparison with competitive materials, the key environmental issues and industry structures vary, as the list below reveals:

Wood products:

- Slow growth
- Fragmented industry
- Environmental issues: forests, adhesives

Steel:

- Slow growth, oversupply
- Concentrated industry
- Environmental issues: reuse, energy intensity

Aluminium:

- Growth slower than in plastics
- Both basic industry and processing concentrated
- Environmental issues: energy intensity

Cement:

- Slow growth
- Fragmented but ownership rapidly concentrating
- Environmental issues: disposal

Plastic (PVC, PE, PS):

- Faster growth than in wood products
- Basic industry partly linked with oil industry; further processing is concentrating but still a fragmented sector
- Environmental issues: disposal, fossil fuel-based, toxicity

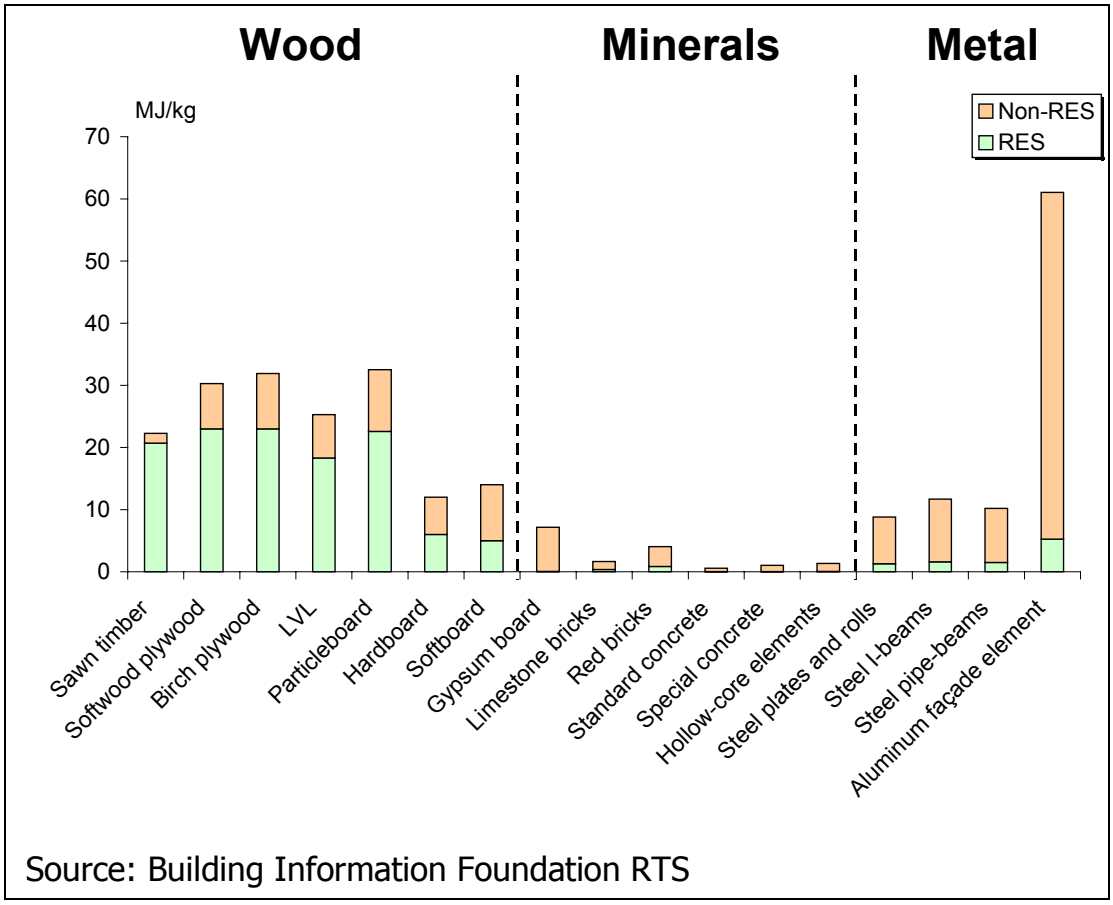
2.3.2 Benchmarking Indicators and Wood's Performance

The benchmarking data drawn for the purposes of this report are constructed around three criteria. First is the energy consumption, measured in the manufacturing process. Second is the share of renewable energy in the products itself. Third is the net CO_2 emission measured during the product lifecycle.

In terms of total energy consumption, wood does not rank very favourably compared with mineral-based materials. Wood-based products consume more energy per kg than mineral-based substitutes, but much of that is renewable and self-generated and this turns the comparison around in favour of wood (Figure 2.2). Wood has by far superior shares of renewable energy (mostly 70-90%), and sawnwood leads the product comparisons. Forest residues, wood industry waste and discarded products can be used for energy: unlike in competing industries, these are extracted from wood's own value chain.

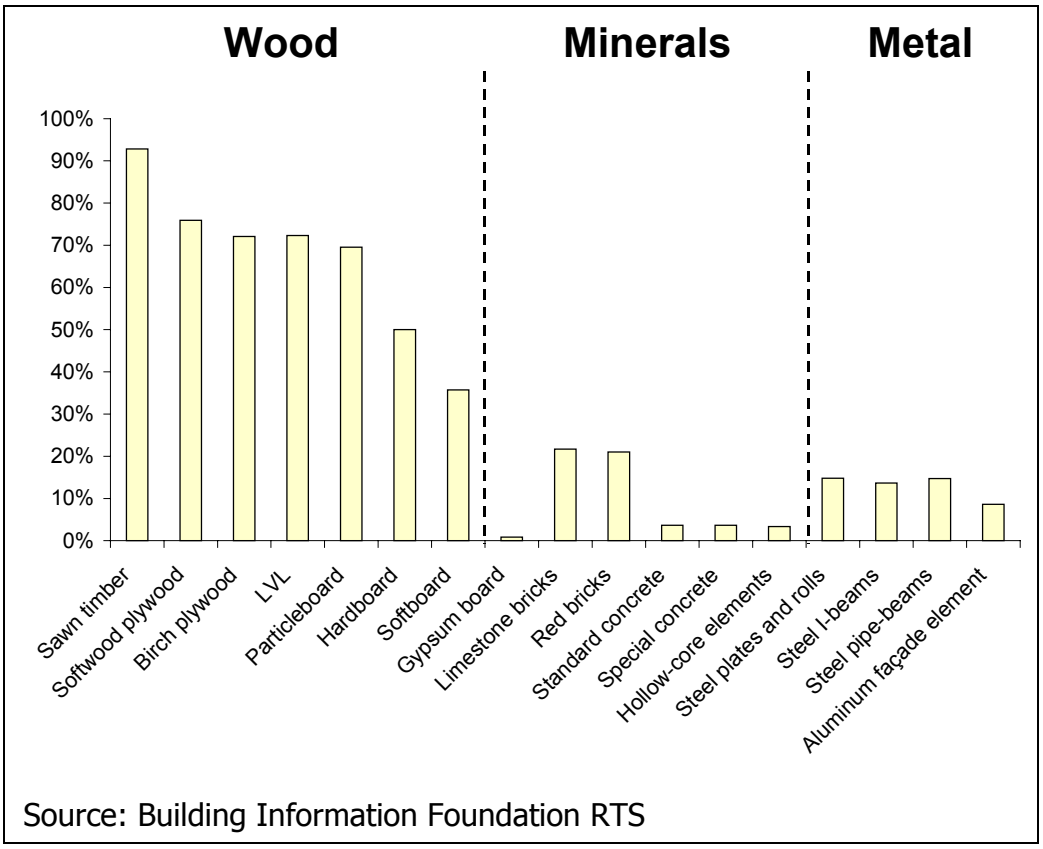
Bricks and concrete as well as steel have a low initial energy consumption per kg, but that is mostly based on non-renewable energy. Aluminium products are very energy-intensive and use non-RES. In this benchmarking aluminium takes a double-wham.

Figure 2.2 Energy Consumption of Selected Building Materials



When the entire lifecycle of products is considered, wood products have negative net emissions while all the others have positive emissions (Figure 2.3). The embodied CO_2 in products is taken into account (i.e. CO_2 absorbed during the growth of a tree converted into a product), what improves the comparison from wood's point of view. Wood can showcase negative net emissions unlike any competing material. The emissions of metal products are much higher than those of mineral-based products.

Figure 2.3 Share of Renewable Energy of Total Energy Use in Selected Building Materials



2.3.3 Lifecycle Assessment of Wood Building Products

The "material lifecycle" is the most effective way of assessing the environmental impact of various building materials. In wood products, the environmental impacts come on five levels:

1. Environmental impact from harvesting timber (including thinnings)
2. Environmental impact from timber in manufacture
3. Environmental impact from timber in construction
4. Environmental impact from living in the timber building
5. Environmental impact from timber in recycling, reuse and disposal

LCA as an analytical tool proposes both opportunities and challenges:
Opportunities:

- Allows quantification of environmental benefits
- Can prove global warming advantages of wood quantitatively
- Relative benefits of wood materials becomes more evident

Challenges:

- Positive role of forestry not adequately documented
- Quality of data difficult to estimate
- Documentation on system boundaries may be insufficient
- Comparison to other studies nearly impossible
- Little international co-ordination of study methods
- Little interest by industry to apply proactively

In most cases, wooden composites are not "by definition" reusable, recyclable and non-toxic. There is still potential for ecological improvements in most manufacturing lines. Users can significantly influence environmental profile of wood products by periodic maintenance.

Since its introduction in 1992, literally hundreds of LCA-reports and studies have been carried out. LCA as a methodology has been defined in the ISO 14040 standard series, which looks into environmental, economic and social aspects of products (Visions and challenges…, 2001). Relatively few studies have, however, been implemented in full compliance with ISO 14040. It has been estimated that about half of the studies have been "research-oriented", meaning that they have addressed very specific issues, and can be at times labelled as "self-information" without a proper utilisation by the industry. Policy-makers have been more keen to use LCA studies, and to sponsor their implementation. Furthermore, it has to be acknowledged that the LCA methodology still continues to evolve, and forest products have received a special attention in this work (Murphy, 2002).

Significant developers of LCA methodology in Europe include BRE (also contributing to Roadmap 2010), CML, IVAM, DTI, BUWAL, ETH, Chalmers University, BFH Hamburg, to name a few. Also EU COST Action E9 aims to expand multidisciplinary life cycle assessments to cover the whole forestry and forest chain, improve methods and establish a European forum on LCA in the forest products field (Life cycle assessment…, 2001).

Major LCA practitioners, in addition to the above-mentioned ones, include EMPA, Imperial College, PIRA, KCL, CTBA, etc. These respond more frequently into genuine product and industry needs than methodology developers. Construction applications (such as the Dutch Building Decree 2001) have continued to demand for LCA services. Other often cited reasons for seeking the services of LCA practitioners include competitive pressure from alternative materials, as well as more stringent waste management and disposal regulations. (Murphy, 2002).

In summary, the key blessing of LCA to forest industry is that it brings forward some very fundamental aspects of the industry: renewability of its resource and energy, carbon dioxide sequestration, low energy-intensity and the role of recycling (European Commission, 2000). On the negative side, LCA can be an accounting system with politicised protocols and conventions. It is being used in a highly competitive atmosphere, in product-to-product, database-to-database, and tool-to-tool senses. As an example, the key decisions about the treatment of CO_2 are left entirely up to the practitioner, what can lead to inconsistent and sometimes slanted approaches. This can be furthermore interpreted as perception of bias and can discredit the use of LCA (Estimating the Impacts…, 1999).

Figure 2.4 **Net CO_2 Emissions of Selected Building Materials during the Whole Lifecycle**

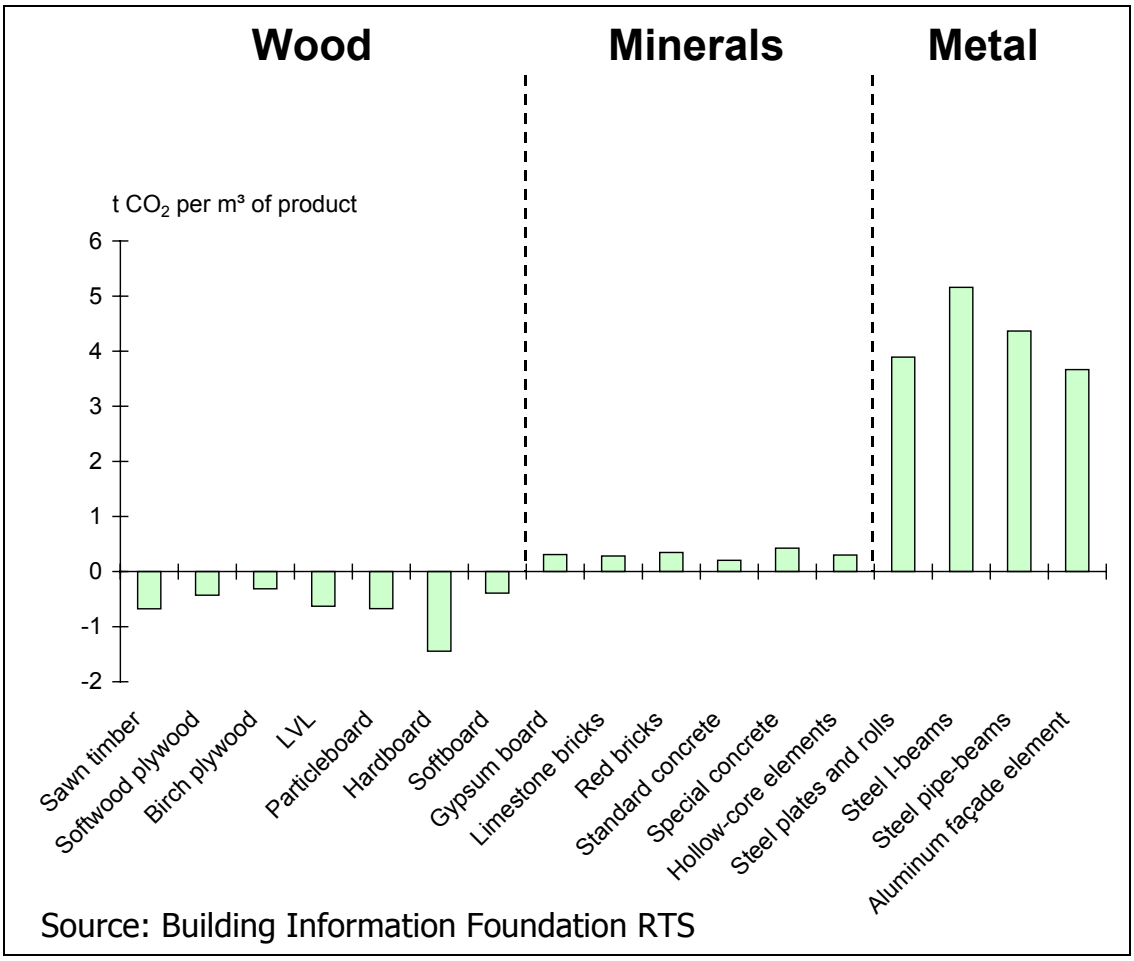
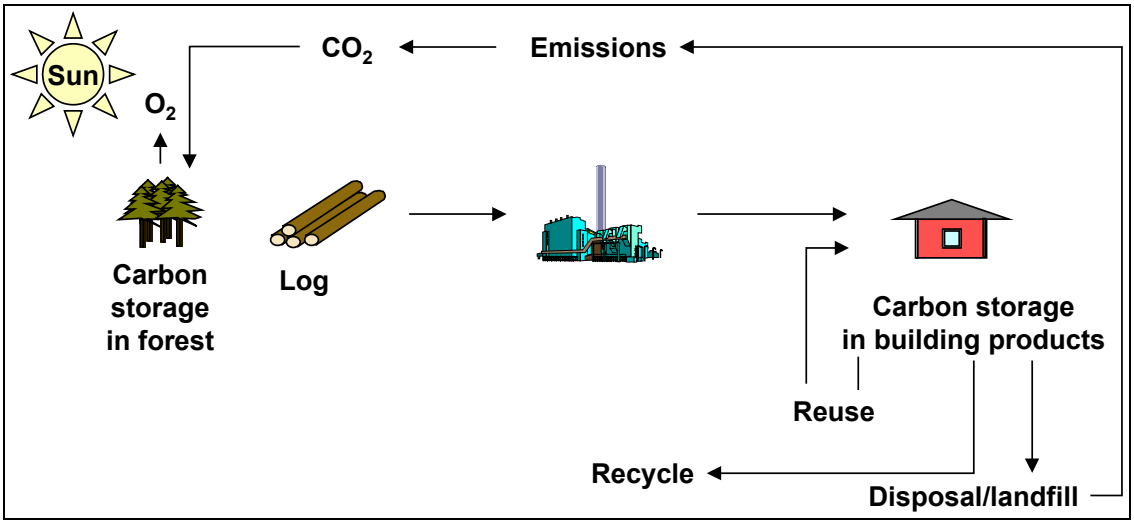


Figure 2.5 **Lifecycle Assessment Levels in Wood Building Products**



2.3.4 Material Comparisons in Products: Window Frames, Flooring, Beams and Houses

2.3.4.1 Window Frames and Flooring

Materials are compared in the following on product level, based on single-issue criteria that have measurable environmental impacts. The assessment is based on FAO's 2002 study on "Environmental and energy balances of wood products and substitutes".

Some of the commonly used impact categories in LCA studies are:

- Global / greenhouse warming potential (GWP, measured in carbon dioxide emissions)
- Photochemical ozone creation potential (POCP)
- Acidification potential (AP)
- Eutrophication potential (EP)

In addition to these, some LCA studies assess toxicity potentials (as critical volume measure for harming humans or for damaging aquatic/terrestrial resources). Ozone depletion potential is another measure, as well as resource use (weighted, kg/tons) and solid waste levels (kg/tons).

In terms of global warming potential (GWP), one can conclude from (Figure 2.6, left side) that on window frames:

- If 30 years service life is considered, wooden window frame ranks only third due to higher need for repair and treatment;
- However, when the entire life cycle (to incineration) is considered, wood is narrowly the least source of global warming impact

In acidification potential (AP, sulphur dioxide emissions) resulting from wooden window frame is only 40-50% of that of aluminium and PVC.

Eutrophication potential (EP, enrichment of dissolved phosphate) of wooden window frame is approximately two-thirds of those of aluminium and PVC.

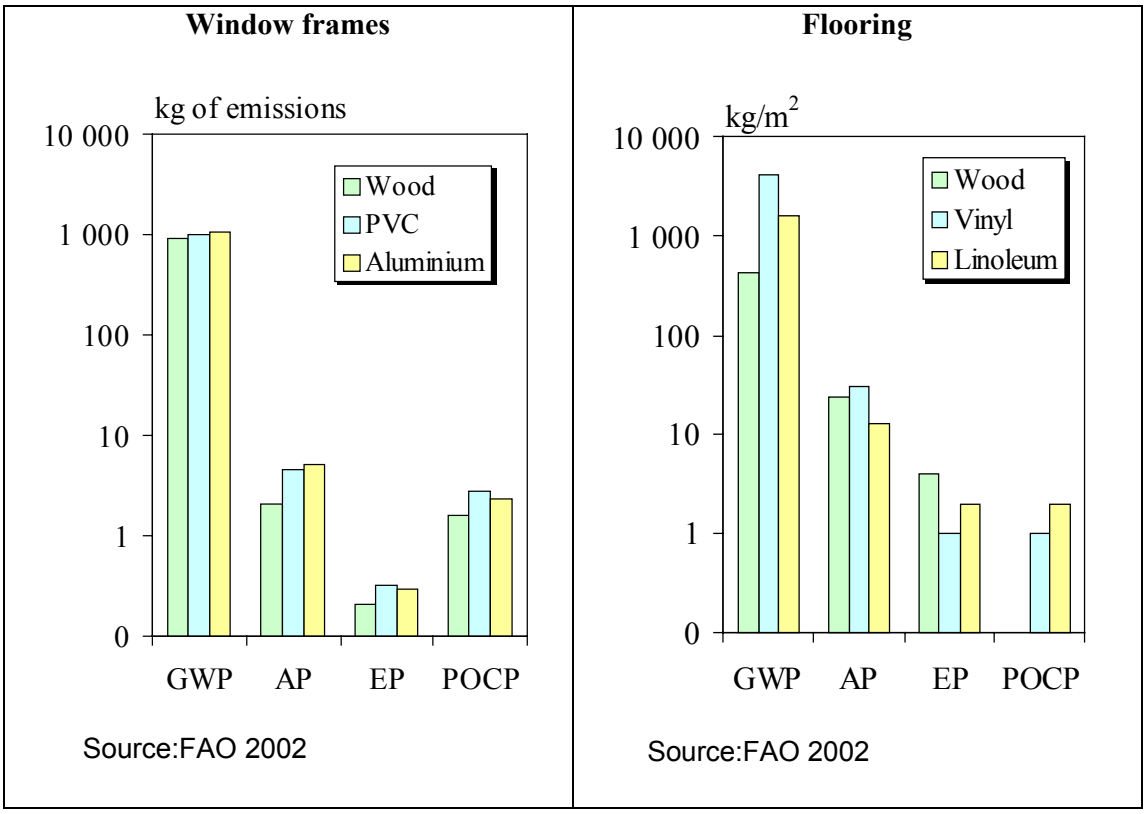
Photochemical ozone creation potential (POCP, ethene emissions) of wooden window frames is clearly lower than comparative figures for aluminium and particularly for PVC.

The similar criteria produce less favourable results for wood in flooring, but this partly due to the area-based comparison that works against wood, as it is produced into thicker flooring than linoleum and vinyl. The key results are:

On global warming potential, wooden flooring is nearly CO_2-neutral, or negligible in global warming effect, unlike its non-renewable rivals, vinyl in particular.

In terms of acidification, wood falls second after linoleum. Eutrophication shows the most environmentally unfavourable result for wooden flooring. But this is particularly a consequence of the comparison done on square meters. Photochemical ozone creation potential of wooden flooring is neutral (zero), much better off than in competitive products.

Figure 2.6 Summary of Environmental Impact Potentials of Window Frames and Flooring Made of Competitive Materials



In addition to the above given parameters, wooden window frames and flooring outplay their rivals of competitive materials on energy grounds. Wooden windows are made with slightly lower energy consumption than PVC, and with much less energy than aluminium windows.

Due to its energy generation potential from processing waste, incineration at the end of the lifecycle, and potential substitution of fossil fuels, wooden flooring has a negative net energy consumption, what compares extremely favourably against vinyl and linoleum.

2.3.4.2 Beams and Houses

A French comparison of wooden building beams against concrete, steel and aluminium clearly illustrates the plausible gap between CO_2 neutral (absorbing) wood and heavily emitting substitutes (Figure 2.7).

(In North America, ATHENA Institute, Forintek Canada Corp. and US-EPA (Environmental Protection Agency) are some prominent LCA developers, and the former one is also a practitioner. Even though there are marked differences in the methods and boundaries used, the comparison in Figure 2.8 gives credit to timber-frame buildings, over steel and concrete. Only solid waste is producing a second rating for wood, but even here, that waste is available for clean energy generation. The case would probably look even more positive if wood's neutrality in terms of embodied CO_2 and bio-energy balance were taken into account.

Figure 2.7 Comparison of CO_2 Emissions of Beams Made of Different Materials

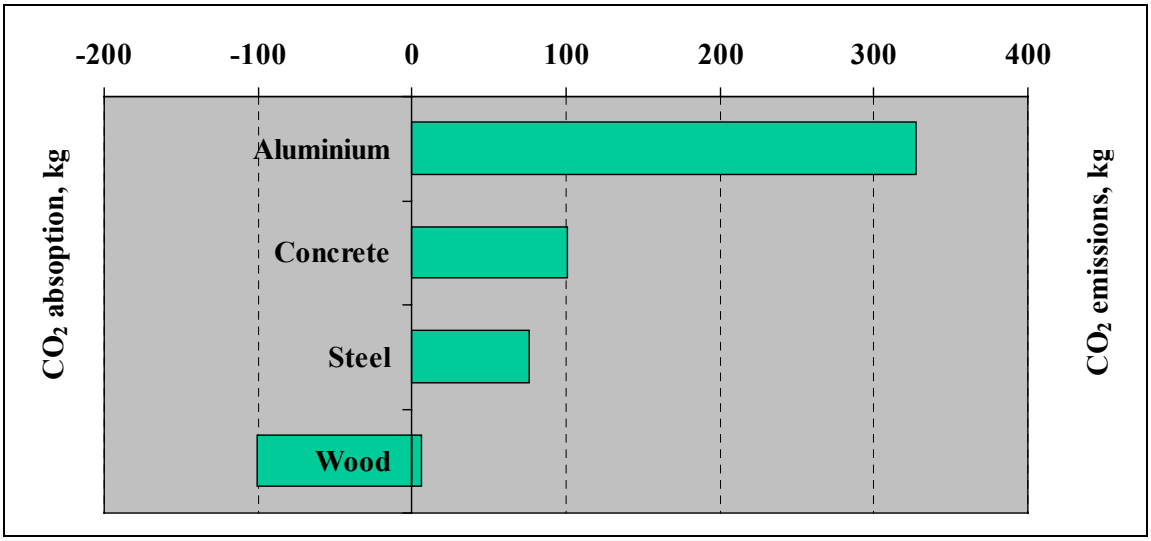
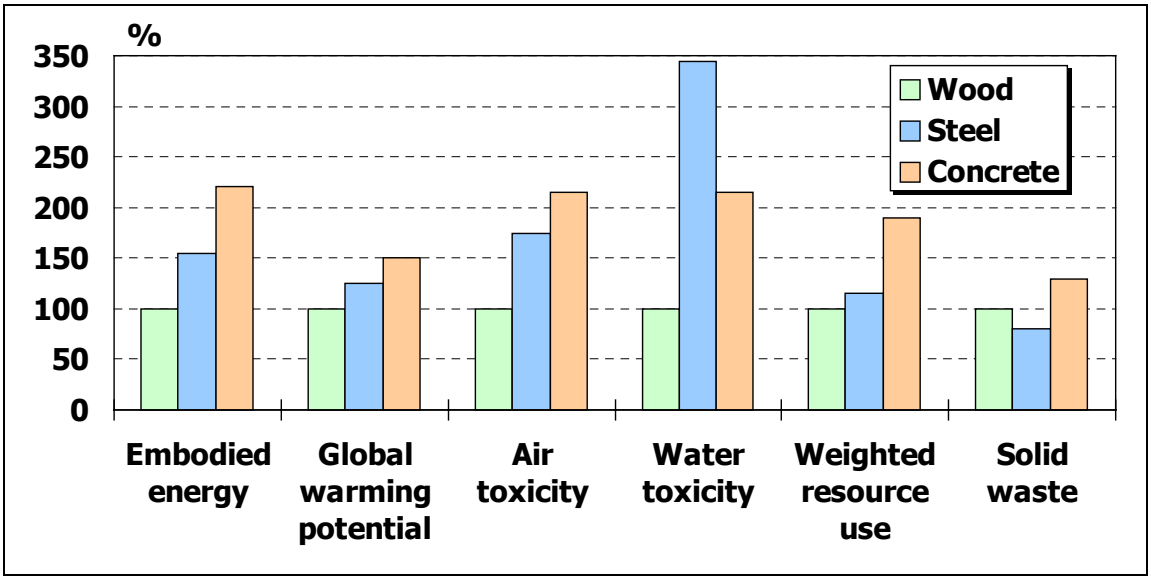


Figure 2.8 Environmental Load of Timber-Frame Houses compared with Steel and Concrete



Source: Estimating the Impacts…, 1999

So why is LCA and environmental benchmarking such a great opportunity, and yet not well applied in marketing of wood for the building sector? The scale of the opportunity is huge: our built environments are estimated to represent 10% of all economic activity, consume 40% of the world's energy and material output and 17% of freshwater, and a quarter of the global annual wood harvest (Estimating the Impacts…, 1999). When the building and construction sector comes under increasing pressure on its environmental responsibilities, only wood can come for rescue. In reality the competing materials, cement industry in particular, are able to slow down the "greening" of the sector due to their closer ties with the building companies and regulators.

2.3.5 Conclusions on Environmental Benchmarking

On climatic benchmarking:

Climate impacts of wood products present an opportunity that the woodworking industries should not miss; but these impacts also represent a major challenge for lobbying and promotion where forces must be united behind a common plan.

Wood can be considered to have a nearly closed product-cycle, starting with sunlight as main production factor and ending with back-to-nature of wood fibre or comparably small amounts of ash after energy generation (e.g. recovered wood or wood products at the end of their lifecycle). The whole cycle includes very low energy requirements for manufacturing and low pollution effects compared to materials originating from fossil or mined resources.

On LCA benchmarking:

Strengths and weaknesses of wood in LCA-based environmental benchmarking against substitutes can be summarised as follows (source: Richter 1995):

Key strengths:

- Renewability of raw material within the biological ecosystem
- Substantially less embodied energy (consumed during manufacturing and construction) than in potential substitute materials
- Low contribution to global warming
- Relatively small waste volumes

Weaknesses:

- High variability
- Need for maintenance and special treatments, especially in outdoor use

Wooden houses, furniture etc. need less energy for manufacturing than the energy that - considering the whole life cycle - can be provided by burning residues from processing or by utilising the energy contained in the wood product itself at the end of the life cycle.

Wood competes with PVC for windows, with steel and concrete for large constructions, with bricks for wall in houses, with plastics for windows and furniture, etc.

Wood has clear advantages expressed in terms of environmental indicators like acidification, ozone formation, toxicity potential and, above all, the global warming potential.

2.4 Sustainability Debate and Wood Products

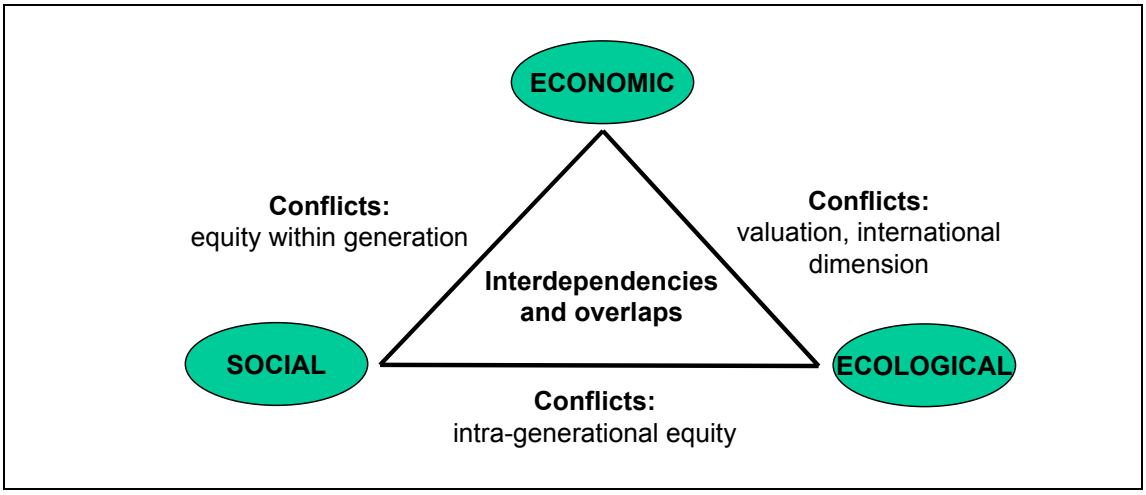
2.4.1 Redefining Sustainable Development

In the aftermath of the World Summit on Sustainable Development, WSSD (Johannesburg, 2002), a wider recognition has been given to the fact that poverty eradication, changing consumption and production patterns, as well as protection and managing of the natural resource base are essential requirements for sustainable development. By definition,

sustainable development assumes that economic well-being, social development, and environmental stewardship are interconnected and must be addressed together.

So, according to the prevailing vision, all the three dimensions of sustainable development have the same importance (Figure 2.9). But over time, their relative importance and visibility in policy debate has varied. It has been seen that while economics featured most strongly in the sustainable development discussion in the 1970-1980s, ecological aspects became more profound after mid-1980s and continued to peak in mid-1990s. Thereafter, the social equity and responsible development has been raised into a more prominent position. At the same time, the role of the private sector gas grown stronger as an agile agent for sustainable development, in contrast with slow-negotiating governments in international processes.

Figure 2.9 Framework of Sustainable Development



Forestry and related industries are no doubt among the most illustrative sectors of human activity for understanding both good and bad sustainability records. The sector is fairly transparent for identifying the pointers of sustainability and the underlying issues, which will down the line directly restrict or shape forest utilisation patterns.

In the times of globalisation and industry movements to new areas of the world, the social aspects of sustainable development have been brought to the limelight. Forest industry sector is no exception, even though it has not been subject to such extreme features of labour abuse or minimum salary violations as e.g. textiles and garments sector. However, as migrant workers are a permanent phenomenon in many emerging forest industry countries, the European WWI may face the situation when it decides to invest in low labour cost countries. In the commonly found contract manufacturing in Asia of e.g. wooden furniture, the social and labour aspects form a part of the choice between the supplier countries. Furthermore, as contract manufacturing does not usually involve fixed investments, it is easy to pull out of the contract and start again in another country. In order to safeguard from a backlash, the European WWI should always ensure that it not only adheres with the local minimum labour and social codes, but also regularly exceeds and improves on them.

Another potentially damaging social issue – in fact much more publicly debated – is the foreign investor's failure to recognise community development and indigenous user rights of

forests when entering into forestry operations in the developing countries. Some major companies have pursued a proactive approach on social responsibility by e.g. verifying through stakeholder consultations the major concerns of the local communities over their intended investment projects.

Table 2.4 Key Issues Related to Sustainability in the Forestry Sector

Subject area	Underlying issue	Potential impacts on wood products
Potentially damaging factors		
Forest management standards	Who decides about how forests are managed (certification)	Further restrictions for wood supply
Biodiversity	Protection of old-growth areas Species diversity and habitat protection	Limits productive area Higher harvesting costs Landscape-level planning for biodiversity
Scenic beauty	Conservation of traditional landscape	Limits conversion of marginal land into forestry
Forest fires, storm damage	Ignition material, species and stand structure	Species structure, management regime
Processing and logistics	Environmental impacts	Higher costs
Potentially rewarding factors		
Social aspects	Maintenance of rural livelihoods Land-use rights of indigenous groups and non-owners	Labour supply Non-timber uses
Governance	Illegal harvesting and trade	Verification costs Improves competitiveness of EU producers
Consumption	Materials efficiency and substitution	Improved competitiveness

2.4.2 Forest Protection and Certification

Forests are endowed with rich biodiversity and scenic beauty, for which the societies have demand in order to conserve these services for future generations. Europe has a high level of protection already, with nearly 20% of EU-15 areas already protected, and the ten accession countries have set aside similar proportions of their forests. Between individual countries, the comparison of protection areas is difficult due to national definitions. Shares appear to be ranging from Germany's extreme high (two thirds of forests) to only a couple of percent in Ireland (Figure 2.10). A level of 10% is being promoted by ENGOs as an acceptable target internationally.

The concept of forest certification was introduced in the early 1990's. At that time forest certification was seen primarily as an instrument to halt tropical forest devastation. In reality, the forest certification schemes and areas have progressed rapidly in Europe and North America, but at the same time quite slowly on other continents.

Because of the low proportion of roundwood entering international trade (15-20% of the total logging volume - with the rest used domestically), certification and labelling alone cannot lead to sustainability in forest management. Effective government control and policy guidance on forest utilisation is still imperative for sustaining the finite resources.

The forestry sector has become more cognitive of its environmental weaknesses especially in the area of raw material procurement compared to other materials such as plastics, steel,

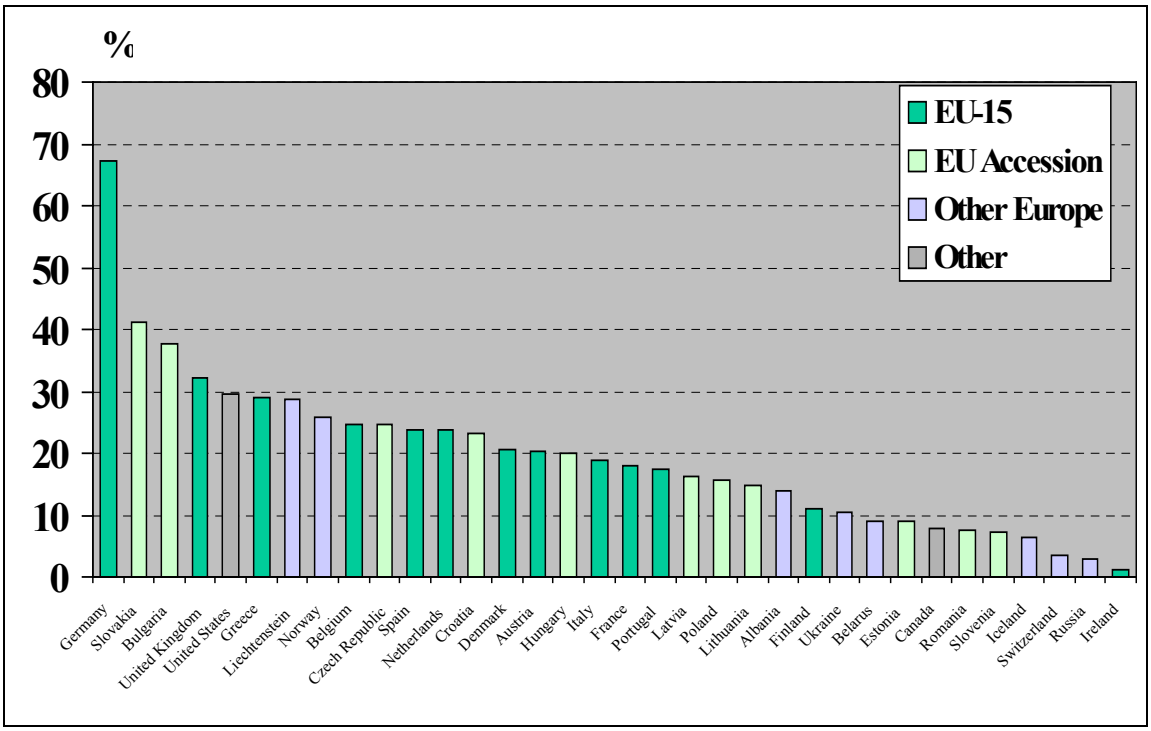
aluminium and concrete. Thus forest certification serves at present two main purposes – to improve forest management, and to improve market access.

Certification can be applied as a proxy on how much of the forest area is verifiably under sustainable forest management. North America accounts for above a half of the total certified area in the world. EU-15, however, is the leader in terms of share of all forests certified (42%). Developing countries have only a few percent of the total certified forest area which is a paradox as certification was introduced to facilitate access of tropical timber to international market (Figure 2.11).

As comes to individual countries, Canada, the USA and the three forest-rich Nordic countries have the largest areas under certification (Figure 2.12). North America (75 mill. hectares) accounts for above a half of the total certified area in the world (156 mill. ha). EU-15 holds 49 mill. ha or 31% of the world total. After the enlargement of the EU, the ten new members will bring additional 24 mill. ha of certified forests to the internal market.

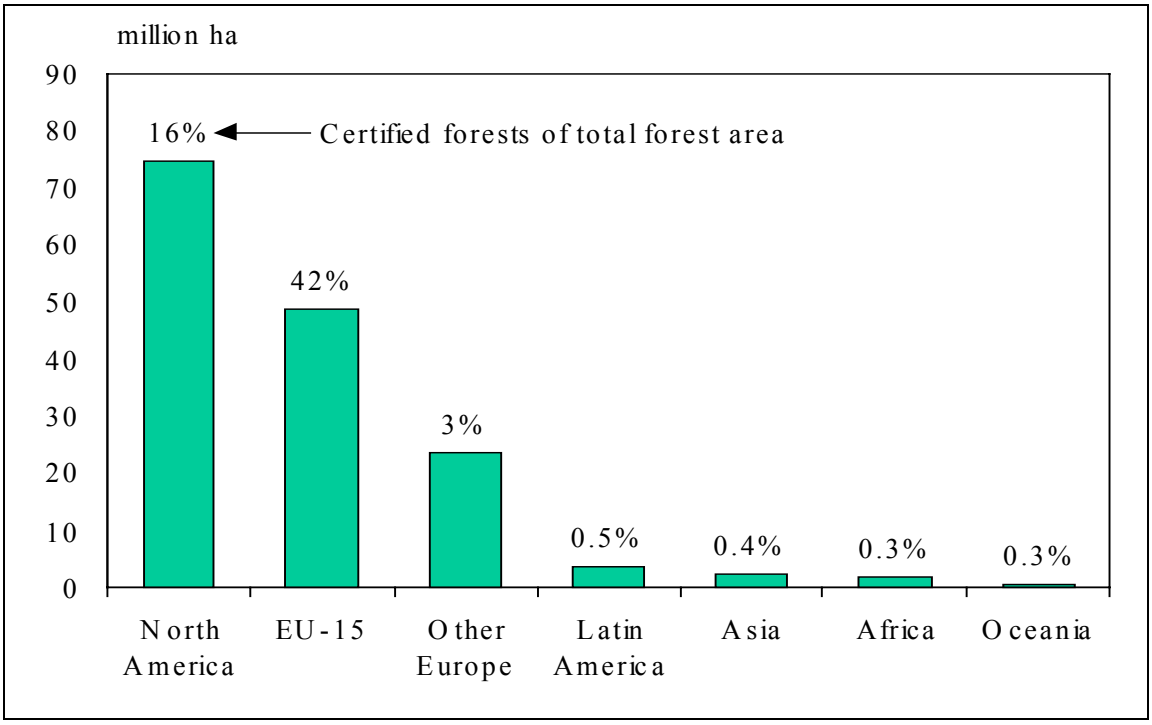
The certification schemes are competing to enlarge their international clout, particularly the Pan-European Certification Scheme, (PEFC), which has in fact recently changed its name into "Programme for the Endorsement of Forest Certification Schemes". This implies that the mutual endorsement between certification schemes has become a solution to circumvent the difficult mutual recognition process tried between schemes for many years. PEFC is currently the global leader in certified forest areas (31%) before SFI (26%) and FSC (24%) (Figure 2.13).

Figure 2.10 Protected Area of Total Forest Area by Country



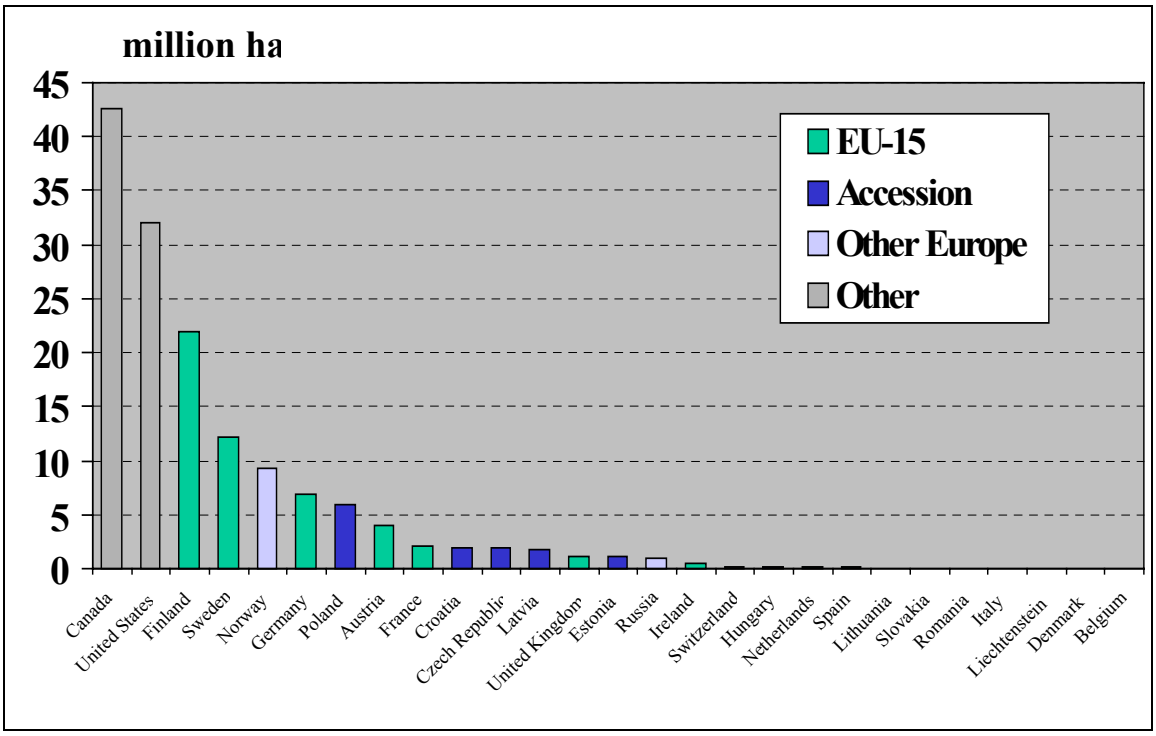
Source: FRA, 2000

Figure 2.11 Certified Forest Area by Region



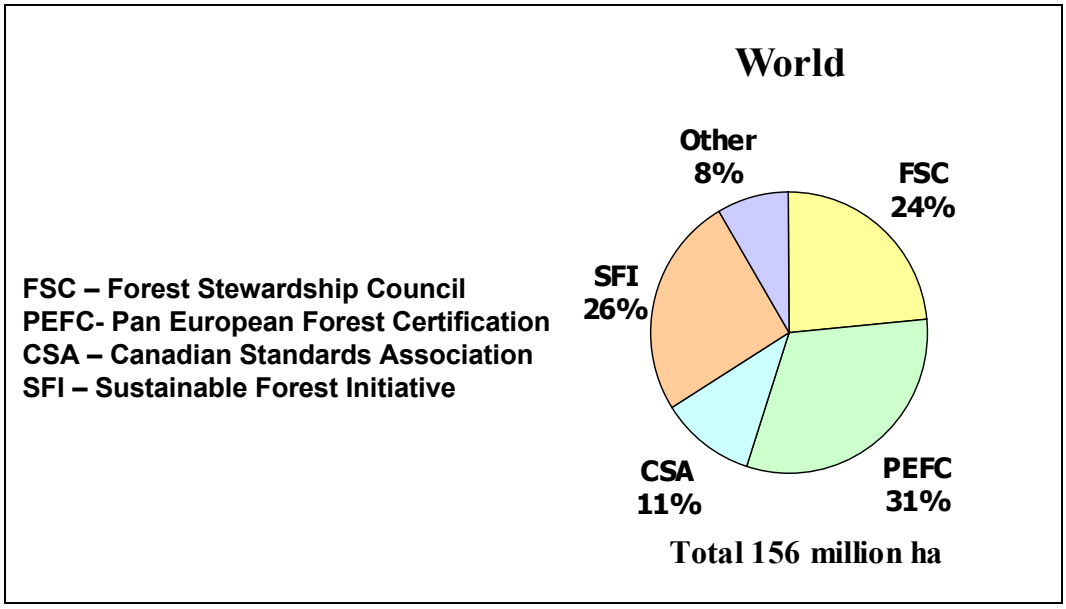
Source: Homepages of Certification Schemes, GFRA, 2000

Figure 2.12 Certified Forest Area by Country



Source: Homepages of Certification Schemes

Figure 2.13 Shares of Certification Schemes of the World's Certified Forests



Source: Homepages of Certification Schemes

2.4.3 Sustainability in Public Procurement

The slack consumer demand for certified wood products has been acknowledged by the leading certification schemes, and FSC (backed by WWF and in alliance with the World Bank) in particular has tried to influence the authorities and the public procurement rules in the key markets, with some success.

In the UK, for example, the government has endorsed a step-wise approach to ensure first the legality, and secondly, the sustainability of their public procurement of wood products. As a minimum requirement, legality would have to be ensured by verifying that:

- The producer has legal usage rights to the forest
- The producer complies with the laws and codes of practice of the country that are relevant to the management of forests and the mitigation of the impacts of forest management on people and the environment

Second step implies that suppliers are legal (as defined above) and progressing towards sustainability. The final third stage is achieved when suppliers can be verified both legal and sustainable.

Also the G-8 countries have pledged commitment in 2000 to procure wood from "legal and sustainable sources", which would eventually be granted a preference in government procurement. There is an on-going debate on whether such criteria can be used at the award stage of contracting.

Certification can be linked up with proving the legality in public procurement, with some reservations:

- Certification is a possible means provided that legality is defined as an explicit criterion in the standard (this is common in all certification systems)
- But suppliers should also have other means to prove that their products meet the legality criteria if they are not certified
- E.g. Indonesia has embarked on a national certificate of legality on roundwood being processed for exports, but so far it lacks international recognition and a third-party verification. The issuer, BRIK (Forestry Industry Revitalisation Body) is mandated to execute industry self-regulation, and report to the Government.
- It is unlikely that a reference to specific schemes can be applied under the EU law and WTO rules, but the criteria to be met in verification can be defined

2.4.4 Conclusions on Sustainability and Wood Products

Conclusions on future outlook of certification:

- On its 10th year of existence and with at least 156 mill. ha covered, forest certification is a baseline requirement in many segments in the environmentally conscious markets
- Mutual recognition between competing systems is not foreseen in the medium term, demands appear to be lowered to "mutual endorsement" for practical reasons
- An international level arrangement to assess individual schemes will be in any way necessary for public procurement and would help industry manage fibre flows with different certification status
- Differences between the contents of standards and the provisions of the systems will be reduced
- An internationally recognised standard for chain-of-custody (CoC) is needed to facilitate woodworking industry to certify its products
- Need for the legality utility of certification systems is on the increase (e.g. Indonesia)
- FSC and other systems are likely to revise their requirements upwards
- Big doubts remain, however:
  - certified forest products are gaining recognition mainly at the business-to-business level, and gradually in public procurement policies; consumers continue to respond hesitantly
  - the lack of tangible price premiums and warfare between certification schemes expose wood sector's inherent weakness to stand united - already the lack of certificates is used as a punitive bargaining argument by some importers
  - internalisation of the certification costs is very difficult in markets where price always decides

Conclusions on wood products in the sustainability debate:

1. Transparent sustainability reporting (economic, environmental, social) is essential in communicating the triple-bottom-line of the WWI
2. Public procurement, DIY, large professional buyers and business-to-business maintain interest on certification and legality of wood products
3. Burden-of-proof is firmly on the industry and trade
4. Political and scientific weight to back the WWI's sustainability record is needed
5. Scorecards or similar means to visualise the "sustainability difference" at point-of-purchase are needed to capture the gains

2.5 Health and Safety Issues

2.5.1 Potential Effects of Wood Products on Health and Safety

Four aspects to be considered during product lifecycle are the following:

- Manufacture of wood products
- Building with wood
- Living with wood
- Disposal

Aspects related to manufacture of wood products:

Table 2.5 Pros and Cons of Health/Safety in Manufacture of Wood Products

Pros	Cons
- Natural	- Wood dust
- Non-toxic	- Preservative chemicals
- Easy to work	- Paints and glues
- Climate-neutral and nearly closed product cycle	⇒ Exposure can be limited with proper protection
- Low energy consumption, self-generated	⇒ Mostly already under control

Aspects related to building with wood products:

Table 2.6 Pros and Cons of Health/Safety in Building with Wood Products

Pros	Cons
- Easy to work and assemble - Versatile - Strong and light - Low heat conductivity - Ease of maintenance - Adaptability to remodelling - Retention of strength in fire	- Preservative-treated products - Paints and glues - Susceptible to microbial attack under moist conditions

Aspects related to living with wood products:

Table 2.7 Pros and Cons of Health/Safety in Living with Wood Products

Pros	Cons
- Natural material - Non-toxic - No radon emissions - Low heat conductivity - Hygroscopicity	- Susceptible to microbial attack under moist conditions - Some products emit formaldehyde ⇒ Emissions have already been reduced to acceptable levels

Aspects related to disposal of wood products:

Table 2.8 Pros and Cons of Health/Safety in Disposal of Wood Products

Pros	Cons
- Natural - Non-toxic - Can be used for bio-energy - Recyclable	- Introduced chemicals, including preservatives, paints and glues - When burned, compounds are released into atmosphere with smoke and concentrated into ash and soot ⇒ Emission levels of wood burning are relatively low

Key issues related to toxicity in wood products include the following:

Natural chemical poisons:

- Refer to chemicals produced by the tree
- Originated as part of the tree's natural defence system against insect and other animal attack
- Tend to be present in higher concentration in the sap, bark and foliage of the tree, and to a much lesser extent in the trunk
- Reaction can range from that of a mild irritant, to something that is truly toxic and lethal, although the latter is very rare

Natural physical poisons:

- Fine wood dusts, even if they have no chemical toxicity, can pose a health risk
- Dust can act as an irritant to the skin and particularly to the respiratory tract of people that have a natural sensitivity in this area

Introduced poisons:

- Nature can introduce toxins as the wood rots on the forest floor
- Fungal spores and bacteria that invade a rotting tree can be toxic if they are able to invade the human body
- Toxins introduced by mankind into wood:
    - chemical treatments to prevent rotting
    - formaldehyde glues to glue plywood layers together in both sheet materials and flooring
    - in woodworking dust generated introduces these toxins back into air
    - many of these glues emit vapours long after the manufacturing process has been completed. Both the dust and the vapours can be very toxic.

2.5.2 Conclusions on Health and Safety

- Beneficial effects far outplay potentially harmful ones
- The knowledge of the harmful ones is needed among industry and promoters of wood to return attacks from competing materials
- Negative aspects are mainly related to chemicals (natural or introduced into wood), while an array of experience-related mental, physical and spiritual positive values can be identified to support consumer perception and acceptance of wood

PART B

3. WOOD RAW MATERIAL SUPPLY

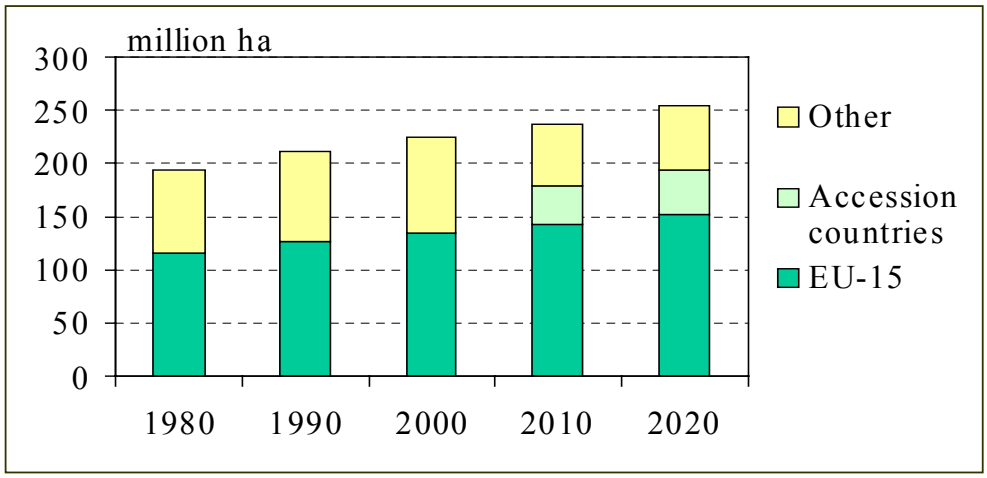
3.1 Area, Volume, Growth and Supply in Europe

3.1.1 Expansion of European Forest Resource Base

3.1.1.1 Expansion of Forest Area in Europe

The future of European forest resource base looks quite promising, both in terms of area, and growing volume. Gross forest area keeps expanding, due to land-use changes, but the net increase of forests available for wood supply (FAWS) will be much smaller. Figure 3.1 illustrates the historic and projected development of European forest areas by sub-region.

Figure 3.1 Forest Area of Europe by Sub-region 1980-2020



Sources: FRA2000, UNECE, CEPI

3.1.1.2 Forests Available for Wood Supply, Driving Forces

Box 3.1 Driving Forces for Forests Available for Wood Supply

+	The total European gross forest area is on the increase, as a result from land-use changes.
+	Economic accessibility of forests for harvesting improves through development of infrastructure and harvesting technology.
+	Potential transportability improves through new logistic solutions.
–	Non-productive use pressures of forests are increasing, thus decreasing the net area available for commercial wood supply.
–	Regulations, such as on surface transport, put constraints to haulage and to wood procurement.
–	Energy needs, sensitive areas, noise, sanitary restrictions and other barriers to trade are among factors which form additional constraints.

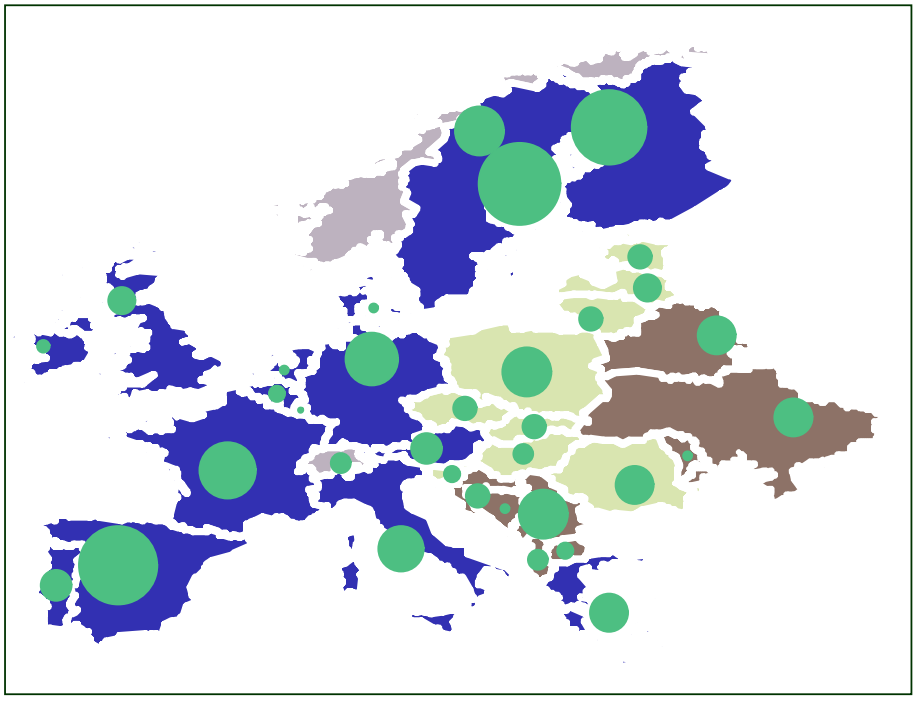
In addition of the basically favourable, expanding forest area, there are balancing factors, such as pressures for non-productive uses, and competing needs.

Forest Available for Wood Supply (FAWS) increases only marginally in EU-25 in the medium term future.

3.1.1.3 Forest Area for Wood Supply by Sub-region in 2000

Figure 3.2 illustrates the relative forest areas for wood supply in European countries (Russia has been excluded in this illustration but will be discussed below). In summary, what is presently EU-15 will continue to form a major part of future forest resource of EU. The forest area for wood supply (FAWS) by sub-region in year 2000, is as summarised by sub-region in Table 3.1. Figure 3.3 illustrates the relative FAWS areas by sub-region, in Europe (excluding European side Russia).

Figure 3.2 Forest Areas for Wood Supply by Country and Sub-region, in 2000



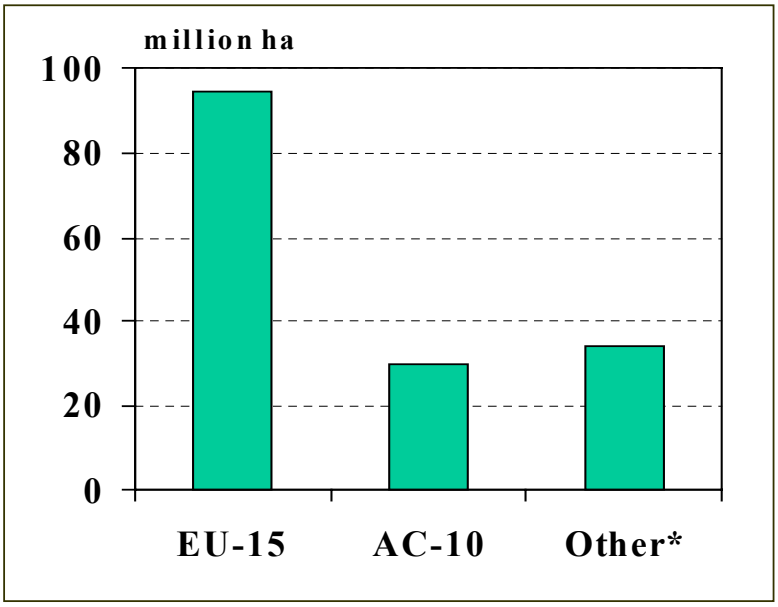
Sources: FRA2000, UNECE, CEPI

Table 3.1 Forest Areas in Europe by Sub-region in Year 2000

	million ha
EU-15	94.8
AC-10	30.1
Others	34.0
Total	**158.9**
(European Russia)	174.0

Sources: FRA2000, UNECE, CEPI

Figure 3.3 Forest Area for Wood Supply by Sub-region in 2000

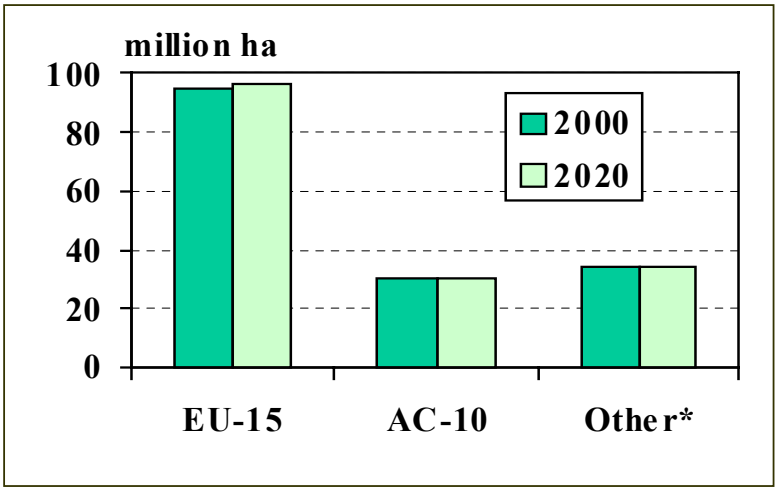


*Sources: FRA2000, UNECE, CEPI, Foreco *) excluding Russia*

Accession of ten new member countries will change the forest situation of European Union. Some of the new members have rich, and partially under-utilised, forest resources. The accession will add 31.8% to the present forest available for wood supply (FAWS) of EU-15. Expansion in forest area increases the potential and offers new opportunities for EU-25 forest based sector and related policy. Accession promotes the need for convergence of policies, governance and sustainable management practices.

Figure 3.4 illustrates the change in FAWS areas by sub-region in Europe, to year 2020.

Figure 3.4 Forest Area for Wood Supply by Sub-region to 2020



*Sources: FRA2000, UNECE, CEPI, Foreco *) excluding Russia*

3.1.1.4 Development of Forest Area for Wood Supply to 2020

Table 3.2 Forest Area for Wood Supply by Sub-region 2000-2020

	2000	2020	2000-2020
	million ha		change (%)
EU-15	94.8	96.1	+1.4
AC-10	30.1	30.6	+1.7
Other	34.0	34.1	+0.3

Sources: FRA2000, UNECE, CEPI, Foreco

Most of the gross increase in forest area in EU-25 will be absorbed by other uses than wood supply. As a result, the forest area available for wood supply (FAWS) in the new EU-25 will keep increasing only by about 1.5% in 20 years.

The expansion will significantly add to the potential resource base, allowing an increase in future wood production.

3.1.2 Wood Volume and Growth in European Forests

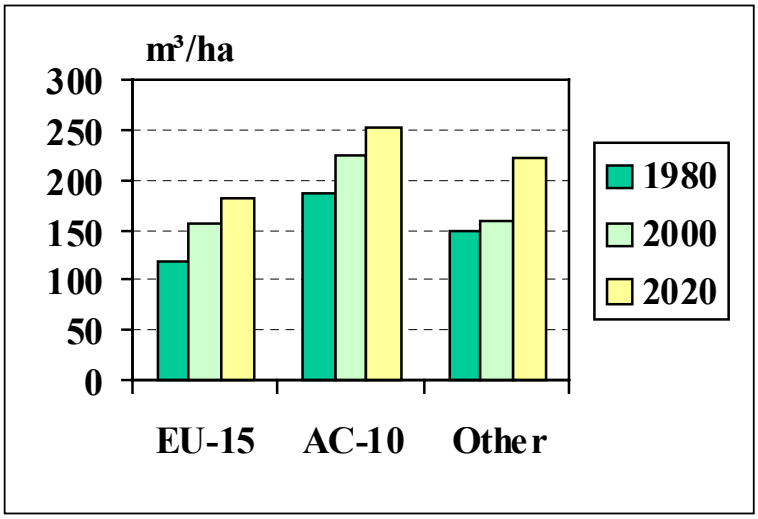
3.1.2.1 Average Wood Volume per Hectare 1980-2020

The European forest management systems have quite generally favoured progressive development of growing stock. As a consequence, the average wood volume per hectare is increasing in general in Europe. The new accession countries (AC-10) have higher wood volume per hectare than EU-15, on the average. The growing stock, the average tree size and the growth will all be on increase in next 20 years in EU-25.

Increasing volume per hectare will be the main driving force for the increase of wood supply potential in Europe in the coming decades.

Figure 3.5 illustrates the development of average wood volume per hectare in Europe. The time span is 20 years of history and similarly 20 years to the future. It is clearly visible how both (what is presently) EU-15 area, and (what has become) AC-10 area, have had a strong accumulation of average wood volume per hectare. As demonstrated in Table 3.3 as well, this tendency is projected to continue in the coming decades.

Figure 3.5 Average Wood Volume per Hectare by Sub-Region 1980-2020



Sources: FRA2000, UNECE, CEPI, Foreco

Table 3.3 Average Wood Volume per Hectare by Sub-region, 1980-2020

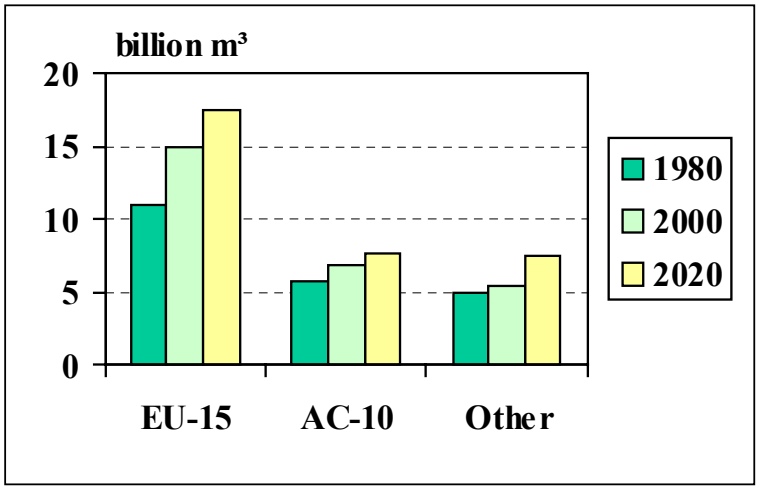
	1980	2000	2020
EU-15	119	158	183
AC-10	187	225	254
Other	150	161	223

Sources: FRA2000, UNECE, CEPI, Foreco

3.1.2.2 Total Wood Volume in European Forests 1980-2020

Figure 3.6 illustrates the past and future development of the total wood volume (growing stock) in the European forests. As can be observed, the present EU-15 still holds a very large majority of the standing wood volume in its forests. The consequence of the large volume, and the continuing growth, jointly mean that the EU-15 area will accumulate more of wood volume in its forests than AC-10, in the future as well. However, one should note that the other countries, (which excludes the European Russia), will have a major growth even as its wood volume is relatively small. This is an indication of the projected improvement of forest governance in this area.

Figure 3.6 Total Wood Volume in European Forests 1980-2020



Sources: FRA2000, UNECE, CEPI, Foreco

Key findings:

(i) Standing wood volume (growing stock) is increasing in European commercial forests.
(ii) EU-15 standing wood volume will expand by 17.3% in 20 years.
(iii) AC-10 standing wood volume will increase by 15.0% in 20 years.
(iv) Standing volume outside EU-25 will expand even faster: 20% in Russia and 38.0% in other countries.

Standing wood volume will expand by almost one percent annually in EU-25, and even faster elsewhere in Europe.

Table 3.4 Total Wood Volume in European Forests, 1980-2020

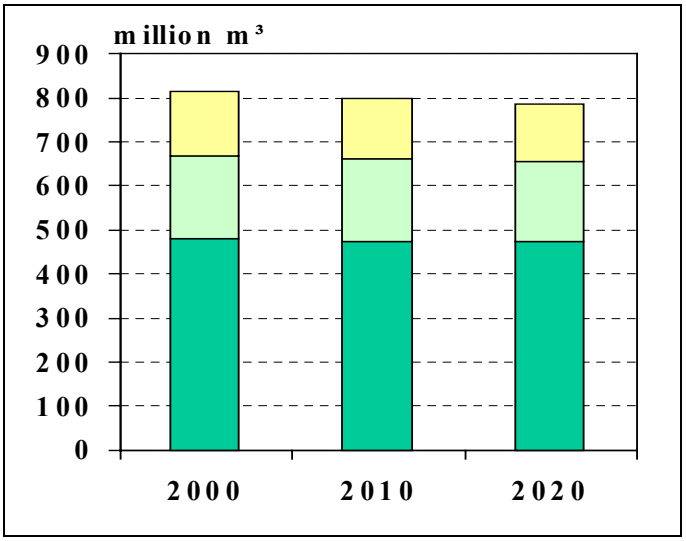
	EU-15	AC-10	Other
1980	11.0	5.7	5.0
2000	15.0	6.8	5.5
2020	17.6	7.8	7.6

Sources: FRA2000, UNECE, CEPI, Foreco (billion cum)

3.1.2.3 Net Annual Increment in European Forests

Figure 3.7 illustrates the total annual growth (net annual increment) in the European forests. One can observe that the net growth has stabilised at around 800 million m^3 per year. This is a natural result from increased average age of the trees.

Figure 3.7 Net Annual Increment in European Forests to 2020



Sources: FRA2000, UNECE, CEPI, Foreco (EU-15, AC-10 and Other, excl. Russia)

Key findings:

(i) Growing stock of European forests is expanding, as harvesting has remained lower than net annual increment (NAI = growth).
(ii) However, the growth will not improve in the near future due to ageing forests.
(iii) Eventually, growth will react to change in forest structure through harvesting and forest management regimes.

The Growth in European forests is high and will remain on a high level, even if harvesting would be higher in the coming decades.

3.1.2.4 Conclusions on Expansion of Forest Resource Base of EU-25

(i) Gross forest area keeps expanding, due to land-use changes, but net increase of forests available for wood supply (FAWS) will be much smaller
(ii) Accession will add 31.8% to present forest area available for wood supply (FAWS) of EU-15
(iii) Forest area available for wood supply (FAWS) of EU-25 increases by about 1.5% in 20 years, to 2020
(iv) Accession will increase the forestry potential of EU-25 and promote convergence of policies, governance and sustainable management practices
(v) Increasing volume per hectare will be the main driving force in increase of wood supply potential in Europe
(vi) Standing wood volume will expand by almost one percent annually in EU-25, and even faster elsewhere in Europe
(vii) Growth in forests of Europe is high and will remain on high level, even if the harvesting will be higher in the coming decades

3.1.3 Supply of Wood Raw Material

3.1.3.1 Factors Influencing Wood Raw Material Supply

The actual supply of wood raw material is a net result from a complicated set of conditions and drivers. As presented previously, the land-use conditions form a favourable basis for forest development in Europe. The biological and management conditions are favourable also and the net growth of forests is on a good level. Other use and non-use pressures cause restrictions, which lower the actual wood supply from the biological potential. The harvesting and selling behaviour of the forest owners is a very important determining factor.

Summary of key groups of drivers of wood supply:

(i) Supply potential, i.e. increment in the forests, is favourable
(ii) Socio-economic development favours other uses
(iii) Conservative attitudes of forest owners and core change in their behaviour
(iv) Forest policies and management prescriptions
(v) Non-forest policies, such as on environment, industry and trade.

Summary of key impacts on wood supply:

(i) Areas used for protection and other purposes (decreases potential wood supply, but enhances other services, and thus value of forests)
(ii) Forest management standards are getting stricter (limits some methods and use of some forest types, increases costs)
(iii) Capacity and willingness to supply wood (forest owners' link to forests may become more distant, both forest related skills and values towards industrial uses are likely to suffer)

3.1.3.2 Trends in Global Wood Raw Material Supply

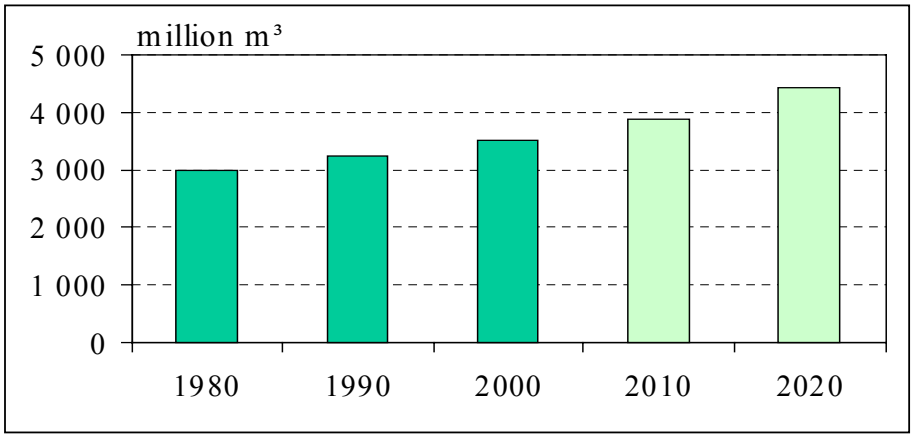
European wood supply conditions are decisive in terms of the health of Woodworking Industries (WWI). However, both products and increasingly also the wood raw materials are traded globally. Thus, changes in the international balance are being felt in the European wood supply as well. Europe is very central from the point of view of global trade flows, there are trading links with most of major regions. Figure 3.8 illustrates the history and projected future of the global wood raw material supply.

Key findings on international wood supply:

(i) Global wood raw material supply has a number of wood rich supply areas, while others, such as Asia-Pacific, will need large net imports.
(ii) Significant future excess supply areas will include: Russia, including Russian Far-East, New Zealand and Chile.
(iii) Many of the competing wood raw material sources have high yields.
(iv) A high share of the emerging plantation wood is very cost efficient.
(v) Some of the competing wood raw material suppliers have financial support through direct or indirect subsidies.
(vi) Plantation wood will be competitive, and can be certified and labelled.
(vii) Plantation wood will take a large share of growth of wood production; projected to meet up to 50% of industrial wood supply by 2050 (WB).

Global wood raw material supply appears sufficient to meet the demand. Expansion in plantations and international trade is needed. At least local price increases are likely in various locations. Europe is well positioned as the local wood supply potential and conditions are in good shape. However, global impacts and fluctuations are increasingly felt in Europe as well.

Figure 3.8 Estimated Global Wood Raw Material Supply



Sources: FAO, JPMC, Foreco

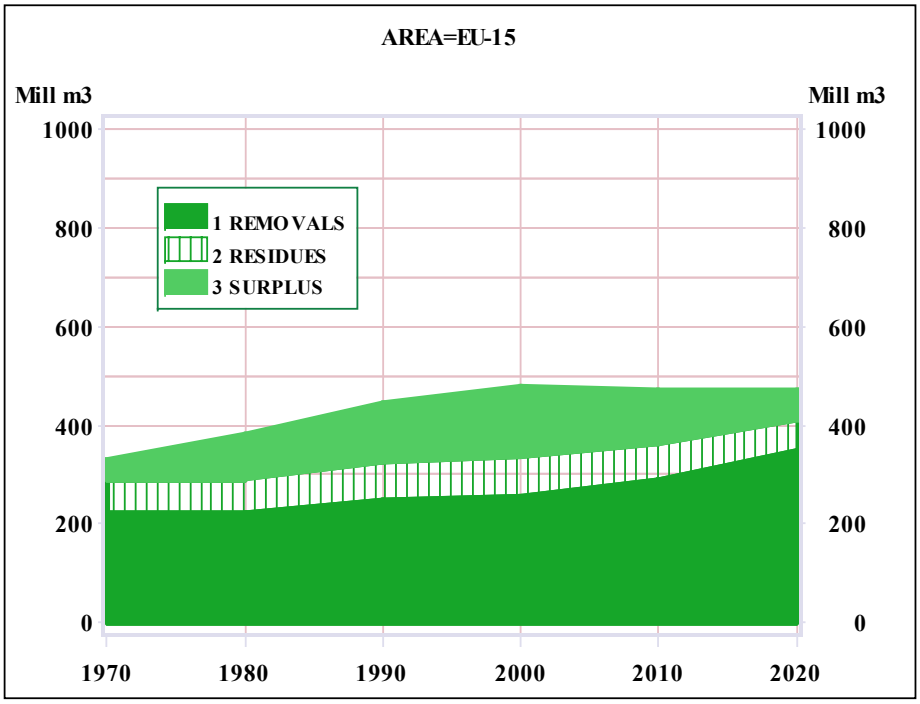
3.1.3.3 Development of European Harvesting Balance

EU forestry has an inherent capacity to respond to demand increase but needs strong policy backing to enable expansion. New constraints are likely to cut into supply performance, but sizeable volume expansion in wood raw material supply is still possible. Wood raw material demand keeps increasing in traditional uses and more transparent markets increase competition between users.

New wood raw material uses are emerging, including bioenergy. As a consequence, the overall wood demand shifts further up. The demand for non-wood uses of forests is increasing. These include biodiversity conservation, recreation and landscape values. The non-wood uses of forests need compromises between conflicting policy objectives and interests.

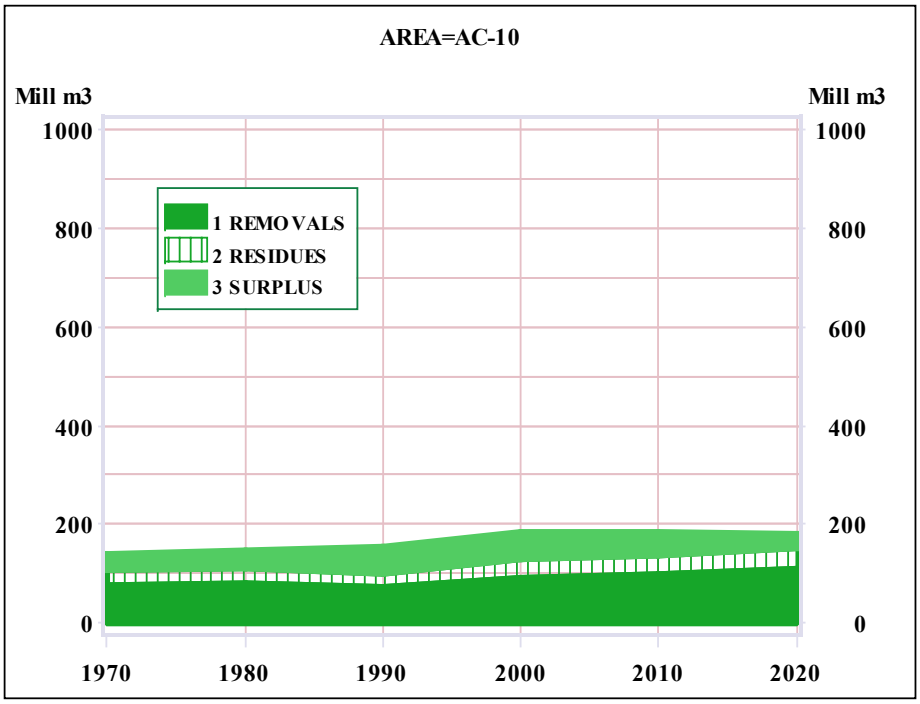
The balance in the European wood markets will be reached on a clearly higher volume of wood supply level; pressure will increase towards higher prices, especially where they are presently low, and where the openness and transparency have been constrained in the past. Figures 3.9 to 3.12 illustrate the development of the long-term balance of growth and harvesting in the European forest. In each of the sub-regions, the harvesting (=removals + residues) is clearly lower than the potential. Thus a sizeable surplus remains in the forests annually, and adds to the accumulation of growing stock, as demonstrated above.

Figure 3.9 Cutting Balance in European Union (EU-15), 1970-2020



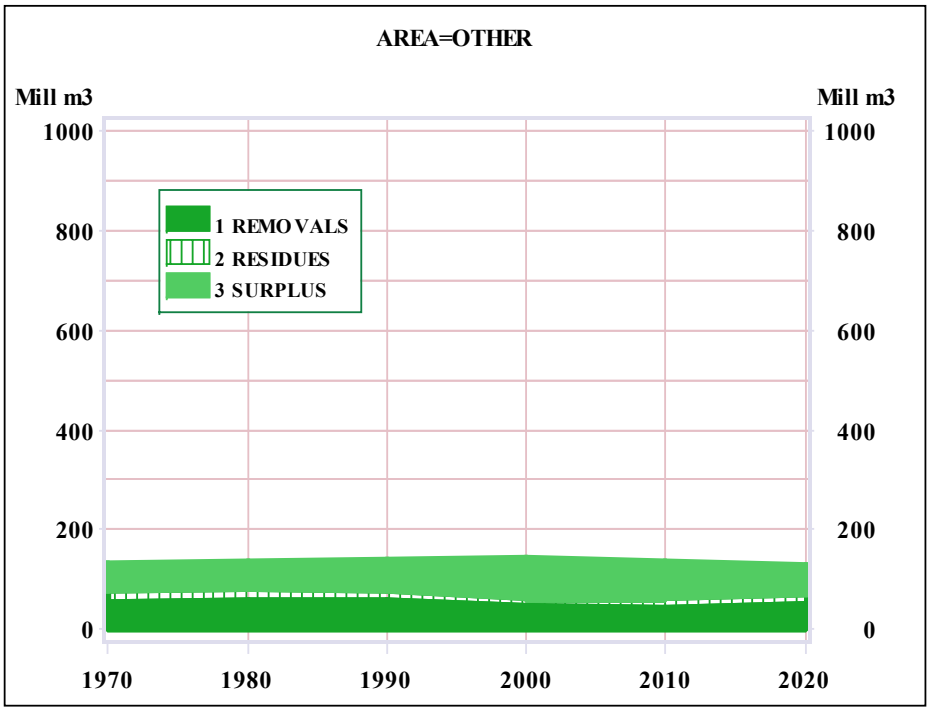
Source: FAO, CEPI, UNECE, Foreco

Figure 3.10 Cutting Balance in Accession Countries (AC-10), 1970-2020



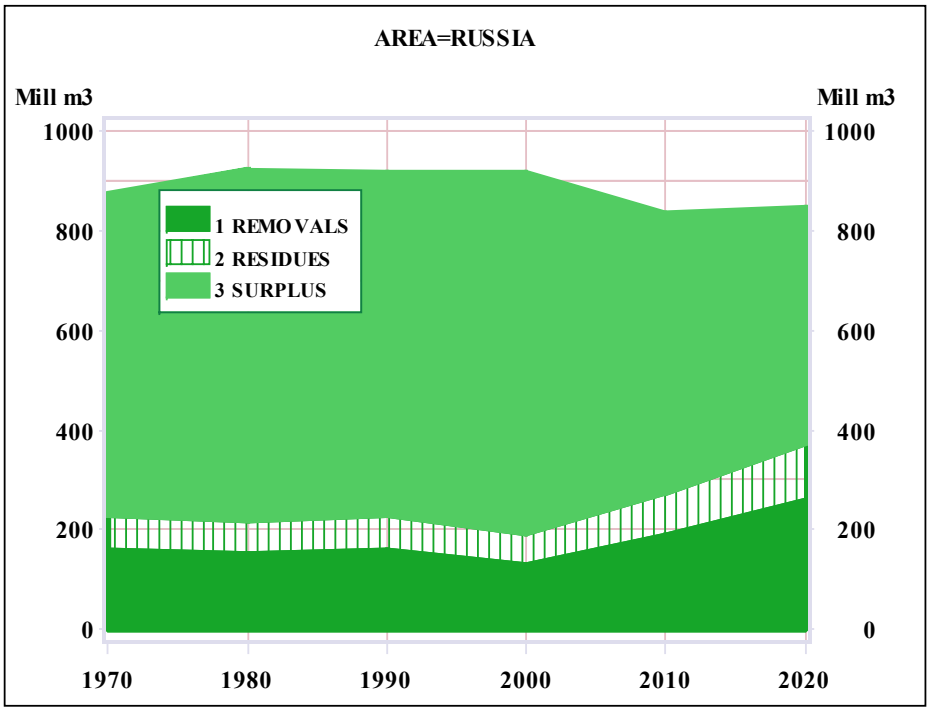
Source: FAO, CEPI, UNECE, Foreco

Figure 3.11 Cutting Balance in Rest of Europe, 1970-2020



Source: FAO, CEPI, UNECE, Foreco

Figure 3.12 Cutting Balance in Russia, 1970-2020



Source: FAO, CEPI, UNECE, Foreco

3.1.4 Development of European Wood Raw Material Supply

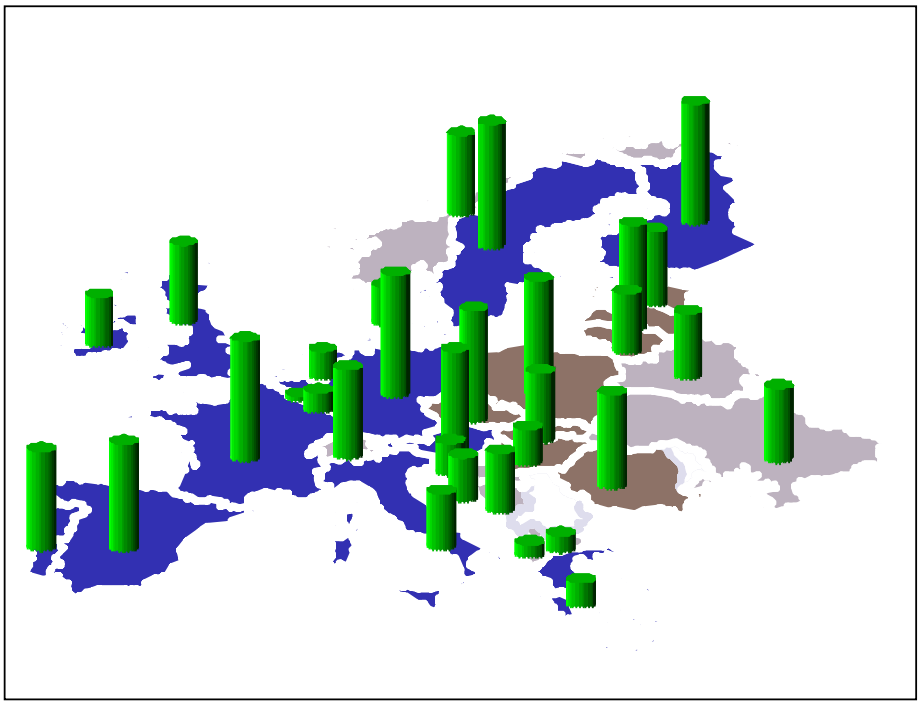
3.1.4.1 Overall Wood Raw Material Supply in Year 2000

Figure 3.13 and Table 3.5, summarise the situation of wood raw material supply in Europe in the year 2000. Figure 3.14 illustrates the projected total wood raw material supply development in Europe to the year 2020. More detailed situation is described in subsequent sections.

The overall supply situation can be characterised as follows:

(i) EU-25 wood raw material supply has to be based on higher utilisation rate and higher removal rate from the forests than at present.
(ii) EU-25 are projected to expand their wood raw material supply.
(iii) Other Europe has capacity to expand wood supply even faster.
(iv) Wood raw material supply of Russia has potential for a strong expansion.

Figure 3.13 Total Wood Raw Material Supply in Europe in 2000



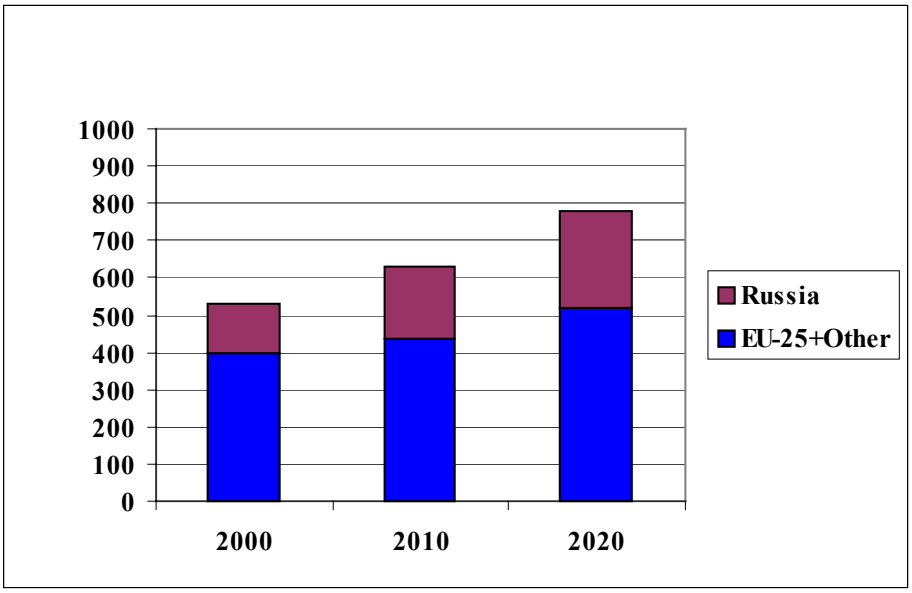
Source: FAO, CEPI, Foreco

Table 3.5 Wood Raw Material Supply in Europe in Year 2000

	million m^3
EU-15	296.9
AC-10	88.5
Others	68.4
Total	**453.8**
(European Russia)	148.9

Source: FAO, CEPI, Foreco

Figure 3.14 Total European Wood Raw Material Supply to 2020



Source: FAO, CEPI, UNECE, Foreco

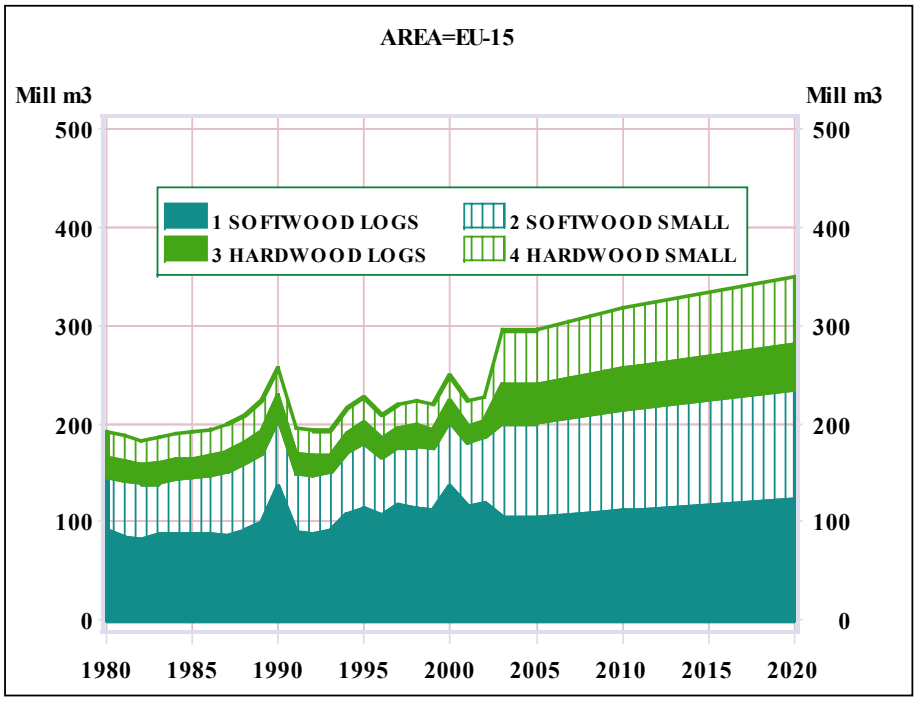
3.1.4.2 Wood Raw Material Supply by Sub-region and Grade

The supply of different wood raw material assortments develops differently by grade, and in addition has local variations. Developments in the supply of both log size wood for saw-milling and peeling, as well as small size wood for panels, are very important for the European WWI. The following overall findings can be made:

(i) EU-15 log supply expands
(ii) AC-10 absorbs most of its own supply increase
(iii) Rest of Europe expands most in logs
(iv) Most net export logs to international market in Europe will come from Russia

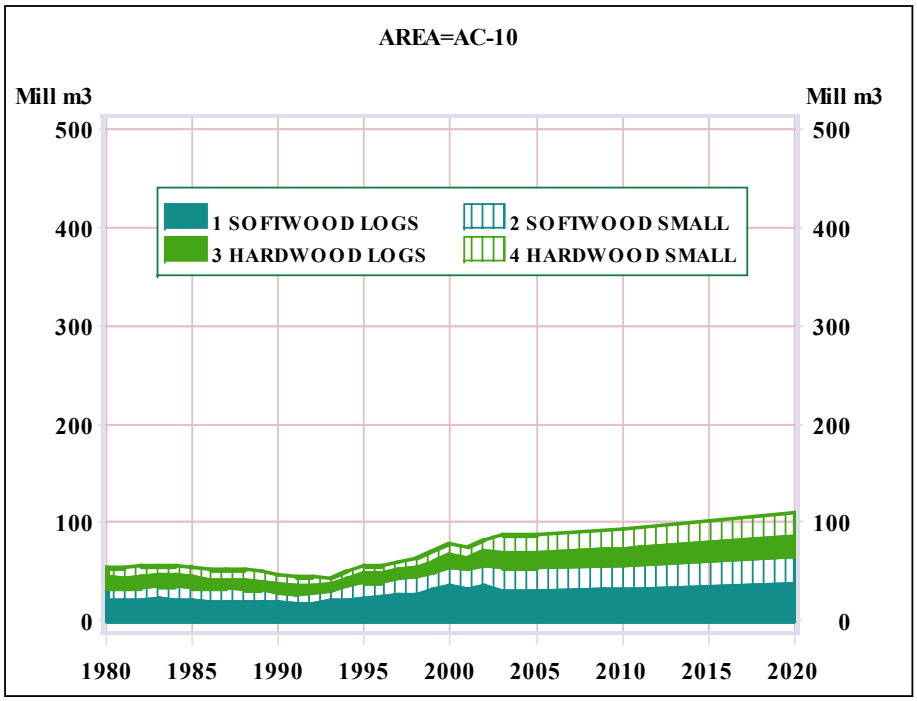
The Figures 3.15 to 3.17 illustrates the development of wood raw material supply by grade and by sub-region in Europe. A historic period of 22 years, as well as future projections for the coming 18 years, is covered. All the four grade categories (logs, small, softwood, hardwood) are trend-wise expanding in all of the sub-regions. Of course, this is an exceptionally good situation in global comparison, and offers an excellent opportunity for the European forest based industry.

Figure 3.15 Wood Raw Material Supply in EU-15 by Grade to 2020



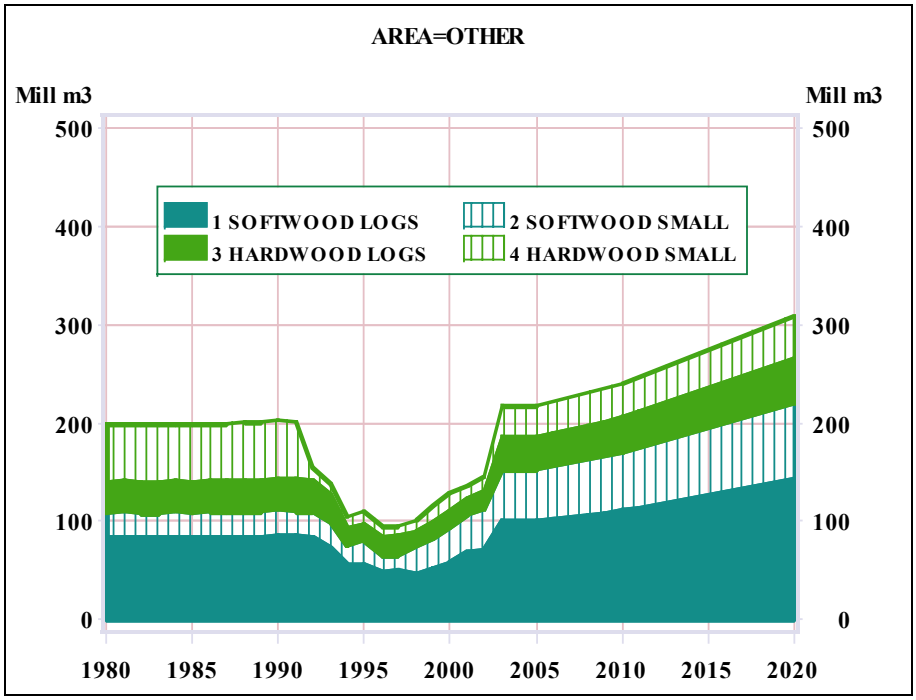
Source: FAO, UNECE, CEPI, Foreco

Figure 3.16 Wood Raw Material Supply in AC-10 by Grade to 2020



Source: FAO, UNECE, CEPI, Foreco

Figure 3.17 Wood Raw Material Supply in Rest of Europe to 2020



Source: FAO, UNECE, CEPI, Foreco

Key conclusions from raw material supply:

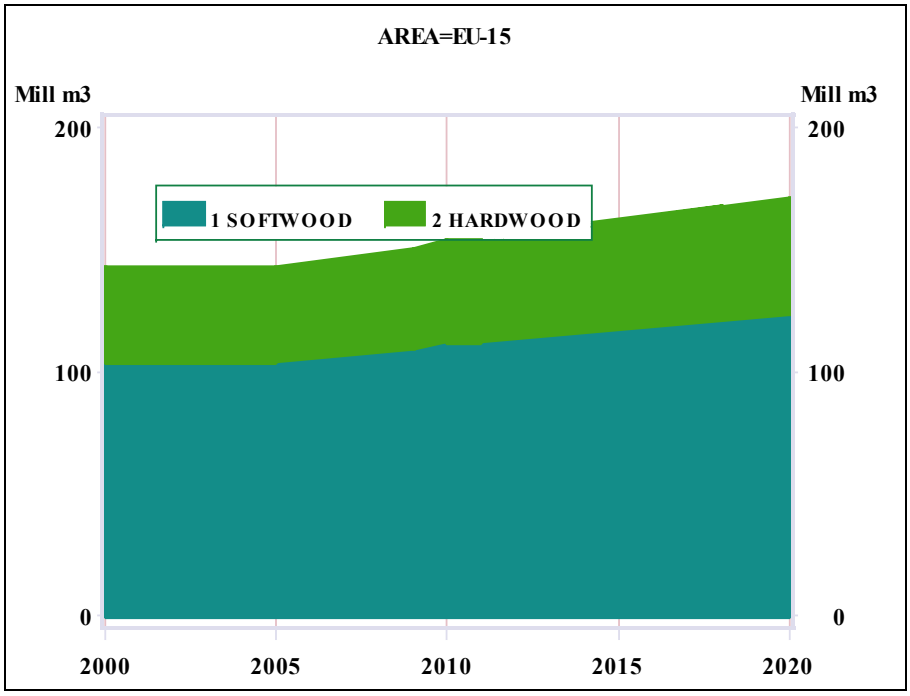
(i) EU-25 supply will be able to grow in the near future
(ii) EU-25 will remain wood raw material importer
(iii) Supply grows even faster in non- EU Europe, especially in softwood.

3.1.4.3 Future Log Supply in Europe, Including Russia

The Figures 3.18 to 3.20 focus on the projections that have been made on the future supply of logs in Europe to the year 2020. As illustrated in Figure 3.20, the softwood log supply from Russia has a large expansion potential. Even as the Russian log supplies remain outside the trade union, they are likely to have a very strong influence in Europe.

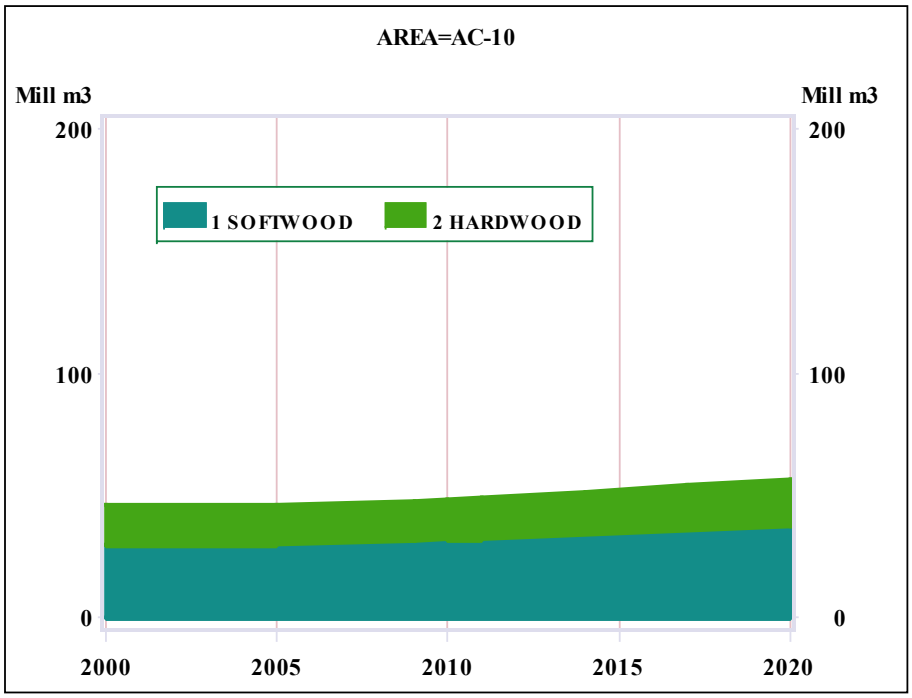
The influence of the rich softwood log supplies from Russia is likely to be felt in several ways: (i) The Russian saw-milling and plywood industry keeps expanding. (ii) The new Russian sawmills and plywood mills are built to international standards, and in addition have the benefit of inexpensive wood and labour costs (and possibly low energy cost, too). (iii) There will be lots of direct foreign investment (FDI) in this sector in Russia, as western industry takes the opportunity of the favourable conditions. (iv) An oversupply of logs will remain, which can to some extent be exported to European markets.

Figure 3.18 Log Supply in European Union (EU-15) to 2020



Source: FAO, CEPI, Foreco

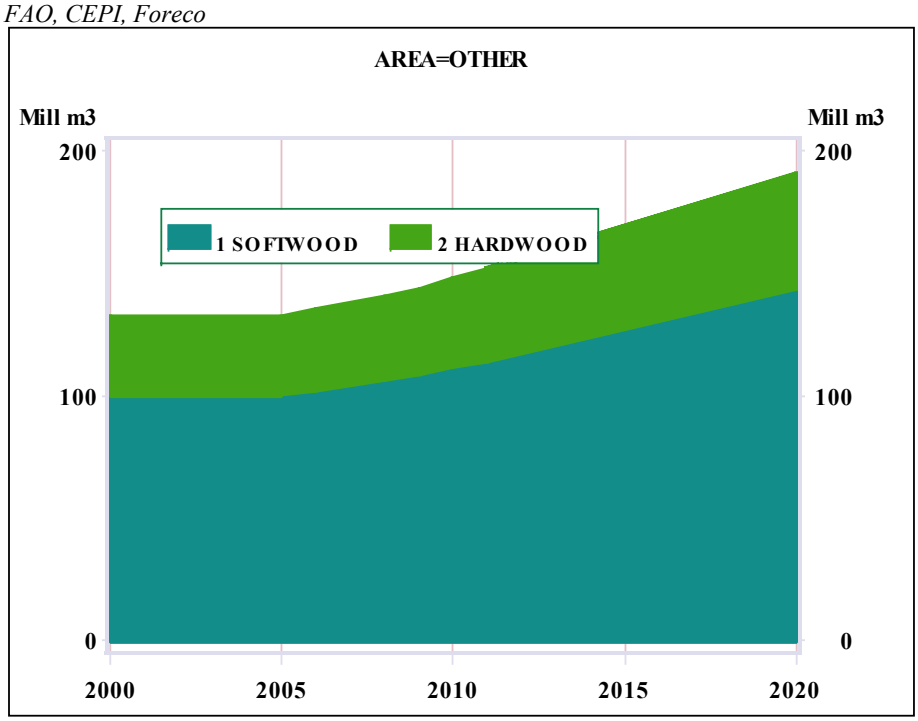
Figure 3.19 Log Supply in Accession Countries to 2020



Source: FAO, CEPI, Foreco

Figure 3.20 Log Supply in Rest of Europe (incl. Russia) to 2020

Source: FAO, CEPI, Foreco



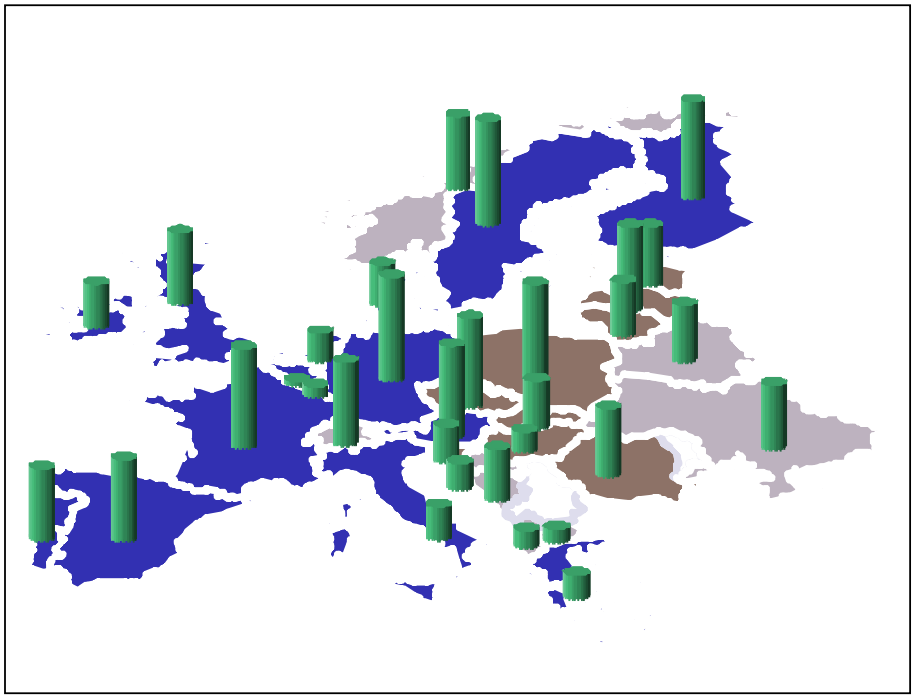
Key findings on log supply:

(i) EU-15 log supply keeps expanding
(ii) AC-10 absorbs most of its own supply increase
(iii) Rest of Europe expands most in logs
(iv) Most of net export logs to international market in Europe will come from Russia

3.1.4.4 Softwood Log Supply in Europe in 2000

The map of Figure 3.21 illustrates the spatial distribution of softwood log supply in Europe. The map does not include the Russian supplies, which are on a very high level compared to other nations. The spatial view confirms the conclusion of the rather high level of self-sufficiency in softwood logs. Table 3.6 summarises the softwood log supply in Europe by sub-region. Close to one third of European softwood log supply is coming from Russia at the present time.

Figure 3.21 Softwood Log Supply in Europe in 2000



Source: FAO, CEPI, Foreco

Table 3.6 Softwood Log Supply in Europe in Year 2000

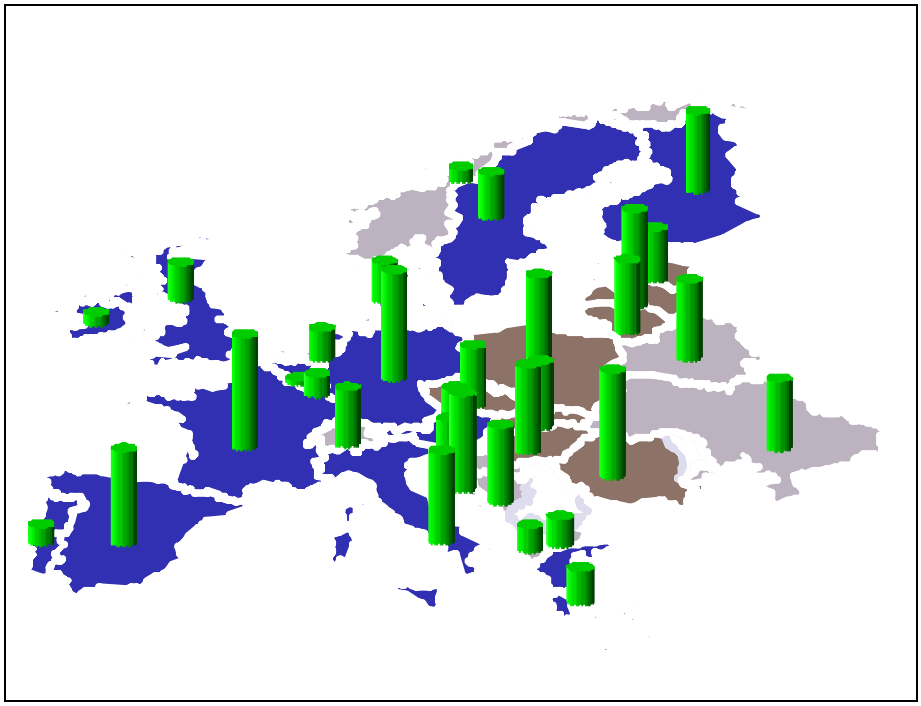
	million m^3
EU-15	104.3
AC-10	30.2
Others	24.7
Total	**159.2**
(European Russia)	75.5

Source: FAO, CEPI, Foreco

3.1.5 Hardwood Log Supply in Europe

The map of Figure 3.22 illustrates the spatial distribution of hardwood log supply in Europe. The map does not include the Russian supplies, which are on a rather high level compared to other nations (but not as dominant as in softwood logs). The spatial view confirms the conclusion of the rather high level of self-sufficiency in softwood logs. However, the very important role that the accession countries can play in the hardwood log supply is visible, too. Table 3.7 summarises the softwood log supply in Europe by sub-region.

Figure 3.22 Hardwood Log Supply in Europe in 2000



Source: FAO, CEPI, Foreco

Table 3.7 Hardwood Log Supply in Europe in Year 2000

	million m^3
EU-15	38.8
AC-10	16.0
Others	14.3
Total	**68.6**
(European Russia)	20.1

Source: FAO, CEPI, Foreco

3.1.6 Conclusions: Saw-log and Veneer Log Supply in Europe

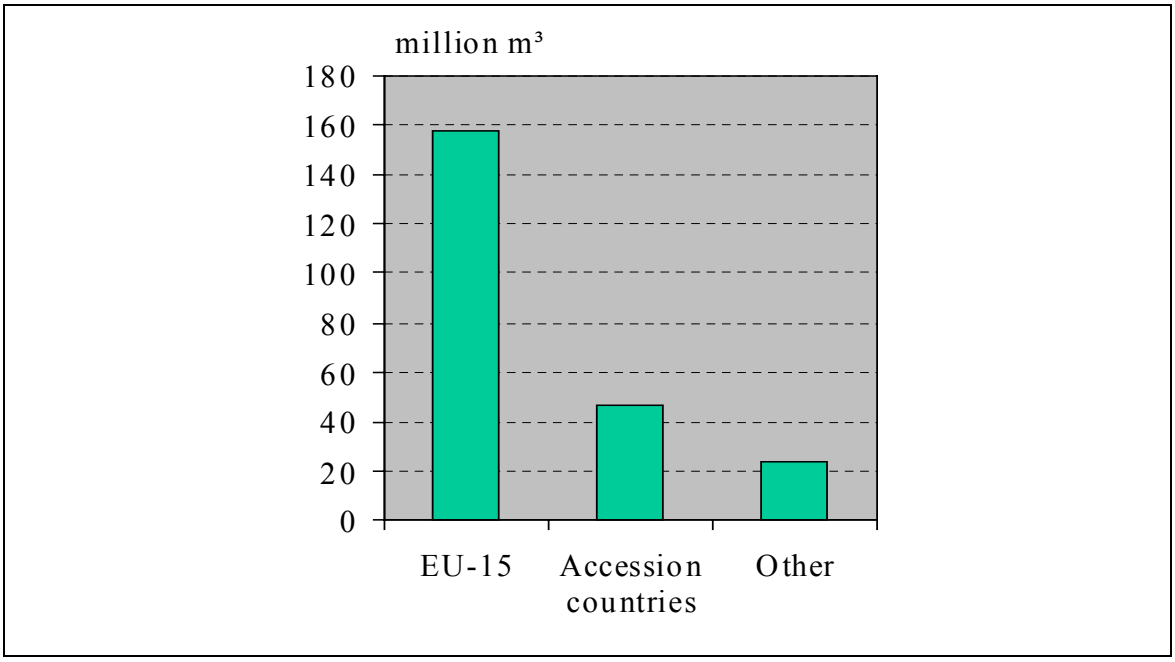
Key conclusions on log supply:

(i) Accession has strong impact in log supply
(ii) Some accession countries have backlog of under-utilised old forests
(iii) Opportunities in Accession countries
- policies for sustainability progressing well
- growth & investment opportunities

(iv) Threats in accession countries
- stumpage value will remain low initially
- integrated utilisation of by-product raw material needs high investments

Figure 3.23 summarises the relative contributions of the sub-regions in total log supply to the European markets. The strong dominance of EU-15 is well visible. Outside the picture is the importance of Russian log supplies, which however is an extremely important issue, from forest policy, and trade policy point of view, for the new expanded EU-25.

Figure 3.23 Total Saw-log and Veneer Log Supply in Europe, 2000



Source: FAO, CEPI, Foreco (other, without Russia)

3.1.7 Small-Sized Softwood Supply in Europe in 2000The map of

Figure 3.24 illustrates the supply of small-sized softwood in Europe. The high self-sufficiency of EU-15, as well as the expanded EU-25, is clearly visible. Table 3.8 completes the picture by showing the potential contribution of Russia to the overall small-sized softwood supply. The additional supply from Russia adds over 25% to the total of Western Europe.

Figure 3.24 Small-sized Softwood Supply in Europe, 2000

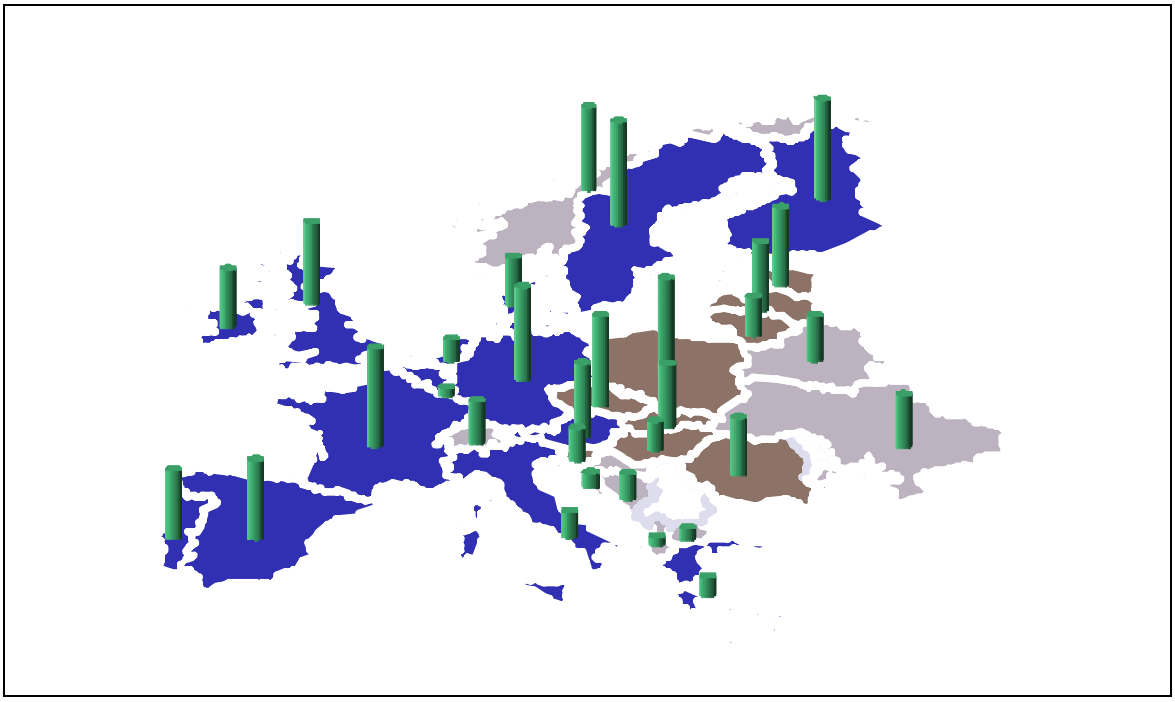


Table 3.8 Small-sized Softwood Supply in Europe in Year 2000

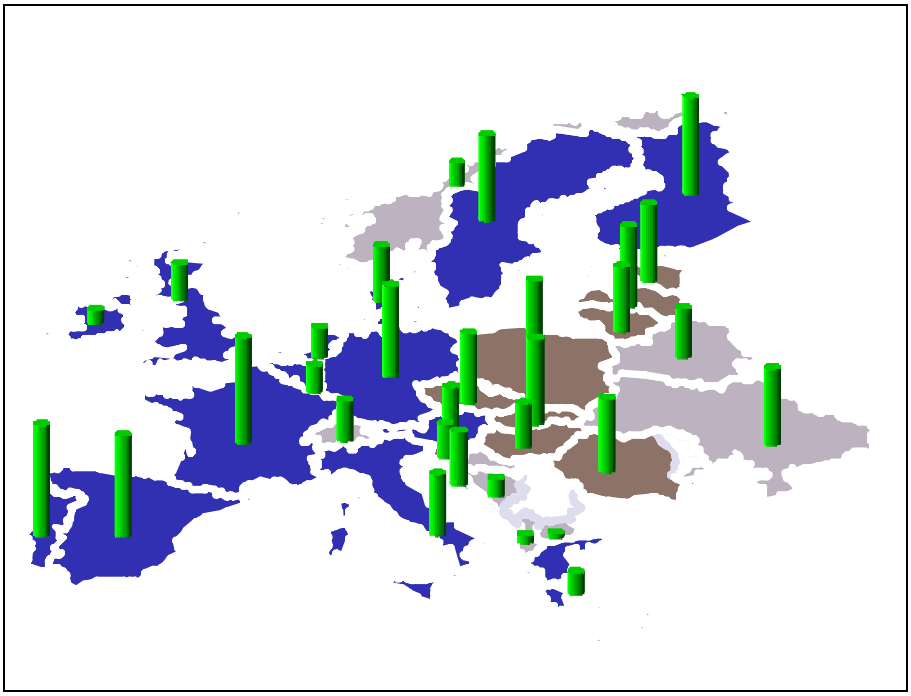
	million m^3
EU-15	97.3
AC-10	23.1
Others	17.1
Total	**137.5**
(European Russia)	36.2

Source: FAO, CEPI, Foreco

3.1.8 Small-Sized Hardwood Supply in 2000

The map of Figure 3.25 illustrates the supply of small-sized hardwood in Europe. The high self-sufficiency of EU-15, as well as the important expansion from AC-10, is clearly visible. Table 3.9 completes the picture by showing the potential contribution of Russia to the overall small-sized hardwood supply. The additional supply from Russia adds over 20% to the total of Western Europe.

Figure 3.25 Small-Sized Hardwood Supply in Europe, 2000



Source: FAO, CEPI, Foreco

Table 3.9 Small-Sized Hardwood Supply in Europe in Year 2000

	million m^3
EU-15	57.0
AC-10	19.1
Others	14.3
Total	**90.4**
(European Russia)	17.1

Source: FAO, CEPI, Foreco

3.1.9 Conclusions on Expansion of Wood Volume and Supply in EU-25

(i) Average growing stock per hectare is on increase and enhanced productivity means a higher growth

(ii) Average wood volume per hectare is increasing in general in Europe

(iii) AC-10 has high average wood volume per hectare, and is contributing especially to log supply

(iv) During the next 20 years in EU-25, growing stock, average tree size and growth will all be increasing

(v) Increasing volume per hectare will be the main driving force in increase of supply potential in Europe

(vi) Global wood raw material supply appears sufficient to meet the demand. Expansion in plantations and international trade is needed. At least local price increases are likely.

(vii) EU-25 wood raw material supply has to be based on higher intensity of forest utilisation and higher removal rate from the forests.

(viii) Wood supply grows even faster in non-EU Europe, especially in softwood. EU-25 remains a wood raw material importer.
(ix) Most net export logs to international market in Europe will come from Russia

3.2 Development of Wood Use Balance

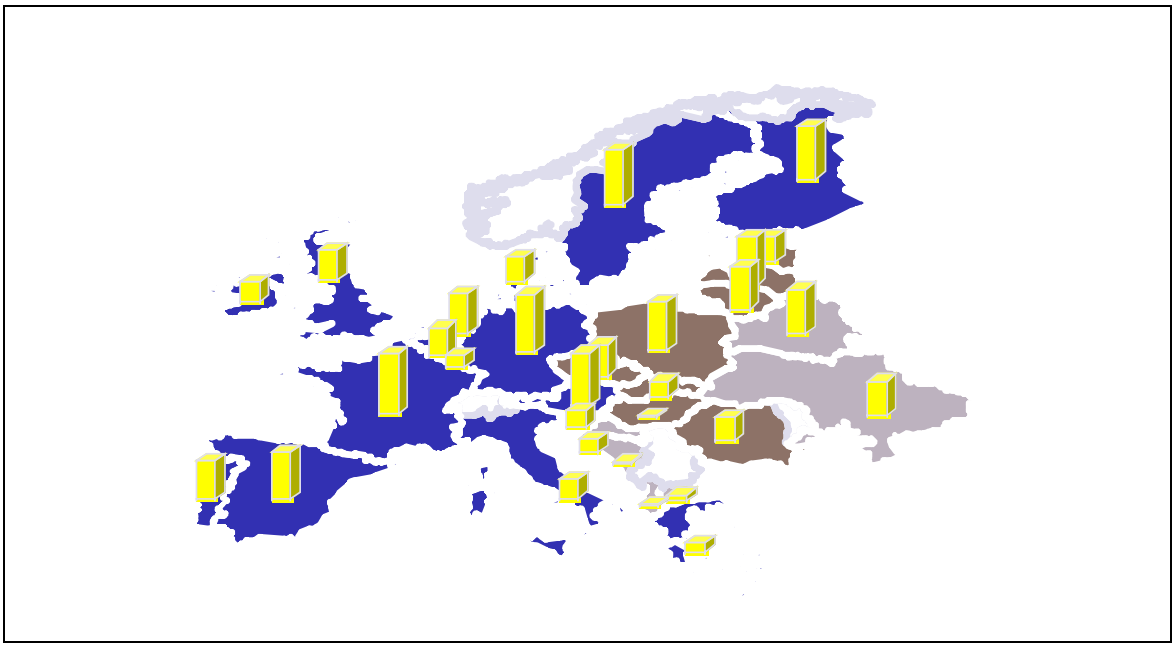
3.2.1 Efficiency of Wood Use in Europe

Key findings on wood use efficiency:

(i) Wood use efficiency has several levels:
(ii) Intensity of utilisation of allowable cut (high pressure in EU)
(iii) Efficiency of conversion (mostly going up) but in some areas lowering log quality reduces recovery rates.
(iv) In summary: what is harvested, is quite well utilised.
(v) Accession countries have largest potential for conversion efficiency improvements.
(vi) With low harvesting intensity, they are fast moving to make a better use of economic potential of the forests.
(vii) Conversion efficiency was previously not the first concern due to low raw material prices.
(viii) Improved efficiency needs investment in technology, which is well under way.
(ix) Harvesting and conversion of by-products offers unutilised opportunity.

The map of Figure 3.26 illustrates the supply of industrial wood by-products in Europe in the year 2000. The supply, of course, reflects closely the capacity and production of the primary wood processing industry (sawmilling and plywood).

Figure 3.26 Supply of Industrial Wood By-products in Europe, 2000



Source: UNECE, EFSOS, FAO, JPMC, Foreco

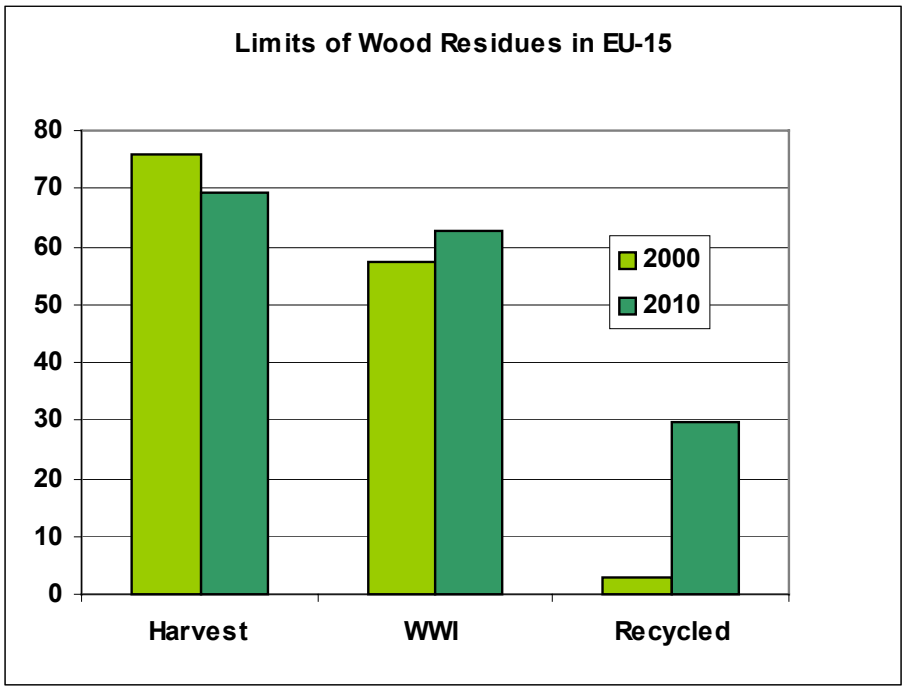
3.2.2 Upper Limits of Residues in Wood Supply Chain

The industrial wood utilisation has improved its efficiency over the past decades. The overall material balance and conversion efficiency depends on the whole material chain, from the stump to the consumer (and closed by recycling, energy conversion or waste).

Figure 3.27 illustrates the upper limits of wood residues that can be potentially utilisable by secondary processing in EU-15 sub-region. As can be seen, the harvest residues is clearly the largest portion of the wood residues. Even more importantly, this portion provides the most of the presently unused wood residues. The second group of residues, the by-product from the primary woodworking industries (here labelled WWI) means the chips, particles, sawdust and shavings from the wood industries. Figure 3.28 and Figure 3.29 illustrate that situation is similar in other sub-regions. It is important that the WWI residues have a higher potential outside EU-15 as the by-products are not as yet fully utilised.

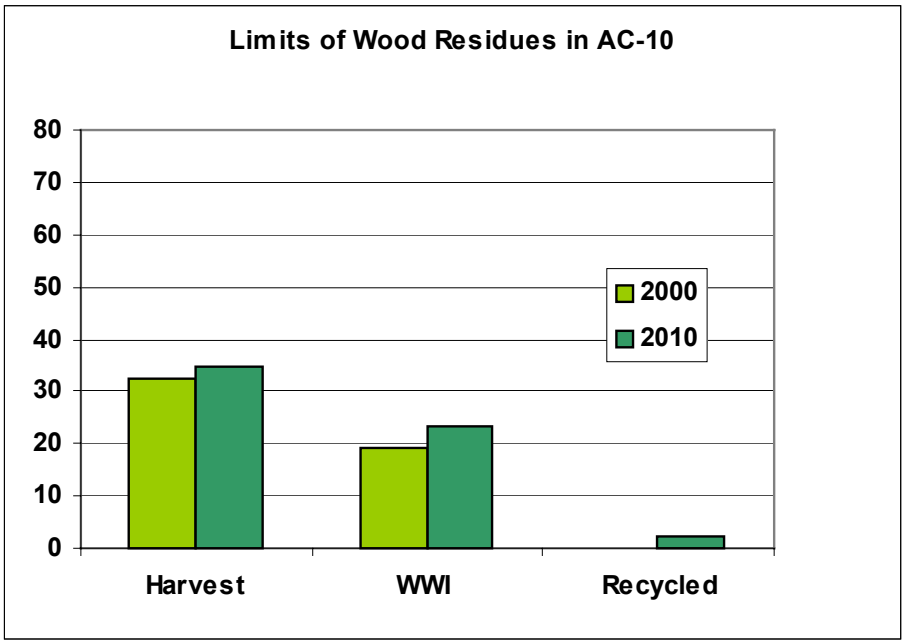
The WWI by-product residues are rather efficiently in use already, by the panel industry inside the WWI, and by the pulp and paper industry. The harvesting residues are in a key role in the future improvement of the overall efficiency of the wood raw material flow. This is enhanced by the fact that the forests are capable of increasing their supplies further, when required. In addition, the wood harvesting and transport provide the logistic framework, which can be made capable of handling at least some of this potential.

Figure 3.27 Upper Limits of Wood Residues in EU-15 to 2010



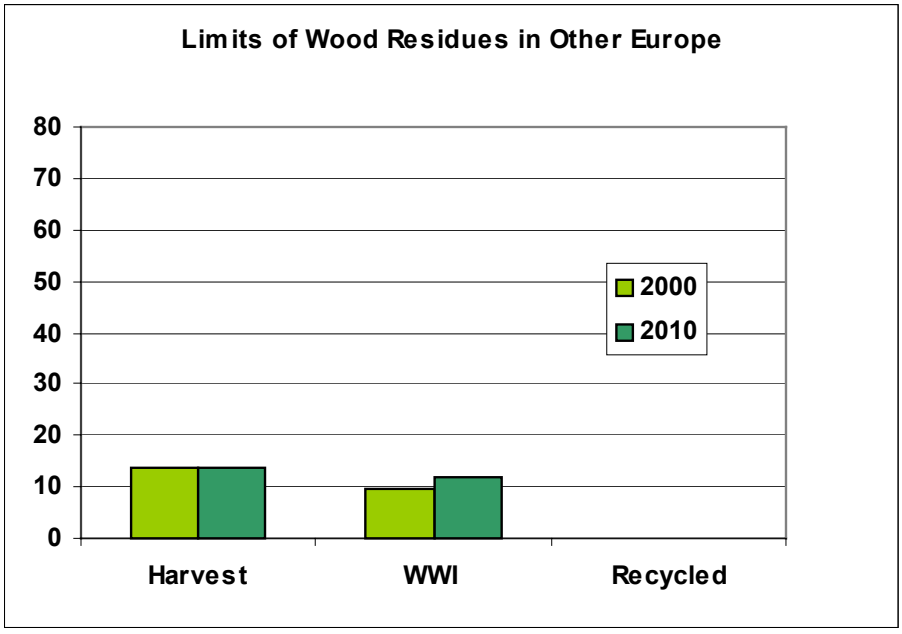
Source: UNECE, EFSOS, FAO, JPMC, Foreco

Figure 3.28 Upper Limits of Wood Residues in AC-10 to 2010



Source: UNECE, EFSOS, FAO, JPMC, Foreco

Figure 3.29 Upper Limits of Wood Residue in Rest of Europe to 2010



Source: UNECE, EFSOS, FAO, JPMC, Foreco (excluding Russia)

The estimate of the third residue group, the recycled wood, is made by using the assumption that up to 20% of solid wood products would be recycled in EU-15 by year 2010. This is typically a conditional prediction, which should be updated as more is known about recycling policies and success in practice.

The text Box 3.2 comments on the European Paper & Paperboard capacity. As the main user of the primary wood residues, outside the WWI itself, pulp and paper sector is important in affecting the overall material efficiency of forest-based sector.

Box 3.2 European Paper & Paperboard Capacity in 2000

- High capital intensity limits expansion outside EU-15 in Europe
- High human capital requirements are another entry barrier
- Smaller market size has not attracted global scale mills in AC-10
- AC-10 needs Foreign Direct Investments (FDI) in paper industry
- WWI–pulp industry integration has not been fully implemented as yet in AC-10
- Emergence of WWI mega-sites would prepare ground for further integration
- Integration with pulp, paper and paperboard likely to follow

3.2.3 Wood Use Balance in EU-15 Countries

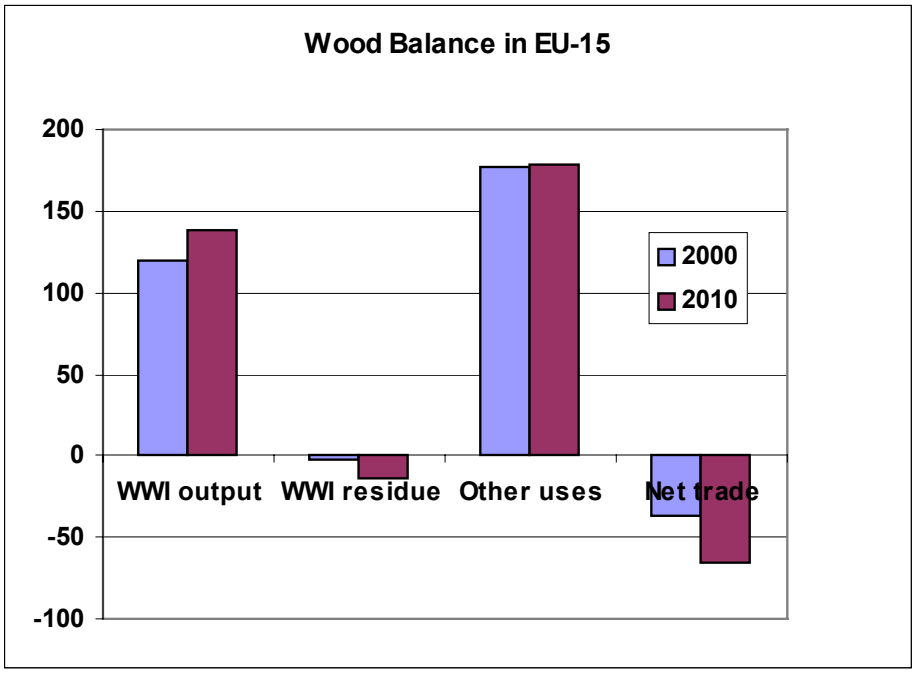
The discussion of wood residues, above, was concerned about the residues. The residues are created in harvesting and primary processing (and recycling). This section expands the view to cover all wood raw material, and the international trade flows.

The following are the key findings:

(i) EU-15 countries had a 37 million m^3 deficit in wood raw material supply in year 2000
(ii) Wood uses expand faster than wood supply in EU-15 countries
(iii) EU-15 countries will attract higher net imports by 2010
(iv) WWI needs to procure a higher level of additional raw material to complement wood residues
(v) Expansion of other wood uses, especially for energy, puts pressure on wood balance

Figure 3.30 illustrates the overall wood material balance in EU-15, and its projected development to 2010. WWI output describes the wood material physically tied in the WWI products themselves (such as volume of sawnwood). This volume is projected to increase linearly with the scenario of production of WWI. The second item WWI residue is roughly in balance in year 2000 and negative in 2010, indicating that no residue reserves are available to outside. The third item, other uses, cover all WWI by-product uses as well as all uses of other primary wood (such as pulpwood for papermaking). Finally, net trade indicates the sub-regional net trade balance (for EU-15 some 37 million m^3 deficit in year 2000).

Figure 3.30 Total Wood Balance in European Union (EU-15) to Year 2010



Source: CEPI, UNECE, EFSOS, FAO, JPMC, Foreco

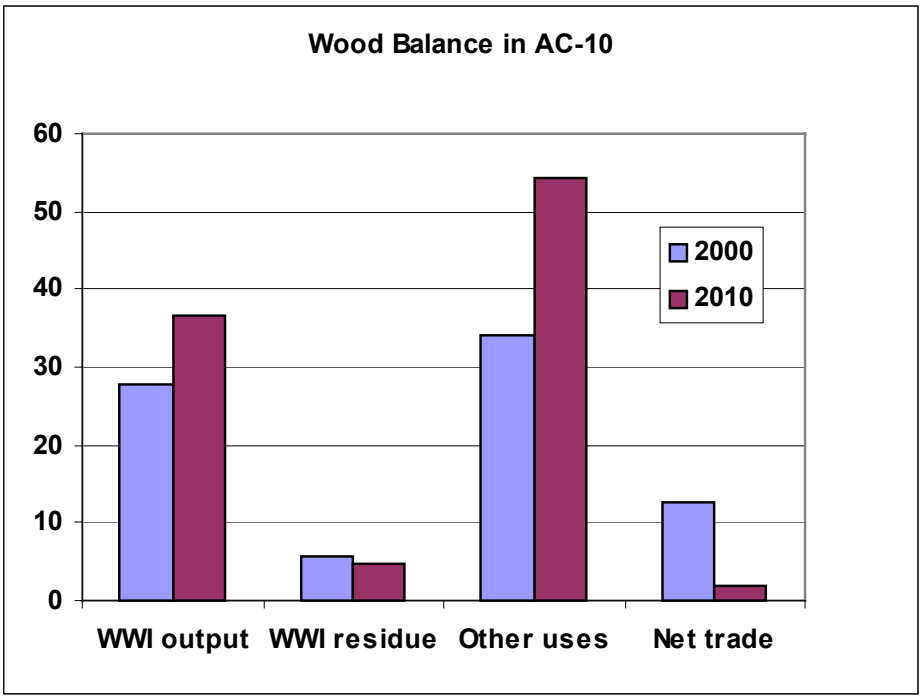
3.2.4 Wood Use Balance in Accession Countries

Figure 3.31 illustrates the overall wood material balance in AC-10, and its projected development to 2010.

Key findings:

(i) Accession countries had 12.6 million m^3 excess wood raw material supply in year 2000. Thus, the net trade was clearly positive.
(ii) Wood uses expand faster than wood supply in AC-10 countries. Thus there will be less of wood raw material available for exports.
(iii) AC-10 countries will themselves absorb most of the excess wood by 2010.
(iv) About 5 million m^3 of WWI residues was potentially available for other uses in the year 2000. Some slack may still exist in the year 2010.
(v) Expansion of other wood uses, including pulp and energy put pressure on wood balance.

Figure 3.31 Wood Use Balance in Accession Countries to Year 2010



Source: CEPI, UNECE, EFSOS, FAO, JPMC, Foreco

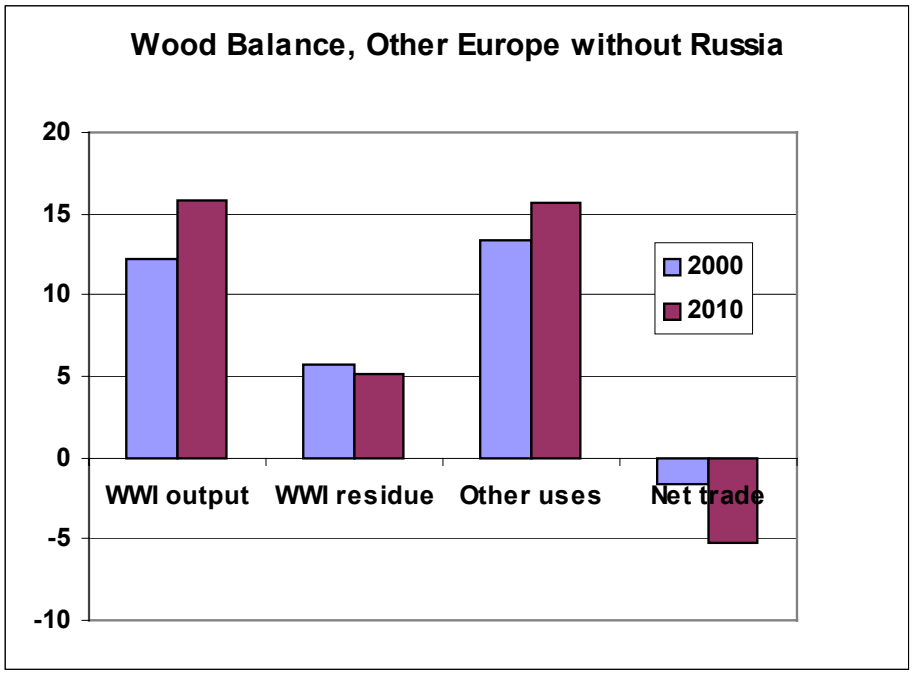
3.2.5 Wood Use Balance in Other Europe

Figure 3.32 illustrates the overall wood material balance in Western Europe outside EU-25, and its projected development to 2010.

Key findings:

(i) Europe outside EU-25, without Russia, had a 2 million m3 deficit in wood raw material supply in year 2000
(ii) Wood uses expand faster than wood supply in these countries
(iii) WWI is dominated by primary processes and is able to provide about 5 million m3 of residue raw material to other uses
(iv) Expansion of total wood use puts pressure on wood balance

Figure 3.32 Wood Use Balance in Other Europe (without Russia) to 2010



Source: CEPI, UNECE, EFSOS, FAO, JPMC, Foreco

3.3 Development of Trade and Logistics in Wood Raw Materials

3.3.1 Developments in Global Wood Raw Material Trade

3.3.1.1 Tendencies in Global Wood Trade

The global Wood raw material trade has grown even faster than trade in general. This is quite remarkable, as the globalisation has been expanding all trade at fast speed. Some polarisation has occurred between fibre baskets (forest rich areas) *vs*. users (net importers).

It is likely that the globalisation will boost the international trade in wood raw materials even further, as improved market access provides opportunities for new trade connections and as the tariffs and other trade frictions get lowered. Opening up of wood raw material trade is a relevant starting option in trade for emerging countries. Eventually, however, they will strive for value added in the medium and long run.

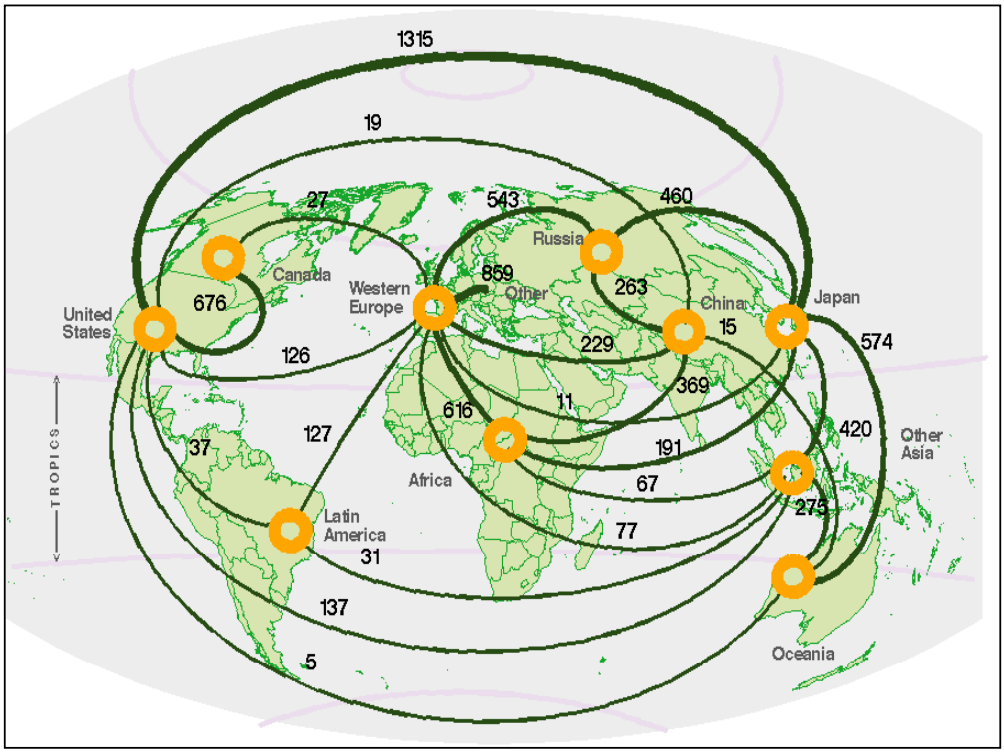
There will be further enhancements in the wood raw materials trade, as increasing volumes have reduced logistic unit costs. Strong intercontinental fibre markets, are likely to remain and get a further boost from increasing supply from fast growing plantations.

3.3.1.2 Value of Global Trade in Wood Raw Material

Figure 3.33 illustrates the main flows in the global inter-regional wood raw material trade. In the following are related key findings:

(i) Wood raw material trade is becoming increasingly global
(ii) Chips and particles trade is on increase in addition to roundwood
(iii) Plantation wood is increasing faster than other sources of wood raw material
(iv) Europe has very many links with the external world and internally
(v) EU-15 has a very significant internal trade in wood raw materials
(vi) Russia is the largest single source for Western Europe's imports
(vii) AC-10 is net exporter now but local processing will soon be growing
(viii) Internal trade within EU-25 will be mostly from the East to the West

Figure 3.33 Value of Global Wood Raw Material Trade in 2000



Source: FAOSTAT, Comtrade, EFI/WFSE, ITTO

3.3.2 Position of European Wood Raw Material Trade

Japan and North America are the largest wood raw material traders, globally. However, EU is very important in wood raw material trade. Intra-EU wood raw material flows are a major factor in overall international trade. The intra-EU market of wood raw material will be enhanced by accession of ten countries, especially in the beginning when they are still striving towards value added conversion. The spatial expansion of raw material base facilitates the change into a wider and more effective wood raw material market in EU, and with external traders as well.

The extra-EU wood raw material flows are predominantly inwards (mainly from east to west). The AC-10 sub-region forms presently a part of international wood raw material procurement reserve, but will become a competitive trader of both wood raw material and value added

products when in the EU. Non-EU significant wood raw material net supply sources will remain the most important net import sources in the long run (especially Russia).

3.3.3 Flows in European Wood Raw Material Trade in 2000

Table 3.10 Main Flows in European Wood Raw Material Trade in 2000

Main Exporters	Total 1000 cum	EU-15 partners	AC-10 partners	Other partners
Russia	28171	Fin,Ger,Swe,Aut,Bel	Est,Hun,Lat	Nor
Germany	6878	Aut,Ita,Bel,Fra,Nld	Cze,Pol	Nor
France	5372	Bel,Esp,Ita,Ger,Prt		
Sweden	1853	Fin,Aut,Ger		Nor
Estonia	2535	Fin,Swe,Ger,Bel,Esp		Nor
Czech Rep	1852	Aut,Ger		
Hungary	1350	Aut,Ita		
Latvia	1175	Swe,Fin,Ger,UK	Est	Nor
Lithuania	586	Swe,Fin	Pol,Lat	Rus
Switzerland	3182	Aut,Ita,Fra,Ger		

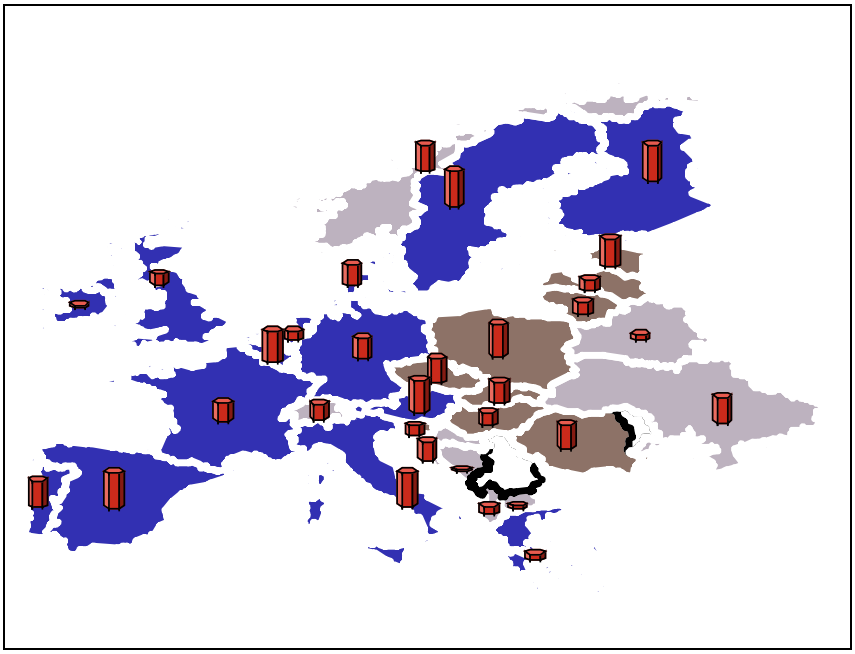
Source: FAOSTAT, Comtrade, EFI/WFSE, ITTO

Key findings on directions of trade in wood raw material:

(i) EU-15 trades very intensively internally
(ii) AC-10 exports to EU-15, but will itself become an importer
(iii) AC-10 moves towards value-added, with increased investments and international connections
(iv) AC-10 is not large excess wood supply area
(v) Russia will move to more local processing and value-added but remains a net exporter of wood raw materials
(vi) EU-15 is becoming more dependent on imports
(vii) AC-10 is becoming a net importer in the medium term
(viii) Russia will remain a net wood source for other nations for foreseeable future
(ix) The whole Europe will increasingly become a net importer of wood raw materials

Figure 3.34 summarises the spatial distribution of projected wood raw material trade for the year 2020. The results are tentative and are based on global projections with a full set of consumption, production and trade estimates, which are mutually consistent. The key conclusion is that in 20 year it is likely that practically the whole of Western Europe will be a net importer of wood raw material.

Figure 3.34 Projected Wood Raw Material Imports in 2020



Source: FAO, UNECE, CEPI, Foreco (base scenarios, respectively)

3.3.4 Logistics and Wood Raw Material Supply

3.3.4.1 Driving Forces in Development of Logistics

Improved systems have various elements:

(i) Procurement, storage, distribution and control systems
(ii) Management of costs, time, quality and environment

Mitigation of climate change and air pollution will be a major factor:

(i) Contribution of the transport sector to greenhouse gas emissions is the second most important (after energy sector)
(ii) EU Programme on Sustainable Surface Transport provides a framework for the technical and system development of the WWI logistics
(iii) New technology will open new options for the industry (e.g. rail transportation of wood in containers)

3.3.4.2 Implications of Logistic Considerations

(i) Need to consider transportation emissions and EU/national policies in business strategies
(ii) Minimisation of transportation output will become a cross-cutting objective
(iii) Increasing the share of rail transportation needs new technologies for roundwood (and chips)
(iv) Logistics will boost development of integrated mega-sites

3.3.5 Conclusions on Wood Raw Material Balance

(i) Accession countries had 12.6 million m^3 excess wood raw material supply in year 2000. In addition, they had about 5 million m^3 of WWI residues available for other uses. AC-10 area will absorb most of this excess supply by 2010.
(ii) Most of "new" EU-25 fibre is locally earmarked, no wood raw material glut is foreseen by 2010
(iii) The demands on forests tend to grow even faster than the production of wood raw material
(iv) EU-15 countries had a 37 million m^3 deficit in wood raw material supply in year 2000. The import requirements will almost double by year 2010.
(v) Wood raw material trade is becoming truly global. In global trade, chips and particles are on increase. Plantation wood is increasing faster than other sources in global trade.
(vi) EU-15 will be becoming more dependent on imports. AC-10 is becoming a net importer as well. Russia will remain a net wood source for other nations.
(vii) The expansion in raw material base facilitates the change into a wider and more effective wood raw material market in EU and with external traders. Non-EU significant net wood raw material supply sources will remain the most important net import sources in the long run.
(viii) Logistics will boost integrated mega-sites of WWI
(ix) Wood procurement areas of new large processing units will become larger, more overlapping and thus more competitive
(x) EU Programme on Sustainable Surface Transport provides a framework for the technical and system development of the WWI logistics
(xi) WWI business strategies need to consider transportation emissions and national and EU policies. Minimisation of transportation output will become a cross-cutting objective.

3.4 Demand for Bioenergy in Europe

3.4.1 Driving Forces and EU Policy on Bioenergy

3.4.1.1 Driving Forces of Bioenergy Demand and Supply

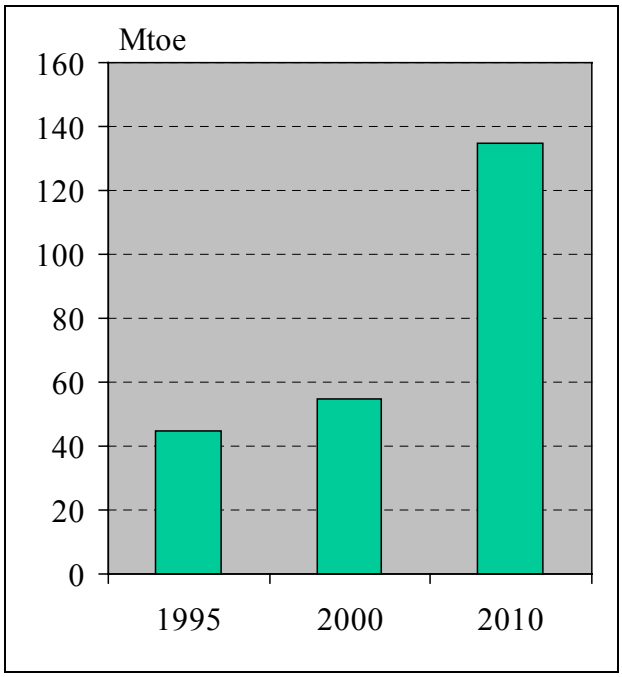
Climate change and air pollution are the driving forces of the increasing global awareness and emerging policies on bioenergy. On the international level the Kyoto Protocol has been defining the steps towards controlling the greenhouse gases and related problems.

At the EU level, the EC White Paper on Energy for the Future: Renewable Sources of Energy, has defined target setting. In addition, the EU Environment Action Programme has an active role to play. The concrete measurable target is that 12% of energy will have to come from Renewable Energy Sources (RES) by 2010. Further on, the RES-E Directive states that the RES share in electricity generation should be 22.1%

On national level there are wide varieties of instruments, including national policies, taxation and incentives.

3.4.1.2 EU White Paper Target 6: Biomass

Figure 3.35 Development and Target for Biomass Energy in EU

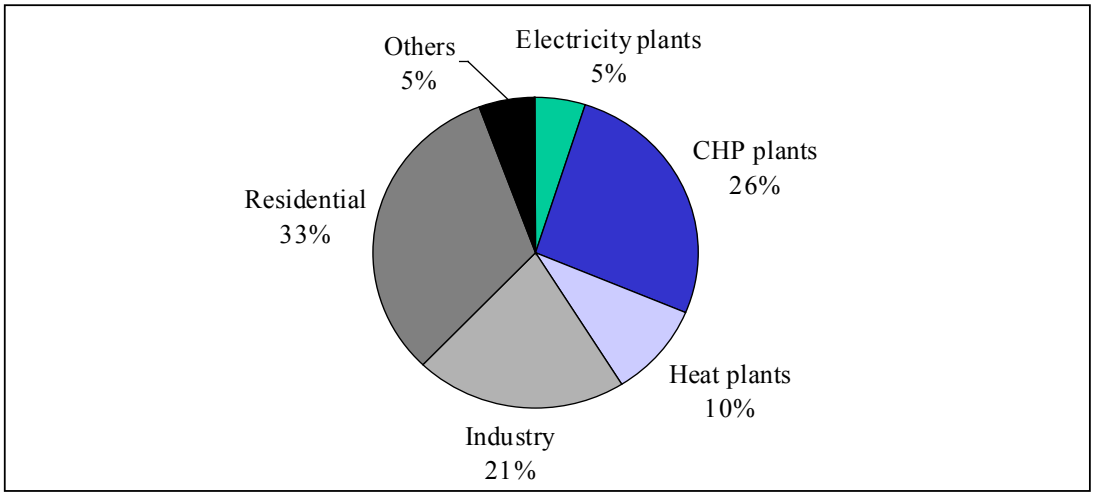


Source: EU White Paper on RES

3.4.2 Demand for Biomass Energy in EU

3.4.2.1 Use of Solid Biomass Energy in OECD Countries

Figure 3.36 Use of Solid Biomass Energy in OECD in 2000

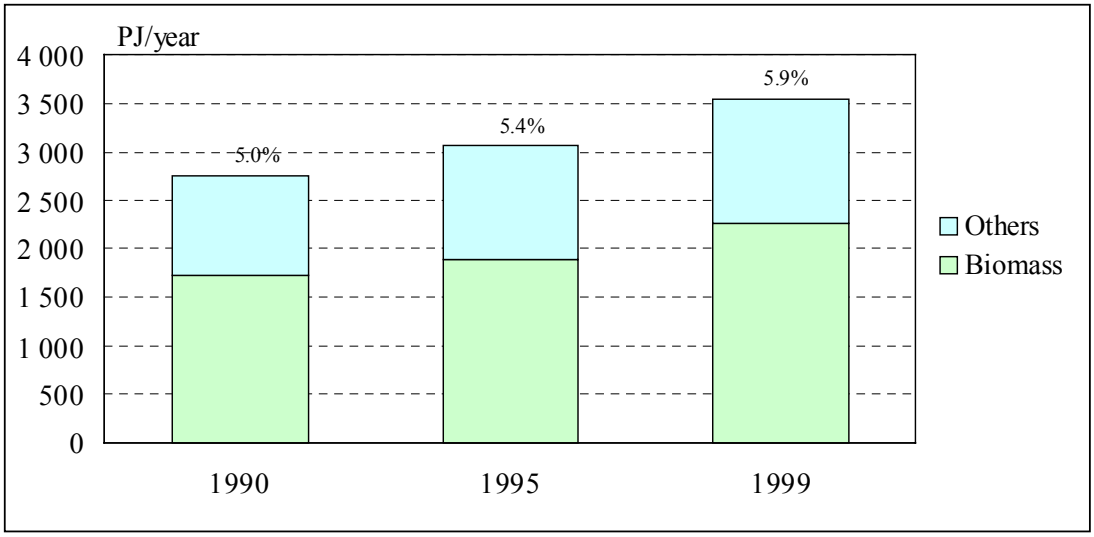


Source: IEA, OECD

The total bioenergy use in EU was at 60 050 PJ/year in the year 2000.

3.4.2.2 Renewable Energy Consumption by Source in Europe

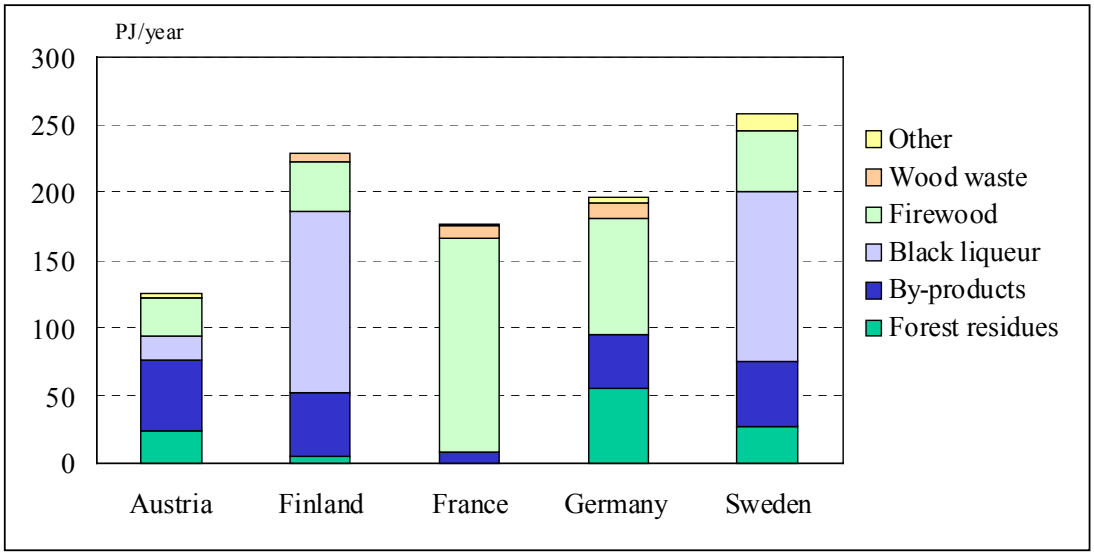
Figure 3.37 Renewable Energy Consumption by Source in Europe



Source: CEPI RES Study, IEA, OECD

3.4.2.3 Use of Biomass in European Union

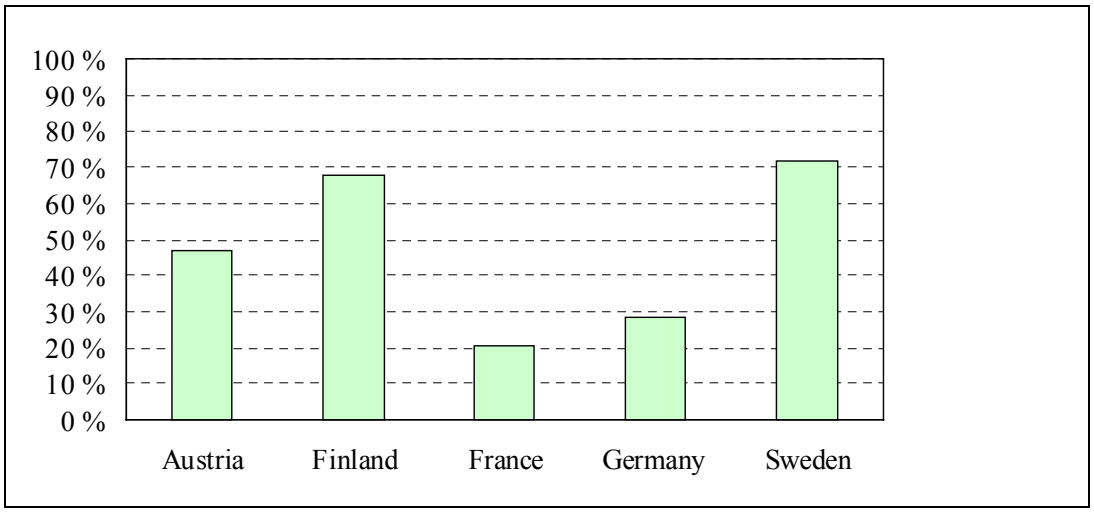
Figure 3.38 Use of Biomass in Selected Countries in 2000



Source: CEPI RES Study, IEA, OECD, National Statistics

3.4.2.4 Utilisation Rate of Biomass in European Union

Figure 3.39 Utilisation Rate of Biomass in Selected Countries in 2000



Source: CEPI RES Study, IEA, OECD, National Statistics

3.4.3 Biomass Resources in European Union

3.4.3.1 Bioenergy Sources

The available range of liquid biofuels includes the following:

(i) Black liqueur
(ii) Ethanol and biodiesel
(iii) Biogas

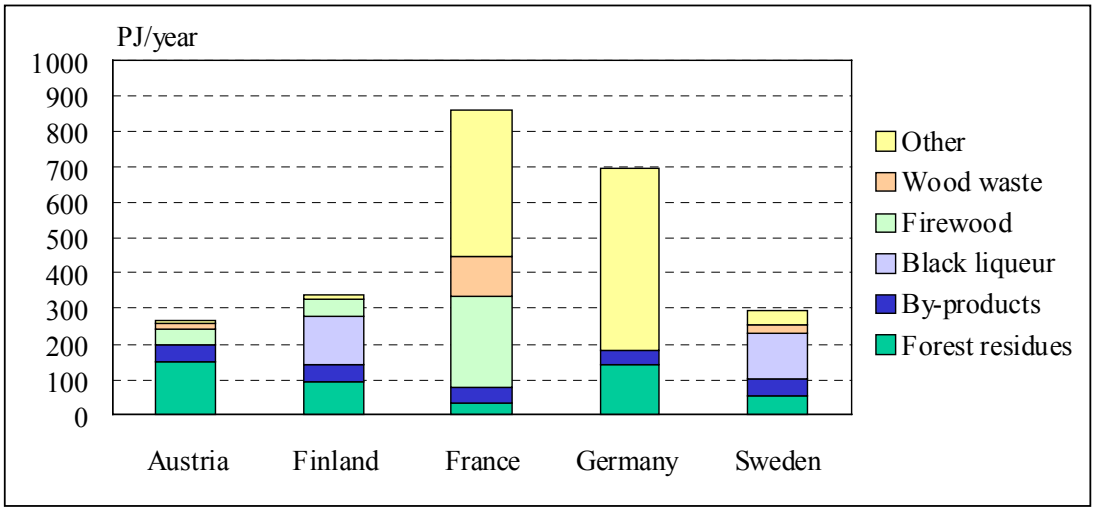
The available range of solid biofuels includes the following:

(i) Roundwood
(ii) Industrial by-products
(iii) Bark, chips and sawdust
(iv) Edgings *etc*.
(v) Logging residues
(vi) Tree tops,
(vii) Branches, *etc*.
(viii) Recycled materials
(ix) Construction wood
(x) Recovered paper, *etc*.
(xi) Agricultural residues
(xii) Non-wood crops

The range of bioenergy sources, which are considered to have potential for increased use are the following:

(i) Agricultural residues
(ii) Forest residues
(iii) Forest industry residues
(iv) Waste streams
(v) New energy crops

Figure 3.40 Biomass Resources in Selected EU Countries in 2000

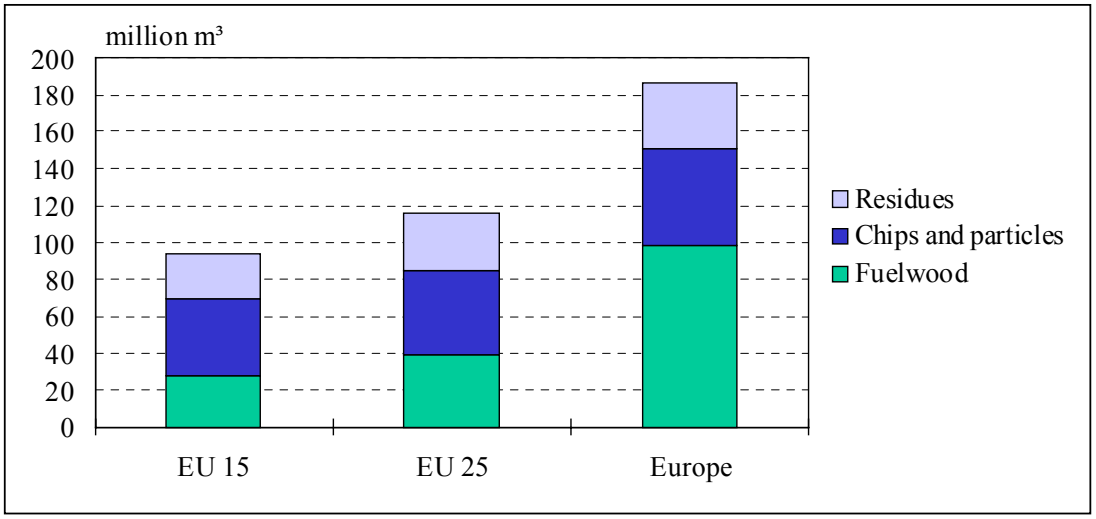


Source: CEPI RES Study, IEA, OECD, National Statistics

3.5 Supply of Wood Biofuels in Europe

3.5.1 Production of Wood Biofuels in Europe

Figure 3.41 Production of Wood Biofuels in Europe in 2001



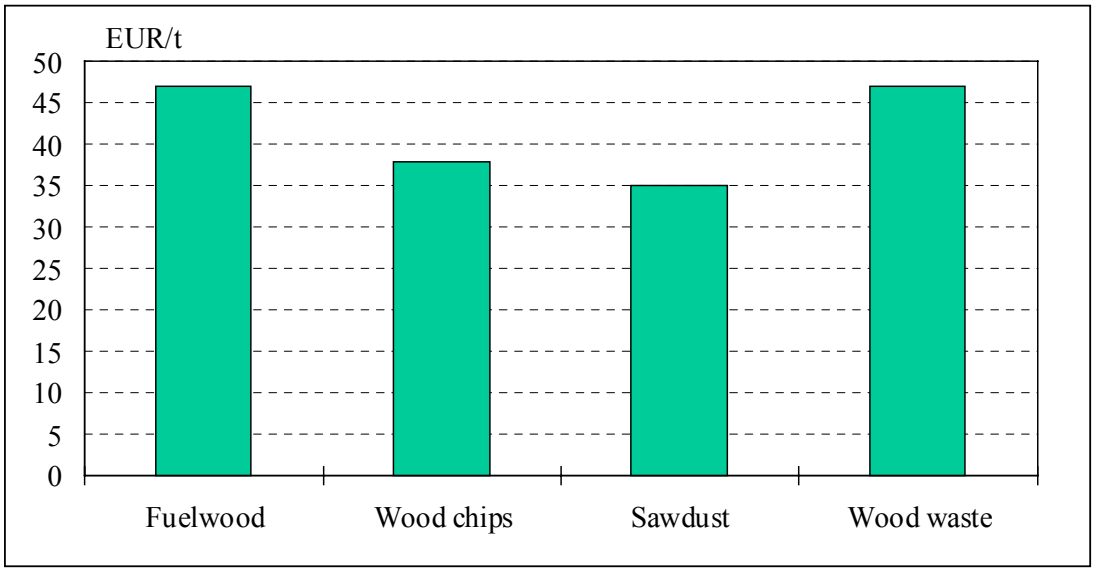
Source: CEPI RES Study, IEA, OECD, National Statistics

3.5.1.1 Imports of Wood Biomass to European Union

Figure 3.42 Wood Biomass Imports by Type in EU-15, in 2001

Eurostat, UNECE, FAO

Figure 3.43 Import Price of Wood Biomass to EU-15 in 2001



Eurostat, UNECE, FAO

3.5.2 Competitiveness of Bioenergy Sector

Key findings on bioenergy sector:

(i) Technological development: combustion technology, combined use of biomass and fossil fuels, combined heat and power (CHP)
(ii) Logistics: development needs in procurement of biofuels
(iii) Capacity increase: existing heat and power plants with minor investments (short term), new plants / replacement investment (medium and long term)
(iv) Environmental aspects: emissions to air, waste management, transportation, nutrient balance of soil

3.5.2.1 Wood Based Value Chains

Table 3.11 Comparison of Wood Based Value Chains

	Wood as fuel (bioenergy	**Wood as raw material**	
		Carpentry (joinery)	**Printing and publishing papers**
Value added (EUR/t)	118	1 044	993
Employment (h/t)	2	54	124
Carbon cycle	neutral	sequestration and final energy potential (neutral)	sequestration and final energy potential (neutral)

Source: CEPF, CEI-Bois, CEPI, CITRA 2002

Industrial use of quality wood more attractive than direct energy use:

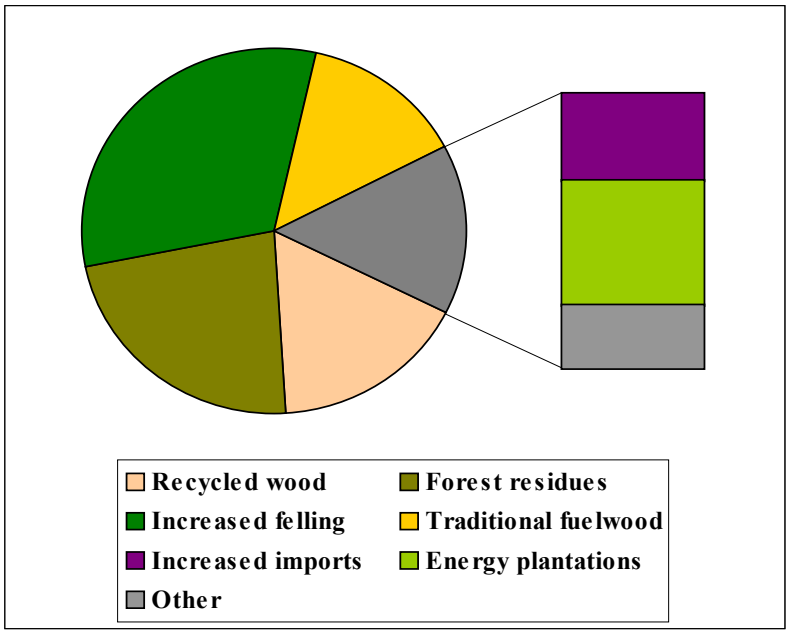
- economically
- socially
- environmentally

Bioenergy benefits can be realised at the end of the value chain.

3.5.3 Impact of EU White Paper on Renewable Energy

3.5.3.1 How Will the Additional Biofuels Be Supplied?

Figure 3.44 Composition of Additional Renewable Energy



Source: based on CEPI 2000

Key findings from the RES policy study:

(i) Market balance 2010 reached at a simulated increase of 146 million m^3 (o.b) of wood raw material
(ii) Market clears at around 15% higher average price of wood
(iii) This already assumes an effective cross-sector policy implementation
(iv) Largest additional volumes for energy come from increased recovery from forest: higher felling, forest residues, clearly less would come from recycling
(v) Industrial production would be somewhat less wood intensive
(vi) Dedicated energy plantations and increased imports are needed to close the gap

3.5.3.2 Impact of Energy Sector on Woodworking

Increase in energy production is projected to be mainly based on biofuels not used in woodworking industry.

Sawmills and plywood mills:

(i) No major constraints to wood supply from bioenergy demand
(ii) Increased value and sales of by-products due to RES demand
(iii) WWI strengths in wood procurement value chain as a strategy

Other woodworking industry:

(i) Will affect wood raw material supply (low priced raw materials will get more expensive)
(ii) Logistics will be important for the increased use of biomass
(iii) WWI strengths in wood procurement value chain as a strategy to make use of bioenergy business opportunities

3.5.4 Conclusions on Demand and Supply of Bioenergy

(i) Energy production from biomass will increase, and main contribution will come from (i) new crops (ii) forest residues, and (iii) wood wastes
(ii) There will be extensive variation between countries and regions in their capability of supplying bioenergy. The allocation of targets will be very difficult and a major policy challenge.
(iii) Impact of increased bioenergy production on forest based industry depends on the ability of various processes to pay for raw material. Reconstituted panel industry is likely to be most affected.
(iv) EU-25 forests have a capacity to meet even the RES challenge, without harsh competition with WWI. Competition would intensify with price pressure on primary wood. At the same time, value of residues would increase.
(v) With RES, market balance 2010 reached at a simulated increase of 146 million m3 (o.b) of wood raw material, still in bounds of potential supply. But market would clear at 15% higher average price of wood.
(vi) Largest additional volumes for energy come from increased recovery from forest: higher felling, forest residues. Clearly less would come from recycling.
(vii) Industrial production would need to be somewhat less wood intensive. Dedicated energy plantations and increased imports are needed to close the gap.

3.6 Policies and Wood Raw Material Supply

3.6.1 Policy Domains with Wood Supply Implications

3.6.1.1 Policies on Forests, Agriculture and Conservation

At least the following policy domains are important from the point of view of wood raw material supply in EU:

(i) Policies on Redundant Agricultural Land
(ii) Forest policies favouring Nature Oriented Management (NOM)
(iii) Nature conservation policies, Natura
(iv) Issues include: Intensified management of commercial sites, with shift towards shorter rotations, smaller dimensions or otherwise regimes, which may not serve best the WWI.

The programs, such as the Kyoto Protocol & European Climate Change Program, will have an important impact in that they will have implications on greenhouse gases, carbon, and bioenergy, including wood. Some of the main channels through, which the impacts on forestry will be felt, are the following:

(i) Land-use, Land-use Changes and Forestry (LULUCF)
(ii) Afforestation, Reforestation and Deforestation (ARD) as priority actions
(iii) Issues include: Valuation of WWI products as carbon sinks.

Specifically, the policies on Energy, Energy Sources and Recycling, will have implications and effects through the following channels:

(i) Policies on Renewable Energy Sources (RES), Energy Efficiency
(ii) Policies on Recycling of Post-consumer Waste
(iii) Issues include: Energy conversion from WWI waste, wood waste collection systems; cost sharing, prices paid, credits issued.

Most importantly, the RES policy will have specific implications on the forestry and wood raw material requirements, as follows:

(i) EU White paper aims at 12% of energy to be produces from Renewable Energy Sources (RES) by 2010
(ii) Biomass is in key position and wood will be the most important
(iii) The policy is estimated to mean 163 million m^3 of additional demand for wood fibre in EU-15 plus Norway and Switzerland
(iv) A practical solution to the challenge needs mobilisation of all potential resources including residues and recycled wood fibre
(v) In a simulated optimal solution 92 million should come from forests and 71 million from industrial residues, recycled fibre and other sources
(vi) Industrial residues are getting increasingly utilised, and post-consumer wood recovery has its limits; focus will be on forest residue and energy plantations

EU-25 forests have a capacity to meet even the RES challenge, without a harsh competition with WWI. However, competition will intensify with price pressure on primary wood. At the same time, value of residues will increase.

3.6.2 Forest Policies in Accession Countries

The forest policy development is quite well taken care of in the AC-10 countries already. There should be no doubt that these countries can catch up with the level of policy implementation as well. It is clear that both EU-15 and AC-10 can benefit from intensive co-operation in forest policy, governance and implementation.

Table 3.12 Forest Policy Formulation in Accession Countries

Country	Establishment of a Steering Committee	Establishment of individual working groups	Analyses and expert discussions	Public debate	Inter-ministerial approval	Steering Group approval	Government approval	Parliamentary approval
Bulgaria	..	+	+	+	@	@	@	@
Czech Republic	..	+	+	+	@	..	..	..
Estonia	+	+	+	+	+	+	+	+
Hungary	+	+	+	@	@	@	@	@
Latvia	..	..	..	..	..	..	+	..
Lithuania	+	+	+	+	+	+	+	..
Poland	..	..	..	..	..	..	+	..
Romania	+	+	+	+	+	+	+	..
Slovakia	+	..	+	..	+	+	+	..
Slovenia	..	+	+	+	+	+	+	+
Turkey	..	..	+	..	..	..	..	..

Key: + **done**
@ **upcoming**
.. **data not available**

Source: EFI, Indufor, Country Reports 2002, European Commission DG Environment

3.6.3 Energy Policies, Taxation and Promotion Programs

3.6.3.1 Energy Policies and Promotion

In the following are some of the selected national level energy policies and promotion programs:

Austria
- Law on electricity production from renewable sources: 78.1% RES by 2010
- RES-E target: 78.1% RES by 2010

Finland
- Action Plan for Renewable Energy, rev. 2002: increase RES 30% by 2010
- RES-E target: 31.5% RES by 2010

France
- National plans for improved energy efficiency and for combating climate change: 1 500 wood boilers, 50 wood/straw CHP plants
- RES-E target: 21.0% RES by 2010

Sweden

- National climate change strategy:
- 4% reduced GHG emissions by 2010
- RES-E target: 60.0% RES by 2010

Germany

- National Kyoto policy:
- 21% lower GHG emissions 2008/2010
- Climate protection programme: reduction of CO_2 emissions from 1990 level by 2005 by 25%; 12.5% of electricity from RES, 4% of primary energy from RES
- RES-E target: 21.0% RES by 2010

3.6.3.2 Energy Taxes in European Union

Table 3.13 Energy Taxes for Industry in Selected EU Countries

Country	General energy tax	CO_2 tax	Other taxes
Austria	–	–	VAT 20%, reduced VAT 10% for biomass
Finland	Excise fax for fuels in heat production, not for wood	17.20 EUR/t (excl. peat and natural gas)	Excise tax for peat. Electricity tax of 4.20 EUR/MWh
France	Not for wood	–	Reduced VAT of 5.5% for wood fuel
Germany	VAT 7% for forestry products	–	–
Sweden	–	Biofuels are not taxed	Sulphur tax: wood is not taxed. Environmental levy on NO_x (4.65 EUR/kg)

3.6.4 Future Impact of Carbon Sequestration on Wood Supply

(i) Presently promotes expansion of forest resource and conservative harvesting to maximise carbon in the growing stock

(ii) Carbon sequestration can become an income source for landowners when they are remunerated (Joint Implementation and clean Development Mechanisms projects, Emission Trading in the long run)

(iii) Intensive plantation forestry in developing countries and countries in transition becomes more attractive through carbon financing

(iv) Carbon in harvested wood products can promote demand

(v) Carbon trade in the form of products may influence trade flows

Conclusion: Carbon becomes an additional reason to boost biomass growth

3.6.5 National Regulations on Road Transport

Maximum dimension of vehicles

(i)	width	2.5-2.6 m
(ii)	height	4 m (some countries without regulations)
(iii)	length of lorries	12 m (Sweden 24 m)
(iv)	length of articulated vehicles	16.50-25.25 m

Maximum weight (typical figures)

(i)	axles	10-11.5 t
(ii)	bogies	12-24 t
(iii)	lorries	16-32 t
(iv)	articulated vehicles	32-60 t

3.6.6 Subsidies in Investments and Wood Supply

Key findings on subsidies

(i) Already, subsidies in the form of regional investment support to industry are having a negative effect on the fairness of the competition

(ii) Price reductions due to investment subsidies have skewed the softwood sawnwood markets both locally and internationally, as an example

(iii) Subsidies, in the form of public sector policy support to forest management are common both in EU-15 and AC-10

(iv) There is a danger that new subsidies will emerge as a part of public support to carbon sequestration, which may be unsustainable

(v) Hidden subsidies are common, especially in the form of very low stumpage prices. AC-10 is moving towards more private ownership.

(vi) Artificially low stumpage prices have detrimental effects by skewing both the wood markets and wood product markets and competition

Conclusion: Elimination of hidden subsidies, and increase of transparency and openness in the wood markets should be the challenging goal but there is a risk of slow progress

3.6.6.1 Impacts of Subsidies in Wood Markets

- Estimated average stumpage income is EUR 32 in EU-15 but EUR 12 in AC-10 area, but there is a pressure to equalise
- An estimated 20-30% of investment in sawmilling capacity was subsidised in EU-15 in 1998-2000
- Subsidies gave those sawmills a 3-5% cost competitiveness edge on top of the edge gained through the modern technology
- Overall, some of the subsidised mills enjoyed a 10-17% cost competitiveness advantage at retail market level
- The modern subsidised mills have a wide wood procurement radius and are already present in AC-10 log markets

- Conclusion: Need exists to further improve functioning of the EU-25 wood markets. Lessons learned from EU-15 sawmill industry indicate that subsidies create distortions and are harmful for the competitive market. Transparency on subsidies is needed.

3.6.6.2 Conclusions on Policies Influencing Wood Supply

(i) A large range of policies impact wood supply: Land-use policy, Nature oriented forest policy, Conservation policy, Kyoto Protocol, Climate Change Program, Policy on Renewable Energy Sources, Policies on Recycling and Post-consumer waste

(ii) The challenging forest policy formulation process is well on its way in accession countries

(iii) EU policy on renewable energy sources (RES) will be a real challenge to forestry. EU-25 forests have a capacity to meet even this, without harsh competition with WWI. However, competition will intensify with price pressure on primary wood. At the same time, value of residues will increase.

(iv) Carbon sequestration will become a new opportunity to create value in forestry value chain. Carbon will become an additional reason to boost biomass growth.

(v) National regulations on road transport and EU-wide regulations on surface transport will create conditions for planning of industrial wood procurement

(vi) Elimination of subsidies, and increase of transparency and openness in the wood markets should be the challenging goal but there is a risk of slow progress

(vii) Need exists to further improve functioning of the EU-25 wood markets. Lessons learned from EU-15 sawmill industry indicate that subsidies create distortions and harm the transparent market

PART C

4. WORK PACKAGE 5.1: PERCEPTION ANALYSES

4.1 Wood Promotion Organisations

Wood promotion has developed from product/company focused advertising into formation of regional industry associations and regional campaign models. Overall, wood promotion activities should cover entire supply chain through national campaigns. A "holistic approach to wood promotion" should attract co-operation between all related organisations from the forestry producers across primary and secondary processing industries, and finally through distribution and trade intermediaries all the way to reach consumer groups. Some good examples of this approach already exist, such as France's joint effort by NTC, CNDB, Commerce du Bois. Other positive examples are wood. for good in the UK, and Finland's Wood Focus. Although rather limited at the moment, there is some co-operation in wood promotion: European Timber Council and other pan-European projects (initiated by NTC), as well as in CEI-Bois and FEBO.

There are first of all some international and European organisations and groups that co-ordinate or implement wood promotion activities:

- CEI-Bois and its member federations
- UNECE/FAO (Team of Public Relation Specialists in Forestry)
- FBI Working Group on Communications (CEPI, CEI-Bois, CITPA and CEPF)
- EC Enhanced Use of Wood Working Group
- Nordic Timber Council (Norway, Finland, Sweden) and European Timber Councils
- European Timber Trade Association, FEBO
- European Timber Council

Secondly, and more importantly, numerous national wood promotion organisations have been established across Europe and practically in all important forest industry countries. Their specific mandates are most clearly on wood promotion work in Western Europe (Table 4.1). In Eastern Europe, the UK and Iberia, the traditional industry associations are doing limited amount of promotion, and concentrate on industry and trade matters in a broader context (Table 4.2).

Latvia, Lithuania and North-Western Russia are in the process of establishing their own national wood promotion organisations. North American organisations such as APA and AHEC are well-known campaigners and information brokers for American wood products.

Table 4.1 National Wood Promotion Organisations

Country	Organisation
Austria	Proholz (Holzinformation Österreich)
Belgium	vzw Hout/Bois (Belgium Timber Council) & Fersic/Sofzan
Denmark	Danish Timber Information Council
Estonia	Puuinfo Estonia
Finland	Wood Focus Finland
France	Comité national de dévéloppement de bois, CNDB
Germany	Arge Holz -> Holzabsatzfonds
Italy	Promo_legno
The Netherlands	Centrum Hout (the Dutch Timber Information Centre)
Norway	TreFokus
Sweden	Swedish Forest Industries Federation (Swedish Wood Association merged into this)
Switzerland	Lignum
USA & Canada	American Softwoods Europe, APA – the Engineered Wood Products Association, American Hardwood Exporters Association (AHEC)

Table 4.2 Trade and Industry Associations Working with Wood Promotion

Country	Organisation
Bulgaria	Branch Chamber of Woodworking and Furniture Industries
Czech Republic	Czech Association of Entrepreneurs in Forestry
Hungary	Hungarian Federation of Forestry and Wood Industries, FAGOSZ
Latvia	Latvian Forest Industry Federation Latvian Timber Exporters' Association
Lithuania	Association of the Lithuanian Woodworking Industry (Lietuvos Mediena)
Luxemburg	Holzhandelsgruppe Luxemburg
Poland	Polish Economic Chamber of Wood Industry Centrum Budownictwa Szkieletowego
Portugal	Associaçao das Industrias de Madeira e Mobiliario de Portugal, AIMMP
Romania	Romanian Furniture Manufacturers' Association APMR
Slovakia	Poslanie a ciele ZSDSR
Slovenia	Slovenian Wood Processing Association (Gospodarska Zbornica Slovenije GZS)
Spain	Confemadera, Spanish Association of Wood Importers AEIM
Romania	Exploitation Transport and Primary Wood Processing, ASFOR
United Kingdom and Republic of Ireland	The Timber Trade Federation of the United Kingdom and Republic of Ireland, Forestry and Timber Association, Forestry Commission

4.2 Wood Promotion Campaigns

4.2.1 Cooperation in Campaigns

Campaigns are only a small part of overall wood promotion activities carried out by a number of organisations in the wood products sector. Campaigns are run on the European and national and levels, and a new feature is the co-operation on the pan-European level. These have been initiated mainly by NTC in 2003 around a common theme "Building Europe". It aims at enhancing the use of wood in construction, by means of:

- investigating the housing sector in selected countries in Europe,
- supporting the ongoing EC5 work (new European building codes).

Another NTC-activity is the Environment Communication Platform, for:

- increasing use of wood due to it's positive impact on the global environment,
- creating opinion in favour of wood as the most environmentally friendly material,
- backing up for Environmental promotion and lobbying.

Wood & Food was launched between NTC, National Associations and European Federation of Wood Packaging Producers (FEFPEB) in order to:

- counteract the negative trend leading to lesser use of wood in food handling,
- inform about the hygienic properties of wood in relation to food,
- encourage networking and co-operation.

NTC uses European wood magazine – "Building Europe" in its public outreach to inspire and educate architects to use and work with wood. It also fills the needs and knowledge gaps among European architects. The magazine is circulated in France, Germany, The Netherlands, UK, Finland, Sweden, Norway (in 2003).

4.2.2 Pan-European Campaigns

The following is an inventory of the most significant Pan-European wood promotion campaigns implemented so far.

Wood Europe:

- Finland's campaign 2001-2005 to promote wood products utilisation in Europe and increase Finnish exports.
- Has links with Timber 2000 and Visio 2010.

Visio 2010:

- Not exactly a promotional campaign but rather a broader action plan.
- European wood industry's initiative to concentrate wood promotion efforts at European level.
- Objective was to increase wood utilisation towards USA/Canada level of 0.4 m^3 per capita from present 0.2 m^3/capita (Finland 1.0 m^3/capita).

EU-FBI Working Group on Communication:

- Planned activities aim at raising the image of the industry to boost attractiveness as an employer. Target groups: youth, teachers, decision-makers, journalists.

4.2.3 National Campaigns

Numerous campaigns have been implemented on national levels in Europe. The national campaign approach is the most accepted form of wood promotion campaigns, as it is usually able to attract fairly large support among the industries of the country. The wider support of the industry is reached, and the wider other stakeholder coverage is ensured, the more successful the campaigns tend to be. Key campaign descriptions follow here.

4.2.3.1 Finland

Year of Timber 1996, followed by Time for Wood (1997-2000):

- State-supported forestry organisations' campaign to support wood in national decision-making and to increase utilisation of wood and make changes in construction-related regulations.

Wood Finland (1998-2005):

- Originally part of Time for Wood. State organisations and wood industry SME's joint effort to support the pan-European vision of increasing wood utilisation.
- Last phase (2003-05) towards European co-operation under Visio 2010.

Wood Europe (2001-2005): cf. European campaigns, runs in parallel with Wood Finland

4.2.3.2 UK

Even though the UK-activities are discussed here under national promotion campaigns, the role of NTC has been imperative in catalysing the birth of campaigns. NTC has ensured a wide UK-based stakeholder support and reached its audiences without being too prominent in the actual campaigning. The messages have been better known than the messenger.

Nordic First:

- Campaign sponsored by NTC from 2000 to 2001 as part of Timber 2000 campaign.
- A major NTC and UK-based campaign in the UK 2000-2003.
- Two emphasis areas: Building with Wood and Living with Wood.
- This successful campaign will be expanded to France as the next step (see below details).

Timber 2000:

- Started in 2000 as a replicable campaign model of NTC and now merged with wood. for good and Nordic First campaigns.
- Will be expanded to other countries.

4.2.3.3 Germany

The German Timber Sales Promotion Fund Act came into force in 1990, and a Timber Sales Promotion Fund (Holzabsatzfond) was established. Initially it carried out image campaign for SFM and wood products (1994). More lately, it has provided specific market and marketing investigations, expert advice for timber construction or product research projects, etc. There have been two major campaigns:

Offensive Holz!

- Holzabsatzfonds campaign 2000-2001 aimed at convincing construction entrepreneurs of wood´s qualities. Target groups were entrepreneurs, renovators, the broad public and thereof women in particular (all parties interested in housing).

Natürlich Holz!

- Continuation of Offensive Holz! With new media (e.g. train screens in Hamburg subway), CD-ROM containing press releases on construction, themes of housing and living with wood; started 2002 and is ongoing.

4.2.3.4 France

Plan Bois Construction Environnement:

- A joint effort by CNDB (Comité Nationale du Développement du Bois) and Centre Technique du Bois et Ameublement (CTBA) to increase share of wood in construction by 25% by year 2010.
- Has an action programme with ten detailed objectives.
- Enjoys a signed commitment by state and professionals engaged to environmental promotion for the use of wood: “Accord cadre bois construction environnement” (2001).

Maison Bois Outils Concept (MBOC)

- CNDB training program to introduce wooden housing to the French market and to mobilise construction professionals to act for wooden housing. Supports also Plan Bois Construction Environnement.

Plan d’action Relais-bois (Cirad-Forêt, CTBA, Fédération Nationale du Bois)

- Info campaign for right selection of wood species for application, is supported by CNDB.

Wood…is essential:

- Jointly launched by NTC and CNDP in late-2003, with funding of EUR 1 million per year by both partners.
- Aim is to increase wood use with 30% by 2010.
- Will adopt concept of wood. for good campaign in the UK, as well as themes "building with wood" and "living with wood".
- Will promote the image of wood as high-performing, environment & climate-friendly building material and improve audiences' overall knowledge of wood and forests.

4.2.3.5 Austria

Stolz auf Holz:

- First phase of the proHolz campaign 1994-2002 aiming at increasing the use and competitiveness of timber products by providing information, by advertising and by harmonising standards.

Holz ist genial:

- Continuation of Stolz auf Holz campaign aimed at consumers and building professionals, and especially to the youth.
- Modern, multiple media approach and emotional messages

4.2.3.6 Italy

promo_legno:

- Organised by ProHolz (Austria) and AssoLegno, aiming at increasing Italian wood consumption and closer co-operation between Austrian and Italian wood sector actors (exchange programs, company linkages, etc.)

4.2.3.7 The Netherlands

Wood +20:

- Target: 20% more timber in building construction (Actieplan voor een 20% toename va hout in de bouwsector).
- First executed by the Ministry of Housing and then Centrum Hout 1996-2000.
- Focused in influencing architects, housing organisations and the Ministry of Transport.

4.2.3.8 Denmark

Tre Er Miljö:

- Campaign of nine Danish wood-related organisations (started 1995), to create awareness and knowledge of the environmental qualities of trees, whether in forests or used in industry, buildings and homes.
- Emphasis on wooden housing, runs Internet portal.

4.2.3.9 Norway

Treprogrammet:

- Ministry of Agriculture's campaign (2000-2005) aiming at bringing Norway to a leading country in the utilisation of wood.

TreFokus Campaigns: Bruk Trykkimpregnert trygt & Tre er et ingeniörmateriale.

4.2.4 North American Campaigns

The Pro-Wood Initiative (USA), Wood is Good (Canada):

- Messages: forests are healthy and growing, using wood is good for the environment, wood is a better building material.

Be Constructive – Wood:

- Wood Promotion Network (WPN, established in 2000) campaign 2001-2003.
- A business-to business foundation (refute attacks on wood, image).
- A consumer component for wood & forests (DIY'ers and first-home buyers, "engaged consumers").
- Carries out regular market research.

Wood Works:

- Canadian Wood Council campaign (1998-) promoting use of wood in commercial construction and developing a "wood culture" in Canada.

4.2.5 Campaign Banners

Nearly all the European level campaigns have launched banners or logos in order to give a visual identity to their endeavours. Table 4.3 compiles the banners used by campaigns featured in this report.

Table 4.3 Wood Promotion Banners

Country/Campaign	Banner / logo
Finland: Time for Wood (also Wood Focus Finland)	
EU: FBI Working Group on Communication	Wood&Paper OPPORTUNITIES FOR GENERATIONS
UK: wood. for good	wood. for good.
Germany: Natürlich Holz!	Natürlich HOLZ
France: Plan Bois Construction Environnement	Bois Construction Environnement L'Etat et les Professionnels s'engagent...
Austria: Holz ist genial	Holz ist genial.
Italy: promo_legno	promo legno
Denmark: Tre er Miljö	TRÆ ER MILJØ
Norway: TreFokus	TreFokus

4.3 Competing Materials' Campaigns

4.3.1 Overview

Materials competing with wood are most often found either in construction: (steel, aluminium, concrete/cement, brick, stone, gypsum, PVC), or in packaging: (plastics, aluminium). In living with wood -area, wood is clearly under-performing, under pressure of various interior materials. Competitive materials can be traditional ones as those listed above, but also frequently, combinations of mixed materials and new natural non-wood materials (natural fibre plants, bamboo, etc.).

Backed by strong, consolidated industry, the campaigns run by steel and plastics industries have been commonly quite successful, and often directed against wood, the prime material these materials want to substitute. The most notable of these campaigns in Europe and in North America include the following:

- **Made of Steel**, European campaign funded by eight steel companies
- **PVC for Life and Living,** by European Council of Vinyl Manufacturers (ECVM) aimed at designers to enable them to create innovative new designs and products (see Box 4.1)
- **Vinyl 2010** voluntary commitment of the European PVC industry to sustainable development
- Association of Plastics Manufacturers in Europe (APME) advertising in 2002
- **The New Steel** by Steel Alliance (USA), Portland Cement Association (USA)
- **American Plastics Council** (APC, USA) new 1,9 mill. USD campaign

Brief description of major campaign s are given in the next chapters. See also Text Box 1 for a detailed assessment of PVC for Life and Living.

4.3.2 Made of Steel

- Organised by eight European steel companies joint in an Editorial Group, meeting once a month, and participating in funding (fixed share according to production quantity): total budget: EUR 54 million for 2001-2003/4.
- Campaign is based on creativity of an PR-agency briefed by the Editorial Group, by advertising which is surprising and sympathetic, impressing and convincing and making sure that everybody in Europe has several chances per year to see the message.
- Results tracked by pre- and post-tests: continuous rise in public awareness and acceptance of steel.

4.3.3 PVC for Life and Living

- Campaign was started by ECVM in 1999/2000 with market research and market testing of the PVC for life and living concept.
- It was formally launched with a major event at the 100% Design exhibition in September of 2001.
- Enables designers to take a fresh look at PVC to create innovative new designs and products

- Campaign focuses on contemporary interiors and fashion, one country at a time: so far Italy, France, UK, and Belgium. Next: Sweden.
- There are small sub-projects: selection of a designer, co-operation with PVC industry and organisation of design and fashion show to increase public's interest in PVC.
- Budget is EUR 200.000 per year.
- Campaign has won two major awards: 2002 it won best international public relations campaign category with both the Institute of Public Relations (IPR) and the Public Relations Consultants Association (PRCA).

4.3.4 American Plastics Council

- Slogan: "Everyday miracles. Everyday plastics."
- Goal: "remind the public about the many benefits of plastics".
- Budget USD 19 million in 2004.
- Four TV, five radio and six magazine ads supported with aggressive Internet and public and media relations efforts, designed by APC and Grey Worldwide.
- Emotionally touching messages: e.g. chemotherapy drugs dosed in dissolvable plastic disks.
- Campaign was criticised in "the Ecologist" of September 2003 as targeting women and children/babies, commenting that the campaign "is not expected to focus on getting mothers to think about the risks posed to their children's health by the toxic additives in plastics".

Box 4.1 Detailed Campaign Description of PVC for Life and Living™

Objectives

The challenge was to make PVC aspirational. The whole industry supply chain committed to a programme of environmental improvements in 2000 but its focus on regulatory audiences; this had left ECVM out of touch with consumers. Our objective was therefore to develop a radical new way of engaging consumers and repositioning the product from a commodity plastic to a material of choice for the future.

To demonstrate the versatility of PVC and illustrate how the product can enhance people's lifestyles, the concept of "PVC for life and living"™ was developed and market-tested in a number of European countries.

Concept

Goal could be reached by creating something fresh and surprising to challenge market perceptions of PVC, engaging consumers and inspiring the industry to take a new pride in its product. In short, a programme that included all the supply chain members to reinforce the industry's united image.

Product specifiers of the future are heavily influenced by design and it is an area, in which consumers across Europe are taking an increasing interest. Designers can be sourced by offering them a commission from the material promoting agency (in this case ECVM). Their task is to take a fresh look at the material and create new designs that challenge traditional concepts of its use. Detailed induction programmes for each designer, covering the PVC supply chain, ensured that they fully understood the product and its properties before they got creative. This induction programme built strong links with the industry in each country to source manufacturers to provide time, materials and know how to support the project.

Audiences

Primary audience was consumers, using designers and design media to reach them, but the PVC supply chain, via the trade media, was an important secondary audience.

Implementation

A key outcome was to create a group of designers who would generate enthusiasm about PVC, thus opening up new platforms and audiences for ECVM to talk about its product.

Designers were commissioned to create five marketable PVC products for the home and launch them at the premier UK show, "100% Design". The British Plastics Federation volunteered as a manufacturing partner, who undertook all the prototyping expenses.

Unique projects in each target country, reflecting the varying design trends and cultural differences across Europe. For example, innovative lighting created by an interior designer was showcased at the Salone del Mobile, Milan´s major interior design exhibition in April 2001.

Lessons to be learned

Quote: "If you are serious about re-educating the design industry about the properties of a product (material), designers must be encouraged to challenge existing perceptions of the product and stimulate discussion about material properties."

Source: www.ecvm.org and interview with Martyn Griffiths, ECVM 23.10.2003

4.4 Analysis of Wood Promotion Campaigns

4.4.1 Wood Promotion Objectives

The following list of observed wood promotion objectives is drawn from a number of campaigns dealing with several wood products. It is therefore not focusing on solid softwood products or any other particular group of wood products. It is understood that even within the European WWI, it is difficult to find universal criteria for promotional messages due to the heterogeneous membership in the sector. There are at least five broad categories that can be identified:

1. Defence objectives:

- Reduce business risks associated with product substitution and anti-wood/anti-forest efforts, change negative attitudes (perceptions) towards wood, remove quilt about using wood,
- Counteract negative trend leading to lesser use of wood in food handling.

2. Increase the Use of Wood:

Expressed as a generic objective:

- Increase the use and competitiveness of timber products, promote use of wood in commercial construction and in the European building industry,
- support the pan-European vision of increasing wood utilisation so that in 2010 wood is the leading material in housing construction systems and in interiors in Europe,
- increase the use of wood due to it's positive impact on the global environment (NTC).

Or, expressed as a specific objective (quantified):

- Increase European wood utilisation towards US and Canadian level of 0.4 m3 per capita,
- increase the consumption of wood in Europe to 0.25 m3 per capita by 2010 (NTC),
- increase the share of wood in construction from 10% to 12.5% by 2010.

3. Environmental objectives:

- Create awareness and knowledge of the environmental qualities of wood,
- build opinion in favour of wood as the most environmentally friendly material,
- provide back-up for environmental promotion and lobbying (NTC) ,
- support wooden window frames as opposed to PVC (BWF, Greenpeace, Weinig),
- increase the use of wood in construction by 20% for environmental reasons.

4. Organisational objectives:

- Increase co-operation in wood promotion via bilateral campaigns and Pan-European projects, with other organisations and parties in European countries (NTC),
- concentrate wood promotion efforts at European Level,
- intensify know-how exchange, internships in companies – between countries (Austria and Italy),
- increase co-operation in research to harmonise wood promotion.

5. Regulatory and technical objectives:

- Achieve general acceptance for wood utilisation and construction and thereby support for wood in national political decision-making,
- increase utilisation of wood and changes in construction-related regulations,
- develop and submit proposal for EU promotion program for wooden construction,
- establish a national regulation (based on EN) for wood construction (Italy),
- build training program to promote wood frame construction and technical acceptance to industrial timber house producers.

6. Other types of objectives:

- Inspire and educate architects to use and work more with wood (NTC),
- objectives for European Promotion Co-operation (NTC),
- make national promotion more efficient and cost-effective (synergy/leverage effect),
- generate prerequisites for effective EU-lobbying,
- single issues management.

4.4.2 Campaign Target Groups and Instruments

4.4.2.1 Campaign Target Groups

One can assume that a thoughtful identification of campaign targets will be an essential decision before any campaign can be successfully planned and implemented. The key question in this consideration should be a simple one: Who are making decisions on the choice of building materials? ECE-FAO (2003) has come up with the following list:

- Building owners, buyers, tenants
- Architects
- Construction engineers
- Real estate firms
- Property developers
- Building contractors, constructors, carpenters and mill workers
- Different actors in the woodworking industry chain
- Wholesalers, agents and retailers

Different campaigns reviewed in this project have identified a large number of broad or specific target groups:

- Consumers, general public
- Building/construction professionals
- Opinion leaders
- Architects
- Retailers and other suppliers
- Home owners, home buyers
- Women
- Young people, teachers
- Policy-makers, public authorities, building regulators

- Trade organisations
- Professional buyers serving institutional or private sector construction projects

The target groups can furthermore be broadly categorised in three groupings:

1. Consumers, distribution and trade:

- Base their buying decisions on values, change the least and are the most expensive target group to influence
- Distribution & trade need to be convinced of supply security

2. Builders, developers, architects (also defined as specifiers, e.g. in European Commission, 2000):

- The most cost-effective target group (can be efficiently reached through e.g. professional media and networks): a key group who define the (new) use and role of a products

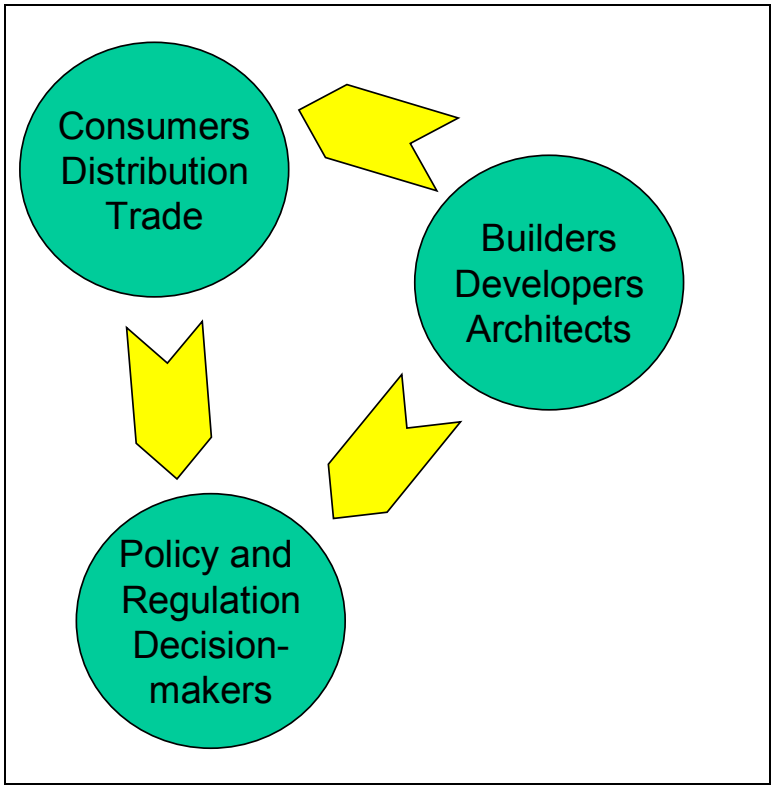
3. Policy and regulation decision-makers:

- Follow the needs and wishes of the two above groups: if react slowly, may become a major bottleneck

The inter-dependence between target groups is explained in Figure 4.1. It has been suggested that the attention of the policy-makers be best captured through mobilising a critical mass of consumers and specifiers behind a common trend first. Policy level attention tends to follow keenly emerging issues in the society, so its influencing mechanisms should be chosen accordingly.

On the other hand, experiences in e.g. Austria have showed how one should not set too high expectations solely on consumers' attitude change for creating a higher demand for wood, unless the specifiers provide competitive building solutions, and authorities allow them to do so without extreme regulatory burden.

Figure 4.1 Relations between Campaign Target Groups



(Source: Interview with Minna Hämäläinen)

4.4.2.2 Campaign Instruments Top-10

The most commonly applied campaign instruments have been listed below for "general" wood promotion and for timber frame housing construction.

In general wood promotion:

1. Advertising (consumer and trade press, TV, outdoors)
2. Production of promotion materials (brochures, publications)
3. Internet-sites and portals
4. Campaign newsletters (for members)
5. Trade shows, architecture and design contests, awards

In timber frame housing construction:

1. Technical publications
2. Technical education, schooling, training
3. Wood information (online databanks, construction guidelines, CD-ROMs, etc.)
4. Lobbying and professional contacts (construction standards development, etc.)
5. Support to technical research and research co-operation

(*Sources: Various campaign descriptions, JPC Evaluation of wfg*)

4.4.3 Evaluation of Campaigns

Published evaluations are relatively few and in most cases, evaluations are not very openly distributed – although it can be assumed that all campaigns include evaluation of impacts in the terms-of-references. Some of the most notable campaign evaluations are summarised in the next chapters.

- UK: wood. for good 2002 (includes Nordic First) and initial results of 2003
- Finland: Time of Wood by Wood Innovation Centre 1999
- Austria: Stolz auf Holz and Holz ist genial both evaluated by ProHolz (not published)
- France: Plan Bois Construction Environnement (not published)
- Netherlands: +20% Wood (not published)
- Canada: Be Constructive – Wood (evaluation under WPN reports)
- Canada: Wood Promotion Network: year one results 2001 and continuous tracking

4.4.3.1 Evaluation of wood. for good (UK)

Staged promotion approach was applied in order to change opinion initially, and behaviour and consumption eventually. Promotional activities took meticulously stock of previous stages, and kept up a momentum to lever further results (Figure 4.2). Campaign objectives were se at:

- increasing the consumption of softwood solid wood products in the UK by 1.8 million m^3 in three years (+20%),
- changing some negative attitudes towards wood,
- increasing the consumption of softwood solid wood products in the UK in excess of 12 million m3 over a longer time frame.

Key success elements can be identified in:

- planning (what to do where, when, how and with whom),
- funding (significant budget – can make a difference and impact),
- organisation (Nordic and local key players co-operating and contributing),
- execution (focus and structure).

Main results achieved were:

- an improving opinion of wood products amongst consumers as to the desire and benefit of using wood, the relevance of wood, the environmental credentials of wood,
- an increasing sale of wood products that partly was attributed to the campaign amongst campaign members and in industry and trade,
- an overall increase in consumption of sawnwood and plywood products in the UK market over the campaign duration, to what the campaign is believed to have contributed.

The campaign also managed to identify so called “fulfilment activities”, which helped enhancing the campaign impact. These ranged from purely advertising tricks to active PR and co-operation with trade and industry in events, publications and educational activities. Wfg itself was not actively recognised among customers, but its advertisements were well

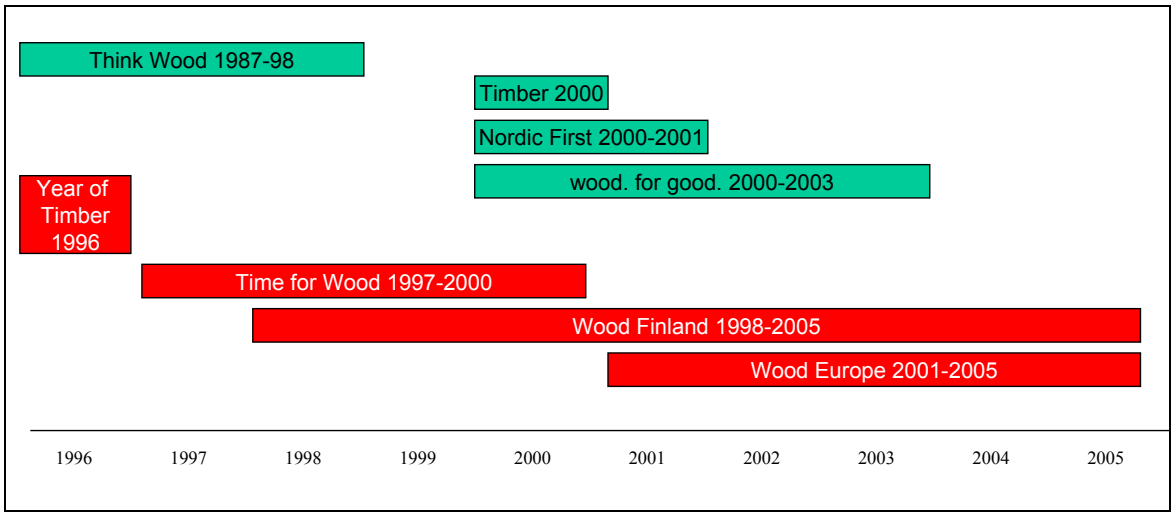
remebered: message became more familiar than the messenger. It became well known and appreciated among industry and trade, specifiers. It was also observed that a considerable time lag between campaign launch and effect: some measurable results will materialise over a much longer time.

Lessons learnt from wfg:

- Commitment to campaign – resources and funding over medium/long term
- Active involvement of members – leverage and fulfilment
- Broadening of member base necessary to create lasting campaign effects
- Broadening of activities to cover a range of wood promotion activities including advertising, PR, etc.

(Sources: Various campaign descriptions, JPC Evaluation of wfg)

Figure 4.2 Phased Approaches in Wood Promotion Campaigns



4.4.3.2 Evaluations of Other Campaigns

Time of Wood (Finland)

- Based on the success of Year of Timber, Time for Wood managed to change attitudes of consumers and decision-makers in favour of wood.
- A broad participation with high-level political commitment was a crucial element behind impact.
- Time for Wood and the other campaigns have induced a change in the higher technical education of engineers and architects, who are now, much more than in preceding decades, pulled back to work with wood and respect the materials' multiple advantages.

Stolz auf Holz & Holz ist genial (Austria)

- Brought good results, and reached out to the younger generation in particular.
- Produced a measurable increase of wood utilisation in Austria.

+20% Wood (Netherlands)

- Managed to increase use of wood by 16%, best success was achieved in timber frame elements and in wooden walls.

Be Constructive – Wood (part of the North American Wood Promotion Network)

- Similar type of positive results as in wood. for good of the UK.
- One reason for improved wood reputation is quoted as "reduced attacks by steel industry".
- A broad-based coalition secured funding and helped communicate united messages successfully (280 companies and organisations contributed USD 15 mill./yr).
- Slogan tested better than competing products' slogans among consumers: it was not about the product itself, rather about the person using wood product. Message was personalised with the consumer.
- Introduction of TV ads raised consumer awareness significantly.

Wood Promotion Network (Canada)

- Year one results 2001 and continuous tracking gave better results for all aspects than the baseline situation (good building material, environmental benefits, availability & price, abundance of the resource, forest management).
- A virtual office approach was an elementary tool to keep costs low.

4.4.4 Evaluation of Competing Materials' Campaigns

In comparison with wood promotion campaigns, Competing materials' campaigns have started earlier (1980s), have enjoyed a stronger industry coalition and commitment, and have had bigger budgets. Campaigns have been based on higher R&D investments, and tended to rely on technical strengths of material. Messages have been flavoured with humour, strongly emotional and simple slogans ("Brick is Rock"), or gimmicks (a mouse who lost his teeth in a brick house says "I wish people would use more wood"), or even misinformation (on wood´s susceptibility of ants, fire, etc.).

Made of Steel

- Organising companies have committed themselves by sufficient funding and working participation, nominated national focal points in campaign countries.
- Behind the common message, certain liberty is given to advertising agency to convey the message in appropriate way.
- Among the European consumers, who were the target group, steel is rated higher by those who claim to have seen steel advertising.

PVC for Life and Living

- A very focused "attack" on designers in one country at a time (Italy, France, UK, Belgium and Sweden).
- Forged a close co-operation with industry (PVC Network Europe) and educational partners.
- Gained publicity through participation in international trade/fashion fairs.

4.5 Introduction

Several factors in our societies affect perceptions on wood products in their main applications, i.e. building, living and transporting with wood.

First area is technological change. For example, the IT sector's development has been a strong force. It helps creating more quick-access information for house-planners in on-line marketplaces, it drums out environmental messages, and distributes industry and product information. With the help of technological advancement, cleaner technologies have been quickly adopted by the forest industries, but paradoxically, PR returns on this have remained untapped (European Commission, 2000).

Society's values, including environmental concerns, have become more pertinent factor in consumer response. Environmental consciousness has become a mainstream value in Europe, even though the intensity of interest has somewhat diminished since 1980s-1990s. At the same time, the previously common polarisation between the environment and the economy has diminished considerably: it is more perceived today that wealth also creates opportunities to tackle environmental problems, not just accumulates them.

Demographic trends in Europe show an ageing average society (fertility rates in Europe well below 2, only Turkey and Ireland above). Together with urbanisation, it limits the growth possibilities in new residential construction, and therefore the building sector focus will be on renovation, maintenance and improvement (RMI).

Information society uses multiple media, of which some are more trusted than the others. It is perceived that a reliable channel "cannot" give wrong messages, but a susceptible channel should not be trusted for. In Europe, the eNGOs have been rated as the most reliable sources in environmental matters, so they can convey even biased information credibly; this may enable them to "confuse" the public in order to control environmental debate.

Many of the European economies have been stuck with a slow growth. Falling earnings and pensions create consumer pessimism that is poised to slow down the construction sector. While new building and construction activity may be stalled, RMI tends to grow. Sometimes timber-framed housing outperforms rest of the construction sector. In some countries, socially motivated, affordable housing projects often employ wood; this may encourage a murky image for wood.

The following trends in consumerism are on the rise:

⇧ UP WITH:

- education and awareness
- leisure and experience orientation
- environmentally-friendly products
- "wellness" and services -oriented consumption
- home and cocooning
- energy saving
- multimedia, communication
- building wealth into home
- re-modelling of homes for individuality

At least some of these would seem to lend support for wood products. A challenge for the wood industry is to capture the hiding potential of the consumer attitudes for pulling up demand for wood.

4.5.1 Perceptions of Wood on Different Levels of Forest Products Value Chain

4.5.1.1 Public Perception of Forests

- Very strong emotional feelings in some European countries (Finland, Sweden, Germany, etc.)
- Younger people are less attached to any socio-economic reasoning on forests, especially in Southern Europe
- Urban residents have minimal firsthand understanding of forestry
- Environmental perceptions are emotional (scenery, wildlife, relaxation) or ideological (world-wide concerns, anti-globalisation, etc.)
- Economic value of forests not seen important in most European countries
- "Forest are a declining or threatened" by felling, pollution, urbanisation and fires. Image is tarnished easily by problems in the developing world, like mining, slash & burn, clearance for cash crops, etc.
- Illegal logging has become a more pertinent issue in 2002-2003

4.5.1.2 Public Perception of Wood as a Material

- In Europe, wood is best known in high-value consumer applications (such as wooden furniture)
- In general, wood is not seen as very modern material
- The wood industries are not well known, nor are the linkages between SFM and products
- Consumer awareness of certified forest products remains low
- In Eastern Europe, consumers do not understand the benefits of wood; an imminent image problem for wood, because advanced high-quality wood products have been absent
- Consumers' perceptions of wood are not well studied in East Europe
- Wood is used to some extent (with concrete) since it is domestic, low-cost and mostly available material, but has "poor" image

Perceptions of timber-fame housing in Germany

Background: a "sector-specific boom" for timber construction in 1991-2000: timber-frame housing construction increased substantially in Germany (covering craftsman and industrial manufacturing).

- The number of annually completed timber houses rose from 8,000 to 35,000 units (market share of timber houses from 7% to 15%)
- Wooden houses were selected because of ecological motives and healthy living conditions (and possibility to most individual architecture)
- Lower price was less important
- Most efficient way to increase the demand for timber-frame housing was reducing building costs and times (systems, prefabrication)

- Timber wholesale and direct construction industry channels are the dominant distribution channels for timber-frame materials

(Source:Forest product consumption… 1998 and NTC 1998)

4.5.1.3 Specifiers' Perception of Wood as a Material

In Austria, wood's functional properties have been rated as follows. (Kissinger, 2002)

Wood was not seen very:

- solid (only 14% of respondents)
- moisture resistant (13%)
- load bearing (10%)
- fire resistant (3%)
- but technical development is acknowledged

But, wood was perceived:

- economical (39%)
- stable in value (36%)
- inexpensive (29%)
- sound absorbing (40%)

4.5.1.4 Public Perception of Wood Industries

- "Hazy" block as a whole
- Not seen as major or visible industries at national level (except in Finland & Sweden)
- Impact to environment moderate, wood industry is less criticised for destroying forests than pulp and paper industry
- Traditional, but keeping up with development
- Manual, repetitive work, not attractive as employment
- Furniture industry highly visible, retailers are well-known
- A particular problem is the poor communication between SMEs and the public

(Source: Perceptions of the …, 2002, Qualitative study of…, 2002)

4.5.1.5 Changes in Attitudes Over Time

- Young, urban people tend to take wood in products for granted: they fail to understand the significance of forest management or industry
- The longer the perspective, the more positive attitudes for wood
- Austria study: general improvement in perception of wood and forestry is possible over time
- Wood can be presented as a high-tech material (so good that it would have to be invented, if it didn't grow naturally)
- A great potential in making wood a life-style product

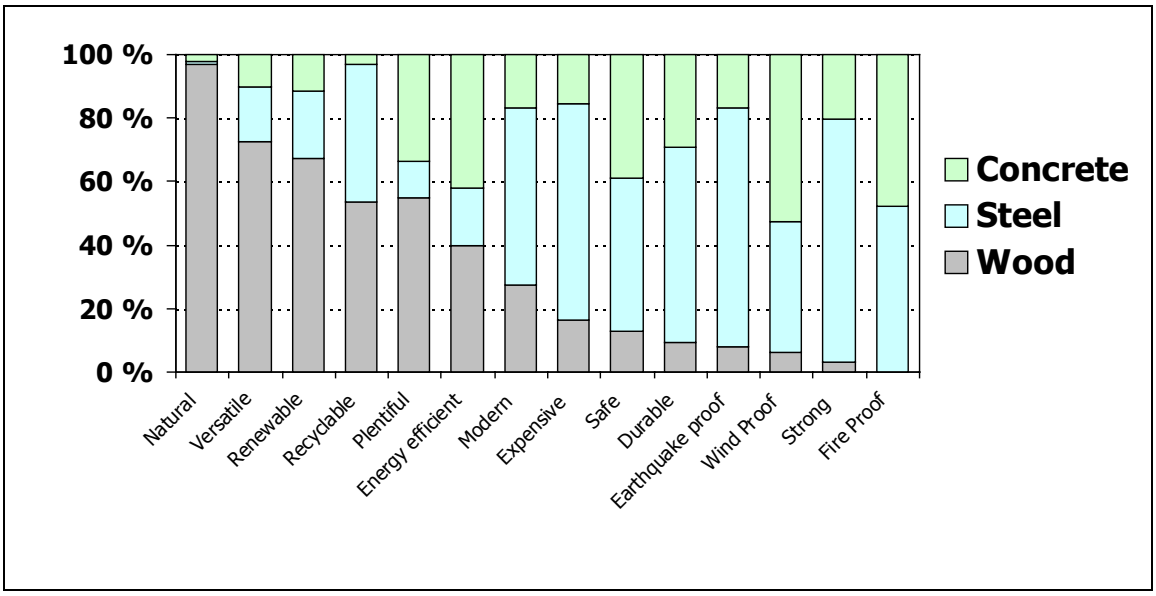
4.5.1.6 Lessons on Perceptions of Wood in North America

In North America, specifiers find wood as the "most environmentally friendly" structural material, and steel the "least environmentally friendly".

- Wood scored poorly only in relation to the extraction of raw material and service lives of buildings
- Steel scored best on recyclable material, wood is second (overlooks energy balances)
- Energy use is most efficient in wooden buildings and least efficient in steel buildings

Knoll & Company (1998) have tested the perceptions of wood among both public and specifiers in North America, where timber-frame building is extremely popular. Figure 4.3 illustrates their answers to a simple question (quote): "***Which of the three building materials comes to mind when you hear the word…"*** (see words given on horizontal axis). In result, wood scored more than 50% shares over competing materials in being perceived as natural, versatile, renewable, recyclable and plentiful.

Figure 4.3 US Perceptions on Different Building Materials

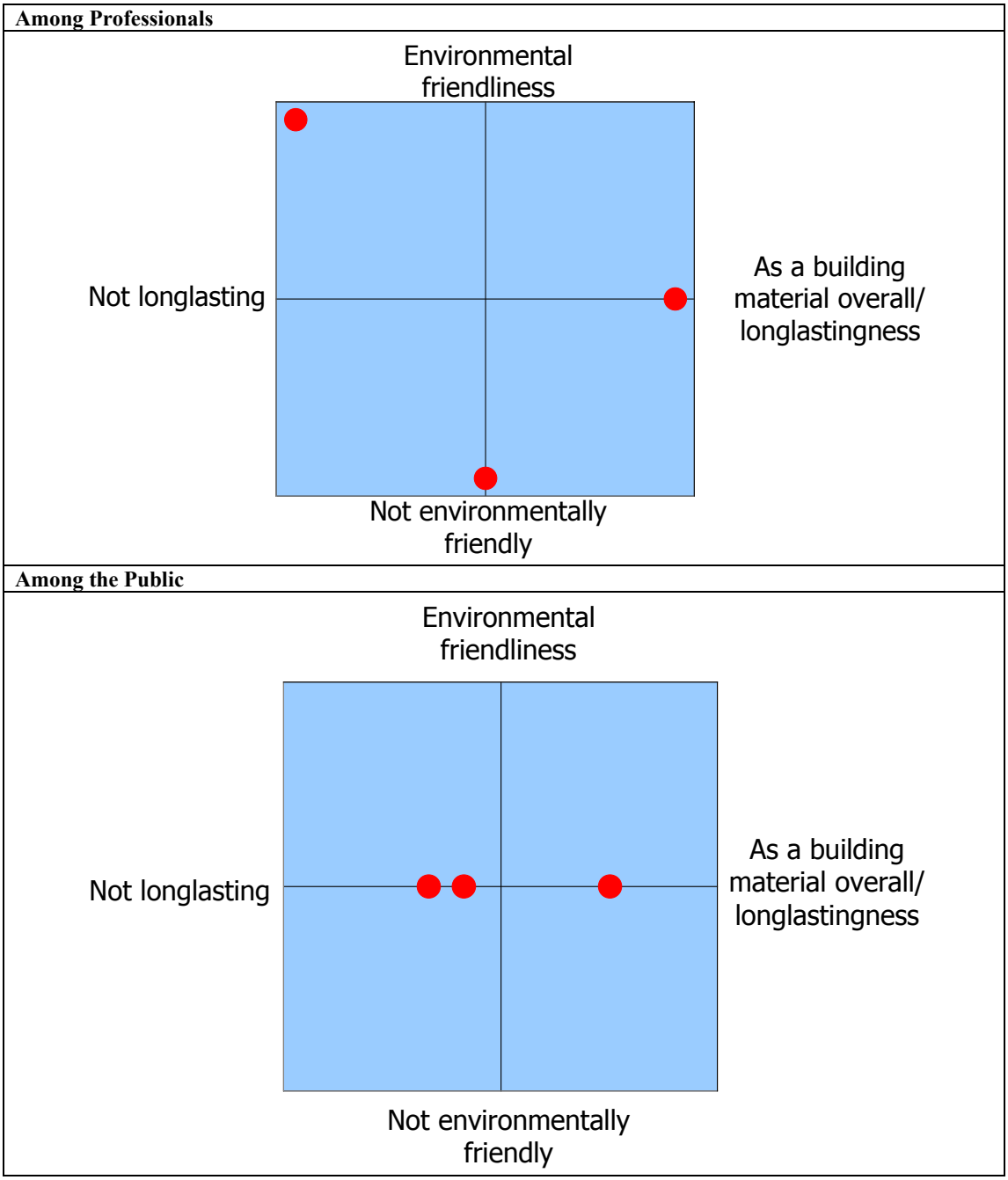


Source: Knoll & Company, 1998

On average, wood was found to be environmentally friendlier, but not as long-lasting/good building material as concrete and steel. But there were clear differences between the perceptions of the public and those of the professionals. Differences are visualised in Figure 4.4. In summary:

1. Professionals considered wood to be environmentally friendlier than the public did;
2. The Public considered wood to be longer lasting/better building material than the professionals did.

Figure 4.4 US Perceptions of Wood as a Building Material



Source: Knoll & Company, 1998

4.5.2 Conclusions on Perception and Promotion Campaigns of Wood

4.5.2.1 Perceptions

- Perception of wood is generally good, and improving over time
- This increase in wood acceptance and utilisation is difficult to allocate to individual campaigns, since external drivers are also important factors
- Effort is still needed to transfer the improved perception of wood to an increase in the utilisation of wood

4.5.2.2 Wood Promotion Campaigns

- Elements from successful campaigns can be replicated to other countries and regions, bearing in mind that they need to be adopted to local conditions and to the stage of wood promotion in that country
- Timing of campaigns to meet dynamic periods in economy and consumer confidence, building sprees, etc. is important
- Wood promotion phases develop from (1) start-up phase through (2) strong campaigning phase to (3) tackling the wood consumption bottlenecks phase
- Campaigning must be synchronised with related tools in each phase
- Related tools include product development/research, improvement of distribution channels and regulatory work
- Much of the regulatory work is related to removing institutional, technical, or economic barriers, rather than actual legal barriers
- Performance criteria (fire properties, durability, stability, sound insulation, etc.) should be tackled in R&D and communicated

In summary, a successful campaign is:

- Speaking with the industry's European-level "one voice", and supported by EU-level action, but
- Planned for a specific country and situation and specific target group(s)
- Learning from other successful campaigns: wfg as success model
- Is simple by its form, creating wow-effect, using catchy and clever slogans (and ethically appealing statements if possible)
- Using advertisements, press and TV to create feel-good emotions
- Attaching wood in a positive life-style setting is important

Action Programs: Who should do what:

- CEI-Bois should initiate an European-level Target Programme and act as a facilitator in starting national campaigns, especially in "young" campaign countries (Southern Europe and accession countries)
- This can be done by establishing a "toolbox and consulting service for a successful campaign" based on the experiences gained in other countries
- CEI-Bois should co-operate with research institutions and other industry organisations to lobby and promote education and training of wood professionals
- CEI-Bois should formulate a PR-program for bringing WWI-SMEs to the public interest, possibly supported and co-funded by the EU

- Industry should consolidate efforts in product development and conquer the DIY-chain markets to ensure that increased positive perception can be realised in increased utilisation of wood

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