

PROCEEDINGS
PROCEEDINGS
PROCEEDINGS

INTERNATIONAL SEMINAR on
ENERGY & THE FOREST PRODUCTS INDUSTRY

Rome 30-31 October 2006



In collaboration with UNECE, ITTO and WBCSD

PROCEEDINGS

INTERNATIONAL SEMINAR on

ENERGY & THE FOREST PRODUCTS INDUSTRY

Rome 30-31 October 2007

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
INTERNATIONAL ENERGY AGENCY
INTERNATIONAL COUNCIL OF FOREST AND PAPER ASSOCIATIONS

IN COLLABORATION WITH UNECE, ITTO AND WBCSD

The proceedings reflect the views of the seminar participants and do not necessarily represent the views of the organizations such as IEA, FAO, ICFPA, etc.

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

All rights reserved. Reproduction and dissemination of material in this information product for educational or other non-commercial purposes are authorized without any prior written permission from the copyright holders provided the source is fully acknowledged. Reproduction of material in this information product for resale or other commercial purposes is prohibited without written permission of the copyright holder. Applications for such permission should be addressed to:

Chief

Electronic Publishing Policy and Support Branch
Information Division

FAO

Viale delle Terme di Caracalla, 00153 Rome, Italy
or by email to: copyright@fao.org

© FAO 2007

CONTENTS

ACRONYMS AND ABBREVIATIONS	1
INTRODUCTION	3
OPENING REMARKS BY ORGANIZERS	5
CONCLUSIONS	7
SUMMARY OF THE ROUNDTABLE DISCUSSIONS	9
PRESS RELEASE	19
<u>Theme 1: Energy Policies and Trends</u>	21
<i>Presentation 1.1:</i> An overview of existing and emerging EU policies relating to energy from biomass and their effects on forest based industries	23
<i>Presentation 1.2:</i> How Brazilian pulp and paper industry faces energy challenges	43
<i>Presentation 1.3:</i> Energy policies as a global investment factor	55
<i>Presentation 1.4:</i> Energy technology perspectives, Scenarios and Strategies to 2050	71
<u>Theme 2: Role of Wood as Energy Source</u>	91
<i>Presentation 2.1:</i> Review of global bioenergy scenarios	93
<i>Presentation 2.2:</i> Biofuels - A Strategic Option for the Global Forest Sector?	115
<i>Presentation 2.3:</i> The sustainable forest products industry, carbon and climate change	139
<i>Presentation 2.4:</i> Forest biorefining and implications for future wood energy scenarios	147
<i>Presentation 2.5:</i> Forest products policies, prices, subsidies and incentives, and implications for future wood energy scenarios	165
<i>Presentation 2.6:</i> Wood waste for energy: lessons learnt from tropical regions	175
<i>Presentation 2.7:</i> Energy and the Forest Products Industry in Malaysia	191
<i>Presentation 2.8:</i> Program for the conversion of Russian municipal boilers with 20MW maximum capacity to biofuel due to funds from the emissions reduction units sell, under the Kyoto Protocol	199
<i>Presentation 2.9:</i> Economic and environmental implications of woodfuel production and competition with other uses	211
<i>Presentation 2.10:</i> Economic and environmental implications of woodfuel production and competition of woodfuel production and other uses: Europe as an example	219
<i>Presentation 2.11:</i> Nature conservation concerns linked to the development of the bioenergy sector	233
<u>Theme 3: Energy efficiency and carbon economy in the forest products industry</u>	247
<i>Presentation 3.1:</i> Report on energy efficient technologies and CO ₂ reduction potentials in the pulp and paper industry	249
<i>Presentation 3.2:</i> Demand side energy management	263
<i>Presentation 3.3:</i> The EE21 project	277
<i>Presentation 3.4:</i> Voluntary Efforts against Global Warming and Benchmark	291
<i>Presentation 3.5:</i> Greenhouse gas and carbon profile of the global forest products industry	301
<i>Presentation 3.6:</i> Benchmarking energy use and greenhouse gas emissions	321
<i>Presentation 3.7:</i> Pulp and paper industry combined heat and power (CHP) in Europe	331
<i>Presentation 3.8:</i> Mondi's perspective on energy efficiency and emission reduction	343
Annex 1 – LIST OF PARTICIPANTS	357

Acronyms and Abbreviations

ACPWP	FAO Advisory Committee for Paper and Wood Products
AF&PA	American Forest and Paper Association
CEPI	Confederation of European Paper Industries
CHP	Cogeneration of Heat and Power
COGEN Europe	European Association for the Promotion of Cogeneration
EEA	European Environmental Agency
EFFE	Evaluating Financial Instruments in Forestry in Europe
EFI	European Forest Institute
ENEA	Italian National Agency for New Technologies, Energy and the Environment
ETS	European Trading System
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FPAC	Forest Products Association of Canada
FRAM	Future Resource Adapted pulp Mill
ICFPA	International Council of Forest and Paper Associations
IEA	International Energy Institute for Applied Agency
IIASA	International Institute for Applied Systems Analysis
ITTO	International Tropical Timber Organization
IUCN	World Conservation Union
JPA	Japan Paper Association
KAM	Ecocyclic Pulp Mill (closed cycle pulp mill)
NCASI	National Council for Air and Stream Improvement
TAPPI	Technical Association for the Pulp & Paper Industry
UBC	University of British Columbia
UNECE	United Nations Economic Commission for Europe
USDoE	United States Department of Energy
USFS	United States Forest Service
WBCSD	World Business Council for Sustainable Development

1 INTRODUCTION

The forest products industry is a major consumer of energy. Worldwide, the final energy use of the pulp and paper industry amounted to 6 ExaJoules in 2003 (6% of total industrial energy use). The pulp and paper industry also produces energy as by-products, as well as other by-products that can be used for energy generation. It already generates approximately 50% of its own energy needs. A significant share of its energy use is renewable CO₂-neutral biomass.

Energy costs, energy supply and climate change are amongst the core issues impacting on the future of the forest products industry. They will have impacts on the manufacturing costs, as well as on the allocation of investments around the globe. The increasing focus on biomass as an energy source may on the one hand lead to competition on the raw material markets for existing industries, but on the other hand open new markets to other parts of the forest cluster. Bio-markets of different sectors and industries will be interlinked. The expected increasing demand for bio-energy will have an impact on the environment. Climate change mitigation policy will add extra spin to all these developments. Renewable energy policies are likely to affect the demand for forest products compared to other competing non-wood materials. Finally, the already rapid globalisation of raw material production and trade for the forest product industry completes a picture of interlinked developments and challenges ahead.

The forest products industry has the potential to play a leading role in these developments, optimizing the use of raw material, increasing energy efficiency, saving energy costs, producing bio-energy itself and expanding its business into bio-refinery products. In the long term, the industry could even develop into a clean energy supplier if residues are used more efficiently. Besides emerging technologies, completely new process designs and processing techniques could bring considerable and long-term energy efficiency improvements in paper production.

Energy and forest policies around the globe set the stage for these developments and need to be well integrated and carefully balanced. Here, governments, industry, institutions and society at large each have a role to play.

The International Seminar on Energy and the Forest Products Industry was organized by the Food and Agriculture Organization of the United Nations (FAO); the International Council of Forest and Paper Associations (ICFPA); and the International Energy Agency (IEA) in close collaboration with the International Tropical Timber Organization (ITTO); the United Nations Economic Commission for Europe (UNECE) and the World Business Council on Sustainable Development (WBCSD).

This meeting built on the results of a technical workshop held in Paris on 9 October 2006 that focused on new technologies and systems leading to energy efficiency and CO₂ emissions reduction in the pulp and paper industry.¹

These seminars brought together representatives from the forest products industry, the energy industry, the service sector, governments, members of international non-governmental organisations and academia with the aim of meeting the following objectives:

- Assess the energy challenges facing the forest products industry globally;
- Examine the impact of new energy policies and future energy scenarios on the competitiveness of forest products;
- Focus on the potential of bioenergy and bio-refining and the potential for further energy and efficiency within the sector;

¹ For more information, please see *Energy and the Forest Products Industry: Towards Higher Energy Efficiency and CO₂ Emission Reductions* at: http://www.iea.org/Textbase/work/workshopdetail.asp?WS_ID=264

- Discuss the possible response and contribution of the forest products industry to changing energy scenarios;
- Formulate a vision of the role of governments and institutions in developing requirements for well integrated and carefully balanced policies at global, regional and national levels.

The two day seminar was sub-divided into three thematic blocks addressing issues related to energy policies and trends, wood as an energy source and energy efficiency issues, as described below:

Theme 1: Energy Policies and Trends

Setting the scene regarding the overall energy scenarios and trends, highlighting the importance of renewable energy policies and trends for energy costs covering:

- An overall review of global energy scenarios (including renewable energy);
- New energy policies and their impact on forest industries;
- An open discussion with speakers on policy coordination, levelling the playing field, competing demands for wood, relative prices of biofuels and hydrocarbons, and the availability of relevant statistics.

Theme 2: Role of Wood as an Energy Source

The increased utilisation of woody biomass (including recycled fibre) as a renewable energy source is likely to create competition between the energy sector and the forest products sector. This session presented and discussed key related topics including:

- An overall review of global bioenergy scenarios;
- Economic and environmental implications of woodfuel production and competition with other uses (forest products);
- Forest products, policies, prices, subsidies, incentives and implications for future wood energy scenarios;
- Technology issues including bio-refineries, black liquor gasification, and efficiency gains;
- Environmental concerns linked to the development of the bioenergy sector.

Theme 3: Energy and material efficiency in the forest products industry

The response of the forest products industry as a producer and consumer of energy to the changing world scenarios was discussed, including the roles of cogeneration and other technological options, investment decisions, positioning of the forest products industry in the international dialogue, interchange with energy sector and governments. Issues discussed included:

- An overview of energy efficiency technologies;
- Economics of energy saving potential in the pulp and paper industry;
- Forest industries in light of the Kyoto Protocol—the potential for Co2 emission reduction in industry;
- Benchmarking energy use and greenhouse gas emissions;
- Energy production including cogeneration by industry;
- Bio-refining as part of the solution;
- A round table discussion with questions from the audience and closing remarks by the participants.

The meeting concluded with the following take-home questions regarding the next steps for industry as well as governments, international organizations, and other relevant stakeholders:

- What can industry do to increase its contribution to climate change mitigation?
- What do we expect from governments to balance the wood supply for the energy and for forest products industries?
- What do we expect from international bodies like IEA and FAO in the follow-up to this seminar?
- How can we better involve/include developing countries or companies in developing countries in these processes we have discussed during the last two days?

OPENING REMARKS

Wulf Killmann (FAO):

The interaction between energy and forests is entering an area of increasing and sometimes contradictory challenges.

First, energy prices, particularly the price of fuels derived from oil, are reaching historically high levels and this trend is predicted to continue—increasing the pressure to find alternative sources of energy.

Wood and agricultural biomass offer the potential for increased use for energy. However, will this be at the expense of other priorities? In some countries, forests are cleared to plant agricultural crops that are not used for food but for biofuels.

Climate change compels countries to seek alternative sources of energy as substitutes for fossil fuels. Wood is one of the major alternatives.

And finally, as the demand for wood for energy increases, the supply of wood available for other uses might decline—resulting in increased costs for the wood based panel and pulp and paper industries.

The time seems to have come to look at the nexus between energy and the forest products industry—which is both a user and a provider of energy and also a user of wood.

This seminar builds on a technical workshop held in Paris on October 9 under the auspices of IEA and WBCSD where the issue of energy efficient technologies and CO₂ reduction potential in the pulp and paper industries were discussed.

So, what do we want to achieve? This seminar aims at four issues:

First, we want to assess, in an integrated way, the energy challenges facing the forest products industry globally. Secondly, we want to examine the impact of new energy policies and future energy scenarios on the competitiveness of forest products. We want to focus on the potential of bioenergy and further energy efficiency within the sector and finally, we want to discuss the possible response and contribution of forest products industries and governments to changing energy scenarios.

We hope that this seminar will help us formulate a vision for the role of governments and institutions in developing requirements for well integrated and carefully balanced policies at global, regional and national levels.

Cecilia Tam (IEA):

When the leaders of the G8 met in Gleneagles in July 2005 they asked the IEA to advise on alternative scenarios and strategies aimed at a clean, clever and competitive energy future. The IEA was asked to work on a number of tasks in many different areas. One very important task was transforming the way we use energy. We were asked to identify best practices and assess energy efficiency performance in industry.

The forest products industry is an important part of this effort. Three weeks ago in Paris, we held a workshop on energy efficient technologies and CO₂ reduction potential in the pulp and paper sector. The goal of this workshop was to better quantify the global potential for energy efficiency; CO₂ emissions reduction in the sector; and to discuss various approaches to overcoming the barriers to improvements.

The IEA would like to work closely with industry and look forward to further collaboration on policy recommendations aimed at improving energy efficiency and reducing CO₂ emissions in the forest products industry.

Armando Cafiero (ICFPA):

Members of ICFPA are national or regional forest and paper associations of 38 countries from all continents. They represent over 90% of world paper production and more than 50% of wood production. ICFPA is still a relatively young organization representing the global forest and paper organizations. ICFPA serves as a forum for global dialogue, coordination and cooperation by industry on issues which include sustainable forestry standards; the promotion of the environmental assets of forest products; and of course, climate change.

In this context, the subject of our seminar on Energy and the Forest Products Industry is of central importance both for the sector and for ICFPA. Some of the aspects which make energy a vital factor for the forest industry are:

First, the sector, particularly the pulp and paper industry, is highly energy intensive. Energy efficiency and costs play a major role in competitiveness for the sector. Issues like fossil fuel price volatility impact deeply on the economic and financial viability of companies—requiring attention from management at every level.

The second aspect is the development of Kyoto Protocol-related policies as a response to climate change. I am referring to measures aimed at promoting the use of bioenergy and the development of legislation, such as emissions trading schemes. These measures, together with the fact that energy has become one of the top priorities of policy makers at international and national levels, are setting the legal framework in which companies have to operate.

Regulatory requirements bring logical limitations but also opportunities. However, some consideration must be given to measures that are potentially market-distorting. We are all aware that this is a very sensitive issue but I am sure that it will be adequately addressed in these proceedings.

A third aspect is the need for the industry to constantly improve its competitiveness and sustainability—bringing companies to invest considerable resources in improving their energy efficiency. Surely more can and must be done. The sector, by its very nature, has become a player of the first level in bioenergy production and consumption. As such, it has become a significant part of the solution to the energy and climate change challenge and has the potential to play an even larger role.

Given the central relevance for our sector of this aspect, ICFPA and its members are fully committed to an open, transparent dialogue with all the stakeholders and policy makers. In this dialogue, our industry has a lot to learn, but also has a unique opportunity to take pride in its achievements and its potential.

Our seminar, in such an important venue as FAO headquarters, proves that awareness of the need to strengthen cooperation on these issues goes well beyond the industry. The programme of the seminar, moreover, recognizes that the global nature of the climate change and energy challenges have national and even local implications. It is important to gain a better knowledge of the international scenario and its outlook but it is also essential to learn from each other, from the experiences and developments taking place in the various regions of the world.

I am sure we all recognize the potential of such programmes to bring a significant contribution to many policy developments, but even more important, to enrich each of us in our everyday job on these issues at home.

Conclusions

- Well-integrated and carefully balanced energy and forest policies set the stage for enhancing the contribution of the forestry and forest products sector to mitigation of climate change. Governments, industry, institutions and civil society at large each have a role to play and should work together.
- Issues related to the nexus of energy, climate change, environment, forestry and forest products industry may differ from country to country, from region to region, maybe even between forest products sub-sectors, and so do solutions. Actions should be taken locally with the global picture in mind.
- Governments should prepare stable and sustainable regulatory frameworks. Creating a level playing field and enabling fair competition should be guiding concepts for such frameworks.
- The forest products industry can play a significant role in combating climate change by optimizing the use of raw materials, increasing efficiency, producing bio-energy and expanding into bio-refinery products while developing the competitiveness of the sector.
- The forest products industry has the exceptional ability to become a net supplier of a range of energy products and it could become an important actor in contributing to the mitigation of climate change.
- The forest products industry suffers an image problem. There is a need to work proactively with the general public and spread a positive message.
- Developing countries, particularly in the tropics, urgently require assistance to make better use of forest and mill residues for energy generation
- International organizations such as IEA and FAO can help to promote, improve and provide analysis on the collection and dissemination of data and information. To this end, feedback from the industry is needed. International organizations can also facilitate in developing partnerships with others, for example with NGOs, and provide neutral fora for discussion. Coordination of research, sharing of research results and information is also necessary.

Theme 1 Round Table Discussions

Moderator: Christopher Prins
Chief, Timber Section, UNECE Trade, Development and Timber Division

Panellists:

1. Neil Hirst (IEA)
2. Jeremy Wall (Forest-based and Related Industries Unit of the European Commission,)
3. Ludwig Moldan (Brazilian Pulp and Paper Association-Bracelpa)
4. Pietri Vasara (Poyry Forest Industry Consulting)
5. Tom Rosser (Forest Products Association of Canada)
6. Gustavo Best (FAO Office on Bioenergy)

1. Need for Policy coordination

Bioenergy has an important role to play in the future energy economy because it can contribute to energy security, the environment and, in the right circumstances, to economic energy supply. It is, however, broadly acknowledged that there is a lack of consistent energy policies at national level. Even where they do exist, they often overlap with those of agriculture, forestry, forest products industry and environment. Need for policy coordination among the relevant sectors was emphasized.

A number of questions on this point were raised, such as:

- What mechanisms are in place to ensure that these policies do not contradict each other? In particular, is an appropriate policy framework in place to encourage the sustainable use of wood energy?
- To what extent does the present situation produce a “level playing field” across regions, between industry sectors, and between materials?
- What is the relative importance of the policy instruments we have seen in the market?
- To what extent is the promotion of bioenergy dependent on high oil prices?

It is recognized that there are complex linkages between energy policy, environmental policy, and the value chain for bioenergy. That creates tremendous scope, in policy terms, for unintended consequences. For instance, development of policy-driven carbon markets could, over time, have a significant impact on, and implications for, forest and paper industries.

In developing countries, the whole decision-making process related to policies on bioenergy tends to be poor, partly because of lack of data but also due to the lack of methodologies for analyzing the sector. Bioenergy cannot be treated in isolation from environment, from rural development and from the energy sector. Bioenergy has to be further integrated into energy policies in many countries – again, this involves not only policy, but knowledge. Policies and methodologies need to be available to answer questions like: is there enough land? are we threatening the environment? are we threatening small farmers?

Circumstances do vary from region to region, country to country, and locality to locality. For example, EU set several goals and targets to reduce dependency on fossil fuels, but left it to each member state to decide how to attain these goals. Energy efficiency and carbon storage are two important areas where EU can expect to make significant progress.

Data and statistics on the production and consumption of bioenergy are very weak. We do not know much about the sources and uses of bioenergy, including woodfuels. Recognizing this weakness, EC and FAO, in collaboration with IEA, are conducting a study in Europe to obtain a better picture of who is producing how much wood for energy and who is using this, and in what form.

2. Policy, economics and industries

There exists potential for a win-win situation if a positive market signal is created for the use of biomass as a renewable fuel. This could strengthen the competitiveness of the forest and paper industry, make a significant contribution to emissions mitigation and provide a positive incentive for sustainable forest management globally. It is important to note, however, as illustrated in Mr. Jeremy Wall's presentation, that there may arise conflicts of interest between forest resources increment, traditional harvests and additional demand created by the EU's fixed target for renewable energy supply.

There is potential for unintended consequences with respect to emissions pricing, specifically where it changes the relative price of forest and paper products in relation to competing materials. There were mixed signals from the market about whether competition exists between the use of wood for energy and its use for forest products. In the case of Sweden, the CO₂ tax introduced in 1991 facilitated to some degree the increased use of wood for energy from harvesting residues and enhanced efficiency in the use of waste products from the paper and pulp industry. Bioenergy, especially for heat production, has relatively low investment costs and, therefore offers the least expensive option presently available for pulp/paper and sawmilling industries. There are some small instances in agriculture of raw material competition between the energy and food sectors, but they are relatively minor.

3. Research and technology

Biofuels from black liquor could become cost-effective in the future and investment in R&D and demonstration of those technologies is extremely important. New technologies for using forest products for energy are emerging, such as hydrolysis and fermentation processes of lignocellulosic materials to liquid fuels. This could have a tremendous impact on the role of forests and forest products in the future bioenergy scenarios.

4. Concerns about increased production and use of biofuels

Several major NGOs have been presenting bioenergy as a threat to sustainable development because of the problems with increasing intensity of land-use and threats to biodiversity. Some media tend to emphasise negative views of biodiesel and biofuel. We need to send a clear, scientifically-based, objective message to politicians and to stress the need for long-term research.

5. Efforts to address bioenergy issues

EU is in the process of preparing a renewable energy roadmap which looks ahead at the situation from 2010 to 2020 and which includes the impact of an energy efficiency action plan which aims at saving 20% of energy in the EU by 2020.

2008 State of Food and Agriculture (SOFA), which is one of the flagship publications of FAO, will be dedicated to bioenergy. This will represent an enormous challenge because, by then, sufficient knowledge, data and examples of bioenergy production and uses should be available, including lessons learnt from both positive and negative experiences in member countries.

UNECE would hold a workshop on mobilization of wood resources in Europe in Geneva in January 2007. The focus was on "can Europe's forests satisfy the increasing demand for raw material and energy under sustainable forest management?" This is a big challenge, involving looking into value chains, efficiency and logistics as well as its impact in the sector on sustainability and finding the optimum mix.

Theme 2 Round Table Discussions

Moderator: Jack Saddler, UBC

Panellists:

1. Michael Obersteiner, IIASA
2. Mikael Hannus, Stora Enso
3. Alexander Moiseyev, EFI
4. Paul Vantomme, ITTO
5. Zulkifi Bin Ahmad, Forest Industry Unit-Forestry Department Malaysia
6. Benin Andrey Alexandrovich, Russian Federation State Duma
7. Bernard de Galember, CEPI
8. Gerard Closset, Closset Consulting
9. Máthé Lázló, WWF

1. Climate change and bioenergy

In view of the UNFCCC COP12 meeting scheduled for the following week, a number of questions were asked in relation to climate change, such as:

- Will increased production and use of biofuels in place of fossil fuels increase competition for land as resource?
- How should the potential of forest “sinks” be handled in the post-Kyoto Protocol negotiations, specifically for Europe, North America, Japan and the boreal forests?
- Are there both good and bad emission reductions?

Diverse views were expressed, including:

- If the carbon price increases over time, it could happen that, after selling credits at a very low price, one could be liable to a high price for a bigger carbon stock. On the basis of purely economic calculations, it actually makes sense to harvest earlier in order to avoid such high liability. A great deal depends on variations in the CO₂ price and on what use is made of the harvested wood afterwards.
- What is actually paid is a rental fee for temporary storage of carbon in the forest, as long as power plants using fossil fuels continue to function.
- Forest sinks properly belong in national carbon accounting and should not be put on the market because of the risk posed by speculation bubbles to long-term forest policies and forest management. Climate change is a global issue but accounting for emissions takes place within national borders.
- Good emission reductions can produce the same outputs with less emissions or can even increase output with less emissions. Bad emission reductions shift emissions from inside the border to outside the border. It is not clear whether the EU policy on bioenergy consists in shifting emissions from Europe to somewhere else or in actually delivering emission reductions.
- If the consumption pattern of paper in Europe does not change and if wood is diverted from pulp and paper to bioenergy, it means that the demand for pulp and paper in Europe will have to be met from elsewhere. This is not reducing emissions, but simply shifting them from one place to another. Policymakers need to thoroughly evaluate what these indirect impacts could be. There is potential for good emissions reduction through bioenergy but there is also an enormous potential for bad emission reductions.

2. Bio-refinery

High hopes have been pinned on the potential of bio-refinery to promote increased use of biomass for energy, including wood energy. At the present stage, the forest products industries in EU and North America seem to be interested in the bio-refinery potential but are being cautious in making investment decisions. Views expressed include:

- Bio-refineries will need more biomass but new technologies will also enable the current raw material base to be used much more efficiently.
- There has been gradual evolution over the past couple of years in the US. The industry tends to be very conservative and when it comes to making any new products other than traditional products (pulp, paper, wood products, etc.) there is certain reluctance. It is no coincidence that mill closures in North America continue, so the prospect of making the whole process more efficient and the potential of introducing a totally new line of products is beginning to appeal to North American manufacturers.
- Still lacking in the US are the incentives for biofuels from the forest industry. The agricultural sector has been far more successful in obtaining benefits from the government and the forest industry is just beginning to wake up to the fact that a good opportunity exists and that they need to work with the government to achieve such benefits.
- It is indeed a promising way forward and a field for further research and development in Europe.
- Early bio-refineries need to be in association with other commercial plants so the waste heat can be utilized in an efficient manner. Creating a “Greenfield” bio-refinery doesn’t make much sense at this point.
- Process integration, not only technological improvement in pulp and paper manufacturing, can save a lot of energy.

3. Deforestation

- The drivers for deforestation, which accounts for about 20-25% of the world CO₂ emissions, are very complex but the most significant one is the expansion of agricultural frontiers. This takes place differently in various parts of the world and in Latin America it is mostly for soy crop expansion and for production of cattle. In Southeast Asia it takes place largely for palm oil expansion. Strong demand for these products in Europe and elsewhere could be reinforcing this driver of deforestation.
- Europe will never be able to cover its energy demand and always be to some extent dependent on imports. Palm oil is considered to be one of the most efficient biofuels at the moment. Unfortunately, it is grown in regions where there is also significant deforestation going on and this should be taken into account in the energy and greenhouse gas balances.
- Problems arise when bioenergy plantations, annual or perennial, are created at the cost of forests, but the prospect for the second or third generation biofuels are good.

4. Black liquor gasification

There is a potential for efficiency gains if black liquor gasification is widely introduced. And obviously, if black liquor is used to make biofuels then there should be another way to provide energy to the mill. In this regard, collection of materials left in the forest as residues should be considered:

- Producing methanol with black liquor gasification requires large amounts of biomass to be introduced to the plant or to the mill in order to keep the steam balance. The total CO₂ mitigation is not much if that biomass could have been used for some other purposes in society.

5. Energy efficiency in the tropics

In the tropics, efficiency of logging operations and wood processing remains very low. By transferring knowledge on best practices and providing assistance in putting them into actual practice, developed countries could be of help in improving energy efficiency.

One of the best practices ITTO promotes is the criteria and indicators for sustainable forest management at the forest level, particularly reduced impact logging. There is a need to expand the capacity building opportunities for developed countries to achieve more efficient handling of logging operations and better utilization of residues and wastes at processing plants.

ITTO facilitates information sharing and best practices in this regard and is planning an international conference at the lignum Hannover fair next year to bring the tropical countries on board so that they can learn from the available technology and practices presently in place in Europe and North America and see how much this can be transferred to the southern production regions.

Theme 3: Round Table Discussions

Moderator: Niel Hirst, IEA

Panellists:

1. Frank Taelman, Siemens NV
2. Pekka Kullervo Ahtila, Helsinki University of Technology
3. Reid Miner, NCASI
4. Thore Berntsson,
5. Tom Rosser, Forest Products Association of Canada
6. Gianluca Sambucini, UNECE
7. Hiraku Nihei, Japan Paper Association
8. Marco Mensink, CEPI

The discussions centred around how to promote energy efficiency in the pulp and paper industry and the roles of governments and the industry sector respectively.

1. Energy efficiency opportunities

It was generally agreed that more could be done in terms of avoided emissions by promoting cascading use of wood and paper products. Views expressed included:

- The share of non-recyclable paper products, which for Europe is estimated at around 20%, that end up in one of two places. One is landfills, where they produce methane emissions, and the other is energy production, where they can actually generate power. A unique characteristic of the wood and paper cycle is the fact that the products maintain their energy content throughout their life cycle and, once their recycling possibilities are exhausted, they can go to incineration to generate energy.
- The potential for further enhancing energy efficiency of sawmilling and wood-based panel industries is limited.
- Recovery of solid wood products which, at least in Germany, accounts for significant volumes of demolition materials such as from roofs, pallets and furniture, most of which is currently burnt.
- Efforts should be made to use all residuals in forestry and in pulp and paper manufacturing. In Russia, ethanol has been produced from wood for many decades. Furthermore, lignin separated from black liquor can be used as raw material for the chemical industry.
- In Scandinavia, chemical potential of wood material is being studied, and research and development work is expected to intensify.
- Better utilization of rejects from industries requires the application of “best-available” technologies, if economically available; these also have to be locally acceptable.
- We should focus on benchmarking for future technologies, taking all the regional/country differences and conditions into account.

2. Policy interventions

The pulp and paper industry is heavily capital-intensive. Investment decisions for equipment renewal and technical improvement for higher energy efficiency need to be supported by stakeholders, including governments and society as a whole. Views expressed include:

- The Japanese pulp and paper industry is expected to increase use of wood from domestic sources, from the environmental and carbon point of view but this is on a voluntary basis. At the moment, for the industry to stay competitive, it is much cheaper to import wood and wood chips (depending on exchange rate).

- In the 1990s, dioxin was a serious problem in Japan. The Ministry of Environment decided that incineration of all kinds of waste should be done at temperatures above 800 degrees. The key to success was that the whole industry, the population and the government worked together.
- There are three major policies in Sweden today which affect the pulp and paper industry heavily: electricity certificates, voluntary agreement between the government and the industry, and the CO2 trading system.

3. Subsidies, incentives and competition

Examples of trade patterns were given which are presumably the results of subsidies. Forest products industry faces competition when wood for energy use is given preferential treatment. Concerns were expressed both about subsidies and the distorted market they engender.

- Because of the competition caused by subsidies to the energy sector, Switzerland is importing the raw material for its paper and pulp industry from Germany and exporting pellets to Italy.
- The Austrian subsidy scheme for bioenergy has resulted in huge imports from the Czech Republic, which has a scheme focussed on obtaining residues from forests. Pulp wood is exported to Austria because of the subsidies there. There are net exports of woody materials from Portugal to Italy and huge vessels are bringing wood chips from Canada to European ports to collect European subsidies.
- Wood prices are increasing everywhere and transportation distances are increasing because of subsidies. Subsidies have their own role to play but should end at a certain time and have a limited mandate.
- Well-intentioned energy subsidies supporting renewable energies on the energy market should not lead to distortion of the raw material market.
- Rather than straight subsidies, incentives for positive behaviour should be promoted.

4. Follow-up events

- Committee on Forestry. At its 18th session in March 2007, this committee which is the governing body of the FAO Forestry Department, will consider an agenda item on energy under which the results of this seminar will be presented; a side event has also been planned.
- ICFPA will consider next steps towards a global CO₂ position on energy and climate change at its meeting in Shanghai in June 2007.
- IEA will continue the process of communication both through its reports to the governing board, representing 26 OECD countries, and through reports on energy efficiency to the G8.

Wrap-up session

Moderator: Wulf Killmann

The questions posed by the moderator to facilitate the discussions were as follows:

1. What can industry do to increase its contribution to climate change mitigation?

- 80% of the energy performance of a pulp and paper mill is determined on the day machinery is purchased. All that can be done afterward to increase energy efficiency is de-bottlenecking, optimizing, etc.
- CEOs want to hear about the kind of returns that new investment in technological improvement is going to provide. They need to be convinced that mitigating climate change does not harm productivity and is very good for the companies in terms of reducing costs and/or introducing new lines of products.
- The forest based sector technology platform is starting; this will be the framework for spending under the seventh framework programme of the EU where the entire chain (the whole sector) is involved in developing R&D for the future. Industry, suppliers, and researchers will be working together on this platform.
- The forest products sector is probably one of the lowest investors in research of any of the resource based sectors. There is serious lack of funds for R&D.
- The dryer section of the paper machine is the main user of energy, followed by the concentration of the black liquor. Breakthrough technologies are needed that completely change the way mills dry paper and how they concentrate black liquor. A single company does not have the economic power to implement such developments anymore. In order to use scarce R&D dollars more efficiently, collaborative R&D is desired. American industry should cooperate more with European counterparts or industry from around the globe.
- The US, Sweden, Finland and Canada already started working on black liquor and biomass gasification by sharing information and research between the various countries to avoid duplication.
- Black liquor gasification has a potential to be far more efficient than using a black liquor boiler.
- In the Nordic countries, R&D in biorefinery is expected to reach 100s of millions of dollars in the next few years.
- Converting wood to transport fuel (liquid/gasification) seems to be unrealistic with the technology available today.
- Cascading use of wood is the most efficient method; it starts in forests and ends when the products made from wood are burned for energy. The emphasis should be on how to maximize what the tree offers us.
- Rising wood prices triggered by growing demand from the energy sector should increase the amount of wood that is brought out of forests with some time lag.
- The forest products sector has a “black liquor image” that is linked to sunset, blue collar, and environmentally negative connotations but the opportunities offered by bioenergy and biomaterials should be a drawing card. There is a need to disseminate a correct and positive message in a coordinated way to policy makers, general public (including NGOs), students and consumers.
- CEPI issued a joint statement with WWF on bioenergy, supporting the most efficient use of biomass and expressing concerns about the possible impacts of renewable energy system policies on sustainability.
- Particulate emission from small wood stoves/heaters poses health risks; petrol and gas are much better in this regard. In Norway, new filters to reduce particulate emission are available and they are cheap (170 to 400 euro) but not widely used because people don't think it is necessary.

2. What do we expect from governments to balance the wood supply for the energy and forest products industries, including the issues related to subsidies?

- There should be a stable regulatory framework but it must also be a sustainable one. Targets must be challenging but they must also be achievable.
- Government policies must also be assessed for the distortions they can cause.
- Use of solid wood and fibres creates much more employment than their use for energy. Government policies should look at health aspects as well as energy, jobs and growth.

3. What do you expect from international bodies like IEA and FAO in the follow-up to this seminar?

- International organizations are expected to provide quantitative data and analysis. They can provide a forum by sponsoring workshops like this.
- Data on energy and CO₂ in this sector is lacking and that might be the first statement by IEA to the G8 to start working.
- They can facilitate collaboration between and other industry sectors. Taking bio-refining with wood as an example, integrating that with bio-refineries in the sugar, starch and potato sectors makes a lot of sense. There are other sectors with large tonnages and similar problems in drying natural materials and much to be learned from sharing experiences.
- There is a need for one portal or entry point across the ocean where people meet each other—not only in practice but also on the web.
- International bodies can promote interaction between developed and developing countries. Without some sort of convening body, interaction both from the technical and the policy side might be less likely to happen.

4. How can we better involve/include developing countries or companies in developing countries in these processes?

- There is an urgent need to assist tropical countries in improving energy efficiency and better utilizing residues in logging and the primary processing sector, such as sawmilling and plywood manufacturing. If forest industries or forest land use options cannot maintain a livelihood for the populations, chances are that deforestation will increase even further.
- The underlying reason for the lack of incentives for the local industry in the tropics to utilize residues and improve efficiency is that logs are procured rather cheaply, protected by log export bans and other measures. Those measures are driven by necessity, particularly social necessities, notably poverty alleviation. Energy generation from waste materials can be relatively easily achieved without large investment. Technology transfer and capacity building will be required.
- Lack of incentives for better resource utilization is not only characteristic of developing countries. It is enconced in the developed countries as well, including North America.
- IEA's Industrial Energy – related Technologies and Systems (IETS) implementing agreement includes Mexico and Brazil. Network of Expertise in Energy Technologies (NEET) is also in place to promote collaboration of non-OECD countries, especially the +5 countries (Brazil, China, India, Mexico and South Africa) in its various implement agreements which focus on energy technology collaboration. An important aspect to the NEET initiative will be finding the “right” counterparts in these countries.
- ITTO, in collaboration with FAO and with the German Government and other agencies, is organizing an international conference on wood-based energy production in tropical timber producing countries (17 - 18 May 2007 in Ligna Hannover). The objective is for the participants to have full knowledge of state-of-the art energy savings technologies, with visits to places of action in Germany. Discussion on policies and on how to promote more efficient uses of residues will also be organised.

PRESS RELEASE

Can the forest products industry be part of a bio-solution to climate change?

Rome, 31 October 2006 - The global forest products industry can play a significant role in combating climate change by optimizing the use of raw material, increasing efficiency, producing bio-energy and expanding into bio-refinery products while developing the competitiveness of the sector.

This was the conclusion of the International Seminar on Energy and Forest Products Industry (30-31 October), in which intergovernmental and private sector organisations of the global forest product industry joined forces. Participants stressed that well integrated and carefully balanced energy and forest policies around the globe set the stage for these developments. Governments, industry, institutions and society at large each have a role to play and should work together.

The forest products industry is a major consumer of energy, using 6 percent of total industrial energy use in 2003. But the industry also produces energy, as well as other by-products that can be used for energy generation. It is the only sector that already generates approximately 50 percent of its own energy needs, the majority from renewable carbon-neutral biomass. Energy costs, energy supply and climate change are amongst the core issues impacting on the future of the forest products industry.

"The forest products industry can be part of the solution for climate change if committed to technological changes and energy efficiency," said Neil Hirst, Director of Energy Technology of the International Energy Agency (IEA). "It has the exceptional ability to become a net supplier of a range of energy products and it could, in combination with carbon capture and storage, become an important actor in removing carbon dioxide from the atmosphere",

Wulf Killmann, Director of Forest Products and Economics at FAO, said that this potential needs to be tapped. "Governments have a key role to play in encouraging industries to use cleaner and more efficient energy technologies and in promoting bio-energy."

"Wood and paper products are uniquely renewable and recyclable products that help reducing greenhouse gas emissions by absorbing carbon dioxide from the atmosphere," said Teresa Presas, Chair of the International Council of Forest and Paper Associations (ICFPA). The industry is committed to innovative energy solutions that meet the challenge of climate change, increase efficiency, reduce reliance on fossil fuel and expand the use of renewable energy sources. The industry believes that fibre from sustainable managed forests makes a positive contribution to the world's future energy supply.

"To achieve this", Presas said, "the industry needs enabling policies that support research and innovation, promote demonstration projects and improve the investment climate, specifically in this sector. Moreover there needs to be a level playing field between energy and non-energy uses of wood, considering that all this has to take place within the boundaries of sustainable forest management."

The World Wide Fund for Nature (WWF) would be glad to see the global forest product industry taking a stronger role in the energy and climate change mitigation field, but also sets some requirements. "WWF considers that sustainable bioenergy has to be part of the global strategy to reduce greenhouse gas emissions, among other measures aiming to reduce the ecological footprint. Credible certification of bioenergy feedstocks with a focus on social and environmental issues - including greenhouse gas calculations - and land use planning are part of the solution to ensure the sustainability of development", said Duncan Pollard, Director of the WWF Forests for Life Programme.

The seminar was jointly organised by the Food and Agriculture Organization of the United Nations (FAO), the International Energy Agency (IEA) and the International Council of Forest and Paper Associations (ICFPA), in collaboration with the UN Economic Commission for Europe (UNECE), the International Tropical Timber Organisation (ITTO) and the World Business Council for Sustainable Development (WBCSD).

During the meeting, ICFPA, FAO, IEA and WWF agreed to continue working together to apply the unique potential of the forest products sector to mitigating climate change and increasing energy security. The IEA will prepare report back to the G8 with an analysis as part of the Gleneagles Summit Plan of Action and ICFPA will take forward its global CEO leadership statement on energy and climate change in June 2007 in Shanghai.

Contacts:

ICFPA

Eleanor McFadden Tel. 3226274926

e.mcfadden@cepi.org

IEA

Cecilia Tam Tel. 33140576755

cecilia.tam@iea.org

FAO Cheemin Kwon Tel. 57054464

cheemin.kwon@fao.org

WWF International

László Máthé Tel. 36305866660

laszlo.mathe@wwf.hu