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European Forestry Commission

Joint FAO/UNECE Working Party On Forest
Economics And Statistics

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Item 7 of the provisional agenda

SPECIAL TOPIC: MONITORING AND ANALYSIS OF WOOD ENERGY DEVELOPMENTS

Note by the Secretariat

This paper reports the progress made in implementing the action points that were agreed at the 2005 Working Party meeting.

After several years of investigating available data on wood energy and assessing data from publications the secretariat drafted a questionnaire in 2005.

Searching for the smallest common denominator, the secretariat changed the strategy and drew up a very detailed questionnaire offering ample scope to fill in all available national data on wood energy deriving from many different sectors (energy, forestry, waste etc.).

Collecting disaggregated and detailed data instead of looking for the lowest common denominator avoids loss in data precision. Negative impacts on the aggregate caused by missing information on single items can be avoided.

The results presented in this paper lead the discussion to the point where the Working Party is requested to consider how to continue the work to improve the quality and availability of information on wood energy.

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1. Introduction:

1.1 Recent developments in the wood energy sector

1. The last 12 months have seen several developments that will impact on the use of wood as an energy source and almost certainly lead to increased demand.

2. Firstly, the Kyoto protocol came in to force on 16 February 2005 when the Russian Federation ratified the treaty. While the precise impacts of this are difficult to forecast, the pressure that it places on governments to reduce levels of CO₂ emissions can be expected to be a strong driver for increasing wood's share in total energy production.

3. Secondly, 2005 has been the first year since the 1980s when the annual average price for crude oil has remained, consistently, well above \$50 per barrel, reaching record prices and closing the year at more than \$65 per barrel. Gas prices, too have spiralled and the extremely cold winter, especially in central and eastern Europe, has seen unprecedented demand for gas, with some interruptions to supply. High fuel prices in themselves will be a strong driver for a growth of wood energy. Different energy agencies predict that, while prices are likely to ease over the next two years,¹ they will nonetheless remain significantly above \$40 per barrel. At these prices, even without subsidies, wood should be competitive with oil and gas, so that investment in wood energy will gain further momentum. In addition, concern about the security of energy supplies should also work strongly in wood's favour.

4. Wood is a highly versatile raw material that can be used in the wood processing industry or for energy purposes. Competition for the raw material "wood" e.g. for energy, will have an impact on the market structure and supply chains. Wood as renewable, carbon neutral, energy source will drive political and economic decisions throughout the next years. Therefore, decision makers urgently need detailed and reliable information about bio-energy and the dynamic development.

¹ Prices for crude oil, petroleum products, and natural gas are projected to remain high through 2006 before starting to weaken in 2007. For example, the price of West Texas Intermediate crude oil, which averaged \$56 per barrel in 2005, is projected to average \$63 per barrel in 2006 and \$60 in 2007. U.S. Department of Energy's Short-term Energy Outlook. January 10, 2006. <http://www.dailyfutures.com/energies/>.

5. This report describes the ongoing work of the secretariat to improve the data quality on wood energy. It is important to have reliable data about the amount of energy that is produced using wood as well as the sources of the wood. Of particular interest is how much of the wood used for energy is sourced directly from the forest.

1.2 Wood energy and the Joint Working Party on Forest Economics and Statistics

6. Wood energy has been a regular topic at the annual Timber Committee Market Discussions since 2002. It featured as the major topic of the Policy Forum in 2003, the same year that it entered the agenda of the annual meeting of the Joint Working Party on Forest Economics and Statistics.

7. The breakout session on wood energy during the Joint FAO/ECE Working Party on Forest Economics and Statistics (15-17 March 2004, Geneva) confirmed the importance of reliable and accurate information to aid policy discussions. The major obstacle to assess the situation and the development throughout the UNECE region was the unsatisfactory **quality of wood energy statistics**. In the following year the secretariat was asked to **assess the sources and quality of information** available via national statistics correspondents and other sources.

8. By the end of 2004, the European Forest Sector Outlook Study (EFSOS)² identified the outlook for wood energy as a crucial area, which was not well understood, partly because of the weakness of the information base (unclear definitions, bad quality information, missing information).

9. Some of the missing definitions were given by another publication, released in the same year by FAO. The comprehensive Unified Bio-Energy Terminology (UBET³) followed up the Unified Wood Energy Terminology (UWET⁴). These standards have not yet been universally adopted or applied in practice, however.

10. As Item No. 6, wood energy was the subject of discussion during the Joint FAO/ECE Working Party on Forest Economics and Statistics from 20-24 March 2005. A stakeholder analysis provided information about the different data available by county and the different organizations involved in data collection⁵.

11. An outcome of the Joint FAO/ECE Working Party on Forest Economics and Statistics was the setting up of an *ad hoc* group on Wood Energy Statistics.

1.3 Tasks assigned to the secretariat and others for the period 2005/2006

12. At its meeting in March 2005 the Working Party requested that the secretariat:

- (a) Identify the lowest common denominator of wood energy data, which all ECE countries should aspire to provide
- (b) Analyse existing “real” data (national and international statistics, ad hoc surveys) supplied to the Working Party and from other sources, notably energy surveys, to get a first picture of wood energy at the regional level.
- (c) Make recommendations for permanent arrangements
- (d) Throughout, be very precise and whenever possible use internationally agreed solutions with regard to use of terms and concepts

2 Electronic version published in December 2004

3 Published in December 2004 (<ftp://ftp.fao.org/docrep/fao/007/j4504e/j4504e00.pdf>)

4 Released in 2001

5 Report for the Working Party 2005 http://www.unece.org/trade/timber/docs/stats-sessions/stats-27/English/Wood_Energy_Background_Paper.doc and the table http://www.unece.org/trade/timber/docs/stats-sessions/stats-27/English/wood_energy_responses.xls further informations http://www.unece.org/trade/timber/docs/stats-sessions/stats-27/English/Links_to_Wood_Energy.htm

- (e) Ensure that the Joint Sector Questionnaire correspondents are aware of other wood energy data sources, as presented to the working party
- (f) Work with all data suppliers including notably national statistical officers and energy ministries and make contact with any possible effort by other organizations

13. To progress these actions it was agreed to set up a wood energy discussion group (Wood Energy Statistics Working Group) with representatives of international organizations and interested countries. UNECE, FAO and EU expressed their willingness to contribute, and would contact the International Energy Agency (IEA) on this issue.

2. Work of the secretariat in 2005

2.1. The wood energy discussion group

The list-server discussion group

14. As agreed after the last meeting of the working party, a group of volunteers was established. In May 2005 a list-server based discussion group was set up to aid communication among the members <http://lists.unece.org/scripts/wa-UNECE.exe?LMGT1>.

15. The level of participation in the discussion group has been low. Several who volunteered to become members have not taken part at all and discussion has tended to centre on a much smaller group of active members. It is possible that many who joined the group did so as a means of keeping themselves informed, rather than as a means of contributing views. Those who have participated have given much useful feedback. The most active members were invited to attend a discussion meeting that took place in Hamburg on 10 October 2005.

The Hamburg meeting

16. In September 2005, Nico Leek of (Probos Netherlands) became aware of the list-server group. He suggested that there might be merit in arranging a meeting to exchange ideas and explore scope for joint working. Probos had worked closely with Udo Mantau (Bundesanstalt für Forst und Holzwirtschaft - BFH) since 1997, studying wood balances in Germany and the Netherlands. Nico Leek invited the Secretariat and other members of the List-server group to a meeting in Hamburg.

17. Based on the results of the list-server discussion the secretariat presented the draft version of a simplified grid that integrated the different possible wood energy flows of the UBET scheme between S1-3 and U1-3 (ANNEX II). Using information taken from the chapter on wood energy in the national market statements for the Timber Committee, 63rd session, proved the feasibility of filling in the different cells (ANNEX I). The lowest common denominator in this grid would have been the filled in the outer line "frame cells", that give an aggregated total sum for the different sources and users. The different data quality of two sample countries showed, that the grid would easily adapt to varying conditions.

Outcome/Decisions

18. Since countries would have to aggregate data to provide information for the categories S₁₋₃ and U₁₋₃, it was accepted that a better approach would be to ask for data for different commodities. By giving countries the chance to report data for separate commodities e.g. sawmill by-products or recovered wood, there would be far greater flexibility to analyse the data. It would still be possible to aggregate the data if this was desired provided, of course, that all data were present, adopting the UBET categories. In addition, it would avoid the need for countries to interpret what commodities fell within the different UBET categories and thus reduce the scope for errors.

19. It was agreed, therefore, to draw up a more detailed questionnaire, based on a grid that Udo Mantau had used in his research on wood balances and the wood energy markets in Germany and the Netherlands and to send this to 11 sample countries: Austria, Canada, Estonia, Finland, Greece, Italy, Portugal, Russian Federation, Slovenia, Sweden, USA.

2.2. The Secretariat

Issue of the questionnaire

20. Before the questionnaire was sent out, the secretariat adjusted the wording and set up definitions and conversion factors based mainly on the UBET document. In addition, the List-server group was invited to comment and these were integrated into the document. A covering letter gave guidelines on filling in the questionnaire (for a comprehensive description, please see [Annex III](#)) Before sending out the draft questionnaire to the sample countries the advice from the Working Party as well as the List-server group has been requested. To reduce the work for countries, the secretariat pre-filled as many data fields as possible using official data plus estimates from unofficial records and reports.

21. Questionnaires were sent to the JFSQ national country correspondents, of the 11 sample countries, on 11 November 2005 requesting replies by 9 December 2005.

Presentation of secretariat's work at the IEA meeting

22. A further outcome of the Hamburg meeting was that the International Energy Agency (IEA), having heard about the questionnaire on wood energy, expressed interest in learning more and invited the secretariat to give a presentation at the International Meeting on Energy Statistics 2005 (IntEnerStat) in Paris 21/22 November 2005.

Return of the replies

23. Only four countries from the 11 that were sampled (Austria, Finland, Slovenia and USA) completed the questionnaire. Three countries (Canada, Sweden and the Russian Federation) explained that they were not able to complete it at that time. Three countries confirmed receiving the request (Estonia, Italy and Portugal) but did not return comments or a completed questionnaire. No contact could be established with the Greek correspondent (3 attempts).

24. Since then, the secretariat has worked with the IEA to issue the questionnaire to a range of further sample countries but these replies arrived too late for analysis and inclusion in this paper. A short written update on the results from the questionnaires that IEA issued will be given in advance of the Working Party.

Analysing the replies – what do the data tell us?

25. The number of sample countries and replies is too small to allow general conclusions to be drawn about wood energy in the UNECE region. Limits on space have prevented inclusion of data in this paper. Copies of the responses will be available at the meeting.

26. The tables below, using data for Austria, Estonia and Finland show how these data could be presented in a simplified output grid. The data from Slovenia were incomplete. The data for USA have not been included simply because of limits on text but they will be available at the meeting.

27. The responses allow a comparison to be made of the scale of use of wood for energy with wood consumption by other forest based industries. They identify also the main users of wood for energy and the sources from which the wood for energy has been derived. Thus, for Finland, the main users appear to be electricity and heat producers. There is significant consumption of wood (and its derivatives) by industrial users in Finland but these figures are missing. When the secretariat issued the questionnaire in November 2005, black liquor, a major source of 'wood' energy in the pulp sector, was left out. Austria

took the view that this was a significant omission. Before completing the questionnaire, Austria modified it, to include black liquor. By this time, however, Finland had returned its completed questionnaire.

Finland (2004):

[1000 m ³]	S ₁ Direct	S ₂ Indirect	S ₃ Recovered	S	%
U₁ Power and heat	2310	27000	350	29660	86 %
U₂ Industrial	
U₃ Private households	4500	1000	-	5500	14 %
S	6810	28000	350		
%	20%	79 %	1 %		
				35160	

Industrial round wood consumption (1000 m ³)	Direct fuel wood consumption (1000 m ³)	Total wood for energy production ⁶ (1000 m ³)
62 000	4700	35160 (!)

Comments: The responses do not distinguish between combined heat and power (CHP), heat alone and electricity. Consequently, it is not possible to make a distinction between internal consumption and energy sold on the market. The data suggest that only 14 % of the energy derived from wood is used by private households. This

low figure might reflect that many households buy energy from existing combined heat and power (CHP) or district heating plants. Under this system of recording, even though the householder buys heat energy or electricity derived from wood, the volume of wood appears as user category U₁.

Austria (2004):

[1000 m ³]	S ₁ Direct	S ₂ Indirect	S ₃ Recovered	S	%
U₁ Power and heat	100	4100	...	4200	20 %
U₂ Industrial	1100	7000	...	8100	37 %
U₃ Private households	8000	1200	...	9200	43 %
S	9200	12300	...		
%	43 %	57 %	...		
				21500	

Industrial round wood consumption ⁷ (1000 m ³)	Direct fuel wood consumption ⁸ (1000 m ³)	Total wood for energy production (1000 m ³)
20 000	9200	21500 (!)

Comments: Austria returned its completed questionnaire within 24 hours, though it was not able to provide data for recovered wood. Fuelwood supplied directly from the forest is of major importance in Austria (43%). Individual private households account for 43% of all wood energy use. This figure is perhaps not surprising

in a country where half a million households use wood as their principal heat source. Indirect wood fuel plays a less important role for the private householder than for power and heat production or internal industrial use. Power and heat generation account for 30 % of the consumption of indirect wood fuels.

⁶ Questionnaire on wood energy

⁷ JFSQ 2005

⁸ JFSQ 2005

Estonia⁹ (2004):

[1000 m ³]	S₁Direct	S₂Indirect	S₃Recovered	S	%
U₁ Power and heat	32	2.76 ?	485	517	22 %
U₂ Industrial	80	2.76	621	704	30 %
U₃ Private households	1415	8.28	582	2005	48 %
S	1590	13.8	1940		
%	45 %	0.5 %	54.5 %		
				3226	
					3544

Industrial round wood consumption (1000 m ³)	Direct fuel wood consumption (1000 m ³)	Total wood for energy production (1000 m ³) ¹⁰
20500	1590 ¹¹	3226

Comments: Estonia did not return a completed questionnaire. The data presented here, were taken from the national market statements for the Timber Committee 2005. Total production does not equate with the sum of consumption.

28. A lot of the progress made in the last stage has been the result of the input from Austria. The questionnaire has been improved, so that it is now possible to distinguish between internal energy consumption in the industry and the type of energy (CHP/heat/electricity) sold on the market. Black liquor and thinning residues have been added as energy sources.

29. The questionnaire was sent out as a one-off exercise this time. If it were sent on a regular basis, valuable information about the different developments in the market could probably be detected through a detailed dialogue with national correspondents. This information could provide a basis for informing future political and economic decisions.

How to explain the low response?

30. The secretariat has tried to understand the reasons for the lack of response. It seems that there could be three explanations, possibly more:

- Countries do not have the data that was requested i.e. there are no surveys or regular estimates made of wood energy;
- The data do exist but correspondents do not know how to access them e.g. if they are kept by energy ministries or research institutions;
- The deadline did not give enough time to allow the data to be compiled and, with more time, countries could have completed the questionnaire.

31. At the present time it is not possible to give a definitive answer. It is probable that the explanation is a mix of all three. Canada, for instance, explained that it could not provide figures as it did not have "official" statistics for many of the requested items and could only supply such official figures and not unconfirmed estimates. This was despite the covering letter from the secretariat explaining that estimates were acceptable, provided the source was quoted.

⁹ Data source: National market statement for the Timber Committee 2005

¹⁰ National market statements for the Timber Committee 2005

¹¹ Figure from the questionnaire on wood energy. JFSQ 2005 22000000 m3.

32. The deadline for replies was very tight but no country asked for an extension of time or explained that, while it could not meet the given deadline, it would be able to reply by another later date.

33. In the case of Portugal, which did not reply originally, other than to acknowledge receipt of the questionnaire, the secretariat asked if IEA might approach its contact for Portugal. IEA was happy to cooperate. For reasons of confidentiality, it could not disclose the details of its national contact but it sent the questionnaire to the contact and a partly completed questionnaire was returned subsequently to the secretariat, via IEA.

Improvement of the questionnaire due to national correspondents' feed back

34. The experience and input from national correspondents has helped to improve the questionnaire. The advice from Austria has been especially helpful, i.e. the structural changes mentioned already and the inclusion of both volume and mass for input to energy production and energy output in energy units. The commodity "black liquor" was reintroduced, even though it is used exclusively by industry, internally.

35. Another structural change that has been proposed, is to adapt the questionnaire to the general structure of the IEA questionnaires. This has not been possible yet: it will be a time demanding job that will not influence the general structure of the questionnaire. It will need to be considered.

3. Possible ways forward

36. The results of the work that the secretariat has done in 2005/2006 - in particular, the efforts to improve the quality of data (and data collection) about wood energy - show how difficult it has been to achieve progress.

37. The UNECE/FAO Timber Section has been working on the topic "wood energy" since 2003, The work to date may be seen as a preliminary assessment of available data sources. On this basis, is it reasonable to consider that much of the information for wood energy is in fact available for many ECE countries and that it could be accessed given time and the right contacts?

38. If the work is to progress beyond the current stage, a decision needs to be taken on the form that this should take. Should the secretariat try to revise the questionnaire and undertake a comprehensive survey of all ECE countries for one year?

39. By its nature wood energy is a cross-sectoral topic. Therefore, a cross-sectoral approach will be crucial to tackle it. Assuming that the Working Party agrees that the wood energy work should be extended, the secretariat would need to focus on the following:

- (a) Cooperation/Partnerships:
 - (i) Promote the idea/approach with other (inter-)national organizations and maintain close contact with them. Attend topic related meetings, make presentations and invite specialists from other sectors to our meeting.
 - (ii) Share our network of national specialists
 - (iii) The questionnaire requires more information than JFSQ national country correspondents alone can supply. It could be helpful to develop contact with the national focal points of other sectors involved.
- (b) Data collection:
 - (i) Exchange existing information with other sectors energy/waste/environment etc (bring together stakeholder, specialists, etc.). Consult sectoral specialists for advice (e.g. about common definitions).

- (ii) Allow much more time for national correspondents to supply data and provide them with good backup from Timber Section in case they have questions about the task.
 - (iii) Modify the questionnaire so that it is clearer what information countries are being asked to supply. → At the same time, avoid losing information caused by requesting aggregated data.
- (c) Communication:
- (i) Provide permanent advice in case of questions
 - (ii) Follow up the questionnaire (meet deadlines)
- (d) Output:
- (i) e.g. annual report and publication on the internet

40. If it is decided to go beyond the current stage, this would require fundamental structural changes in the work of the secretariat. Reasons for this are:

41. Pace of progress: We have to accelerate. Timber Section has spent three years assessing the available data on wood energy in its region. In the wake of continuing high oil prices and concerns over energy supply security, wood energy has become highly topical. The work done already and the increasing interest in quality data gives the Timber Section an opportunity to provide the various stakeholders with the necessary data and to enhance the reputation of the forestry and timber sectors.

42. The market demands for timeliness of data on wood energy argue forcefully that an acceleration in pace is needed. This will require structural changes e.g. continuity of staff.

43. Past continuity of the work: Continuity of personnel is important. The secretariat's work on wood energy has been discontinuous. Since 2003 several interns have worked on the topic (Juha Mustonen, Tapani Pakkasalo, Caroline Stein and Florian Steierer). Momentum is lost when these changes take place. New staff have a steep learning curve before they can begin the real work. In addition, external contacts need to be rebuilt. To make real progress a person who can concentrate fully on the wood energy work would be essential.

4. Conclusions

44. After several years investigating existing information about the use of wood for energy the UNECE/FAO Timber section has reached a crossroads. It is clear that data for wood energy are not readily accessible from any one source.

45. The logical continuation of earlier work would be to adopt a more active role in data collection by means of a Timber Section questionnaire on wood energy. Information about wood energy exists in various forms with different data qualities from various sources. Currently there seems to be no one organization that takes a comprehensive view. Experts and expertise are abundant, often appearing to work in separate cells. Most focus on energy output and energy units: they offer little if any information about the different origins of the raw material, the wood. Could a new questionnaire help to assess the influence of the different wood-flows for energy final-use and the impact on the forest based industries?

46. Following discussion within the List-server group and with other specialists in the field of wood energy and wood trade, an attempt has been made to find a lowest common denominator. The first simple grid was modified and instead a draft questionnaire was developed and sent to 11 sample countries. In spite of the variable response there has been much good feedback and there is an intention to redraft the questionnaire to take account of the comments received.

47. This paper highlights the difficulties that the secretariat has faced during the drafting phase and analysing the responses from the sample countries. The Working Party is now requested to give guidance on whether the secretariat is on the right track and the work should be continued or if activity in the field of wood energy should cease. A decision to proceed has implications for resources that cannot be disregarded.

5. Questions for the Discussion:

48. Gathering viable information for permanent data arrangements will require time and staff who have a degree of familiarity with the subject and who can sustain a focus on the work. Finding the right people in the countries who have the data that is needed and having a strategy for maintaining regular contact will be essential for this cross-sectoral topic, which will need agreement on standard definitions and data exchange.

49. To aid discussion, the Working Party is invited to consider the following questions:

- (a) **Would each country consider the points listed at page 9 (para. 2.2.5) Do countries have the data? If not, what are the reasons?**
- (b) **How does the Working Party want the secretariat and national correspondents to continue the work on wood energy?**
- (c) **Is the questionnaire taking the right approach?**
- (d) **Is UBET the appropriate terminology for future data collection? What alternative is there?**
- (e) **What level of commitment would the Working Party wish to see and what resources can be made available?**

6. Annexes

Annex 1
Simplified grid

Which countries can provide data about sources and consumers of wood energy?

This table shows information on countries for which data about fuel wood production and/or consumption are available. The corresponding colour indicates the availability of information at the national level. No responsibility can be taken for the accuracy of the information in the documents.

Country	Volumes [1000m ³]					
	S ₁ Direct	S ₂ Indirect	S ₃ Recovered	U ₁ Power	U ₂ Industry	U ₃ Private
Albania	Y	Y				
Austria	Y	Y (no panels)				
Belgium						
Canada						
Croatia	Y	Y		Y		
Cyprus						
Czech Republic	Y	Y				
Estonia	Y	Y	Y	Y	Y	Y
Finland	Y	Y	Y	Y	Y	Y
France	Y	Y	Y	Y	Y	Y
Germany	Y	Y	Y			
Hungary						
Ireland	Y	Y	Y	Y	Y	Y
Italy	Y		Y	Y	Y	Y
Latvia				Y	Y	Y
Lithuania	Y	Y	Y			
Netherlands	Y	Y	Y			
Norway	Y	Y				
Poland	Y	Y				
Portugal						
Romania				Y		
Russian Federation	Y	Y	Y	Y	Y	Y
Poland	Y	Y				
Turkey						
Slovakia	Y	Y				
Slovenia	Y	Y				
Sweden	Y	Y		Y	Y	Y
Switzerland	Y	Y	Y			
United Kingdom	Y	Y	Y			Y
United States of America	Y	Y	Y			

This table has been compiled from three sources: (1) The questionnaire distributed by the secretariat in 2004 (2) Country Market Statements supplied to Timber Committee (3) Country reports on wood energy. A blank cell indicates no figures were submitted. Data might exist but the secretariat has not so far found them.

	Questionnaire 2004 (17 respondents)
	Country Market Statements 2005
	Country Reports on wood energy
	Source
	User

S ₁	Direct	U ₁	Power and heat generation
S ₂	Indirect	U ₂	Industrial (internal)
S ₃	Recovered	U ₃	Private households

The table above shows that most countries have data on S₁ and S₂ but that coverage for S₃ (recovered wood) is not as good, at least for the sources that the secretariat has reviewed. Data for consumption seems generally to be much less well covered. Even where data do exist there is often doubt about their quality.

First data output stage – *The national wood energy frame*:

If a country were able to provide all the information for sources S₁-S₃ and users U₁ to U₃ the frame information for the national wood energy market could be given. The total figures at the right side reflect the different importance of the user categories in a country, whereas the totals in the bottom line reflect the relative importance of the different sources for wood energy. Additional information on percentages could improve the overview as shown in the tables in section 2.2.4.

	S ₁ Direct	S ₂ Indirect	S ₃ Recovered	
U ₁ Power and heat				Y
U ₂ Industrial				Y
U ₃ Private households				Y
Units: 1000m ³	Y	Y	Y	Total

Second output stage – *The national wood energy flow*:

Below we show one possible output of the matrix where there is a full set of information.

Using the Estonian market statement to the 63-rd session of Timber Committee, 27.-30. September 2005¹² the following information could be filled into the grid¹³:

(1000m ³)	S ₁ Direct ¹⁴	S ₂ Indirect	S ₃ Recovered ¹⁵	
U ₁ Power and heat	32	22.76 ?	485	517
U ₂ Industrial	80	2.76 ¹²	621	702
U ₃ Private households	1415	8.28 ¹²	582	2001
	1590	13.816	1940	3220
				3537

Note:

¹² Page 5 chapter 3 B (<http://www.unece.org/trade/timber/mis/market/market-63/estonia.pdf>)

¹³ In accordance with the conversion factors in the Unified Bio-energy Terminology (UBET, FAO 2004) the tons for S₂ have been converted into m³ using the mass/volume relation for Indirect Woodfuels (page 26). [1 m³ = 0,725 ton → 1 ton = 1,38 m³]

¹⁴ 4 % are missing in S₁

¹⁵ 13% are missing in S₃ (likely that they forgot to mention the “Commercial and Services”).

¹⁶ Export figures aren't presented in the chart. This leads to an incomplete picture, especially for the S₂. Estonia is an important pellet and wood briquettes exporting country. In total the export for this Item was 210 000 tons, which corresponds to 290000 m³ (same conversion factor as mentioned above). The national consumption of pellets represents only 4.76 %.

- The four consumer groups mentioned in the Estonian market report (derived from the UBET classification) were reduced to the three (U_1 - U_3) agreed by the Joint Working Party on Forest Economics and Statistics in 2005.
- (“Wood Industry and Agriculture” + “Commercial and Public Services” = U_2)

In spite of some missing information it is now possible to see in addition to information on national figures of users and sources, which sectors are the most important consumers of wood energy and how these needs are met.

This matrix is meant to be an instrument for a comprehensive output matrix. To collect data from the countries it became clear that a rather more detailed questionnaire would be necessary. By not aggregating data in the questionnaires, countries would be able to provide all the details about their wood energy market. To allow for instances where detailed data were not available, columns were introduced so that countries could enter total figures for the different sources and consumers.

The example above, using data from Estonia, also shows how significant import and export flows can be when considering wood energy and that these need to be taken into consideration. This will be especially important in future with increased efforts to meet Kyoto emission targets. International trade in biofuels will almost certainly increase in size and importance (e.g. wood energy flow between Estonia and the Netherlands).

Annex 2
The flow scheme

Type	Flow	Typical Product	Importance in wood energy	Information Quality	Origin of Information	Units for collection
Direct (Forestry)	S1-U1	Chips made from wood or logging by-products with intention of burning them	High	Medium	Wood fuel sales	m3/mt
					Energy generators	TJ
	S1-U3	Wood-in-the-rough for private use	High	Low	Forest inventories / removals	m3
					Consumption of households	Steres/cords
S2-U1	By products for energy sales (a) pulp mill direct energy sales (b) sawmill/panel by-products sold to produce heat/electricity	Medium	Medium	Consumption of energy generators	TJ	
Indirect (residues and by-products)	S2-U2	Byproducts burnt for own use, (a) black liquor (b) bark stripped (c) Chips, residues (d) waste cartons and pallets burnt by industry	High	High	Consumption and production of industry	m3
						m3/kW
						m3/kW
						mt
	S2-U3	Pellets/briquettes made from by-products and chips for private use, charcoal	Low	High	Consumption of households	mt
				Wood residue traders	m3/value	
Recovered (after use in society)	S3-U1	Waste, paper, old furniture burnt for heat and electricity	High	Low	Consumption of energy generators	?
	S3-U3	Household clippings and cuttings reused/sold	Medium	Low	Consumption and production of households	?

Source		User	
S1	Direct	U1	Power and heat generation
S2	Indirect	U2	Industrial (internal)
S3	Recovered	U3	Private households

Annex 4

Frequently asked questions (FAQ) for the questionnaire:

Which unit fits for filling in the different cells?

The units for the various sources differ according to the usual unit of measure. The units should be used for all entries in the corresponding line, except for the cells under the four columns “Output after transformation” where energy units only are requested.

Which cells should be filled in?

All cells should be filled in apart from those under the “domestic availability” and the blocked cells.

Line 5 is the sum of the individual sub-items 5.1 to 5.4 (see below). $5 = 5.1 + 5.2 + 5.3 + 5.4$.

Directly related columns:

In the columns headed “Input for transformation...” the units may be in volume or mass as listed against the various sources. For the columns headed “Output...” enter the energy produced from source. With the help of (future) agreed conversion factors it may be possible to convert the information into the required units.

What should be filled in if the requested information is too detailed?

If there is no detailed information for “Input for transformation into...”, “Output after transformation” or “Final direct energy use by...” , enter an aggregate figure in the “Total” column.

In the same way enter a total figure in line 5 where data for the sub-items (lines 5 to 5.4) are not available..

Who can provide data?

The complex matrix might require a combined effort of different statistical sources, such as: Forestry data (JFSQ), waste statistics (e.g. recovered wood), national energy statistics on bio-energy, customs services (e.g. import and export of biofuels) for the international trade, port authorities for the inner European transport.