Joint FAO/ECE Working Party on Forest Economics & Statistics
Geneva, 22-24/03/2005

Item 6 of the Agenda

Special topic: monitoring and analysis of wood energy developments: data quality and availability, inter-organisation co-operation, strengthening the EFSOS analysis

Background paper - report of

Joint FAO/ECE Working Party on Forest Economics & Statistics (15-17/03/2004)

Wood/energy interface "break-out" meeting 09:30 – 10:15 hrs, 17/03/2004:

Background: During the plenary session of the above meeting on 15/03/2004, there was a brief discussion on wood energy, especially in relation to the difficulty in obtaining and comparing statistics in this field. Following an enquiry to the Secretariat as to what follow-up was foreseen to the highly useful policy forum at the 2003 Timber Committee meeting, it was suggested to have a "break-out" meeting during the days of the Joint Working Party. When the Secretariat confirmed such a meeting, a short background note was circulated, identifying the purpose of the meeting, as follows:

Purpose: to identify and discuss issues arising from the wood/energy interface, with a view to, inter alia, follow-up to the Policy Forum on wood and energy at Timber Committee (TC) 2003, especially taking into account work of FAO, IEA and EU, including:

- how to approach unrecorded wood removals, including those for energy use;
- estimations (from EFSOS/FRA/other sources?) of regional and national woody fuel resources, in the form of :
    - forest residues;
    - SRF (short-rotation forestry);
    - transfer of use of wood raw material from F-BI (forest-based industries) to fuel;
- other sources of bio-mass, especially agriculture;
- use of economic instruments, esp. subsidies;
- register of regional/national case studies on wood/energy interface;
- use of ToS on FP Markets and Marketing intranet site to collect information on biomass (bio-fuels);
- possible workshop on this set of issues, either as a stand-alone event, or connected to TC 2004, or other ECE/FAO meeting.

Record of the "break-out" meeting:

The European Commission (J. Wall), chairing, introduced the purpose of the meeting, as indicated above, in the context of the increasing use of wood as a renewable energy source and with even higher expectations from the forest sector to contribute to RES (renewable energy sources) in the future, especially, but by no means exclusively in the EU. Not only were national (and therefore ECE) situations about information on the use of wood for fuel and on the capacity of forests to provide that wood highly inadequate, but it was not at all clear how these information problems could be overcome. Therefore, it was seen as a useful first step to get national positions and levels of interest on this issue and try to establish whether any substantial follow-up action, such as a workshop, would be worthwhile and feasible. Delegates were then invited to comment on the basis of the above outline. Their comments, as modified and supplemented after the meeting, are shown in the appendix to this report.

General discussion:

J. Wall: results of this discussion need to be clarified and could perhaps be posted on ToS FPM&M intranet site. He posed a question to the TC and FAO – can their info-gathering systems, e.g. the JQ and/or EFSOS be useful to fill gaps on fuel wood information?

Kit Prins: "déjà-vu all over again!" There was such tour-de-table in the 1980s, but we are glad initiative has been taken to hold "break-out" meeting and to try to advance work in this field.

High-level organisations claim to have dependable figures, but we don't really know where these come from. Interestingly, no one in the tour-de-table seems to be able to measure, let alone state, short and medium-term estimates.

Policy discussion takes place on the basis of a very weak information base. Thus, things could blow up in peoples' faces. We do not want to invent figures. Therefore, is it worth making a serious effort to bring together what we have, recommending e.g. how changes could be measured, as an input to policy-making? Are we at the limits of SFM? There is clearly much unrecorded wood material not in official inventory.

FAO colleagues in Rome have worked with IEA (International Energy Agency). We should work with them and others to try to bring issues and data together, not re-invent the wheel.

Hermann Huckert: agrees with KP: we can only pick up information as it becomes available. E.g. in Germany this is at random. It is not so important that every country make such a study as in Germany. We could make wood energy a reporting area to Timber Committee, including e.g. to what extent are national subsidies used?

FAO (C.T.S. Nair): we have done much, especially in developing countries in 70s and 80s. We could bring much information and expertise to this group.

All information on wood, including long-term trends up to 2020, is still to be published.

Secretariat (Ed Pepke): We could try to slot in discussion at TC/EFC Joint Session in Geneva this year, but time is already limited

J. Wall (wind-up): suggests findings of this ad hoc group be followed up and have reporting to Timber Committee 2004 and possibly a small session there, partly as follow-up to TC 2003 Policy Forum and, separately, in light of the report and comments on it, a possible workshop on wood/energy issues. (The meeting nodded agreement to this suggestion).

Kit Prins: yes, this could also be suggested to the Extended Bureau meeting on 01-02/04/2004.

J. Wall: in light of this, he asks for help from a "core group" to organise reporting and recommendations to TC. Volunteers were acknowledged from:
CEPI (Bernard de Galembert)
Italy
France
Finland
Latvia
TC Secretariat (Kit Prins)
FAO (Mr. C.T.S. Nair).

NB Secretariat: this report reminiscent of discussion on bio-fuel data question at November 2003 Eurostat meeting.

Jeremy Wall,
ECE TC ToS FP M&M and
DG Enterprise/E/4,
(Forest-based Industries' Unit),
European Commission,
Geneva & Brussels, 17-19th March 2004.

(NB Appendix up-dated March 2005).

APPENDIX

National comments as modified and supplemented after the meeting:

(NB these comments have been gathered on an ad hoc, informal basis. They have been up-dated and added to so far without validation. Accordingly, they have, as yet, no official status, are presented for information only and are subject to change).

France - Estimation of energy wood in France (Mr. Morel, up-dated 15/03/2005):

Although a lot of studies have been published about it, estimating the quantity of energy wood used in France is no easy task. The main problem is that the results are broadly different, according to their sources.

It would be easier if the figures obtained through the Annual Survey of Branch « forest logging » were sufficient. These figures are reported in the JQ1 and TC1 questionnaires: 2 388 000 m3 in 2000, 2 360 000 m3 in 2001, 2 667 000 m3 in 2002, 2 287 000 in 2003 (wood fuel, including wood for charcoal). They come from the declarations of the professional loggers. But it is a well-known fact that the majority of firewood used in France is cut by the consumers themselves in their own forests, or in forests in which the owner has allowed them to cut. So those declarations do not give a correct assessment of the firewood removals.

We can proceed by two different methods to get a better assessment.

1) **The first method is based on the comparison of successive forest inventories**. The National Forest Inventory assesses every 10 to 12 years in every « département français » the growing stock volume, the annual increment, the volume cut over the past five years and the natural mortality in productive forests. The comparison of the last two successive inventories leads to an estimation of the global removals amounting to: 51.4 Mm3 in 1999, 58.4 Mm3 in 2004 (1999 = average 1993-1997, 2004 = average 1998-2002).
   The removals declared by the professional loggers in sawlogs and veneer logs, pulpwood, other industrial roundwood and fuel wood (JQ1 and TC1 corrected with bark coefficients and a logging losses coefficient) are: 37.0 Mm3 in1999, 39.5 Mm3 in 2004.
   The difference: 14.4 Mm3 in 1999, 15.7 Mm3 in 2004 (taking into account 3.2 Mm3 of exceptional losses due to the December 1999 storms) corresponds to self consumption in which there is a small part of saw-logs and a majority of firewood. When added to the 2.6 Mm3 cut by professional loggers in both periods, it is generally admitted that the quantity of energy wood harvested in productive forests is about 17 to 18 Mm3 per year: 17.0 Mm3 in 1999, 18.3 Mm3 in 2004.

   The volume assessed by the National Forest Inventory is the volume of trees above-stump measured over-bark. It includes all stems over 7.5 cm d. b. h. The trunk is

entirely measured. In the crown, only the main stem is measured up to a diameter of 7 cm (so-called « découpe bois fort »).The volumes of the main stem of less than 7 cm in diameter and of the other branches are not taken into account.

According to the assessment of the Forest Economics Laboratory UMR ENGREF/INRA of Nancy for the national annual account of silviculture in France, the removals of energy wood in the forest would be 26.5 Mm3. The difference between the 18 Mm3 of the National Forest Inventory and the 26.5 Mm3 of the Forest Economics Laboratory lies for a small part in methodological approaches and for the major part in the volume of the branches whose volume is included in the latter's assessment but is not in that of the former.

I must also mention a recent study of IFN and Solagro (2004), which estimates the potentials of supplementary harvest of forest remnants according to various technico-economical scenarios.

2) **The second method is based on the consumption of energy wood in households and industries**. It can be admitted that the origin of the quantities used in industries and collective households – 5.1 Mm3 in industry and 0.4 Mm3 in collective households according to study (1) - is sawmill and other wood industries residues. The problem then is to determine the origin of the quantities used in households. According to studies (1) and (2) mentioned hereafter, it could be (see details in attached table):

Origin	Mm3 r. w.e. (1)	Mm3 r. w. e. (2)	Mm3 r. w. e. (3)
sawmill and other wood industries residues	9.1	5.6	
orchards, vineyards, fence poles…	2.8	4.8	
old pallets, wood packagings, frames and fittings, furniture…	2.7	4.8	
roundwood from hedgerows, scattered trees, groves, copses, poplar plantations, parks, gardens	22.0 (5+17 ?)	6.4	
roundwood from forests		18.4	
total	36.6	40	39.4
Destination			
individual households	31.1		33.5
collective households	0.4		0.7
total households	31.5		34.2
industries	5.1		5.2

(1) G.A. Morin, P. Laufer « La consommation de bois de feu en France » - Revue Forestière Française, 1992
(2) INESTENE, 1993
(3) Ministère de l'Economie, des Finances et de l'Industrie - Observatoire de l'énergie – Rapport Les énergies renouvelables en France 1970-2003, janvier 2005

r. w. e. : roundwood equivalent

The gap between the results of study (1) on the one hand, studies (2) and (3) on the other hand is significant. The conversion factors used can account for a part of the differences. The first one does not explain which proportions of roundwood are coming from productive forests or from other wooded lands. According to the 2003 data, the surfaces of the wooden areas in France are : forests 15 091 700 ha (89.5%), other wooded lands 1 779 000 ha (10.5%). It can be thought that the other wooded areas are harvested more intensely than the forests. Comparing these results to our first investigation, it is possible to admit that the breakdown of the removals could be: 17 Mm3 in forests and 5 Mm3 in other wooded lands. Whether the branches are included in those studies is not mentioned, but it is likely that they are.

According to another recent study (National survey on demand for recreation in French forests – Jean-Luc Peyron, Patrice Harou, Alexandra Niedzwiedz and Anne Stenger – Forest Economics Laboratory UMR ENGREF/INRA – December 2002), the total fuel-wood quantity consumed by households annually in France amounts to 25 Mm3. This study confirms the previously mentioned assessment of the LEF, but its results are significantly lower than those of studies (1) and (3).

As a conclusion, if the global consumption level of wood energy in France – more or less 40 Mm3 per year including branches - seems to be confirmed by studies (2) and (3), the breakdown between forests and other origins given by study (2) – more or less 18 Mm3 from forests - should be updated. It is not consistent that it would lead to the same result as the first IFN method corresponding to a “main stem découpe bois fort” volume. The question of conversion factors should also be placed under review.

In 2000, the French Ministry of Agriculture published the second edition of “The national indicators of sustainable management of French forests” (MCPFE indicators): 17.0 Mm3 of fuel-wood (2.6 Mm3 recorded and 14.4 Mm3 unrecorded). The updating of these indicators for 2005 lead to an estimate of 18.3 Mm3 (2.6 Mm3 recorded and 15.7 Mm3 unrecorded) (provisional data). In order to maintain the coherence of the data published by our Government, I think that the best assessment of fuel-wood removals in French forests is currently 18 Mm3 per year. As explained before, this is an average value based on forest inventories extended on 10 years. As a consequence, it is impossible to measure annual evolutions by this method. It is sure that the removals have been much higher in 2000 and 2001 because of the storms of December 1999. It is possible to give a figure: the total removals of fuel-wood in forests for the whole of both years 2000 and 2001 would be about 45 Mm3 (4.8 Mm3 reported and 40 unreported), compared to 30 unreported Mm3 ‘normally’ harvested in two years. It is likely that the unreported removals have been lower than the ‘normal’ harvest in 2002 and 2003, but currently there is no serious estimate.

Germany (Mr. Huckert): it was stated that there is a similar situation. Like France, Germany has a national forest inventory and annual surveys on removals of industrial roundwood and other roundwood including fuel wood. New inventories are due to be completed soon. These should give incremental information since they are comparable in some but not all respect with a previous survey carried out between 1986 and 1990.

According to a study carried out in Bavaria a significant amount of unreported use by private forest owners has been revealed. When comparing demand forest industry [to supply, significant differences show up.

However, the only way to get a realistic picture is the kind of special study. There is one going on at present [Universität Hamburg, Zentrum Holzwirtschaft, Arbeitsbereich Ökonomie der Holz- und Forstwirtschaft] aimed at and directed to making up the balance between supply of roundwood, residues and waste paper on the one hand and the demand by forest industries and users of wood for energy on the other hand. Preliminary results indicate that fuel wood removals are by far higher than estimated and hence that the alleged gap between officially recorded cuttings and reality is much bigger than was thought. The study resorted also to figures that were derived by using estimates, e.g. through boiler-makers who supply wood-burning equipment.
Also there are surveys of recovered wood, but these only give estimations.
Summing up: available information should be used as much as possible and it should not be tried to make too many extra surveys.

Switzerland (Mr. David Walker, SAEFL Swiss Agency for the Environment, Forests and Landscape: Forest Agency):

Switzerland has the same approach as Germany and France. There is an inventory on wood consumption, with particular problems on lack of data and estimating recycling rates, as well as recording recovery and waste.
CH previously made a wood-flow model, but not recently. It was useful to show where missing fuel wood turns up.
CH would be glad to receive other countries' experience in modelling.

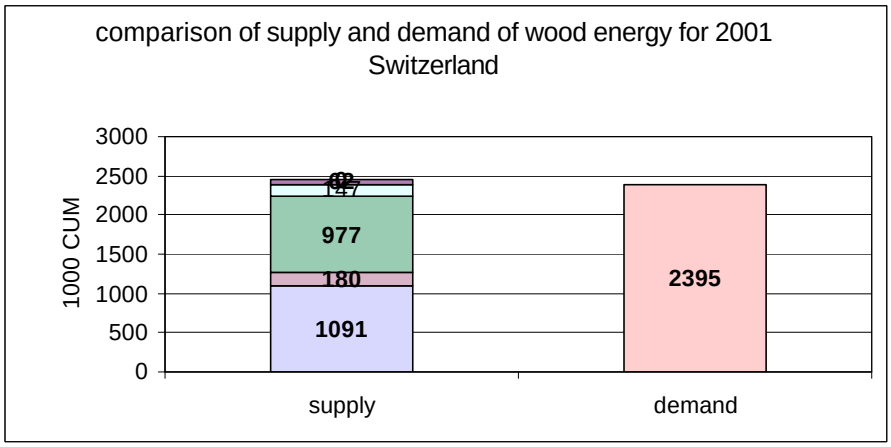
New information received March 2005:

Monitoring and analysis of wood energy developments: data quality and availability, inter-organisation cooperation, strengthening the EFSOS analysis.

National Statement Switzerland[1]

[1] 1 for further information please contact:
David Walker
Swiss Agency for the Environment, Forests and Landscape
CH-3003 Bern, Switzerland
Email: david.walker@buwal.admin.ch

Quantitative information: an overview



Supply (see chapter 3 below)

wood from forests	1'091'000 CUM
wood from urban cuttings (estimation)	180'000 CUM
wood residues	977'000 CUM
recovered wood	147'000 CUM
others	62'000 CUM
TOTAL	**2'457'000 CUM**

Demand (see chapter 2 below)

- total supply comes to 2'395'000 CUM

Notes

- both supply and demand exclusive wood combustion in waste incineration plants (about 400'000 CUM)
- taking into account all the uncertainties (as quality and lack of information) the consistency of the results is astonishing (see further comments below).

Source

SAEFL (ed.) (2004): Branchenprofil der Wald- und Holzwirtschaft 2001 *(Survey of the forestry sector 200*1). Bern, 192 pages
(http://www.umwelt-schweiz.ch/ -> media -> e-shop, available in German only!).

2 SWISS WOOD ENERGY STATISTICS: THE DEMAND SIDE

Goal

- to gather quantitative information about the consumption of wood energy

Methodology

- general approach: instead of an utilisation of fuel orientation an approach focusing on the heating systems is used

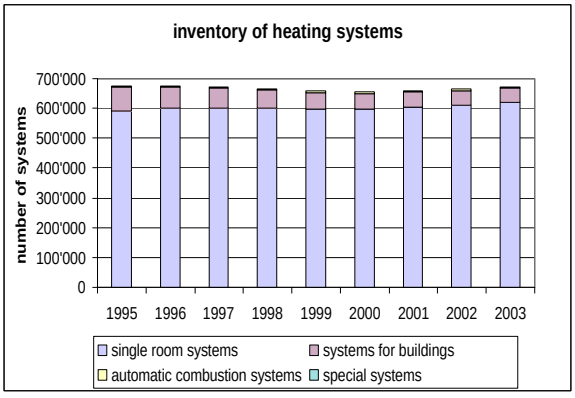
inventory of heating systems	x	coefficients per heating system	x	meteorological coefficient	=	wood energy consumption

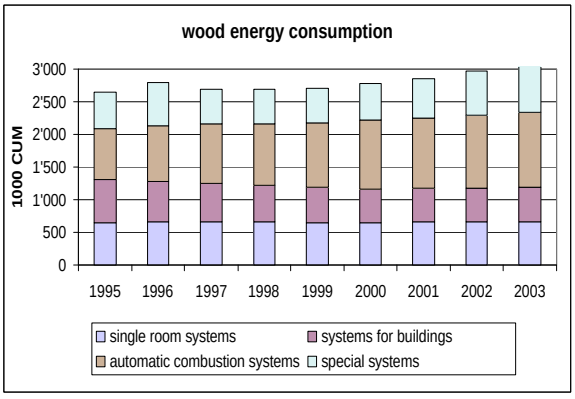
parameter	description	source of information
inventory of wood energy heating systems	- 20 categories of heating systems: single room systems (e.g. wood stoves), systems for buildings (e.g. central-heating), automatic combustion systems (e.g. in forest products industry), special systems (e.g. power plant, incineration plant)	depending on the category: - survey (e.g. power plants) - import and production data from the SFIH2 - and others
specific coeffi-cients per heating system	- specific coefficients per heating system: beginning of operation, technology, operational effectiveness, utilisation of fuel, fuel value	- studies - expert opinions
meteorological coefficient	- taking into account the influencing factor of local weather conditions on an annually basis *(Heizgradtage)*	- input data from 40 meteoro-logical stations

Problems

- quality of input data: heterogeneous
- accuracy of specific coefficients for the different heating systems
- influence of other factors: attitude of individuals, factor of buildings insulation, et cetera
- ongoing improvements are made as well as comparisons with other approaches

Results





Body carrying out survey and further information:
Swiss Federal Office of Energy (SFOE):
http://www.energie-schweiz.ch/internet/index.html?lang=en

Energie-bois Suisse: http ://www.holzenergie.ch/index.php ?id=1&L=1

SAEFL: Thomas Grünenfelder (Email thomas.gruenenfelder@buwal.admin.ch) SFOE (2004): Schweizerische Holzenergiestatistik. Datenerfassung, Auswertungen und Interpretationen. Folgeerhebung für das Jahr 2003 *(Swiss wood energy statistic. collection of data, analysis and interpretation. last census for 200*3). Bern, 55 pages (not published).

Source: SFOE (2004): Schweizerische Holzenergiestatistik. Datenerfassung, Auswertungen und Interpretationen. Folgeerhebung für das Jahr 2003 (*Swiss wood energy statistic. collection of data, analysis and interpretation. last census for 2003*). Bern, 55 pages (not published).

3 SWISS WOOD FLOW MODEL: THE SUPPLY SIDE

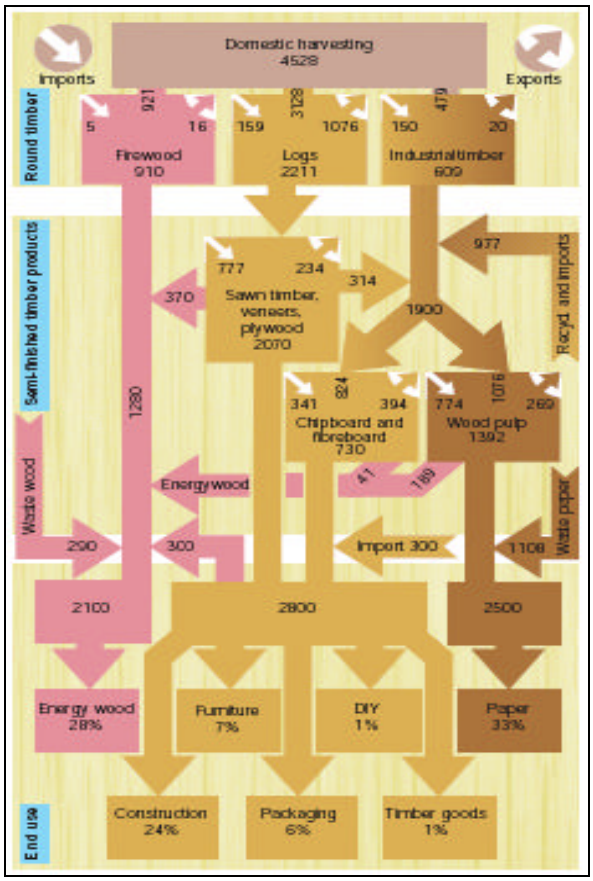
Goal: to give a quantitative and consistent description of the wood flow in Switzerland

Methodology: - basis: static input-output model (according to the approach of Input-Output-Economics by Leontief)
- implementation:
  - to date: SIMBOX simulation software
  - at present: development of a Microsoft Excel solution by SAEFL (see Outlook)

Sources of Information

Instrument	Attributes, Information	Frequency
National Forest Statistics	- fellings by assortiments and by species (supply)	annually
Survey of Consumption and Production of Wood Based Panel as well as Pulp, Paper and Paperboard Industry	- wood consumption by assortiments (demand): pulpwood, wood residues, energy wood - production	annually
Survey of Consumption and Production of Sawmilling Industry	- ditto	before suspen-sion, annually
National Trade Statistics	- import and export of forest products, secondary processed wood and paper products	annually
Study of the national wood cycle from the production to the end-use by consumers	- co-efficients of production and products flow, end-use	to date every five years

Results



Problems

- the implementation with SIMBOX was too complicated, detailed and laborious
- heterogeneity of input data and difficulties with the fine-tuning
- lack of information (e.g. sawmilling industry (momentary)

Outlook

- further development of the model from a static to a dynamic approach (e.g. combination with a Marcovian Chain approach)

Body running the model and further information:

SAEFL: David Walker
(Email david.walker@buwal.admin.ch)

Sources:

SAEFL (ed.) (2004): Branchenprofil der Wald- und Holzwirtschaft 2001 *(Survey of the Forestry sector) 200*1). Bern, 192 pages (http://www.umwelt-schweiz.ch/ -> media -> e-shop, available in German only!).
SAEFL (ed.) (2001): Ökonomische Branchenstudie der
Wald- und Holzwirtschaft *(Economic sector study of the forestry sector 200*1). Bern, 109 pages (http://www.umwelt-schweiz.ch/ -> media -> e-shop, available in German only!).

Czech Republic (Mr. Z. Pexidr): wood energy is very important for CZ. The volume estimate for wood used as fuel is about 2 Mm3 out of a total of 14 Mm3.

There are three types of subsidy:

- Ministry of Agriculture – small cutting 375 € (CZ Crowns??) per hectare for cutting wood
- Ministry of Environment – for heating
- Ministry of Industry - for heating.

CZ authorities are not satisfied with data collection.

There is also pressure to use wood remaining after normal cutting in forest harvest.

New information received March 2005:

There are some comments about the situation in the Czech Republic in this case:

1. In the Final Draft (Joint FAO/ECE WP – 15—17/03/2004) in part of Czech Republic is listed the subsidy from Ministry of Agriculture in **€** (wood chipping in the forest) per hectare of cutting – (12000 CZ Crowns=400€).
2. National Forest Inventory (NFI)– the work was finished in 2004 (2002-2004). Besides, this report contains also data about dead wood in the forests (in different degree of disintegration) – volume of "hard dead wood" in the forests is ascertained on 2.8 m3/ha (this representatives - 7 mil m3/CZE). But this volume is not possibly to use like wood energy.

Reason: low concentration of this wood in the forests, requirement to retain this wood in the protective and special purpose forests.

3. Data of Forest Management Plan (FMP) – every forest owner (over 200 ha of forest) has a duty to make FMP. All this FMP are saved in Information Data Centre (Forest Management Institute in Brandys). By virtue of this data was processed the calculation of volume of wood energy (exploitation of wood from total removals):
   - ✓ Timber to the top of 7 cm o.b. 1,0 mil. m3
   - ✓ Smallwood (below 7 cm d.o.b.), 0,3 mil. m3
   - ✓ Bark 0,2 mil. m3

   Total 1,5 mil. m3
4. Since 2004 is embodied the data field about production of chipping wood for energy use in the forest - in the form of statistics. First data will be available in April 2005.
5. The data about SRF is not available nowadays. It is concerned around some dozen hectar in the CR - only on non-forest land.

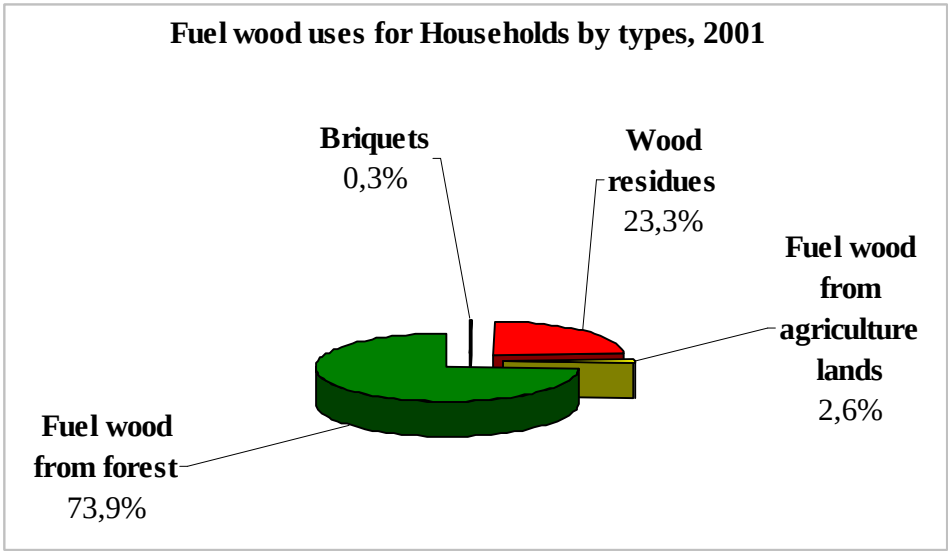
6. Consumption of energy resources by their type, year 2000

Energy source	Share % in Czech Rep.
Non Renewable energy source	**98,5**
- Coal	14
- Electricity	17
- Oil	24
- Gas	26
- Heat	18
Renewable energy source	**1,5**

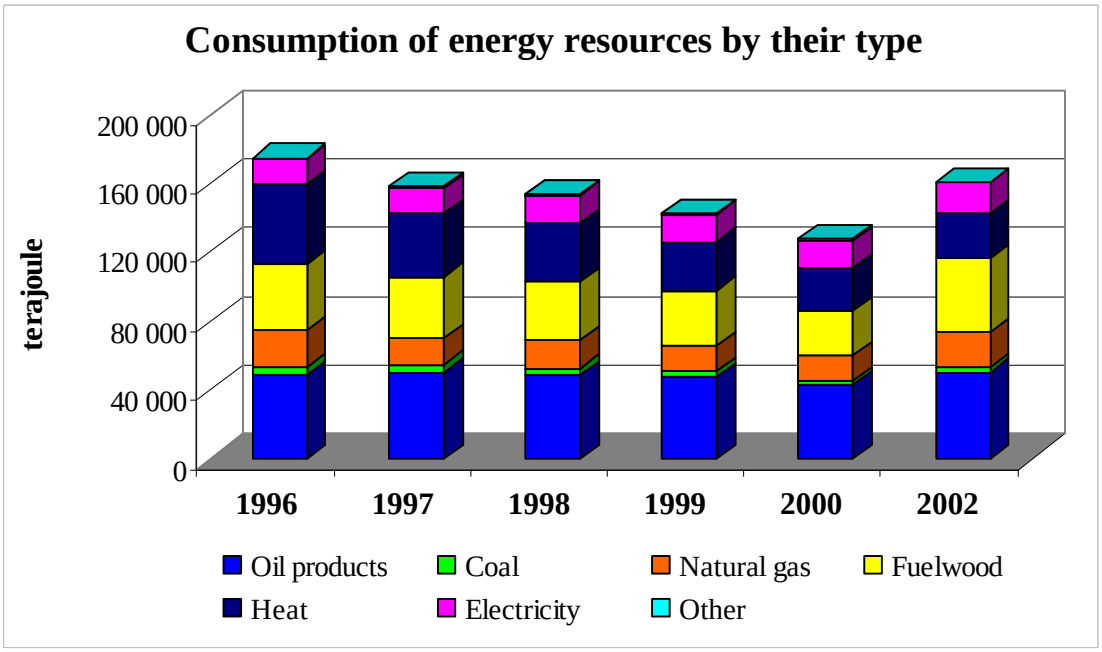
7. Renewable energy source, year 2000

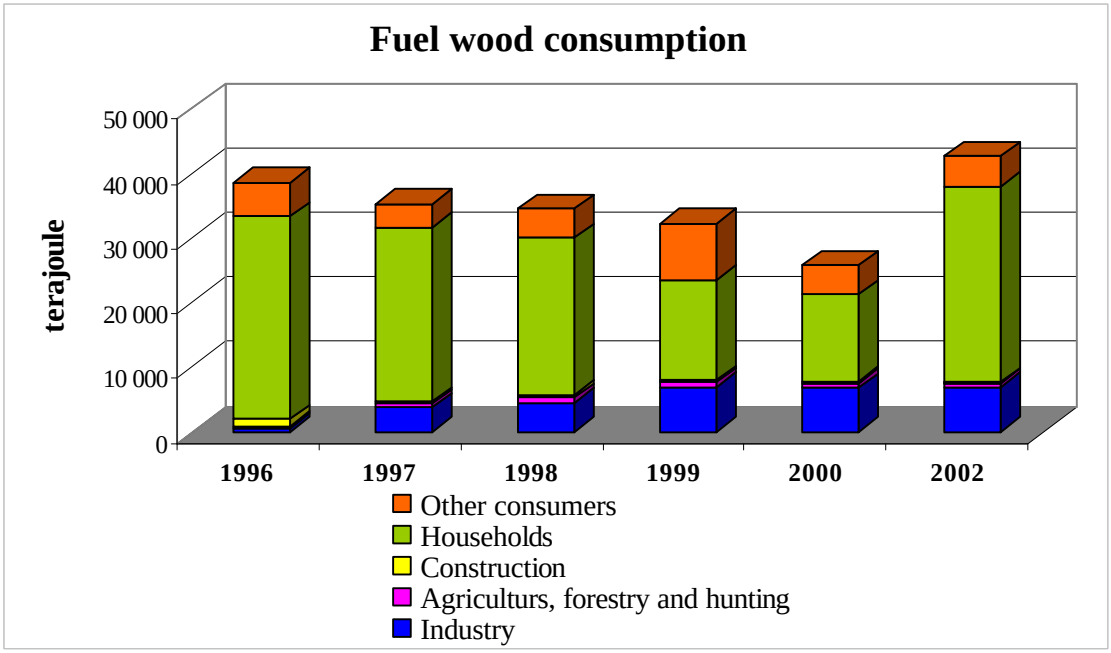
Renewable energy source	Share % in Czech Rep.
- Wind	0
- Water	24
- Solar	1
- Geothermal	0
- Bio-mass	64
- Waste	3
- Ethanol	1
Gesamt	**100**

Latvia (Mrs. A. Budreiko):
Latvia makes annual wood balance estimations, showing industrial uses of roundwood and fuel wood. Every five years there is a fuel wood survey (and estimate) for households done by Central Statistics Bureau (CSB). Department of Forest Resources co-operates with CSB on the improvement of the fuel wood questionnaire. There are figures from the questionnaire in the following diagram.

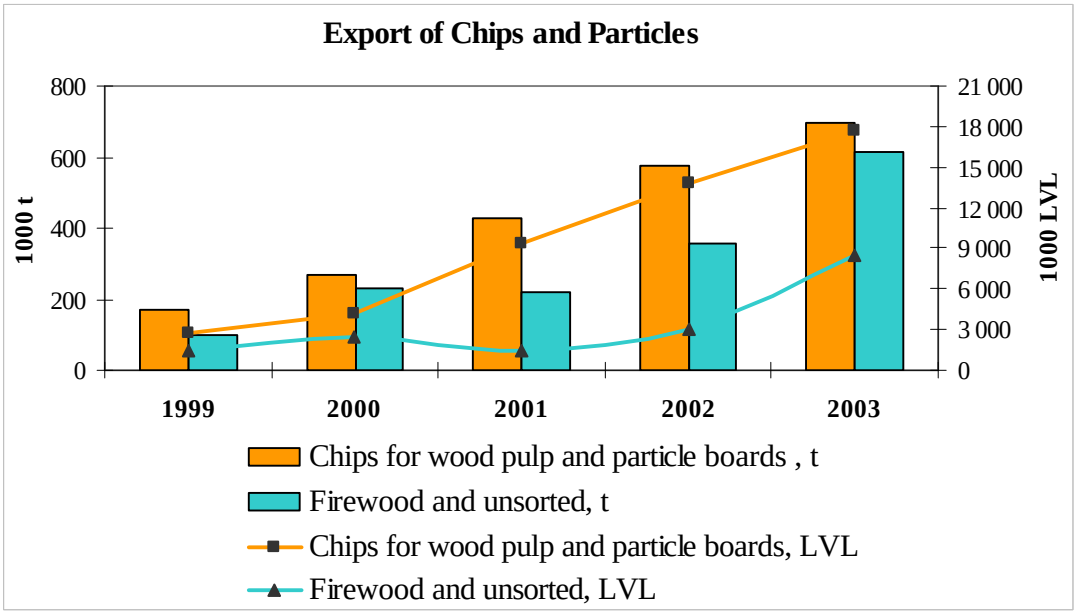


All municipalities, state enterprises and enterprises (where the staff is 20 or more) give an account of fuel wood uses to CSB every five year. These figures reinforce the Association of Heat Producers' information.





Export volumes of fuel wood we get from the CSB.



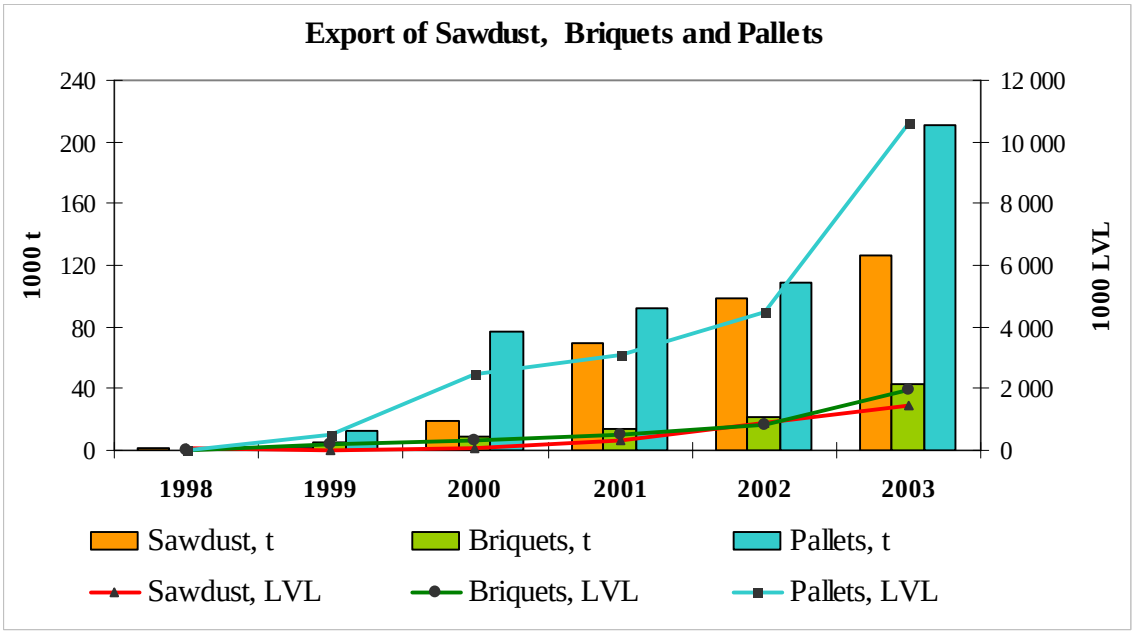
The problem is to get figures for small sawmills and their residues (for the big ones the figures are well recorded – as mentioned).
A major problem is that all forest owners can legally take 10m3 per year as fuel wood, but there is no control and who knows if they don't cut significantly more? We want to get better information.
As regards SRF (short-rotation forestry), we estimate investment is greater than output.

Finland (Mr. Maarti Aarne): we had a work programme two years ago for the Baltic Sea region. We can provide this information. NB The following information was subsequently received from METLA, Finland (Esa Ylitalo):

Wood fuel statistics in Finland

The collection and compilation of wood fuel statistics in Finland with a complete coverage can be summarised as follows:

1) Statistics on the consumption of **waste liquors** as wood fuel, produced by forest industries (annual information, Energy Statistics by Statistics Finland).



2) Statistics on the consumption of **solid wood fuel** by forest and other industries, power and heating plants and large-sized dwellings.

3) Statistics on the consumption of **wood fuel by small-sized dwellings**.

All the data are annully published in national Energy Statistics by Statistics Finland.

The collection and compilation of **solid wood fuel statistics** (items 2 and 3 above) are collected and compiled by the Finnish Forest Research Institute (Metla). The material and methods of these statistics can be summarised as follows:

2) Statistics on the consumption of **solid wood fuel** by forest and other industries, power and heating plants and large-sized dwellings:

Periodicity: Annually.
Regionality: By municipality.
Methods: Postal questionnaire, with a possibility to deliver the data by web-form via Internet; telephone.
Coverage: Forest industries and other industries, power plants, heating plants, large-sized dwellings (in 2002 about 700 sites in industry).
Inquired data: Wood fuel consumption by assortments (volume and/or energy contents); wood fuel prices by assortments; raw material sources for forest chips, volume of imported forest chips.
Assortments Forest chips, industrial chips, sawdust and other wood dust, bark, recycled timber, other wood fuel and pellets and briquettes.
Reported: Annually; Forest Statistical Bulletin (in Finnish only), Statistical Yearbook of Forestry, Metinfo Statistical database on the web (in Finnish only).

3) Statistics on the consumption of **wood fuel by small-sized dwellings:**

Periodicity: At approximately 5–10 -year intervals (latest study published was made to cover the heating season 2000/2001).
Regionality: By municipality.
Methods: Postal questionnaire; telephone.
Coverage: Basic population all small-sized dwellings in Finland (detached houses, farms, recreational buildings, etc.), in 2000/2001 approximately 1.4 mill. dwellings. Sampling 1/130, consisting of approximately 11,000 dwellings. Returned and accepted replies from approximately 6,000 dwellings.
Inquired data: Wood fuel consumption by assortments (volumes).
Assortments: Roundwood (split billets, short split billets, small diameter stems, forest chips) and wood residues (industrial, forest).
Reported: Forest Statistical Bulletin (in Finnish only), Statistical Yearbook of Forestry, Metinfo Statistical database on the web (in Finnish only), a separate publication (in Finnish only).

New information, received March 2005 (from Jan Ilavsky at METLA):

The final report of the project "Estimation of Energy Wood Potential in Europe" at web-site: http://www.metla.fi/julkaisut/workingpapers/2004/mwp006.htm

The other project to mention is a new four-year project "The Forest Energy Potential and Technology Market in European Union and International Bioenergy Trade" launched at the beginning of this year. Hopefully, there are a lot of possibilities to find synergies between this work and UNECE TK/FAO EFC, as well as EU activities.

All information on results from 2004 can be found at the above-mentioned web-site.

Sweden (Mr. S. Karlsson): statistics are poor. Inventories provide poor quality data for checking fuel wood use. For instance our official figures are the same for the years 1998-2002. We have a working group to trying to get better data in this area, including from the wood chain itself, covering the whole chain from felling to ashes. There are many technical problems, particularly how to measure things, especially assortments?

New information received March 2005:

Information on supply and demand for wood fuel in Sweden

The use of wood fuel has increased in Sweden since the beginning of the 1990s, particularly for district heating but also for electricity production. The energy sector is very complex which makes collection and compilation of relevant data very difficult and problematic. There are a lot of producers and consumers which are both small, medium size and large in size. Many actors are also both consumers and producers. Just a small part of the trade takes place in the open market. Finally the use of different measurements and assortments, especially among the processed wood fuel, makes compilation of data problematic. At the same time is the co-ordination among producers of statistics in Sweden regarding wood fuel poor. Something has to be done.

In a forestry perspective it is important to compile statistics about the use of different parts of the tree in the energy production, i.e. the first step/flow in the supply chain of wood fuel. But also the intermediate and end users are important because assortments can in some cases change from for example pulp plants to the energy sector.

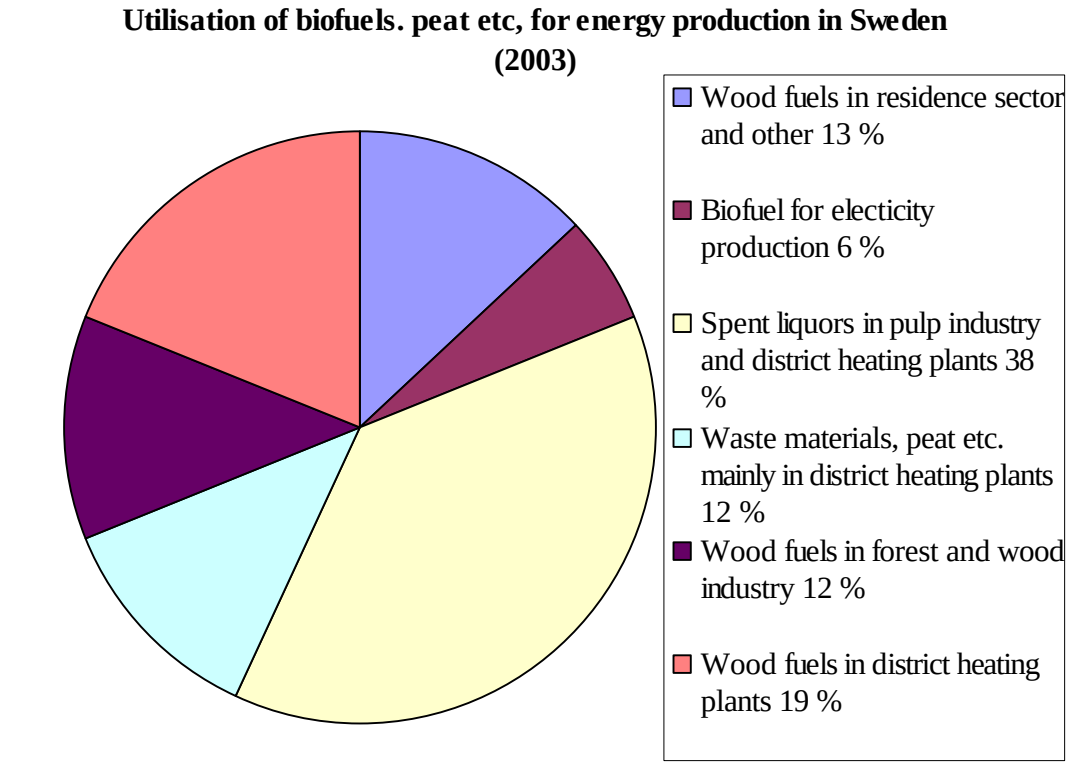
Due to the problems identified above there will be a meeting between the authorities concerned with the objective to agree to an action plan for how to proceed. The meeting and further activities will take place during 2005.

The Swedish Energy Agency is responsible for energy statistics and Statistics Sweden carries out the different surveys. More specific information about the sources of wood fuel (subject, source, methodological highlights etc.) has already been provided for the survey and therefore not necessarily to repeat here.

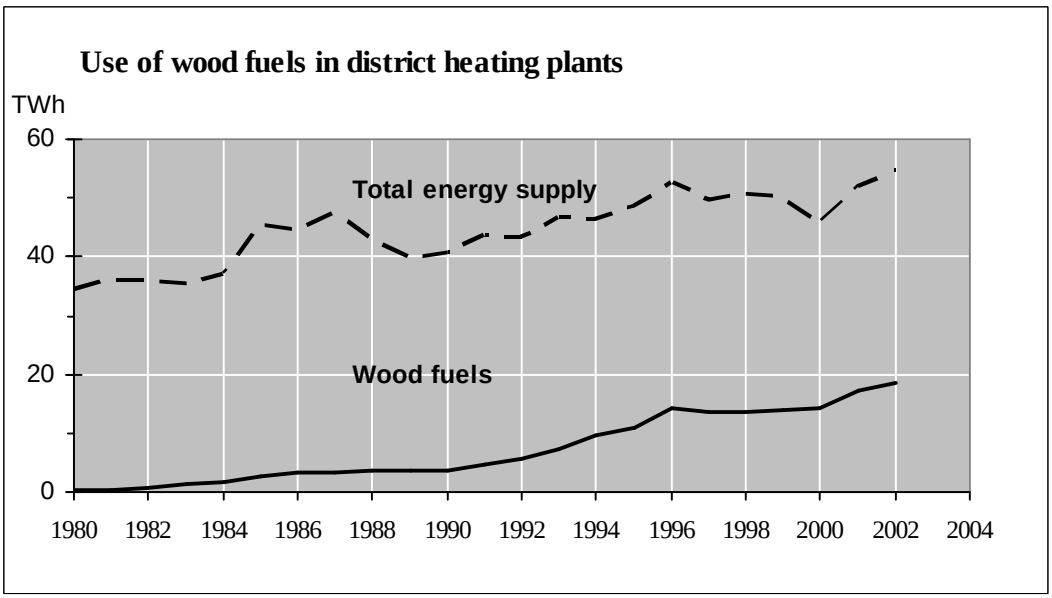
Below are some of the statistics regarding wood fuel published in the Swedish Statistical Yearbook of Forestry (2004).

More information and statistics can be downloading from National Board of Forestry's web page:

http://www.svo.se/fakta/stat/ssi/engelska/



Source: Swedish Energy Agency, Facts and Figures 2003



Source: Swedish Energy Agency, Facts and Figures 2003.

Consumption of firewood in one- and two-dwelling buildings

Year	One- and two-dwelling buildings on agricultural properties	Other one- and two-dwelling buildings[1]	Total
	million m³ stacked volume		
1990	2,9	5,3	8,2
1991	..	5,3	..
1992	..	5,3	..
1993	3,2	5,5	8,7
1994	..	5,2	..
1995	..	5,8	..
1996	3,2	5,8	9,0
1997	..	5,3	..
1998	..	4,6	..
1999	2,2	5,0	7,2
2000	..	4,9	..
2001	..	4,6	..
2002	2,2	4,7	6,9

[1] As from 2000 summer houses are included

Source: Swedish Energy Agency and Statistics Sweden

Austria (Mr. J. Hangler): there are two main sources of information about the use of forests:

- national forest inventory – 5-7 years between sets of results from permanent sample plots. Volumes are reported in m³ overbark.
- annual removals questionnaire – all forest businesses over 200 ha have to fill this in, smaller ones (under 200 ha) are sampled, so we can calculate the sum, including fuel wood removals, including that used for own purposes. Volumes are reported in m³ underbark.

However, for different reasons there are always gaps between the results of the two systems.

We have good statistics from sawmills and paper industries on production, timber used and residues, but not from panel industry (because of the small number of firms in this branch, production data for certain panels are confidential).

Almost ten years ago Statistics Austria worked on a wood balance calculation. However, so far it is not foreseen to make a new balance calculation. This might partially be explained by some of the technical difficulties persisting, including information gaps. These include:

- chips being made directly in the forest – no official statistics available
- recovered timber/used timber that is being recycled – no comprehensive figures
- use of trees from outside forests – no official statistics available.

Since 2003 the “Green electricity” directive has guaranteed prices for electricity from produced from biomass (wood etc.), thus encouraging more use of biomass.

(The Tariff Ordinance ("Tarifverordnung") to the Eco-Electricity Act, which entered into force on 1 January 2003, provides for attractive and nationally uniform feed-in tariffs for electricity from new eco-electricity plants (from wind, sun, biomass, small-sized hydraulic power units, geothermal plants) approved until 2004. This measure also contributed to increasing the competitive capacity of wood as a provider of energy and has given important stimulatory impulses for investments in new biomass plants.

Energy production from wood plays a key role in the Austrian Climate Strategy and with respect to higher supply security in the field of energy. Therefore also the government programme provides for a 75 % increase in the use of biomass by 2010. Due to the new framework conditions (Eco-Electricity Act – Ordinance on a Feed-in Tariff for Electricity) the targeted supply of existing biomass heating plants and new large-sized plants through forestry will gain significance. Austrian forests clearly have the capacity required therefore. The essential thing is now to accept the logistic challenges and to intensify forest tending measures.)

UK (Mr. Simon Gillam): UK has no statistical source for annual statistics on fuel wood; we have an estimate from an expert group, but this indicates no change since 1990 and is thought to be too low.

Some other figures are becoming available, e.g.:

- better information on availability (not use) is available from a new (2003) study, incl. park trees, sawmill residues, etc.
- Dept. of Energy has statistics on wood for energy, but does not distinguish forest sources from residues, and also has experienced difficulties with its surveys.
- Forestry Commission (FC): in 1997 commissioned a domestic fuel wood use survey and is considering a similar survey in 2004.
- FC has the idea to survey via appliance manufacturers on pilot basis in some English regions.

FC thinks trade statistics are unreliable; e.g. UK shows large fuel wood exports! What trading businesses call fuel wood may go beyond fuel wood on JQ definition.

NB Subsequently, additional information has been received from the UK Forestry Commission (Dr. Helen McKay, Sustainable Forestry Group). This includes the executive summary of the final report of a woodfuel resource study:

"Woodfuel resource in Britain, final report", (B/W3/00787/REP, URN03/1436) 2003. The full report can also be made available. An important part of the project was to make the data available on an inter-active website: http://www.woodfuelresource.org.uk

which has proved useful for potential developers but also for planners and policy development. An additional note on the quality of statistics on the use of woodfuel for various end-uses (defining: end-use, description of stats, likely scale of use, confidence in estimate) has also been provided, together with PowerPoint slides on the domestic use of woodfuel in the UK.

The following paper in our "Sustainable Forestry in Brief" series outlines the background to policy in the UK:

http://www.forestry.gov.uk/pdf/sfibenergymarkets.pdf/$FILE/sfibenergymarkets.pdf

The following note prepared for a recent meeting gives the results of our 1997 survey of domestic use of fuelwood and also outlines possibilities for future survey work:

http://www.forestry.gov.uk/pdf/egttspaper20043.pdf/$FILE/egttspaper20043.pdf

The same meeting also had a presentation about the UK Renewable Energy Statistics database. A copy is available here:

http://www.forestry.gov.uk/pdf/egttssdag0204.pdf/$FILE/egttssdag0204.pdf

New information received March 2005:
The UK's present approach to assess domestic woodfuel usage (in Scotland for the moment) by a combination of a general Omnibus survey plus a detailed questionnaire for those identified in the Omnibus survey as using woodfuel. There are linked assessments of i) use in commercial and industrial premises and ii) woodfuel suppliers. All of these should be complete by the end of March and unfortunately, no results are yet available.

DOMESTIC USAGE

Omnibus survey - the rationale is that the Omnibus survey will:

* give information on key questions that can be extrapolated in a valid way to the Scottish population
* identify people using woodfuel who are willing to take part in a more detailed survey of their woodfuel system, attitudes towards woodfuel, experiences and perceptions.

The Omnibus survey will ask a total of six questions four of which are the same as those asked in the 1997 survey (to allow gross changes to be detected):

* Do you ever use wood as a fuel in your home, either on its own or with other fuels?

For those who responded "No" to Q1, they were asked to identify the reasons from the following list (Never thought about it; Happy with existing system; Not practical for this property; Concerned about cost; Concerned about efficiency; Concerned about ease of use; Concerned about environmental issues; Do not own property; Lack of local help/suppliers; Other (SPECIFY); Don't know)

For those who responded "Yes" to Q1, the following 4 questions were also asked:

* Do you get the wood by the truck load, or a few bags, or gather it yourself?

* Do you use wood as a fuel regularly or only occasionally?

* Is wood the main fuel for heating your home, or do you mainly use something else?

If the respondent does use woodfuel at all, there will be a follow up question

* Would you be willing to take part in a more detailed anonymous survey of woodfuel consumption, system, attitudes towards woodfuel, experiences and perceptions.

Follow-up survey

The rational is that the follow up survey will give a better understanding of:

* the quantities of wood used which can be factored back into the analysis of the Omnibus Survey
* the systems that people use and why
* useful experiences that could be promulgated
* barriers/difficulties that could be avoided in future
* perceptions that proved false in practice and which could be addressed in an information campaign

(The questionnaire is available separately).

Estonia (Mr. M. Valgepea): Estonia has no special industrial fuel wood survey and there seems to be little interest to hold one. However, there have been attempts to estimate household fuel wood use through surveys, but people do not understand units and conversion factors to and from solid and stacked volume.

The State Forest Management Centre gives accurate data on state forest fuel wood production, including estimates from sample plots. Commercial sales in state forests (1/3 of forest land) are thus known.

Overall trends show change:

- 10 years ago there was little interest in fuel wood, but now there are higher prices for pellets from residues, also briquettes (these compete with higher electricity and gas prices);
- sawdust is in short supply and is being imported from Latvia.

Norway (Mr. S. M. Tomter): poor statistics persist, despite two sources:

- annual statistics on marketed fuel wood, but these are based on estimates by local forest authority, not measured;
- quantity harvested by forest owners – based on a complete agricultural survey through farm questionnaire, but this is only done every 10-15 years. More frequent estimates have also been based on data from sample surveys, when questionnaires have been distributed to a smaller sample of farm owners.

There are indications that fuel wood consumption in households is underestimated. There exist statistics on the use of fuel wood in industry, but difficult to say how reliable these statistics are. Amongst other factors, there is a difficulty in separating imported fuel wood from domestic supplies. However, it might be possible to do a survey of domestic use; estimates could be made, e.g. on how many houses are heated by fuel wood.

NB: subsequently to the meeting, the following additional information was received from Norway:

Forest fuel statistics in Norway - by Astri Kløvstad, Statistics Norway, September 2002

What is forest fuel?

- Roundwood
- Waste from logging such as branches, tops etc
- Waste from the wood industry
- Sawdust, briquettes, pellets etc - such products that are manufactured for fuel
- Chips - like a waste product from the industry - or fresh directly from the forest
- Other?

Our wood fuel statistics is limited to cover the wood fuel from roundwood.

Roundwood as wood fuel; it can be:

- Cut for sale
- Cut for own consumption by forest owner
- Cut by relatives or friends for own consumption

Roundwood cut for sale as wood fuel:
Our legislation says that all roundwood cut for commercial purposes should be reported to the Register of Timber Trade. In reality:
There are usually small quantities per seller (forest owner),
It's a lot of paperwork connected to doing it according to the rules, and of course, if you sell roundwood in the legal way, you have to pay a tax for what you earn from it.

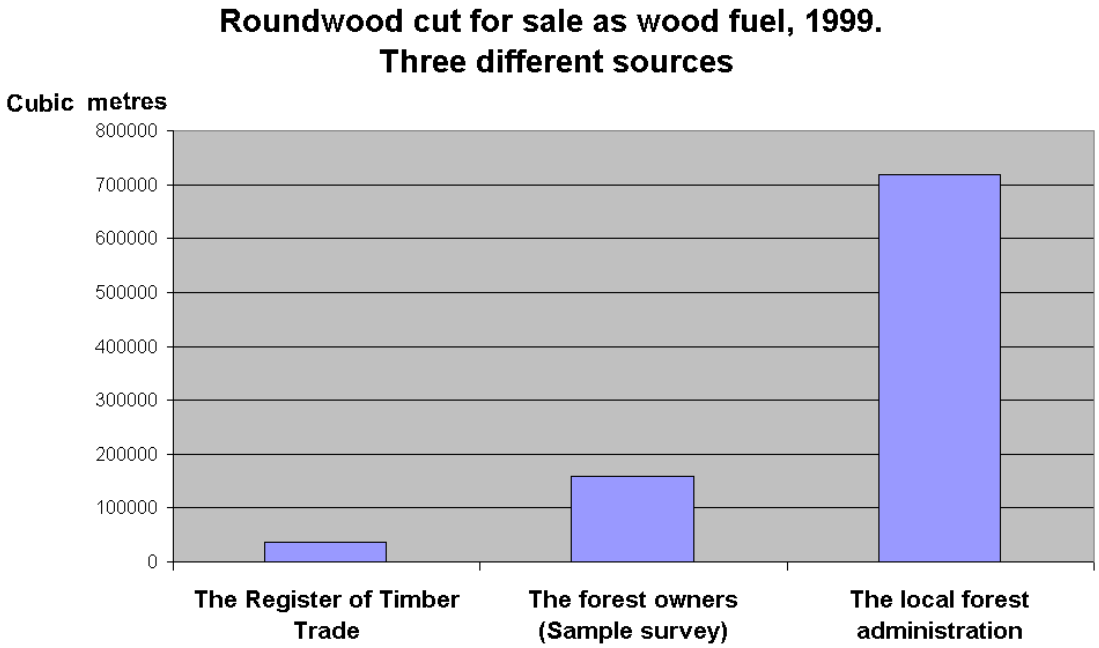
Selling some wood fuel private and on the black market have traditionally been forest owner's opportunity to a small extra income. Those who make big business out of wood fuel production will possibly pay their tax and register their quantity in the Register of Timber Trade. But the small-scale production of wood fuel for sale is mostly unorganised and not reported. In fact, a lot of the wood fuel sellers consider this more like a hobby.

How can we put a right figure on the quantity of roundwood cut for sale as wood fuel?

- We could close our eyes and trust the figures in the Register of Timber Trade
- Or we could ask the forest owners directly
- Or we can ask the local forest administration.

In every municipality there are persons working with forest matters, such as the administration of the Forest Trust Fund, legal matters connected to the sales of forest properties and other things. These people do not have information about the exact quantity of wood fuel sold, but they have inside information about the activities in the forests of the municipalities. In such way, they are the best ones to make an estimate. And since their estimate is a summing up of the whole municipality, the figure will be anonymous and no tax inspector can find out who sold this wood fuel.

Diagram: telling about it in the sample survey is not popular either.



So much for the roundwood sold as wood fuel. What about the wood fuel used by the forest owner himself or his nearest persons?

Roundwood cut for wood fuel for own consumption or ceded on usufruct:

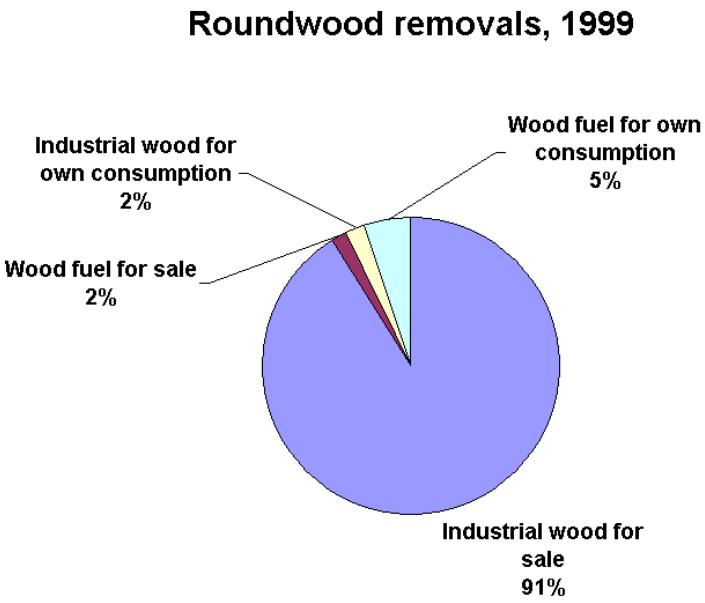
Everybody may not know the term usufruct. It means that other persons have the right to get wood fuel from your property. How do we get information about the quantity of wood fuel used by persons not buying it?

We ask the forest owners through the Sample Survey of Agriculture and Forestry.

It is not as touchy as wood fuel for sale because there is no tax that should have been paid for this.

But it is difficult to estimate quantity cut by others on usufruct and it is difficult to draw the line between sale and usufruct or act of friendship.
Example: You can say to your good neighbour: Go to my forest and take the wood you need for fuel. And then he might give you a bottle of cognac or a sack of potatoes in return. Is then the wood fuel sold or is it given away?

This last diagram shows the distribution of the Norwegian forest owners' roundwood removals by how the wood is used. (Editor: missing)



Statistics Norway calculates an energy balance which gives more information. These statistics are presented at:

http://www.ssb.no/english/subjects/01/03/10/

Italy (Mr. Antonio Macri - NB modified information in green): Italy has statistics about forestry residues, but this is what is left over in the forest, this is estimated from biotope analysis, using input/output tables.
Forestry residues in PIOT (physical input-out table) are estimated for the aggregate of "un-used material" (there is the material left over in the field or forestry).
In Italy forest removals are estimated using administrative data. Between data on forest removal (wood) we have data on wood removal for energy purposes: these are the data that we give in JFSQ as "wood fuel".

For short-rotation forestry (SRF) some forest owners make contracts with power plants. The national power network has carried out a survey on the use of bio-fuels: they use 50-60% agricultural and 40-50% forest material as fuel and are able to shift between sources of material. There is a wish to make the informal survey into an official one.

Domestic fuel wood use cannot be estimated, except with sample survey every 2-4 years; this is expensive, (XXX but could reduce costs.) and at this moment there is no official project to produce similar data.

Italy would like to share synergies from a common study with other countries.

Sawmill residues are estimated for each species. In Italy, these data are used in the compilation of national materials "input/output" tables (physical "input/output" tables, PIOT), in related tables and in environmental statistics.
There is now a new project, named NAMEA, to classify the end-uses of wood and other organic materials. In this way a new survey can be carried out on all utilisations of organic materials for the production of energy.
Here, maybe there was a misunderstanding: forestry residues are estimated for more important species: they are used in compilation of PIOT as un-used material.
NAMEA matrix is compiled in all EU countries. NAMEA uses data input from PIOT; between these inputs there are biomasses (wood included) as all. These data are utilised in NAMEA for estimation of gas emissions.

New information from Dr. Angelo Mariano, March 2005:
In Italy there is not much official information on the production and use of wood for energy, apart from the forest removals survey, which is also used for feeding international statistics (e.g. JFQ).

Trade Organisations (e.g. FEDERLEGNO) should have data on industrial wood residues used for energy purposes, but the access to this information is not easy for the public and its availability on a regular basis must be further investigated.

Anyway, as concerns unofficial information, I can point out an article (in Italian made by FEDERLEGNO) on the use of woody biomass for energy production, which is based on 1996/97 data. It can be found at web-site:

http://www.federlegno.it/appuntamenti/convegni/gruppi/assolegno/settimanalegno99/default.asp?pagina=magni

Furthermore, an important study on woody biomass in Italy was published in 2003 by APAT. The most interesting is chapter 4, which contains information on the use of residues in wood enterpises. It can be found at web-site:

www.apat.gov.it/site/_contentfiles/
00138000/138020_Rapporti30_2003_**biomasse_legnose**.pdf

An attempt to estimate the consumption of wood fuel at household level was carried out in 1998 by INEA (National Institute for Agricultural Economy) by means of phone interviews. Such a survey could be repeated in the future although not regularly (frequently?).

Russia (received from Nikolai Burdin, March 2005):
Unfortunately, in recent years the Russian bodies of official statistics have kept no records of consumption of wood and wood residues for energy purposes.

According to calculations of OAO"NIPIEIlesprom" in 2003 the total wood consumption for energy purposes accounted for 46.7 M m3 for Russia as a whole.

The estimated volume of fuel-wood for 2004 remained at the 2003 level.

Besides this, sawmilling, plywood and other woodworking enterprises use part of the wood residues to produce thermal energy. The volume of these wood residues for 2004 is estimated at 7.0 Mm3.

Pulp and paper enterprises use spent liquor and wood bark as fuel. However, these residues are not taken into account.

Appendix compiled and edited by:

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