



UNECE/FAO

Joint Wood Energy Enquiry

User Manual

version 2023-1



About this User Manual

This manual describes the structure of the UNECE/FAO Joint Wood Energy Enquiry. It builds on improvements and experiences made and valuable feedback from national correspondents during the previous rounds. This paper seeks to support and guide national correspondents in providing latest data. The objective is to gain better information on the changes and developments in the field of wood energy. Every effort has been made to make this manual and the spreadsheets as comprehensive as possible. Nonetheless they remain work in progress. Correspondents and experts are invited to send questions and/or suggestions to woodenergy.timber@un.org

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Acronyms and Abbreviations

FAO	Food and Agriculture Organization of the United Nations
IEA	International Energy Agency
ISIC	International Standard Industrial Classification
JFSQ	Joint Forest Sector Questionnaire
JWEE	Joint Wood Energy Enquiry
m ³	solid cubic metre, underbark
NAI	Net Annual Increment
NC	national correspondent
pwbfb	processed wood-based fuels
RENQUES	IEA/Eurostat/UNECE country annual questionnaire renewables and wastes
swe	solid wood equivalent
S1	direct source of wood
S2	indirect source of wood
S3	Post-consumer recovered wood/wood waste
S4	unspecific source of wood
t d.m.	metric tonnes dry matter
TJ	terajoules
toe	tonnes of oil equivalent
U1	Use of wood by power and heat sector, i.e. main activityproducer
U2	Use of wood for energy by industry sector
U3	Use of wood for energy by residential sector
U4	Use of wood for energy by undefined user
UNECE	United Nations Economic Commission for Europe

Foreword

Energy policies in Europe and beyond have increased the share of renewable energy in total energy supply in the past decade. Mitigating climate change is the major reason for political incentives supporting renewables and wood energy use. However, wood energy use has also the potential to create new job opportunities in rural areas by stimulating wood harvesting and processing as well as develop wood fuel markets and trade opportunities. Due to its regional availability wood energy can contribute to energy security. Currently wood energy denotes the principal source of renewable energy for heating in the UNECE region.

On the long term, potential benefits can only be achieved if forests - which provide wood resources for material as well as energy purposes - are sustainably managed. In addition, although wood resources are renewable, they still should be used efficiently by applying the principals of cascading use or circular economy, meaning wood is ideally burnt only after several cascades of material uses. Nowadays a substantial part of wood energy already comes from non-forest resources such as industrial co-products, landscape care wood and post-consumer recovered wood.

Monitoring use patterns of wood resources and wood energy in particular, requires detailed data. For wood and paper products production, most countries have reliable information available for the current and expected wood fibre supply and demand. On the other hand, wood energy statistics are often scattered among different entities and integrated within statistics on energy from renewables and waste. Energy statistics typically focus on the consumption and transformation side rather than the underlying supply patterns and origin of fuels, although this situation seem to slightly improve in some regions (e.g. Europe). Developing reliable statistics on the sources and uses of wood energy is thus a highly cross- sectoral and complex exercise.

Since 2005 the UNECE/FAO Joint Wood Energy Enquiry addresses this information gap by providing a framework for dialogue and cooperation between all relevant wood energy stakeholders. The Joint Wood Energy Enquiry provides specific information on the origin and amount of wood energy consumed by different users. This knowledge allows decision makers to enhance socio-economic welfare by reducing conflicts between energy and material use while guaranteeing the fulfillment of renewable energy targets and sustainable forest management commitments. Reliable statistics remain fundamental for policy formulation at both national and international level.

1. About

The UNECE/FAO Joint Wood Energy Enquiry (JWEE) collects information on wood energy. It has been developed and constantly further refined since 2006. The JWEE is a joint exercise involving the Forestry and Timber Section of the United Nations Economic Commission for Europe (UNECE/FAO Forestry and Timber Section), the Food and Agriculture Organization of the United Nations (FAO) as well as national statisticians and experts from the forestry, energy and waste sectors. The main forum to exchange views on the JWEE is the Joint FAO/UNECE Working Party on Forest Statistics, Economics and Management.

Workshops were held in Paris in 2012 and in Budapest in 2016 to improve the completeness and quality of wood energy data in the UNECE region. During the workshops national correspondents from the energy as well as the forestry sectors got introduced into the JWEE and were informed about the relationship between the JWEE, the Joint Forest Sector Questionnaire (JFSQ) and other relevant wood energy data sources.

Member states' participation in the JWEE is on a voluntary basis. UNECE and FAO are able to provide some technical support and transfer of knowledge to member states, however, no financial support can be granted.

The latest JWEE is available online in English. Users are strongly encouraged to download the latest spreadsheet from <https://unece.org/forests/joint-wood-energy-enquiry>.

2. Objective

Wood energy data is often scattered among different entities or concealed within statistics on renewables and waste. The JWEE aims to act as a bridge-builder between the energy, waste and forestry sectors, catalyzing cross-sectoral collaboration among national experts and relevant stakeholders.

The JWEE asks for detailed and disaggregated data on the supply and use of wood energy. Such level of detail allows for an effective analysis of trends and developments in the sector and a reliable assessment of the data quality. The JWEE does not necessarily require official data on wood energy, but rather looks for data that reflects realities in the wood energy sector in a timely manner. Correspondents and experts are encouraged to critically assess available official data on wood energy and where appropriate complement it by using empirical data from studies, science and industry. Expert estimates are also welcome in cases where no hard data is available. Past experience has shown that through the JWEE, member states can enter into a process of gradual improvement of their wood energy data.

3. Structure of the Enquiry

The enquiry consists of a number of different tables (i.e. workbooks) having different functions. Four tables are designed for raw data collection. One table provides an overview on the JWEE structure and compiles the data provided for verification purposes. The remaining sets of tables provide conversion factors and background information on the JWEE definitions.

The JWEE has been developed to be self-explanatory even without this Manual at hand. It provides an extensive set of additional information to facilitate the task of correspondents and experts.

3.1. "Overview" table

The "overview" table comprises all information necessary for a quick overview on the JWEE. The only action required from correspondents is to select their country in cell "B7". After selecting the country, the enquiry will i) show the country name on all the subsequent tables and prefill some cells in Tables TI and TII with the most recent information on production and trade of forest products for that country.

The "Content" sub-table in the "Overview" table presents the structure of the JWEE with hyperlinks to the workbooks. Besides the links, every worksheet is briefly described to highlight its key content and function.

The "Aggregated results" sub-table is meant to provide an instant overview of the results provided when filling in the JWEE table "T IV - energy use" (section 3.2.4). It consists of a "Timeseries" section, "Aggregated data" section and "Explanations on aggregated data" section. The "Timeseries" section shows all datapoints for total wood energy consumption ever reported in the JWEE since 2005. It also shows the share of total wood energy consumption in total primary energy supply (TPES) and renewable energy supply (RES). The data which is required to fill this table is obtained from the JWEE database as well as the IEA database, which provides information on all OECD countries and some non-OECD countries. The "Timeseries" section is meant to support correspondents in verifying their reported data.

The "Aggregated data" section shows wood energy flows from the different sources (S1-S4) to the different users (U1-U4) in a highly aggregated table format. This table reflects the main information presented in country profiles and also provides the basic information for calculating indicators on wood energy use. All values of this table are presented in 1000 m³ as a unique, single unit, using the conversion factors of the "Conversion factors" table (section 3.3). It enables correspondents and experts to immediately check their values and verify the consistency of the data before submission.

This table should not be modified by correspondents.

Table 1: "Aggregated data" table

		USES								Sum [U1;U2;U3;U4]	%
		U1 Power & heat		U2 Industrial		U3 Residential		U4 Other			
SOURCES	[1 000 m3]	S1 Direct	...	...	...	...	...	...	...
		S2 Indirect	...	...	...	...	...	...	...
		S3 Recovered	...	...	...	...	...	...	...
		S4 Unspecified	...	...	...	...	...	...	...
		Sum [S1;S2;S3;S4]									
		%									

Since 2015 the JWEE provides IEA data for comparison with the user totals (U1-U4) of the “Aggregated data” table. The total of ‘U1 - Power & heat’ is compared to IEA data, including solid biofuel consumption by main activity producers (incl. electricity, CHP and heat). Total wood energy use in ‘U2 – Industrial’ is compared to final solid biofuel consumption in i) Paper, Pulp and Print, ii) Wood and Wood Products and iii) Industry not elsewhere specified as well as solid biofuel consumption by iv) Autoproducer (incl. electricity, CHP and heat). ‘U3 – Residential’ is directly compared to IEA’s residential solid biofuel consumption. ‘U4 – Other’ is compared to the IEA sectors: Transport, Commercial and Public Services, Agriculture/Forestry, Fishing and Final consumption not elsewhere specified.

The definitions of sources (S1-S4) and uses (U1-U4) are provided in the “Explanations on Aggregated Data” section:

S1 Direct

Any wood fibre entering energy production without any further treatment or conversion. It comprises removals from forests and outside. This comprises also any wood defined by the FAO as coming from “Other Wooded Land” (OWL) and “Trees Outside Forests” but is wider than these two definitions. It comprises any woody biomass from any land use and covers amongst others infrastructure maintenance (roads, railway, power transmission lines, pipelines, etc.), hedgerows, agricultural residues from fruit tree orchards, wood from gardens and parks, etc. It comprises any form of woody biomass, such as green chips, roundwood or split, stacked or loose from any part of the trees such as roots, stemwood and branches, fruits and shells.

S2 Indirect

Processed and unprocessed co-products (residues) from the wood processing industries are considered as indirect supply. These co-products can be solid (sawdust, chips, slabs, etc.) or liquid from the pulp industry (black liquor or tall oil). Processed wood fuels with improved energy content per bulk volume (compressed), such as wood pellets, briquettes but also wood charcoal are also included under indirect supply.

S3 Recovered

The so-called post-consumer recovered wood comprises any waste wood fibre after at least one life cycle. It comprises wood from construction, renovation and demolition, but also packaging as well as old furniture. Countries often apply different classifications to distinguish between different wood waste categories (contaminated with colours, glue, etc.).

S4 Unspecified

Many countries know something about the amount of wood used but not its source. These households’ surveys are often conducted by the energy statistics and are hence not interested in detecting the different sources and origin of the wood fibres. This category represents a further step in making the JWEE more compatible with the energy statistics.

U1 Power & heat

The definition of U1 refers to “Main Activity Producers” (IEA definition), which refers to plants which are designed to produce electricity/combined heat and power (CHP) or Heat only. If one or more units of the plant is a CHP unit (and the inputs and outputs cannot be distinguished on a unit basis) then the whole plant is designated as a CHP plant. However a sawmill, for

example, which produces heat for itself as well as selling it outside, would fall under the next (U2) category. **Main activity supply undertakings generate electricity and/or heat for sale to third parties, as their primary activity.** They may be privately or publicly owned. Note that the sale need not take place through the main activity grid.

U2 Industrial

This refers to “auto producer” (IEA definition) undertakings that generate electricity and/or heat, **wholly or partly for their own use as an activity which supports their primary activity.** They may be privately or publicly owned. It includes mainly the forest-based industries, namely the (chemical) pulp producers who sell some of their energy to third parties (real or virtual sales are considered). Ideally the data should also include the process heat that is used for the production of the good at the specific plant.

U3 Residential

In the first version of the JWEE this user group was referred to as “Private households”. For consistency reasons with energy statistics it was renamed to “Residential”. It is referred to by the IEA as all consumption by households, excluding fuels used for transport. It includes households with employed persons (ISIC Division 95) which is a small part of total residential consumption.

U4 Other

This definition comprises any other economic sector that is not included in the above mentioned (e.g. agriculture, forestry and fishing, commercial and public services and transport).

3.2. Data collection tables

The core of the JWEE questionnaire consists of four interlinked data tables. These tables request detailed information on wood energy sources, the transformation of woody biomass into processed wood-based fuels, trade as well as use by the different user groups. The structure of the tables prevents double counting or overestimation of wood fibres’ availability – in particular for processed wood-based fuels and their raw material sources.

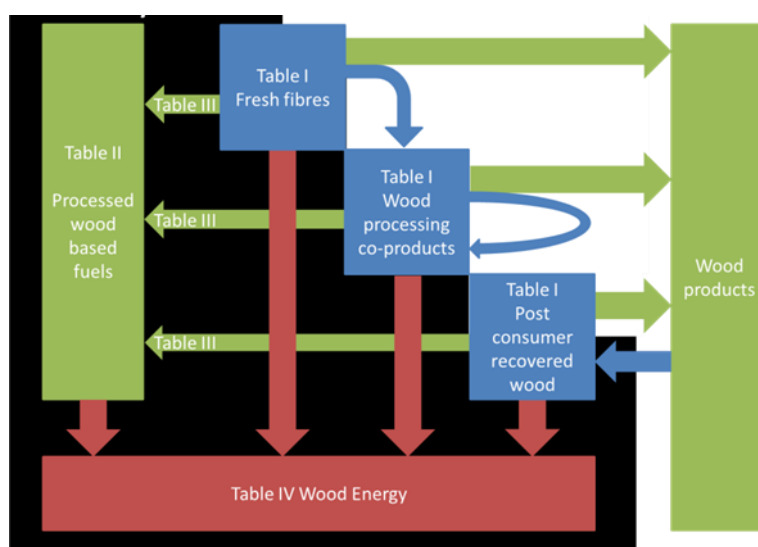


Figure 1: Scope of the JWEE 2013

The entire enquiry consists of over 400 empty cells – of which a few are pre-filled with data on forest products as soon as the reference country is chosen in the “Overview” table. However, not every single cell has to be filled. Most responses typically contain a modest average of data entries in addition to the prefilled set of data. Correspondents and experts are nonetheless encouraged to provide disaggregated data wherever possible. **Correspondents are also invited to substantiate and/or clarify any data entry by inserting comments as appropriate.**

3.2.1. Table “T I fibre sources”

T I fibre sources	Assessment of wood available for energy and material use at national level. Partially pre-filled table with data from the Joint Forest Sector Questionnaire.
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Table “T I fibre sources” is an inventory of the domestically available wood sources and fibre types for the reference year. It also includes information on the trade balances. The volumes reported should include any fibres available, without considering their potential use at that stage – **This table is not limited to energy use of wood fibres.** This approach will enable some conclusions on the role of wood energy for the forest-based sector and also helps to assess potential gaps, availabilities and conflicts.

Table I goes beyond the set of data collected in the Joint Forest Sector Questionnaire (JFSQ). However, the linkage and overlapping with the JFSQ is taken into consideration and any data already available at international level is used to pre-fill a number of cells.

Table “T I fibre sources” distinguishes three categories of forest products by the origin of the wood fibres: i) primary solid biomass from forest land and from outside forests, ii) solid and liquid biomass from forest-based industry and iii) municipal solid waste/biodegradables. Forest products from “primary solid biomass” and “solid and liquid biomass from forest-based industry” comprise forest products as defined in the JFSQ. Definitions for industrial roundwood and fuelwood from forests, chips and particles as well as wood residues are harmonized with JFSQ definitions.¹

The cell on “Black liquor (without crude tall oil)” is prefilled, based on JFSQ information on chemical pulp production using the conversion factors from the “Conversion factors” table. Since the conversion factors for prefilling the black liquor data are generic, country correspondents are strongly encouraged to verify the amount and to adjust it accordingly. The unit has been changed to metric tonnes upon request during the Paris workshop in 2012.

Since the 2009 questionnaire, the category tall oil has been modified to “Crude tall oil” to include the entire amount of resin acids, fatty acids and other derivatives that are obtained when acidifying black liquor soap with sulphuric acid. Tall oil generation is not being prefilled, since it is a highly specific by-product of kraft pulping of pine wood. The amount of tall oil pitch should also be reported under this category – despite the fact that a very limited number of countries may have different tax schemes for each tall oil distillate.

¹ Glasenapp S, McCusker A (2018) Wood energy data: the joint wood energy enquiry. In: Aguilar, F X (ed) Wood energy in the ECE region, Data, trends and outlook in Europe, the Commonwealth of Independent States and North America. Geneva: UNECE, pp 12-29.

Bark data is also prefilled based on the rather conservative estimate that bark represents 3% of harvested industrial roundwood. This estimate is unlikely to reflect real volumes. In fact, in the UNECE region, the bark of conifers and non-coniferous species ranges from as little as 5% of the total over bark volume (and weight) to as much as 30%.² The objective of prefilling a low estimate is to increase awareness on this concealed source of energy. Unlike fuelwood bark, industrial roundwood bark has a different application right from the beginning. Sawmills and pulp and paper plants are equipped with very efficient bark separation units. Any international statistic and most of the national statistics report industrial roundwood under bark. However, bark may play a significant role in the fuel supply to pulp and paper and sawmill industries for heat and steam production.

Since 2019, data on post-consumer recovered wood is prefilled using JFSQ data. However, it is suggested that national/ international waste statistics and experts may provide additional information on post-consumer recovered wood, e.g. on the split of hazardous and non-hazardous post-consumer recovered wood. The table also provides some information, where national correspondents and experts may find relevant information on post-consumer recovered wood.

The column on “Gross Domestic Supply” should remain unchanged since it is calculated based on production and net trade figures.

3.2.2. Table “TII processed wood based-fuels”

TII processed wood-based fuels	Assessment of national production of processed wood-based fuels (charcoal, pellets, torrefied pellets, briquettes, pyrolysis oils, biodiesel, ethanol and synthesis gas).
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Even though the JWEE does not cover most of the forest-based products, it makes an exception for processed wood-based fuels (pwbf), inclusive of solid and liquid fuels. This is necessary since pwbf are subject to intensive trade. In case of exports, these volumes are first deviated from the domestically available volumes and then need to be subtracted from the available biomass. Table TII compiles the information about national production and trade.

Wood charcoal and wood pellets are already reported in the JFSQ, so these cells are prefilled with existing data. Briquettes can also be included under pellets if it is not possible to distinguish them from pellets. At the request of national correspondents, a category: ‘wood pellets of which: torrefied’ was introduced in 2015 to allow separate reporting of torrefied pellets. Please indicate in the comments when a distinction of wood pellets, briquettes and/or torrefied pellets is not possible and a total of these products is reported under wood pellets.

The liquid biofuels (incl. pyrolysis oils, biodiesel and ethanol) and gaseous wood-based fuels (incl. synthesis gas) have been inserted for completeness and priority should be given to providing information on solid wood-based fuels. Yet, it is not possible to report production and trade data for synthesis gas. This might change if synthesis gas becomes more relevant in the future.

The column on “Gross Domestic Supply” should remain unchanged since it is calculated based on production and net trade figures.

² FAO, ITTO and United Nations. 2020. Forest product conversion factors. Rome.
<https://doi.org/10.4060/ca7952en>

3.2.3. Table “T III processed wood-based fuels origins”

T III processed wood-based fuels origins	Assessment of wood fibres origin and quality used for the production of processed wood-based fuels (pwbf).
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Table “T III pwbf origins” has been developed to avoid double counting. It subtracts the wood fibres used for the production of processed wood-based fuels from the domestic supply and therefore provides an exact balance of wood available for energy and material use. The table enables correspondents and experts to provide information on the sources of wood fibre used for the production of solid fuels (i.e. wood charcoal, wood pellets, torrefied wood pellets and wood briquettes) and liquid processed wood-based fuels (i.e. pyrolysis oils, cellulose based ethanol, wood-based biodiesel). The liquid biofuels have been inserted for completeness so priority should be given to providing information on solid wood-based fuels.

This table may be of particular interest to countries with an extensive production of processed wood-based fuels and a high share of net exports. The transformation of wood co-products and wood fibres to pellets and their export can reduce the wood availability at national level. The secretariat very strongly encourages correspondents to at least provide information on the production of wood pellets. The reason for that is that the pellets sector traditionally uses co-products as raw material. A downturn of the sawmill sector and constant increase in wood pellets production capacity and demand, may change the wood demand pattern of the sector. The share of co-products in the raw material portfolio could decline and fresh fibres might be directly used to produce wood pellets. Careful assessment of this sector is likely to provide valuable information for decision makers.

In case correspondents and experts are unable to provide total volumes, they may provide information on the specific shares for each single fibre source in percentage points. In case no detailed information is available, aggregated shares for the direct, indirect and recovered fibres may be entered. In case of partial information on the fibres used, the remaining amount will be automatically highlighted and included in table IV. In case no data are provided in this table, the volumes required will be generated based on default values and will be subtracted from fibres from unknown sources.

3.2.4. Table T IV “T IV energy use”

T IV energy use	This is the core table of the JWEE. It gathers information on fibre origin and amounts used for energy production by the different sectors.
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Table “T IV energy use” is the core of the JWEE where correspondents and experts from the energy, forestry and waste sectors need to collaborate closely. It provides in one single table the information on wood resources as inserted in tables T I – T III and asks for energy use of wood fibres by sectors. Any value in this table is given in the standard unit of 1000 metric tonnes dry matter (t.d.m.), except for certain liquid co-products. The provided figures are converted into cubic meters solid wood equivalents (m³ swe) using conversion factors from the table “Conversion Factors” (section 3.3), to facilitate comparison with forestry statistics. “

The users are differentiated according to the International Standard Industrial Classification of all economic activities (ISIC) and mostly match the vertical part of the IEA/Eurostat/UNECE annual

questionnaire on renewables and wastes (RENQUES), i.e. the sectors of the energy balance.³ The total volumes of the JWEE may provide information for cells F7 and G7 of RENQUES “Table 2a. SUPPLY, TRANSFORMATION, ENERGY SECTORS & END USE” as well as parts of table 4 “Production of solid biofuels and biogases”.

In the JWEE questionnaire, the “Main Activity Producers”, “Industry Sector” and “Other Direct Final Consumption” denote the three main wood energy consuming sectors. “Main activity producers” are defined as undertakings primarily producing energy (e.g. power plants). This category further distinguishes between heat, electricity and combined heat and power (CHP).⁴

For the “Industry sector” the JWEE questionnaire gathers information about the wood energy use of the wood processing industry which comprises pulp and paper, wood and wood products and other industry. The industry sector includes undertakings that do not primarily produce energy (e.g. pulp mill, sawmills). It includes the generation of heat, electricity or CHP which is produced by the facility for its own use and/or for sale. The JWEE combines own use of energy (direct consumption) and sale (autoproduction). This is different from the IEA/Eurostat/UNECE definitions which separate direct consumption and autoproduction. Autoproducer undertakings generate electricity and/or heat, wholly or partly for their own use as an activity which supports their primary activity.⁴

The “Other Direct Final Consumption” matches IEA/Eurostat/UNECE definitions for direct final consumption. This sector comprises the residential sector, agriculture, forestry and fishing, commercial and public service, transport sector as well as other sectors (“not elsewhere specified” in IEA definition).⁴

Wood consuming sectors are matched against the forest products introduced in Tables I and II (sections 3.2.1 and 3.2.2).⁴ Please note that since 2013 industrial roundwood and fuelwood is separated into i) woody biomass from forests and ii) woody biomass from outside forests. Please also note that roundwood is reported under bark, i.e. without bark. The amount of bark attached to logs is subtracted from the roundwood figures and reported in line 25 as bark, even if bark is attached to the roundwood when it’s burnt.

In total up to 287 single data points can be filled in table “T IV energy use”. However, it is not expected that all cells will be filled by correspondents or experts. Providing 24 key data points (18 of which being Totals) in lines 21, 26, 29, 31, 32, 41 and columns R, AC, AH, and AR is satisfactory. These are key data points that provide highly useful information for analysis and filling in of the “Aggregated data” table (section 3.1). In case no disaggregated data is available for wood energy users, correspondents may enter data directly into the columns: ‘unspecified’ (i.e. columns R, AC and AR).

In case no other information is available on forest products, correspondents and experts are invited to provide information or expert estimates in line 43 (‘wood from unknown sources’). Energy experts should be able to provide this information too. In case these are available in energy units, information from Table “Conversion Factors” can be applied (section 3.3).

³ primarily RENQUES tables “PRIMSBIO” (Solid biofuels), “CHARCOAL” (Charcoal), “MUNWASTER” (Municipal Waste (renewable)), “BIOGASOL” (Biogasoline), “BIOETHANOL” (Bioethanol) and “BIODIESEL” (Biodiesel).

⁴ Glasenapp S, McCusker A (2018) Wood energy data: the joint wood energy enquiry. In: Aguilar, F X (ed) Wood energy in the ECE region, Data, trends and outlook in Europe, the Commonwealth of Independent States and North America. Geneva: UNECE, pp 12-29.

3.3. “Conversion factors” table

The “Conversion factors energy” sub-table plays a crucial role in the JWEE. The conversion factors are applied to link tables I and II with table IV (column H), convert wood energy data reported in table IV in 1000 m³ (column J) and to link table IV and the overview table (column L).

Correspondents are invited to adjust the conversion factors by updating following wood properties:

- More appropriate values for density can be either directly entered into column Q or updated through selecting up to 6 wood species (line 12; columns R, T, V, X, Z and AB) and weight them by relative relevance (columns R, T, V, X, Z and AB). The weighted density will be computed automatically when selecting wood species and providing relative weights (column Q).

Data in the “Conversion factors volume” sub-table is for information only and not directly applied and linked to the data collection tables. They represent default values and may vary according to local conditions and definitions. Table 2 and Table 3 present conversion factors from and to solid cubic meters (m³) under bark (i.e., excluding bark).

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Table 2: Conversion factor volumes solid m³ to other

1	m ³ (solid u.b.)	split firewood	=	1.4286	m ³ (stacked)
1	m ³ (solid u.b.)	firewood	=	1.1765	m ³ (stacked)
1	m ³ (solid u.b.)	firewood	=	2.0000	m ³ (loose/bulk)
1	m ³ (solid u.b.)	wood chips G30	=	2.5000	m ³ (loose/bulk)
1	m ³ (solid u.b.)	wood chips G50	=	3.0303	m ³ (loose/bulk)
1	m ³ (solid u.b.)	sawdust	=	3.0303	m ³ (loose/bulk)
1	m ³ (solid u.b.)	wood shavings	=	5.0000	m ³ (loose/bulk)
1	m ³ (solid u.b.)	bark chippings	=	3.3333	m ³ (loose/bulk)

Table 3: Conversion factor volumes other to solid m³

1	m ³ (stacked)	split firewood	=	0.7000	m ³ (solid u.b.)
1	m ³ (stacked)	firewood	=	0.8500	m ³ (solid u.b.)
1	m ³ (loose/bulk)	firewood	=	0.5000	m ³ (solid u.b.)
1	m ³ (loose/bulk)	wood chips G30	=	0.4000	m ³ (solid u.b.)
1	m ³ (loose/bulk)	wood chips G50	=	0.3300	m ³ (solid u.b.)
1	m ³ (loose/bulk)	sawdust	=	0.3300	m ³ (solid u.b.)
1	m ³ (loose/bulk)	wood shavings	=	0.2000	m ³ (solid u.b.)
1	m ³ (loose/bulk)	bark chippings	=	0.3000	m ³ (solid u.b.)

3.4. “User information” table

One of the features of the JWEE is the intention of going beyond official data. Correspondents and experts are encouraged to use any source of information for providing as detailed information as possible. Hence, data accuracy can vary greatly and correspondents are asked to rate the quality of data points. The data quality indicator (DQ) allows correspondents to submit the most complete dataset possible even though data may originate from a range of sources of differing quality.

The following data quality flags are used:

- A Excellent data quality (e.g. empirical data from a recent study)
- B Good data quality (e.g. older studies with widely recognized precision or a good expert estimate - based on more than one source)
- C Rough estimate (about right order of magnitude),
- D No information on data quality available
- O Official national statistics

The “Information on Data Quality” sub-table in the “User information” table of the JWEE provides this information on data quality flags.

The “Definition” sub-table is another table in the “User information” table which provides definitions used in the JWEE. The JWEE does not introduce any new definition. However, definition might have been adjusted to better suit the JWEE reporting (e.g. definition for ‘Direct Final Consumer and Autoproducer’). The terms and definitions are listed according to the JWEE section in which they appear:

- Fibre sources and types (Table I)
- Processed wood based fuels (Tables II and III)
- Energy use (Table IV)
- Conversion factors (Conversion factors)
- Miscellaneous (other)

Each of the definitions is supplemented with its source and a hyperlink in a separate column where appropriate. Correspondents can thus look up and understand the context of each definition. Some of the hyperlinks refer to valuable information beyond the scope of the JWEE.

4. Prefilling

The UNECE/FAO secretariat pre-fills tables as far as possible to avoid duplication of correspondents’ efforts. The secretariat is providing pre-filled data for shaded fields in the enquiry (based on JFSQ data). However, correspondents may modify these figures should they meanwhile have obtained access to more recent or reliable data.

5. Data collection procedure

The following sections will briefly describe the role of the national correspondents (section 5.1), suggestions made during the Paris workshop in 2012 on data collection (section 5.2) and support in cross-sectoral communication (section 5.3).

5.1. National Correspondent

Appointing a National Correspondent (NC) is essential to maintain a clear line of communication between the Secretariat in Geneva and the Member states. It is not necessary or expected that the NC personally provides all the data but that the correspondent brings all the data together. The NC is therefore encouraged to reach out to national specialists for specific data (e.g. solid/liquid processed wood-based fuels, energy or waste statistics, pellets associations, etc.) in order to collect the latest information on each commodity and use.

The main functions of the JWEE National Correspondent are:

- To oversee the collection and verification of data provided for the JWEE.
 - coordinate with different governmental and non-governmental groups (National Statistical Institute, Forestry Ministry, Energy Ministry, industry associations, and other interested groups).
 - understand the data and ensure the data is coherent and in balance with known figures (e.g. electricity consumption or wood removals).
- To function as the key contact between the international secretariat and the various bodies bringing data together, replying to questions, providing feedback on questionnaire and process, and meeting deadlines. The correspondent is also expected to raise issues or difficulties, both directly with the secretariat and at international meetings to review the JWEE process (e.g. ECE/FAO Working Party).
- To use estimations where official data is unavailable or unreliable and share these with the international secretariat. Deviations from data standards should be explained (either directly in the questionnaire or in a side note), particularly where data do not cover the entire geographic area or trade sector.

5.2. Suggestions on collecting data

A common issue is the difficulty on finding data that are not generally available and there may be a number of different approaches facilitating the collection of data. These include the use of household survey data to estimate fuelwood use, contacting pellet producers or associations and working with energy information networks. Special studies could also be carried out with support from other actors. Frequently persistence and repeated contacts result in improved information.

Based on past experiences it may be advisable for member States to:

- establish a national network or working group of wood energy experts. To this end, they should:
 - Identify the right person to be appointed as national correspondent;
 - Use informal methods for initiating contact with stakeholders;

- Conduct a “mapping exercise” to identify relevant institutions and actors; this includes but is not limited to national statistical institutions, energy agencies, forestry agencies, wood and biomass energy associations, trade federations, the academic community and energy users.
- First-time respondents to provide minimal data to JWEE rather than seeking to complete all parts;
- get in touch with the authorities providing similar data (e.g. EU member states reporting on wood energy use).

5.3. Communication

As mentioned above, the national correspondent (NC) is invited to consult with any expert at the national level to find required information. Should it be difficult to reach out to national contacts, the secretariat would be pleased to provide support to identify and facilitate the necessary contacts.

The secretariat may directly inform national experts or specialists about the enquiry based on the networks and contacts made in all relevant sectors. The secretariat will inform any specialist who has been contacted directly that information should be provided via the NC. Where possible, the secretariat will inform NCs about each directly contacted expert. This may not always be possible due to confidentiality reasons of some networks (e.g. national correspondents of the International Energy Agency). The secretariat will ask the NC for approval for any data not being sent through them.

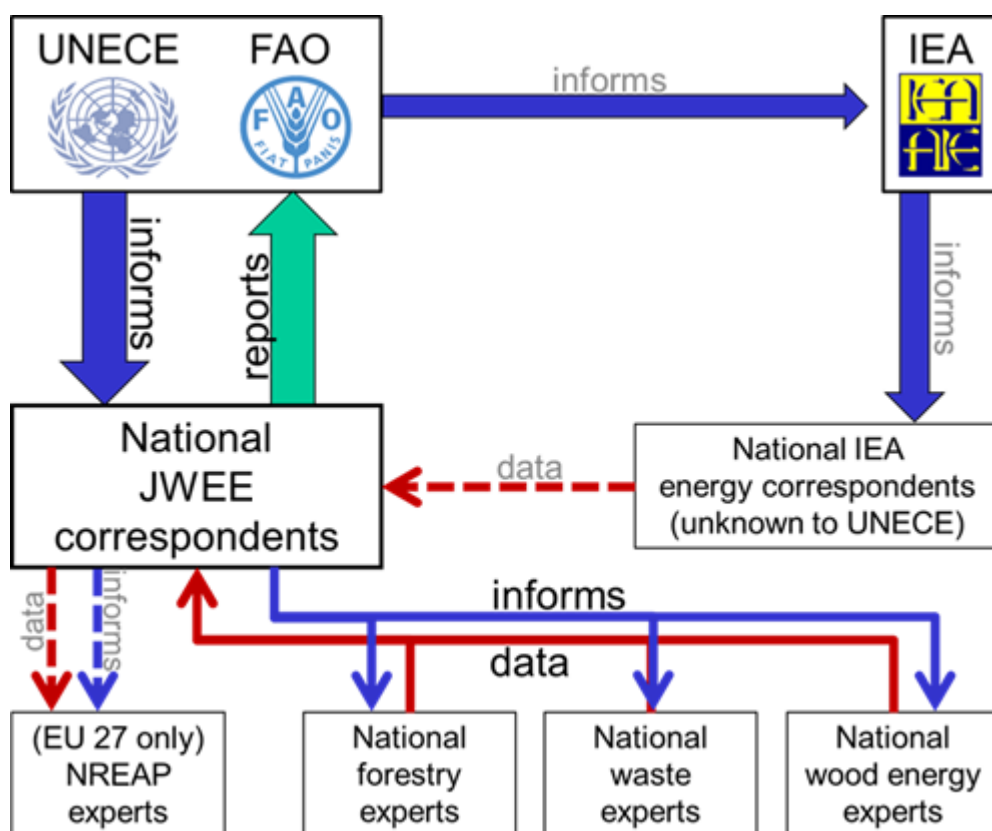


Figure 2: Data collection procedure