



EFORWOOD

Sustainability Impact Assessment
of the Forestry - Wood Chain



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EFORWOOD

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**Report on Indicator Working Groups on data collection protocols
for Single FWC**

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RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

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- THIS IS ONLY FOR THE SINGLE CHAINS –

- DO NOT USE IT FOR THE CASE STUDIES –

1. INTRODUCTION

This compilation is undertaken according to IP board 14 and 15 decision (Paragraph 3) in order to review boundaries, changes and open issues to discuss concerning data collections for indicators. It consists of;

1. An introduction, where a general approach is stated as decided in the IP Board 14 and 15, as well as in the Indicator Working Group discussions.
2. Data protocol according to the Indicator Working Groups.
3. Literature.
4. Annexes.

Indicator descriptions according to reports from Indicator Working Groups are not published in this document. They are referred to in 3. Literature

The Indicator Working Groups have not been covering the indicators:

- 17 Forest resources
- 20 tree species composition
- 21 Corporate responsibility
- 28 Indicator missing
- 30 Noise and Smell
- 31 Use of Aesthetics

PURPOSE OF THE DOCUMENT

The purpose of this document is to provide guidance for the data collection of Single FWC that shall be completed to the 10th of June. This is Draft PD and encompass the indicators that are agreed upon. They are (1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 22, 23, 24, 29). They are in black. **Red ones (Nr 4, 7, 16, 19)** need further definition. Indicator 18 has been deleted. **Blue ones (Nr. 17, 20, 21, 28, 30, 31)**, as mentioned above, have not been dealt with by the indicator groups. Data collection for the qualitative indicators 25, 26 and 27 is not entirely clear. Further information will come later.

This is so a catalogue over the indicators to be dealt with. The data collector should for a closer definition of indicator and recommendations also consult the reports from the Indicator Working groups, on Socio - Economic indicators, Energy, Environmental indicators, Transport and Waste. They are referred to at the end of this report (3. Literature).

GENERAL SYSTEM BOUNDARIES

Infrastructure¹: They include public roads, electric grid, tracks. Buildings and machinery are excluded from the system in terms of indicator calculations. They may appear as indirect production costs.

Supply Chain¹: Supply chains of non-wood materials are excluded. Only for the indicators “Energy” Nr. 13 and “GHG” Nr. 14 supply chains are being followed as far as possible.

Non-operating costs¹ (administration costs, leasing and rental fees, etc.) and **services and process not directly related to a product** (maintenance of machines and building, cost of sales personnel and facilities, warehousing, cost of hedging and profits/losses due to change of exchange rates ...):

Insurance costs: should be included

VAT and other indirect taxes: should be excluded wherever possible. For Indicator “Wages and salaries”, Nr. 10, the wages and salaries should be reported, including the income tax and the social security payments (both by the employer and the employee) if possible.

Costs vs. prices: IP Board 15 (3):

"... where data on costs are available, these should be used, and when not, to rely on prices on a case-by-case basis."

INDICATOR REFERENCE UNITS (ALIAS FUNCTIONAL UNITS), MEASUREMENT UNITS AND CONVERSION FACTORS

In ToSIA products and processes are calculated. For *products* it is necessary to state a **conversion factor**. *Processes* are reported by **measurement unit per reference unit**.

Products -> **conversion factor:**

All products (of processes) need to be stated for conversion into the following ToSIA calculation units. Those are for:

M2: ha

M3-5: tons of Carbon

Processes -> **measurement unit per reference unit:**

All units used for measuring indicators (and which are individual for each indicator) should be provided **per reference unit** (e.g. m³ ub) and represent a yearly (e.g. 2005) material consumption of a process. In ToSIA the indicator results are calculated on the basis of the total sum of all input to a process.

The measurement units can be found in the protocol of the individual indicator. The **reference units** are for:

M2: ha

M3-5: m³

That description **measurement unit per reference unit** could, for example, be €/ha for M2 or €/m³ for M3-5

TRANSPORT

Transport is a process and so all applicable indicators apply. The former indicator “Transport” Nr. 15 will be renamed to “Distance and Load” Nr. 15 and as such is only calculated for transport processes, together with the indicators for production, employment, etc. In case there is a specified way of calculation it is stated at the indicator in question. It is a process which appears in all modules (see test chain).

¹ EFORWOOD IP Board (14) minutes of the meeting dated February 16, 2007; minutes dated March 5, 2007, Uppsala

Transport is mainly freight (passengers transport could be included in specific situation - study cases).

2. DATA PROTOCOL ACCORDING TO INDICATOR WORKING GROUPS

Indicators in black are operative for immediate data collection for the Single FWC (due until the end of May). **Red ones (Nr 4, 7, 16, 19)** need further definition. Indicator 18 has been deleted. **Blue ones Nr. (17, 20, 21, 28, 30, 31)** have not been dealt with by the indicator groups.

Economic indicators	
Number	(1)
Name	Gross value added and gross domestic product
Sub- Indicators	1.1. <u>Gross value added (at factor cost)</u> by processes within each Module (M2-M5)
Measurement units	1.1 in Euro (million) per reference unit .
Number	(2)
Name	Production costs
Sub- Indicators	2.1. Average cost by processes within each Module (M2-M5) classified by: <ul style="list-style-type: none"> a) Raw materials from FWC [Production cost of process inputs from the FWC i.e. wood raw material from preceding FWC processes] b) Raw materials from outside FWC [Production cost of process inputs from outside the FWC] c) Labour costs d) Energy costs (e.g. fuel costs in case of transportation) e) Other productive costs (maintenance, general industrial costs, administrative costs, etc) f) Non-productive costs (corporate taxes, capital charges, VAT and any other taxes or charges)
Measurement units	2.1.a – 2.1.f) in Euro (million) per reference unit .
Number	(3)
Name	Trade balance
Sub- Indicators	3.1. <u>Imports of wood</u> in total FWC and by sub-sector classified by: <ul style="list-style-type: none"> a) volume b) value c) % of total volume consumed 3.2. <u>Imports of products derived from wood</u> in total FWC and by sub-sector classified by <ul style="list-style-type: none"> a) volume b) value c) % of total volume consumed 3.3. <u>Exports of wood</u> in total FWC and by sub-sector classified by: <ul style="list-style-type: none"> a) a) volume b) value c) % of total volume consumed 3.4. <u>Exports of products derived from wood</u> in total FWC and by sub-sector classified by <ul style="list-style-type: none"> a) volume b) value c) % of total volume consumed
Measurement units	3.1.a and 3.2.a and 3.3a and 3.4a) ktonnes, kg, m ³ , etc. (depends on product unit) per reference unit. 3.1.b and 3.2.b and 3.3b and 3.4b) Euro (million) (aggregated) per

reference unit..

3.1.c and 3.2.c and 3.3c and 3.4c) % of total volume consumed per reference unit.

Number	(4)
Name	Resource/ material use
Sub- Indicators	4.1.) volume of material from inside the FWC of virgin origin 4.2.) volume of material from inside the FWC of recovered origin 4.3.) volume of material from outside the FWC of virgin origin 4.4.) volume of material from outside the FWC of recovered origin
Measurement units	4.1– 4.4) ktonnes, m ³ , kg, etc. (depends on the unit) per reference unit.

Number	(5)
Name	Enterprise structure
Sub- Indicators	5.1. <u>enterprises and forest holdings</u> in total FWC and by sub-sector classified by: a) size classes i. enterprises: micro and small enterprise (0-49 employees), small and medium sized (50-249 employees), large enterprises (>250 employees) ii. forest holdings (<=500 ha), (>= 500 ha) b) ownership categories for forest and other wooded land i. in public ownership ii. in private ownership iii. in other ownership
Measurement units	5.1.a) number per class per reference unit. 5.1.b) number per category per ha per reference unit.

Number	(6)
Name	Investment and Research & Development
Sub- Indicators	6.1. <u>Investment (gross fixed capital formation)</u> in total FWC and by sub-sector classified by: total value of fixed assets (machinery and equipment, vehicles &, the value of land improvements, and buildings) 6.2. <u>Research & Development expenditure</u> in total FWC and by sub-sector classified by: total value of private and public expenditure:
Measurement units	6.1 – 6.2) in Euro (million) per reference unit.

Number	(7)
Name	Innovation
Sub- Indicators	7.1. <u>New products</u> in total FWC and by sub-sector classified by: a) goods (definitions see annex) b) services (definitions see annex) 7.2. <u>New technological processes</u> in total FWC and by sub-sector 7.1.a –7.1.b & 7.2) total number per reference unit. 7.1.a –7.1.b & 7.2) in % of turnover per reference unit.
Measurement units	

Number	(8)
Name	Total production
Sub- Indicators	8.1. <u>Goods (marketed)</u> (classification see annex) in total FWC and by sub-sector classified by: a) volume b) value 8.2. <u>Services (marketed)</u> (classification see annex) in total FWC and by sub-sector classified by a) volume

	a) b) value
Measurement units	8.1.-8.2.a) tonnes, kg, m ³ , etc. (depends on the product) per reference unit. 8.1.-8.2.b) Euro (in million) per reference unit.

Social indicators

Number	(9)
Name	Employment
Sub- Indicators	<u>9.1. Persons employed</u> by processes within each Module (M2-M5) classified by gender categories i. male ii. female
Measurement units	9.1.) Number of employees per year (in full-time equivalents) per reference unit.

Number	(10)
Name	Wages and salaries
Sub- Indicators	<u>10.1. Wages and salaries</u> by processes within each Module (M2-M5) classified by gender category i. male ii. female

Measurement units 10.1. €/hour per reference unit.

Number	(11)
Name	Occupational safety and health
Sub- Indicators	<u>11.1. Occupational accidents</u> by processes within each Module (M2-M5) classified by: a) non-fatal occupational accidents b) fatal occupational accidents <u>11.2. Occupational diseases</u> by processes within each Module (M2-M5)
Measurement units	11.1.a) absolute numbers and in % per 1000 employees per reference unit. 11.1.b) absolute numbers by 100 employees per reference unit. 11.2.) frequency of cases per number of persons exposed multiplied by number of years of exposure and in % per 1000 employees per reference unit.

Number	(12)
Name	Education and training
Sub- Indicators	<u>12.1. Education time</u> by processes within each Module (M2-M5) <u>12.2. Training expenditure</u> by processes within each Module (M2-M5)
Measurement units	12.1.) per person-year working time per reference unit. 12.2.) in Euro per person-year working time per reference unit.

Environmental and Energy Indicators

Number	(13)
Name	Energy generation
Sub- Indicators	<u>13.1. On-site energy generation from renewables</u> by processes within each Module (M2-M5) classified by origin: The total renewable energy generated in the process; energy generation from renewable sources in excess of what is needed in the process (e.g. sold to the grid) should also be accounted for here. i. from residues from process – inputs (wood processing residues and lignin) ii. from other wood biomass – (wood with the main purpose to be used for energy) (branches, small logs, tops, debris and other forest residues) iii. Non-wood based renewable energy (other biomass, wind, solar, geothermal, hydropower etc.)
	<u>13.2. Energy use</u> by processes within each Module (M2-M5) classified by origin:

The total amount of energy used within the process, classified by origin:

- i. renewable energy (see LI 15c) (excluding electricity from the grid)
- ii. non-renewable energy (oil, gas, coal, nuclear and others) (excluding electricity from the grid)
- iii. Electricity from the grid (external electricity; this may originate from renewable or non-renewable sources)

Measurement units 13.1.a & 13.2) absolute numbers in energy terms (MWh) per reference unit.

Number (14)
Name **Greenhouse gas balance**
Sub- Indicators 14.1. Greenhouse gas emissions by processes within each Module (M2-M5)
 14.2. Carbon sequestration by processes within each Module (M2-M5) on average for the reference year averaged over a period of 5 years for:

- a) living woody biomass above and below ground, dead wood and in soils of forest
- b) harvested wood products

Measurement units 14.1, 14.2.a – 14.2.b) all converted in kg of CO₂-equivalents per reference unit.

Number 15
Name **Distance and load indicator**
Sub- Indicators 15.1. Transport distance (loaded and backhaulage for road mode) by processes within each Module (M2-M5) classified by mode of transport:
 15.2. Volume of freight (loaded and backhaulage for road mode) by processes within each Module (M2-M5) classified by mode of transport

Measurement units 15.1 km, 15.2 ton

Number (16)
Name **Water use**
Sub- Indicators 16.1. Water use by processes within each Module (M2-M5)

Measurement units kg per reference unit.
 1kg = 1 dm³ of water

Number (17)

Name **Forest resources**

Sub- Indicators

Measurement units
Number

Name

Sub- Indicators

Measurement units

Deleted: 18

Number (19)
Name **Emissions to soil, water and air**
Sub- Indicators 19.1 Soil pollution by processes within each Module (M2-M5)
 19.2 Water pollution by processes within each Module (M2-M5) classified by:

- a) organic substances (biochemical oxygen demand)
- b) nutrients (nitrogen, phosphorus) as BOD5
- c) hazardous substances

Measurement units 21.2.a – c) gram or kg per reference unit.

Number (20)

Name **Tree species composition - not treated**

Sub- Indicators

Measurement units

Number (21)

Name **Corporate responsibility**

Sub- Indicators

Measurement units

Number	(22)
Name	Generation of waste
Sub- Indicators	22.1 Generation of waste 22.2 Hazardous waste (part of 22.1) 22.3 Waste to material recycling (part of 22.1) 22.4 Waste to landfill (part of 22.1)

Measurement units kg per reference unit.

Qualitative Indicators

Number	(23)
Name	Compliance costs
Sub- Indicators	
Measurement units	Low – medium – high (see indicator description)

Number	(24)
Name	Quality of work
Sub- Indicators	24.1. <u>Persons employed</u> in total FWC and by sub-sector classified by: <ul style="list-style-type: none"> a) skills <ul style="list-style-type: none"> i. low skilled workers ii. high skilled workers b) type of employment <ul style="list-style-type: none"> i. direct employment ii. indirect employment c) equality of treatment

Measurement units 24.1.a – 24.1.c) absolute number (in full-time equivalents) per reference unit .

Number	(25)
Name	Other services to the public including the recreational use of forests (social indicator)

Sub- Indicators**Measurement units**

Number	(26)
Name	Community participation and communication (social indicator)

Sub- Indicators**Measurement units**

Number	(27)
Name	Consumer attitudes on forest management, forestry and forest products (social indicator)

Sub- Indicators

Measurement units % of certified products

Or:
Qualitative assessment? – Good – bad?

Number	28
Name	- missing-
Sub- Indicators	
Measurement units	
Missing: 28 - blue	

Indicators under construction/consideration

Number	(29)
Name	Revenue
Sub- Indicators	29.1. <u>goods and services (see classification in the annex)</u> in total FWC and by sub-sector classified by value
Measurement units	29.1.a) Euro (million)

Number	(30)
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Name	Noise and smell - not treated
Sub- Indicators	
Measurement units	
Number	(31)

Name	Aesthetics- not treated
Sub- Indicators	
Measurement units	

3. LITERATURE:

EFORWOOD. 2007. IP Board (14) minutes of the meeting dated February 16, 2007; minutes dated March 5, 2007, Uppsala

EFORWOOD. 2007. IP Board (15) minutes of the meeting dated March 9, 2007; minutes dated March 9, 2007, Uppsala

FWC Indicator draft set 4 – 30.10.06

FWC Indicator draft set 5 - 09.11.07 (Available at Eforwood Web site)

Laurijssen, J. et al., 2007. Protocol on data collection for single wood chains – energy indicators group. Final Draft 20 May 2007.

Le Net, E. et al., 2007. Protocol on data collection for transport. Final version 21st of May 2007.

Moberg, Å. et al. 2007. Protocol on data collection – Waste group. Final version. 17 May 2007

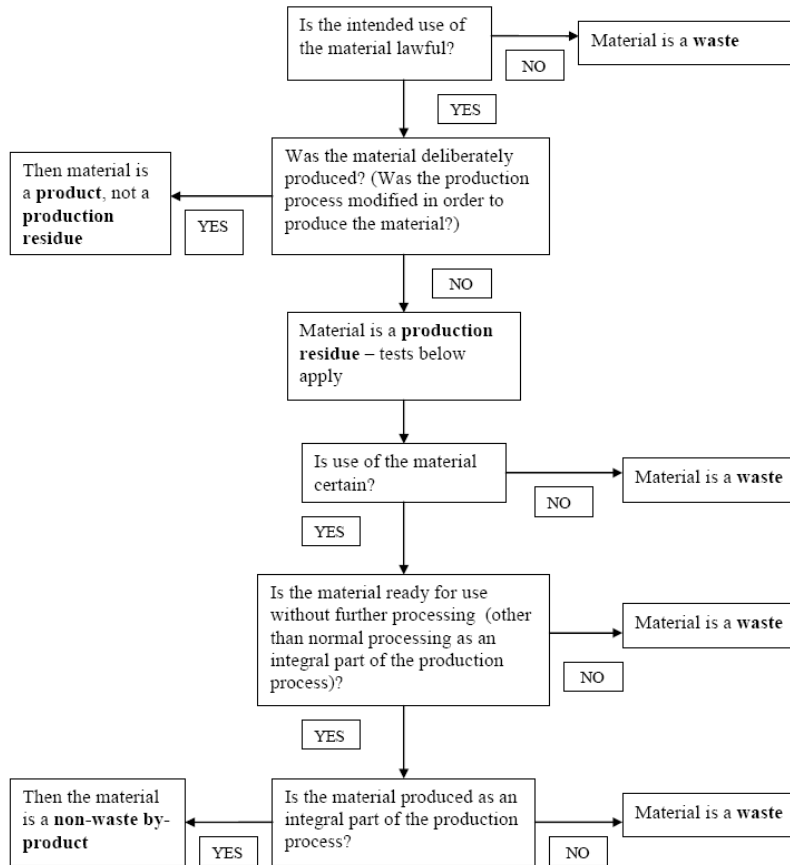
Prokofieva I. et al. 2007. Protocol on data collection for single wood chains – socio-economic indicators group. Final version May 2007.

Schweinle, J. et al 2007. Data collection protocol – environmental indicators group. Final version. 18 May 2007

4. ANNEXES

ANNEX I : - Waste decision tree (see protocol waste):

Annex II – a decision tree for waste versus by-product decisions



ANNEX II (limits of Eurostat data and integrated flows (see protocol transport))

Comments: limits of EUROSTAT data

- Available information: NST/R 24 (24 group of products) for road, railways and inland ways (maritime?) or chapters (10) (cf. table hereafter)
- “[...] the European figures for tonne-kilometres might differ from Member States’ corresponding national statistics” (Eurostat).
- Last available year: 2004

Groups of goods	NST/R Chapter	NST/R groups	Description
1	0	1	Cereals
2		02, 03	Potatoes, other fresh or frozen fruit and vegetables
3		00, 06	Live animals, sugar beet
4		5	Wood and cork
5		04, 09	Textiles, textile articles and man-made fibres, other raw animal and vegetable materials
6	1	11, 12, 13, 14, 16, 17	Foodstuffs and animal fodder
7		18	Oil seeds and oleaginous fruits and fats
8	2	21, 22, 23	Solid mineral fuels
9	3	31	Crude petroleum
10		32, 33, 34	Petroleum products
11	4	41, 46	Iron ore, iron and steel waste and blast furnace dust
12		45	Non-ferrous ores and waste
13	5	51, 52, 53, 54, 55, 56	Metal products
14		64, 69	Cement, lime, manufactured building materials
15	6	61, 62, 63, 65	Crude and manufactured minerals
16		71, 72	Natural and chemical fertilizers
17	8	83	Coal chemicals, tar
18		81, 82, 89	Chemicals other than coal chemicals and tar
19		84	Paper pulp and waste paper
20	9	91, 92, 93	Transport equipment, machinery, apparatus, engines, whether or not assembled, and parts thereof
21		94	Manufactures of metal
22		95	Glass, glassware, ceramic products
23		96, 97	Leather, textile, clothing, other manufactured articles
24		99	Miscellaneous articles

Comments: quality of data on flows

+++	Ad hoc survey on origins/destinations
++	National survey on origins/destinations done by States
++	Mailing survey on origins/destinations
+	Eurostat data with explanatory variables of localisation

Source: ISIS (2003)

If different sources are used, tonnes can have different meaning:

- With or without packaging,
- For railways:
 - Gross tonnes (goods + transport equipment – wagons and locomotives)
 - Net tonnes (tare of transport equipment is excluded)
 - Net-net tonnes (tare of trucks for piggy-back mode is excluded or tare of mobile box for combined transport)
- Average information (load capacity of trucks in average for instance). ISIS (2003) proposes to adjust tonnes from Eurostat by a coefficient of 1.35 to compare with data coming from ad hoc survey.