

EFORWOOD  
Tools for Sustainability Impact Assessment

**An updated and further elaborated policy database**

Thomas Vogelpohl, Ewald Rametsteiner and Filip Aggestam



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## Preface

This report is a deliverable from the EU FP6 Integrated Project EFORWOOD – Tools for Sustainability Impact Assessment of the Forestry-Wood Chain. The main objective of EFORWOOD was to develop a tool for Sustainability Impact Assessment (SIA) of Forestry-Wood Chains (FWC) at various scales of geographic area and time perspective. A FWC is determined by economic, ecological, technical, political and social factors, and consists of a number of interconnected processes, from forest regeneration to the end-of-life scenarios of wood-based products. EFORWOOD produced, as an output, a tool, which allows for analysis of sustainability impacts of existing and future FWCs.

The European Forest Institute (EFI) kindly offered the EFORWOOD project consortium to publish relevant deliverables from the project in EFI Technical Reports. The reports published here are project deliverables/results produced over time during the fifty-two months (2005–2010) project period. The reports have not always been subject to a thorough review process and many of them are in the process of, or will be reworked into journal articles, etc. for publication elsewhere. Some of them are just published as a “front-page”, the reason being that they might contain restricted information. In case you are interested in one of these reports you may contact the corresponding organisation highlighted on the cover page.

Uppsala in November 2010

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**EFORWOOD**  
Sustainability Impact Assessment  
of the Forestry - Wood Chain



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<b>PP</b>	Restricted to other programme participants (including the Commission Services)	
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## PD 1.1.8: An updated and further elaborated policy database

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WP 1.1

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### Abstract:

The purpose of this deliverable is to document the further development of a *policy database* for policies relevant to the European Forestry-Wood-Chain (FWC). The paper shows the structure and extended content of the policy database. All relevant documents have been analysed with a view to determine their targets and thresholds that are related to the EFORWOOD FWC sustainability indicators.

Furthermore, this document will summarise the changes in the EFORWOOD policy database that have been made since PD 1.1.3 (delivered mid-2007) and which shows the preliminary structure and content of the policy database. Since then, the database has been extended considerably, especially with regards to the targets and thresholds set up in European and international policy documents that refer to the FWC sustainability indicators applied in EFORWOOD. Furthermore, the criteria for inclusion of policies into the database and some technical features of the database web-interface have been modified.

In addition, deliverable 1.1.8 will focus on the integration of institutional aspects of sustainability into the database and its relevance within the context of EFORWOOD. Particularly as the institutional structure condition FWC-related policies on the European and international level; influence the development and usefulness of institutional indicators; and, thus, has an effect on how they could be incorporated into the policy database. The institutional structure, into which FWC-related policies are embedded, is therefore also delineated in this deliverable.

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## List of Abbreviations

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Directorate General	<b>DG</b>
European Union	<b>EU</b>
Forest Action Plan	<b>FAP</b>
Forest Wood Chain	<b>FWC</b>
Intergovernmental Forum on Forests	<b>IFF</b>
Intergovernmental Panel on Forests	<b>IPF</b>
Sustainability Indicator	<b>SI</b>
Sustainable forest management	<b>SFM</b>
Tool for Sustainability Impact Assessment	<b>ToSIA</b>
United Nations Conference on Environment and Development	<b>UNCED</b>
United Nations Forum on Forests	<b>UNFF</b>
United Nations or the Ministerial Conference on the Protection of Forests in Europe	<b>MCPFE</b>

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# 1 Introduction

The objectives of the policy database within the EFORWOOD project is outlined as follows in the most recent implementation plan for months 37-48 of December 2008:

“This task will develop a systematic framework of institutional indicators and a related data-base of current relevant policies as well as a policy analysis component for ToSIA base and scenario runs. The data-base of current EU and international policies should contain policies that are deemed to have an effect on SI in the FWC and compile thresholds identified by scientists and set by these policies. This policy data-base will cover all policy areas (biodiversity, trade, forest, climate, and environment), sector-specific policies, and specifications of FWCs (relevant products and production specifications, energy, transport) that are of key relevance to the sustainability performance of the FWC. Existing thresholds for the indicators as specified through legislation or international commitments will be identified through a detailed review and screening of existing EU and international policies” (Implementation Plan 2008: 37).

Thus, an EFORWOOD Policy Database is currently being elaborated in the context of the EFORWOOD project. The Policy Database contains relevant legislation and policy documents that relate to the Forestry-Wood-Chain and thus to the EFORWOOD Sustainability Indicators. Furthermore, the implementation plan refers to institutional indicators that relate to the policies compiled in the database.

The purpose of this deliverable is to further document the development of a *policy database* for policies relevant to the Forestry-Wood-Chain and to show how the above mentioned objectives are supposed to be fulfilled. The paper shows the structure and extended content of the policy database and depicts the changes in the database that have been made since D 1.1.3 “Policy data base on FWC SI-relevant policies”<sup>1</sup>. D 1.1.3, which has been finalized in mid-2007, presents the preliminary structure and content of the EFORWOOD policy database. Since then, several changes and adaptations have taken place. The database has been extended considerably and documents already in the database have been checked for relevance according to revised criteria for their inclusion (see chapter four).

Relevant documents have been identified based on the European and international institutional background structuring this policy area (briefly described in chapter two) and analysed with a view to determine the targets and thresholds that are related to the EFORWOOD Sustainability indicators

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<sup>1</sup> <http://87.192.2.62/Eforwood/LinkClick.aspx?fileticket=NaSURy%2ffJmA%3d&tabid=150&mid=697>

(see PD 1.1.6 “Revised FWC-sustainability indicators set document”<sup>2</sup>). A list of the revised set of FWC-sustainability indicators from PD 1.1.6 can be found in the annex to this document.

Additionally, this PD will focus on the integration of institutional aspects of FWC-sustainability into the database and their relevance in the EFORWOOD context. The importance of the institutional dimension of sustainability will be shortly described in chapter three. It will be shown how the institutional aspects of the policies in the database can help to interpret ToSIA results and how especially the integration of the institutional aspects can be fruitful regarding the policy analysis of ToSIA results as well as the formulation of response options (for details regarding the policy analysis part within EFORWOOD see PD 1.1.7 “Options for the policy analysis interface of ToSIA”<sup>3</sup>).

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<sup>2</sup> <http://87.192.2.62/Eforwood/LinkClick.aspx?fileticket=TXxsKzwGgYA%3d&tabid=150&mid=697>

<sup>3</sup> <http://87.192.2.62/Eforwood/LinkClick.aspx?fileticket=sAE8uqy6zQE%3d&tabid=150&mid=697>

## 2 Institutional Background and its relation to FWC-related policies

There are several institutional players dealing with FWC-related policies at the European level. Foremost, the European Union (EU) is a major player in this realm, whereas other international institutions, such as the United Nations or the Ministerial Conference on the Protection of Forests in Europe (MCPFE), deal with FWC-related issues but rather focus on the development of general frameworks instead of precise guidelines. Moreover, current EU legislation also provides much leeway for nation states to define their own strategies and policies in the forestry sector. But, despite a lack of stringent EU legislation for the forest sector, relatively precise guidelines for other policy realms exists, which are, at least in part, related directly to processes of the Forestry-Wood Chain.

Forest and forest industry policy does not constitute a common European policy area as defined by the European treaties. It remains an explicit member state competence. The lack of a common forestry policy may be explained by the fact that forestry and the forest products industry are organised so differently in the various Member States. Based on the principle of subsidiarity as well as with respect to the principle of shared responsibility between the Community and its member states, the European Community can only contribute to forest policy through already existing common policy areas such as agriculture, environment, trade, development cooperation etc. Forest Policy on EU level is thus a rather diffuse and sometimes confusing policy field. Accounting for policy coherence under these circumstances is a complex challenge. Yet the EU institutions have been striving to harmonise national forestry policies by means of *informational guidance*. To address this issue and tackle the inconsistencies inherent to EU forest policy, the European Council adopted the **EU Forestry Strategy**<sup>4</sup> in December 1998, the main informational instrument, which calls for better coordination of forestry issues within the Union. However, it has not been possible to consider the overall interests of forestry and the forest-based industries adequately, as decisions affecting that sector are being taken in parallel by a number of EU institutions. The report on the implementation of the EU forestry strategy, issued in 2005, revealed that, although important steps have been taken, there is a need to further strengthen coherence between EU policies, as well as co-ordination between the Commission and the Member States, so that the various functions of

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<sup>4</sup> Council Resolution of 15 December 1998 on a Forestry Strategy for the European Union (1999/C 56/01).

forests and their links with other policies are addressed in a coherent way in the policy formation process:

“However, the changes in the policy context suggest that a more coherent and pro-active approach to governing the Union’s forest resources is needed in the future” (European Commission 2005: 8).

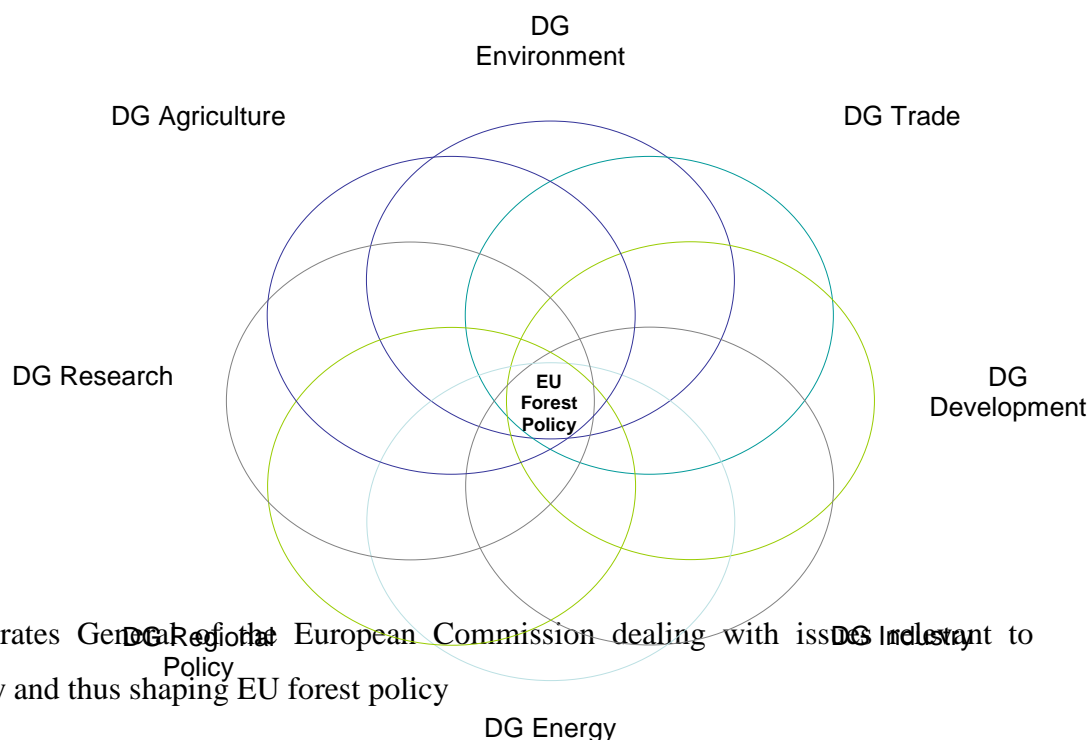
Therefore, the European Council requested the Commission to develop an action plan, that

“should encompass a set of clear objectives that can provide a basis for regular monitoring and stocktaking, and bring together the thematic, horizontal and cross-sectoral policy initiatives at Community and national level in a structured framework to encourage better and more effective co-ordination and consultation, and promote the flow of information among the various actors concerned” (European Commission 2005: 8).

The Forest Action Plan (FAP) thus builds on the report on implementation of the EU Forestry Strategy and consequent conclusions by the Council and follows up the matter of enhancing coordination and cooperation as regards forestry issues within the EU.

However, there are a number of EU regulations and directives that are to be implemented by the Member States and have a direct or indirect influence on the FWC in Europe. In contrast to the common agricultural policy, forest policy is not a common field of politics in the European Community. As a consequence, there is no single Directorate General (DG) of the European Community with sole responsibility for the implementation of FWC-related policy. Figure 1 shows the most important Directorates-General that deal with topics relevant to forestry.

As EU legislation is mostly developed within the Commission (proposed by the Commission and then approved by the Council and/or Parliament), it is of value to know which DG is most relevant for the field of forestry. The competences of the European Commission regarding forest policy are to be derived from the Treaties. Forest issues are currently being managed by a number of Commission DGs, including those responsible for the common policies on agriculture, the environment, enterprise, competition, development cooperation, research, energy, transport, and external relations. Policy decisions affecting the forestry sector are prepared notably by the DGs for agriculture and the environment. The DG for agriculture is responsible for forestry measures pursued within the framework of agricultural and rural development policies and takes part in the implementation of the Forestry Strategy of the Union. The DG for the environment is, in turn, concerned with international conventions on the environment, strategies for the sustainable use of natural resources, and issues falling within the scope of the Habitats and Birds Directives. Being aware of the sectors in which the various DGs operate is thus of particular importance as the European integration process proceeded. Particularly as European politics attain more importance in terms of influencing member states’ policies at all levels and within all policy areas (Pülzl 2005).



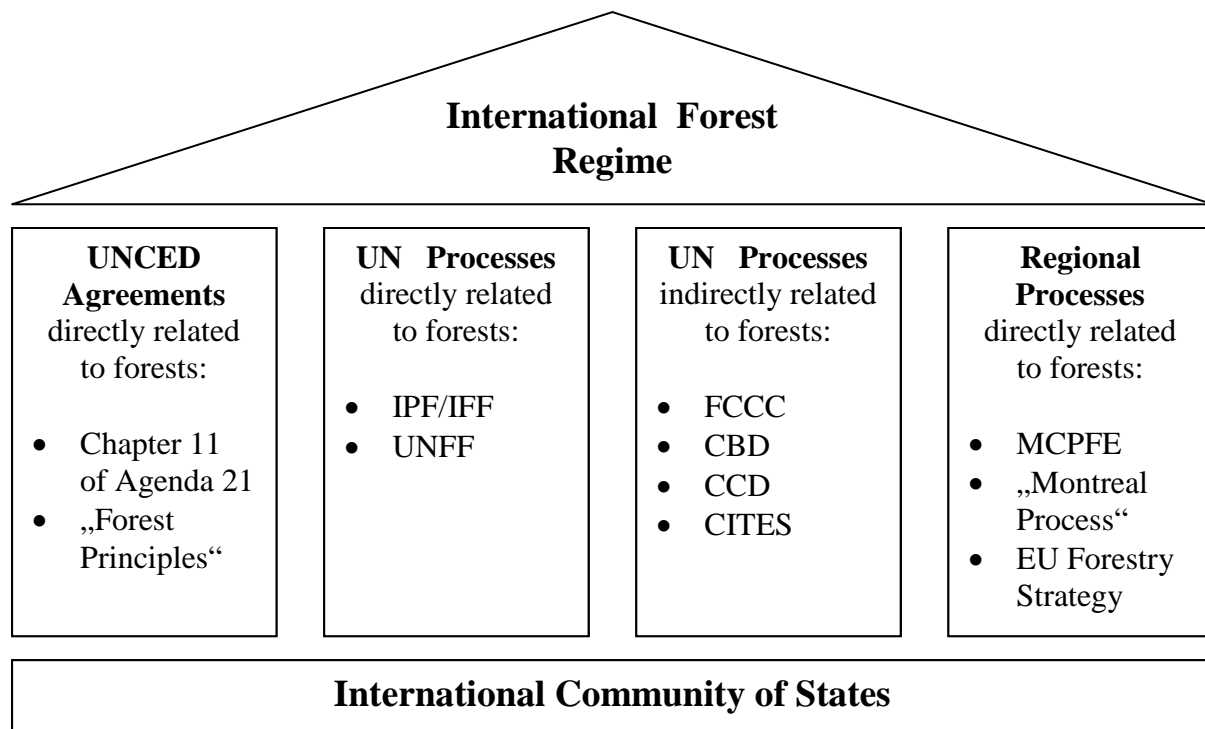
**Figure 1.** Directorates General of the European Commission dealing with issues relevant to forestry and thus shaping EU forest policy

In addition to the European Union, international treaties and conventions deal with forestry or forestry-related issues, on a regional and global scale (see figure 2). As a matter of fact though, the European Union has also entered into international obligations within the scope of European legislation and plays a considerable role in implementing these conventions and observing international obligations on the European level.

However, besides the EU, a number of international policy processes and instruments deal directly with forests. The United Nations have endeavoured to address forest-related issues and to support sustainable forest management on a global scale. The main UN body in this respect is the **United Nations Forum on Forests (UNFF)**. The UNFF is the successor institution to the Intergovernmental Panel on Forests (IPF) and the Intergovernmental Forum on Forests (IFF). The UNFF was established in 2000 as part of a new International Arrangement on Forests, to carry on the work and build on the IPF and IFF processes. At its sixth session, in 2006, the UNFF agreed on four shared Global Objectives on Forests<sup>5</sup>, focusing sharply on the timely and urgent priorities for the practical implementation of sustainable forest management (SFM). The main outcome of the

<sup>5</sup> United Nations Forum on Forests. Report of the sixth session (27 May 2005 and 13 to 24 February 2006). Economic and Social Council. Official Records, 2006. Supplement No. 22, pp 3-4. <http://daccessdds.un.org/doc/UNDOC/GEN/N06/268/51/PDF/N0626851.pdf?OpenElement>.

UNFF is the Non-Legally Binding Instrument on All Types of Forests<sup>6</sup>, which was adopted by the UN General Assembly in late 2007.



Source: Hofmann (2004).

**Figure 2.** Main elements of the international forest regime

In addition to the UNFF, several conventions, conferences and programmes in the realm of the UN are dealing with forest-related issues. First to mention in this respect is the **United Nations Conference on Environment and Development (UNCED)**, also called the Earth Summit, which has given forests an increasingly important role in the context of sustainable development and environmental conservation. The following commitments agreed on at UNCED are of particular importance:

- the non-legally binding authoritative statement of principles for a global consensus on the management, conservation and sustainable development of all types of forests (“forest principles”)<sup>7</sup>;
- chapter 11 on combating deforestation of Agenda 21<sup>8</sup>;

<sup>6</sup> United Nations General Assembly. Resolution 62/98 adopted by the General Assembly. Non-legally binding instrument on all types of forests. Sixty-second session. Agenda item 54. 31 January 2008. <http://daccessdds.un.org/doc/UNDOC/GEN/N07/469/65/PDF/N0746965.pdf?OpenElement>.

<sup>7</sup> United Nations General Assembly. Report of the United Nations Conference on Environment and Development (Rio de Janeiro, 3-14 June 1992). Annex III : Non-legally binding authoritative statement of principles for a global consensus on the management, conservation and sustainable development of all types of forests. <http://www.un.org/documents/ga/conf151/aconf15126-3annex3.htm>.

- the legally binding conventions on Biological Diversity, on Combating Desertification and the Framework Convention on Climate Change as well as their protocols and work programmes (e.g. the Kyoto Protocol).

The **Ministerial Conferences on the Protection of Forests in Europe** (MCPFE) constitute a major initiative in the process of cooperation and policy deliberation amongst European countries (44 European countries as well as the European Community as signatories) to contribute to the protection and sustainable management of European forests as suggested in Agenda 21 and in the non-legally binding “Forest Principles” adopted at UNCED. The MCPFE resolutions address the main policy issues related to the protection, conservation and sustainable development of Europe’s forests and lay down recommendations and principles for achieving those three objectives. Since its beginnings in 1990, the dialogue within the MCPFE has succeeded in intensifying political and scientific communication in Europe and establishing close and successful co-operation on a wide range of issues related to forests and forestry. Encompassing the whole of Europe, the MCPFE can be regarded as a successful example of cross-border co-operation throughout a continent. It has always considered European forests to be a common heritage and has recognised that threats to these valuable ecosystems do not always follow territorial or ideological borders (Bauer and Guarin Corredor 2006).

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<sup>8</sup> United Nations Conference on Environment and Development (UNCED) (1992) Agenda 21: Chapter 11: Combating Deforestation.  
<http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21chapter11.htm>.

### 3 Institutional indicators and mode of governance

So how can the institutional background to forest and FWC-related policies described in the previous chapter be accounted for in the EFORWOOD policy database? One task to be performed within the setup of a policy database in EFORWOOD was to incorporate institutional aspects of FWC-related policies in Europe. As suggested by Spangenberg and Bonniot (1998) the institutional sphere can be considered as a fourth dimension of sustainability, besides its economic, social and environmental character. First of all, the definition of institutions is important in this respect. Institutions here are defined as structures and mechanisms of social order and cooperation governing the behaviour of a set of individuals. For our purposes, this means that institutions important to FWC-sustainability are not just particular formal organizations of government and public service like the European Commission or the MCPFE, but also customs and behaviour patterns important to a society. It is these customs and patterns of unsustainable behaviour, which have emerged over long periods of time and are highly resistant to change, that constitute an obstacle to FWC-sustainability. Therefore, the institutional setting is of critical importance to reaching the goal of sustainable development: “Without institutional change we will not move purposefully toward sustainability” (Dovers 2001). This also holds true for the forestry sector.

For these reasons, the development of institutional indicators has recently attracted considerable attention in sustainability research in order to be able to more comprehensively analyse the underlying complexities of sustainability (e.g. Spangenberg and Bonniot 1998; Spangenberg et al. 2002). Of course, institutional aspects also matter in the EFORWOOD context. However, although EFORWOOD is a project that is somewhat policy-oriented, it does not include a segment that focus on the political or institutional aspects of sustainability in the forestry sector. Thus, it is out of scope to fully integrate an institutional analysis, but institutional aspects should still be taken into consideration. So how can this be achieved regarding the EFORWOOD policy database? Public policies are not always treated as institutions, but, in fact, they constitute a great deal of the institutional arrangement shaping FWC-sustainability. Unlike formal institutions, the influence of policies on politics is necessarily indirect, because the influence of policies on social actors – on who they are, on what they want, on how and with whom they organize – is such that it changes the way these actors engage in politics.

Thus, not just the content of the FWC-related policies in the database, but also

- the structure of the policy area (who issues policies and legislation?),



- the types of policies regulating FWC-sustainability related issues in Europe (predominantly regulations, directives or decisions?), and
- the mode of governance that can be related to them (see below)

tell us a great deal about how FWC-sustainability is (supposed to be) governed in Europe. Therefore, these policy attributes are incorporated into the EFORWOOD policy database.

At this stage, the last attribute “mode of governance” has to be further explained. The notion of the “mode of governance” refers to the way how governance is supposed to be exercised by state actors (in our case the legislator and governmental actors). This mode of governance can be classified according to two criteria:

- The legal instrument used: binding legislation or non-binding policy
- The mode of implementation stipulated by the policy: flexible (leaving leeway to the addressees of the policy as regards its implementation) or rigid (prescribing detailed and fixed standards regarding the implementation of the policy)

According to these criteria, four different modes of governance referring to the policy dimension can be determined via a 2x2-matrix (see table 2).

**Table 1.** A typology of four modes of governance

		Legal Instruments	
		Binding	Non-binding
Implementation	Rigid	Enforcement	Targeting
	Flexible	Framework regulation	Voluntarism

Adapted from: Treib et al. (2007).

One of these four modes of governance can be assigned to every state (or supra-state) policy. Following this approach,

- “Enforcement” means binding legal instruments prescribing detailed and fixed standards that leave little leeway in implementation (least flexible in that it entails fully binding and highly prescriptive pieces of legislation);
- “Voluntarism” means non-binding instruments and only defining broad goals which the addressees may specify in implementation;
- “Targeting” means non-binding recommendations, which are more detailed and thus leave less room for manoeuvre for specification at the implementation stage than is true in the case of voluntarism; and

- “Framework regulation” means binding legislation that, unlike enforcement, offers addressees more leeway in implementation (e.g. by defining only broad goals to be specified by addressees or by presenting a range of policy options to choose from).

According to this basic determination of four modes of governance, European and international FWC-related policies can be further classified. In the end, this will deliver some insight as regards how this policy area is structured and which mode of governance is prevailing. In connection with ToSIA results, these institutional aspects of FWC-related policies and the policy area in general also provide a basis for policy analysis, i.e. for interpreting ToSIA results and formulating response options on a policy level (see PD 1.1.7).

## 4 Scope and criteria for the EFORWOOD policy database

All European and international legislative and policy documents relevant to the Forestry-Wood Chain as well as to the EFORWOOD Sustainability Indicators are to be systematically included in the Policy database. To fulfil this task, unambiguous criteria regarding the scope of the database and the in- or exclusion of policies had to be developed. Concerning the scope, these criteria are:

- The geographic focus on Europe (EU27) → policies to be included in the database had to be relevant to the European countries, which means that policy documents issued by international organizations not exclusively focussing on Europe were only taken into account if a clear thematic relevance to the region of Europe and its countries could be detected.<sup>9</sup>
- The political focus on inter- or supranational policies and institutions → national or sub-national legislation and policies have not been taken into consideration since this would exceed the scope and purpose of this database.
- The institutional focus on (inter)governmental organizations and institutions only policies issued by (inter)governmental organizations and institutions (like the EU, the UN or international conventions), i.e. organizations and institution that are capable of adopting legally-binding legislation and policies (i.e. the ones also mentioned in chapter two), were taken into account.<sup>10</sup>

Generally speaking, sustainability with its economic, social and environmental dimension is a far reaching concept. As such, almost all policies could to some extent be related to sustainability and thus indirectly also to FWC-sustainability. Therefore, some restrictions were to be made as regards the integration of policies into the EFORWOOD database:

- The main criterion regarding the in- or exclusion of policies and legislation was the direct connection between the FWC-SI and targets or thresholds set up in the policy documents. “Direct connection” in this regard means that literally referring to or setting up targets or thresholds for the FWC-SI and their sub-indicators developed within EFORWOOD. Therefore, very general policies (for example on the precautionary principle or on environmental liability) were left out.

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<sup>9</sup> This means, for instance, that international agreements solely relating to tropical forests were not taken into account.

<sup>10</sup> This means, that policies or guidelines issued by non-governmental organizations like the World Wildlife Fund (WWF) or Greenpeace have not been taken into consideration, even if they are clearly relevant to European FWC-sustainability.

- Furthermore, only policies that are actually in force were included, if this category is applicable (in the case of legislation). As regards communications or recommendations, this category would not make sense since the policies simply cannot be “in force” or “not in force”. Therefore, this category does not apply to these kinds of policies.
- Moreover, we concentrated on actual binding legislation (regulations, directives, decisions), whereas recommendations or communications were only included if they were valued as important for further legislation in the respective policy area. This was the case when recommendations and communications clearly referred to FWC-SI, stating that no legislation has been adopted so far. As an example, there is no binding legislation that prescribes how *corporate social responsibility* should be fostered or encouraged in EU member states, but communications or recommendations shed light on what the formulated targets are in the international arena. Nevertheless, a significant number of legislations have already been adopted with regards to FWC-SI, e.g. “water and air pollution” or “waste management”. In these cases, recommendations and communication referring to these issues were therefore, as mentioned above, excluded from the database.

#### **4.1 Data sources**

For identifying all relevant documents the following approach is followed: As it was handled previously (see PD 1.1.3), the websites of the European Union were the main source of the policy documents in the database. Especially the EUR-Lex<sup>11</sup> (<http://eur-lex.europa.eu>) and SCADPLUS<sup>12</sup> (<http://europa.eu/scadplus>) homepages as well as the individual homepages of the Directorates-General were screened with a view to identify all policy documents relevant to FWC-sustainability and its indicators defined within EFORWOOD. Furthermore, relevant policy documents generated in the European context (e.g. Ministerial Conference on the Protection of Forests in Europe) and in the international context (e.g. United Nations Forum on Forests) are analysed and included in the policy database. Moreover, overviews of policies and institutions in international and European forest policy<sup>13</sup> were analysed in order to extract from these the legislation and policy documents relevant to European FWC-sustainability and the EFORWOOD FWC-SI (according to the criteria described above). At this stage, the main task was not only to update the existing database with policy documents relevant to FWC-sustainability issued later than 2005, but also to crosscheck the policy documents already included in the database for relevance and being up-to-date since a lot of

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<sup>11</sup> EUR-Lex provides direct free online access to European Union law (European Union official journals, treaties, legislation under preparation and in force, and case law, in PDF format).

<sup>12</sup> SCADPLUS provides summaries of EU legislation, arranged according to policy areas.

<sup>13</sup> See Pülzl 2005 and Bauer/Guarin Corredor 2006.

regulations, directives etc. have been repealed and replaced by new legislation in the meantime. Besides expanding and updating the content of the policy database, all documents (new and already existing ones) have been analysed with a view to determine (quantitative and qualitative) targets and thresholds that relate to the EFORWOOD FWC-sustainability indicators. Those targets and thresholds are systematically included in the database. This had to be done in particular regarding the policy documents already existing in the database. If a direct connection in line with the abovementioned criteria could not be found, the respective documents were excluded from the database.

## **4.2 Classification of relevance of policy documents to indicators**

Since many connections between European and international policies were found (up to 70 per indicator), a system of categorizing these connections according to the relevance of the policy to the indicator seemed to be very useful. Since this classification would have to be done for more than 500 “indicator uses”, this system could not be overly elaborate. This is why an approach that could be applied simply and fast had to be developed.

Two questions are at the centre of this classification:

- Are the issues of forests and/or wood occupying a central position within the policy document?
- Is the topic of the indicator occupying a central position within the policy document?

According to these questions, the connection between a policy and an indicator can be classified, as the table 2 shows below.

**Table 2.** Ranking of the connection between a policy and an indicator

		Forests and/or wood central to the policy?	
		Yes (= 1)	No (= 0)
Indicator topic central to the policy?	Yes (= 1)	2	1
	No (= 0)	1	0

According to the figure upper figure the connection between a policy and an indicator can reach a “relevance score” ranging from 0 to 2. These scores signify the relevance of the linkage between a policy and an indicator:

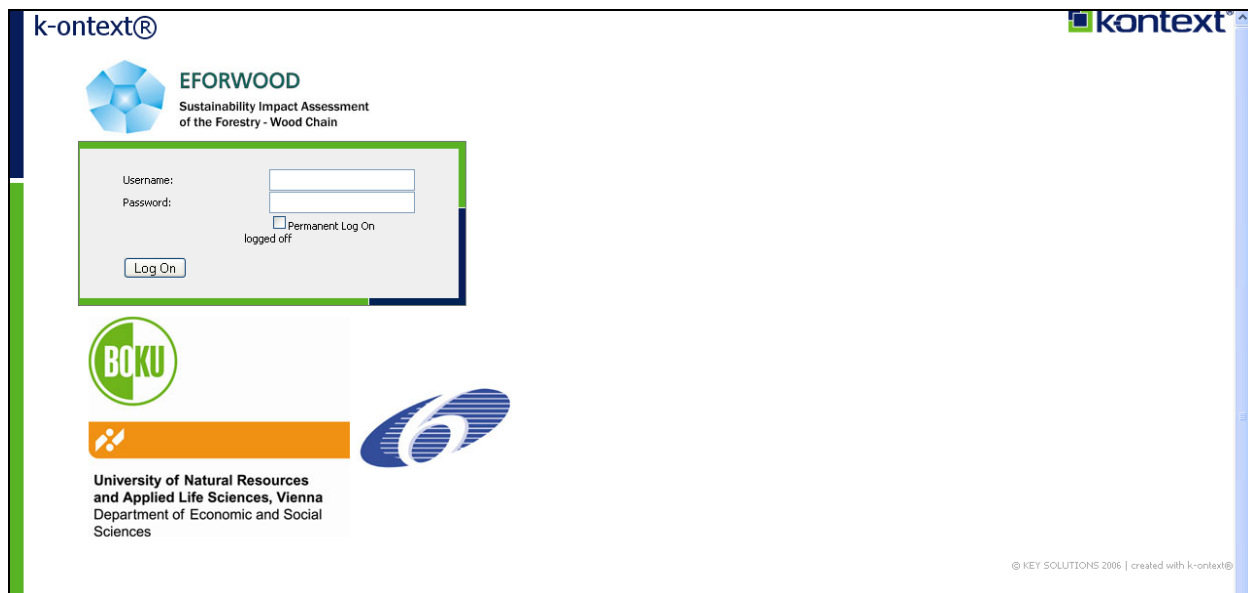
**Table 3.** Classification according to “relevance score”

“Relevance score”	Relevance of “indicator use”
0	low
1	medium
2	high

This classification of relevance will be introduced into the EFORWOOD policy database. What still needs to be said in this context is that low relevance according to this classification does not mean irrelevance. In other words, all connections between the policy documents in the database and the EFORWOOD FWC SI have been judged relevant. Irrelevant “indicator uses” would have been completely left out.

## 5 Alterations of the database and its current structure

The EFORWOOD policy database will be accessible via a web-interface that has been programmed using the web-application “K-ontext” (see D 1.1.3). The database can be accessed at [www.eforwood.at](http://www.eforwood.at) (see Figure 3).



**Figure 3.** Login at [www.eforwood.at](http://www.eforwood.at)

In the following, a focus will be put on the changes made regarding the structure and content under the various tabs. The database contains four tabs, namely tab 1 “Document”, tab 2 “Indicators”, tab 3 “Indicator Use” and tab 4 “Targets/Thresholds”.

### 5.1 Alterations of the database

In this subchapter we focus on the changes made regarding the structure of the database since the finalisation of D 1.1.3 in mid-2007. For an overview of the old structure of the database please see D 1.1.3.

The bulk of changes made within the EFORWOOD policy database have taken place within the tab “Documents”. The category “Status” will not be part of the document information provided under this tab anymore. As mentioned before, only polices that are actually in force were included, if this category is applicable (in the case of legislation). As regards communications or recommendations,

this category would not make sense since these policies simply can not be “in force” or “not in force”, as they are not laws.

The categories “type of legislation” and “type of policy document” will be replaced by the abovementioned categories “type of policy” and “mode of governance”. The category “type of legislation” will merely be renamed “type of policy” since not all policy documents in the database are comparable to legislation (laws). The subcategories of the category “type of policy document” (e.g. action programme, action plan, working programme, implementation report, policy strategy, etc.) were not applicable to many of the policy documents in the database. So the distinction between the categories “type of legislation” and “type of policy document” did not prove to be useful. Therefore, the category “type of policy document” will be replaced by the category “mode of governance” (see chapter three), which, in our view, is more suitable for our purposes and provides more meaningful information on the policy than the category “type of policy document”. Thus, the information on the institutional background and the mode of governance applied (see chapter two and three) will be incorporated into the policy database at this stage:

- The structure of the policy area can be derived by analysing the institutions/organizations adopting policies related to FWC-sustainability in Europe specified under the category “Organisation”.<sup>14</sup>
- The types of policies regulating FWC-sustainability in Europe can be identified by examining the new category “type of policy”.
- The mode of governance applied for the implementation of policies related to FWC-sustainability in Europe can be discovered by investigating the information in the new category “mode of governance”.

As explicated in chapter 4.2, under the tab “Indicator Use” the category “Relevance of policy” has been introduced to enable the user of the database or the policy analysis section within ToSIA to rank the policies related to the various FWC SI and to concentrate on the most important policies when analysing FWC sustainability from a political perspective.

Under the tabs “Indicators” and “Targets/Thresholds” only minor changes have taken place. These changes merely amount to the deletion of the categories “Corresponds to ToSIA class” and “Corresponds to ToSIA subclass”, since these categories are not used anymore within

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<sup>14</sup> This category is not new, but existed already in mid-2007 (see D 1.1.3).



EFORWOOD, and the renaming of the category “Indicator class” as “Indicator subclass” and of the category “Indicator subclass” as “Indicator sub-subclass”. See also Table 4.

**Table 4.** Alterations of the EFORWOOD policy database categories since mid-2007

Location in the database	D 1.1.3	Action	PD 1.1.8
Under tab 1 “Document”	“Status” → “Type of legislation” → “Type of policy document” →	→ Deleted → Transferred to → → Deleted Added →	→ “Type of policy” → “Mode of Governance”
Under tab 1 “Indicator Uses”		Added →	→ “Relevance of Policy”
Under all tabs	“Corresponds to ToSIA class” → “Corresponds to ToSIA subclass” → “Indicator class” → “Indicator subclass” →	→ Deleted → Deleted → Renamed as → → Renamed as → Added →	→ “Indicator subclass” → “Indicator sub-subclass”

## 5.2 Current Elements included in the database


The following subchapters are ordered according to the tabs one to four of the EFORWOOD policy database.

### 5.2.1 “Document”

Under tab 1 “document” all policy documents relevant to FWC-sustainability indicators (binding and non-binding) are stored in the database (see figure 4 on the following page). Those documents can be directly accessed in the database. They are classified according to the following criteria:

- Type of policy: this category distinguishes legislation such as decisions, regulations, directives, international conventions etc., from non-binding policy documents such as communications or recommendations

- Mode of governance (that can be assigned to the policy document): this category distinguishes flexible from rigid modes of governance (see above)
- Organisation that issued the document (e.g. the European Council, the European Commission (if possible to determine, also the Directorate-General), the United Nations Forum on Forests, etc.)
- Year when the document was issued
- Geographical scope (e.g. global, European, European Union)
- Document itself (as a word- or pdf-file)
- Date of inclusion
- Reference number of the document

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Document Indicators Indicator Use Targets/Thresholds

Neu Suchen Liste Aktualisieren Alle markieren Export XLS Zusatzfunktionen Indicators

Document **Document (235)** 10 Einträge/Seite

0 markiert Seite 1 / 24

Aktion	Reference number	Title	Type of policy	Mode of Governance	Organisation	Year	Geographical scope	Mediendatei	Erstellt am
	00/0029	COUNCIL DIRECTIVE 2000/29/EC of 8 May 2000 on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community	Directive (EU)	Enforcement	Council of the European Union (DG Health and Consumer Protection)	2000	European Union		03.12.2008 10:21
	00/0060	DIRECTIVE 2000/60/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 October 2000 establishing a framework for Community action in the field of water policy	Directive (EU)	Framework Regulation	European Parliament and the Council (DG Environment)	2000	European Union		13.04.2007 11:26
	00/0076	Directive 2000/76/EC of the European Parliament and of the Council of 4 December 2000 on the incineration of waste	Directive (EU)	Enforcement	European Parliament and the Council (DG Environment)	2000	European Union		13.09.2007 11:56
	00/0078	COUNCIL DIRECTIVE 2000/78/EC of 27 November 2000 establishing a general framework for equal treatment in employment and occupation	Directive (EU)	Framework Regulation	Council of the European Union (DG Employment, Social Affairs and Equal Opportunities)	2000	European Union		20.11.2008 17:27
	00/0087	Green Paper on greenhouse gas emissions trading within the European Union	Other	Voluntarism	European Commission - DG Environment	2000	European Union		05.01.2007 14:23
	00/0088	Communication from the Commission to the Council and the European Parliament on EU policies and measures to reduce greenhouse gas emissions: Towards a European Climate Change Programme (ECCP)	Communication (European Commission)	Targeting	European Commission - DG Environment	2000	European Union		05.01.2007 14:23
	00/0176	European Landscape Convention	International treaty	Framework Regulation	Council of Europe	2000	European		06.02.2009 15:05
	00/0247	Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of Regions Action Plan to Improve Energy Efficiency in the European Community	Communication (European Commission)	Targeting	European Commission - DG Energy and Transport	2000	European Union		05.01.2007 14:23
	00/0479	Commission Decision on the implementation of a European pollutant emission register (EPER) according to Article 15 of Council Directive 96/61/EC concerning integrated pollution prevention and control (IPPC)	Decision (EU)	Enforcement	European Commission - DG Environment	2000	European Union		05.01.2007 14:23
	00/0532	Commission Decision replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste	Decision (EU)	Enforcement	European Commission - DG Environment	2000	European Union		05.01.2007 14:23

0 6 7 8 9 Seite 1 / 24

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**Figure 4.** Tab 1 “Document”

By selecting policy documents (by clicking on the small arrow on the left of every entry) the user gets further information about the particular policy documents. Firstly, the (sub-) indicators the selected policy document refers to are presented. Figure 5 shows the example of the European Landscape Convention, which can be directly linked to FWC SI 17 (“Consumer behaviour and attitudes”) and 25 (“Forest biodiversity”).

Aktion	Indikator	Indicator subclass	Indicator sub-sub-class	Indicator sub-sub-sub-class	Dokument	Relevance of Policy
<input type="checkbox"/>	(17) Consumer behaviour and attitudes: Consumption of wood per capita and consumer attitudes...				European Landscape Convention	Medium
<input type="checkbox"/>	(25) Forest Biodiversity: Area of forest and other wooded land classified by number of tree...				European Landscape Convention	Low

**Figure 5.** Example for indicator references of the European Landscape Convention

Secondly, by again clicking on the small arrow on the left of an entry, the user can derive information about the targets or thresholds set up in the particular policy document concerning the selected (sub-) indicator. The following figure (Figure 6) shows that the European Landscape Convention sets up one target or threshold in the realm of FWC SI 17 (“Consumer behaviour and attitudes”), namely a non-quantifiable legally binding target.

Aktion	Text	Type of Target/Threshold	Form of Target/Threshold	Quantitative Target/Threshold	Quantifiable Target/Threshold	Kommentar	Indikator	Indicator subclass	Indicator sub-sub-class	Document reference number	Organisation	Year	Document Title	Geographical scope	Type of policy	Docer an
<input type="checkbox"/>	Article 5 – General measures Each Party undertakes: a to recognise landscapes in law...	legally binding target	non-quantifiable				(17) Consumer behaviour and attitudes: Consumption of wood per capita and consumer attitudes...			00/0176	Council of Europe	2000	European Landscape Convention	European	International treaty	06 15

**Figure 6.** Example for a target set up in the European Landscape Convention

### 5.2.2 “Indicators”

If users click on the tab “Indicators” a table with all 27 FWC SI (see the revised FWC-sustainability indicator set annexed to this document) is shown (see Figure 7).

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Document Indicators Indicator Use Targets/Thresholds

Neu Suchen Liste Aktualisieren Alle markieren Export XLS Zusatzfunktionen Indicators

Indicators (27) 10 Einträge/Seite  
Seite 1 / 3

0 markiert

Aktion	Titel
<input type="checkbox"/>	(01) Gross value added: Gross value added (GVA) at factor cost and contribution to gross...
<input type="checkbox"/>	(02) Production cost: Average production cost and share of cost of wood-based materials
<input type="checkbox"/>	(03) Trade Balance: Imports and exports of wood and products derived from wood, and net trade
<input type="checkbox"/>	(04) Resource use, incl. recycled material: Use of renewable and non-renewable materials,...
<input type="checkbox"/>	(05) Forest sector enterprise structure: Number of forest holdings and forest-based enterprises...
<input type="checkbox"/>	(06) Investment and Research & Development: Investment (gross fixed capital formation) and R&D...
<input type="checkbox"/>	(07) Total Production: Production of goods and services
<input type="checkbox"/>	(08) Productivity: Labour productivity
<input type="checkbox"/>	(09) Innovation: Share of forest-based enterprises with new or significantly improved products...
<input type="checkbox"/>	(10) Employment: Number of persons employed in total classified and by gender and by location

Seite 1 / 3

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**Figure 7.** Tab 2 “Indicators”

Selecting one of these indicators provides information about how often the documents in the policy data base refer to this indicator or its sub-indicators (number of “indicator uses”). The following figure (Figure 8) shows the example of FWC SI 10 (“Employment”), to which the documents in the policy data base refer 12 times (12 “indicator uses”).

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Document Indicators Indicator Use Targets/Thresholds

Neu Suchen Liste Aktualisieren Alle markieren Export XLS Zusatzfunktionen Indicators

(10) Employment: Number of persons employed in total classified and by gender and by location - Verwendung (12) 10 Einträge/Seite

Indicator subclass (2) -> Verwendung (12)

0 markiert Seite 1 / 2

Aktion	Indicator	Indicator subclass	Indicator sub-subclass	Dokument	Relevance of Policy
<input type="checkbox"/>	(10) Employment: Number of persons employed in total classified and by gender and by location	10.1. Persons employed in total and by gender		Resolution L1: People, Forests and Forestry – Enhancement of Socio-Economic Aspects of Sustainable Forest Management	High
<input type="checkbox"/>	(10) Employment: Number of persons employed in total classified and by gender and by location	10.1. Persons employed in total and by gender		DIRECTIVE 2006/54/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 July 2006 on the implementation of the principle of equal opportunities and equal treatment of men and women in matters of employment and occupation (recast)	Medium
<input type="checkbox"/>	(10) Employment: Number of persons employed in total classified and by gender and by location	10.1. Persons employed in total and by gender		COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS The future of the European Employment Strategy (EES) "A strategy for full employment and better jobs for all"	Medium
<input type="checkbox"/>	(10) Employment: Number of persons employed in total classified and by gender and by location	10.1. Persons employed in total and by gender		COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT Common Actions for Growth and Employment: The Community Lisbon Programme	Medium
<input type="checkbox"/>	(10) Employment: Number of persons employed in total classified and by gender and by location	10.1. Persons employed in total and by gender		COUNCIL DIRECTIVE of 9 February 1976 on the implementation of the principle of equal treatment for men and women as regards access to employment, vocational training and promotion, and working conditions	Medium
<input type="checkbox"/>	(10) Employment: Number of persons employed in total classified and by gender and by location	10.1. Persons employed in total and by gender		COUNCIL DIRECTIVE 2000/78/EC of 27 November 2000 establishing a general framework for equal treatment in employment and occupation	Medium
<input type="checkbox"/>	(10) Employment: Number of persons employed in total classified and by gender and by location	10.1. Persons employed in total and by gender		REGULATION (EC) No 1081/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 July 2006 on the European Social Fund and repealing Regulation (EC) No 1784/1999	Medium
<input type="checkbox"/>	(10) Employment: Number of persons employed in total classified and by gender and by location	10.1. Persons employed in total and by gender		COUNCIL RESOLUTION of 27 November 2003 on equal access to and participation of women and men in the knowledge society for growth and innovation	Medium
<input type="checkbox"/>	(10) Employment: Number of persons employed in total classified and by gender and by location	10.1. Persons employed in total and by gender		COUNCIL DECISION of 20 February 2006 on Community strategic guidelines for rural development (programming period 2007 to 2013)	High
<input type="checkbox"/>	(10) Employment: Number of persons employed in total classified and by gender and by location	10.1. Persons employed in total and by gender	female	COUNCIL DECISION of 20 February 2006 on Community strategic guidelines for rural development (programming period 2007 to 2013)	High

Seite 1 / 2

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**Figure 8.** Example of a list of indicator references for FWC SI 10 (“Employment”)

### 5.2.3 “Indicator Use”

The tab “indicator use” provides an overview of all found connections between the FWC SI and the documents in the data base. The list shows which indicators, respectively which of its subclasses, have been referred to by which document from the Policy Database. Furthermore, these indicator uses are valued according to their relevance for the particular FWC SI (see chapter 4.2 and the right column in figure 9).

Aktion	Indicator	Indicator subclass	Indicator sub-subclass	Indicator sub-sub-subclass	Dokument	Relevance of Policy
<input type="checkbox"/>	(01) Gross value added: Gross value added (GVA) at factor cost and contribution to gross...	1.2. Gross domestic product: contribution	total FWC		STRATEGIC OBJECTIVES 2005 – 2009 Europe 2010: A Partnership for European Renewal	Low
<input type="checkbox"/>	(01) Gross value added: Gross value added (GVA) at factor cost and contribution to gross...	1.1. Gross value added at factor cost			Working together for growth and jobs, A new start for the Lisbon Strategy	Medium
<input type="checkbox"/>	(01) Gross value added: Gross value added (GVA) at factor cost and contribution to gross...	1.1. Gross value added at factor cost			COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS GLOBAL EUROPE: A STRONGER PARTNERSHIP TO DELIVER MARKET ACCESS FOR EUROPEAN EXPORTERS	Medium
<input type="checkbox"/>	(01) Gross value added: Gross value added (GVA) at factor cost and contribution to gross...	1.1. Gross value added at factor cost			COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT Common Actions for Growth and Employment: The Community Lisbon Programme	Medium
<input type="checkbox"/>	(01) Gross value added: Gross value added (GVA) at factor cost and contribution to gross...	1.1. Gross value added at factor cost			REPORT OF THE UNITED NATIONS CONFERENCE ON ENVIRONMENT AND DEVELOPMENT (Rio de Janeiro, 3-14 June 1992) Annex III NON-LEGALLY BINDING AUTHORITATIVE STATEMENT OF PRINCIPLES FOR A GLOBAL CONSENSUS ON THE MANAGEMENT, CONSERVATION AND SUSTAINABLE DEVELOPMENT OF ALL TYPES OF FORESTS	High
<input type="checkbox"/>	(01) Gross value added: Gross value added (GVA) at factor cost and contribution to gross...	1.1. Gross value added at factor cost			COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Life sciences and biotechnology – A Strategy for Europe	Low
<input type="checkbox"/>	(01) Gross value added: Gross value added (GVA) at factor cost and contribution to gross...				COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT Stimulating Technologies for Sustainable Development: An Environmental Technologies Action Plan for the European Union	High
<input type="checkbox"/>	(01) Gross value added: Gross value added (GVA) at factor cost and contribution to gross...				DECISION No 1639(2006)/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 October 2006 establishing a Competitiveness and Innovation Framework Programme (2007 to 2013)	Medium
<input type="checkbox"/>	(01) Gross value added: Gross value added (GVA) at factor cost and contribution to gross...	1.1. Gross value added at factor cost			Outcome of the sixth session of the United Nations Forum on Forests (Global Objectives on Forests)	High
<input type="checkbox"/>	(01) Gross value added: Gross value added (GVA) at factor cost and contribution to gross...	1.1. Gross value added at factor cost			Decision No 1600(2002)/EC of the European Parliament and of the Council of 22 July 2002 laying down the Sixth Community Environment Action Programme	High

Figure 9. Tab 3 “Indicator Use”

By selecting one of these indicator uses a page opens that shows the particular target or threshold that the particular policy document sets up for the particular indicator (see next chapter).

### 5.2.4 “Targets/Thresholds”

Under the tab “Targets/Thresholds” the database shows all targets and thresholds that have been found in the policy documents in the database, so it’s basically just an exhaustive list of all targets and thresholds providing the information on every single target and threshold at a glance.

The targets and thresholds are classified according to the following criteria (see Figure 10):

- Text (text passage in the document mentioning the target or threshold referred to)
- Type of Target/Threshold (legally binding or non-legally binding)

- Form of Target/Threshold (quantitative, quantifiable, or non-quantifiable)
- In the case of quantitative target (exact target or threshold set up in the particular policy document with measurement unit and time reference if given)
- In the case of a quantifiable target (increase, decrease, maintain)
- Comments (on the target or threshold settings if necessary)
- Indicator (EFORWOOD FWC-sustainability indicator that is being referred to)
- Indicator subclass
- Indicator sub-subclass
- Document reference number
- Organisation (that issued the document)
- Year when the document was issued
- Title of the document
- Geographical scope of the document
- Type of policy

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Document Indicators Indicator Use **Targets/Thresholds**

Suchen Liste Aktualisieren Alle markieren Export XLS Zusatzfunktionen Indicators

Targets/Thresholds **Targets/Thresholds (534)**

0 markiert

Aktion	Text	Type of Target/Threshold	Form of Target/Threshold	Quantitative Target/Threshold	Quantifiable Target/Threshold	Kommentar	Indikator	Indikator subclass	Indikator sub-subclass	Document reference number	Organisation	Year	Document Title	Geograp scope
<input type="checkbox"/>	2. For the purposes of this Directive: - health protection threshold means the ozone...	legally binding threshold	quantitative	110 µg/m <sup>3</sup> for the mean value over eight hours		ANNEX I THRESHOLDS FOR OZONE CONCENTRATIONS IN THE AIR (*) (The values are expressed in ...	(24) Water and air pollution: Water pollution classified by organic substances and nutrients,...	24.1 Water pollution		92/0072	Council of the European Union	1992	Council Directive on air pollution by ozone	European Union
<input type="checkbox"/>	2. For the purposes of this Directive: (...) - population information threshold means the...	legally binding threshold	quantitative	180 µg/m <sup>3</sup> for the mean value over one hour		ANNEX I THRESHOLDS FOR OZONE CONCENTRATIONS IN THE AIR (*) (The values are expressed in µ...	(24) Water and air pollution: Water pollution classified by organic substances and nutrients,...	24.1 Water pollution		92/0072	Council of the European Union	1992	Council Directive on air pollution by ozone	European Union
<input type="checkbox"/>	2. For the purposes of this Directive: (...) - population warning threshold means the...	legally binding threshold	quantitative	360 µg/m <sup>3</sup> for the mean value over one hour		ANNEX I THRESHOLDS FOR OZONE CONCENTRATIONS IN THE AIR (*) (The values are expressed in µ...	(24) Water and air pollution: Water pollution classified by organic substances and nutrients,...	24.1 Water pollution		92/0072	Council of the European Union	1992	Council Directive on air pollution by ozone	European Union
<input type="checkbox"/>	2. For the purposes of this Directive: (...) - vegetation protection thresholds means the...	legally binding threshold	quantitative	200 µg/m <sup>3</sup> for the mean value over one hour and 65 µg/m <sup>3</sup> for the mean value over 24 hours		ANNEX I THRESHOLDS FOR OZONE CONCENTRATIONS IN THE AIR (*) (The values are expressed in µ...	(24) Water and air pollution: Water pollution classified by organic substances and nutrients,...	24.1 Water pollution		92/0072	Council of the European Union	1992	Council Directive on air pollution by ozone	European Union
<input type="checkbox"/>	Article 11. Member States shall take all appropriate	legally binding target	quantitative	a reduction of at least 30 % compared with 1976 levels in the use of the			(24) Water and air pollution: Water pollution	24.2 Non-greenhouse gases emissions into air (CO, NOx,		80/0372	Council of the European Union	1980	Council Decision concerning chlorofluorocarbons in the environment	European Union

Fertig

Figure 10. Tab 4 “Targets / Thresholds”

By selecting one of these indicators a page opens that shows the particular target or threshold that the particular policy document sets up for the particular indicator. Figure 11 shows the example of the minimum recycling target of 15% by weight for wood for 2008, set up in Directive 94/62/EC on packaging and packaging waste and referring to FWC SI 27.2 a) (“waste to material recycling”).

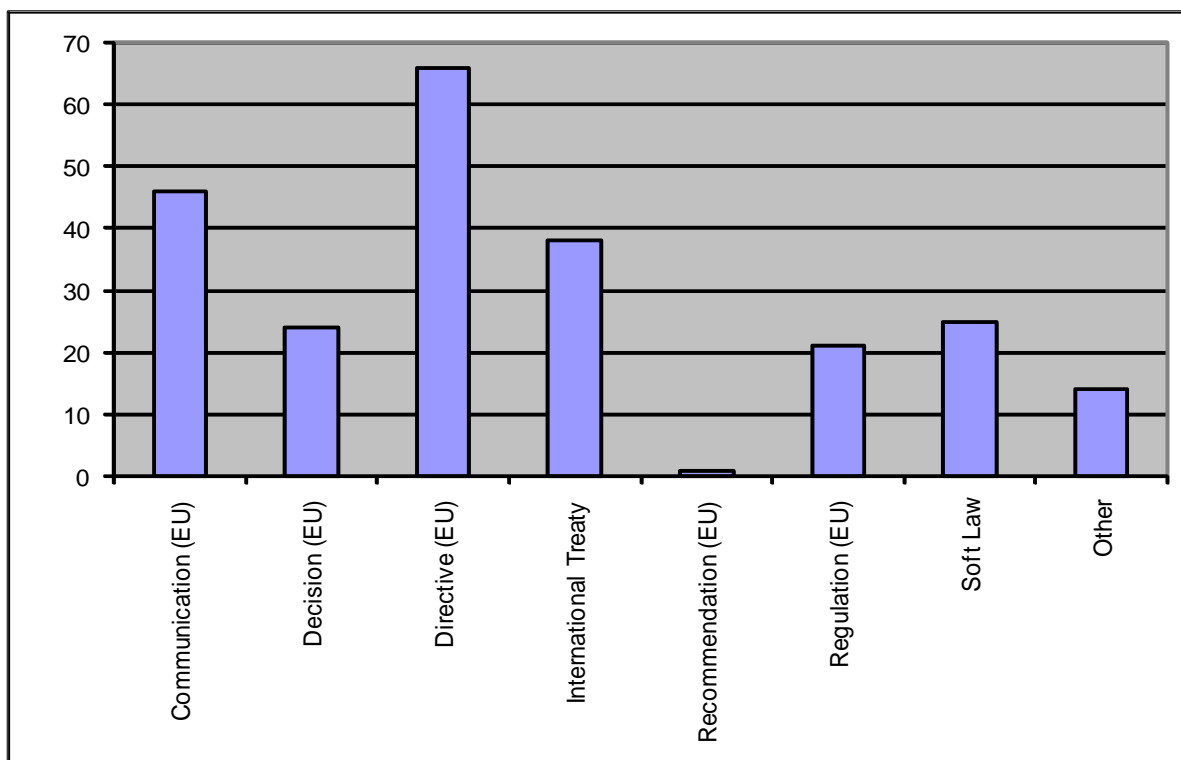
Aktion	Text	Type of Target/Threshold	Form of Target/Threshold	Quantitative Target/Threshold	Quantifiable Target/Threshold	Kommentar	Indicator	Indicator subclass	Indicator sub-subclass	Document reference number	Organisation	Year	Document Title	Geographical scope	Type of policy	Date
<input type="checkbox"/>	Article 6 Recovery and recycling 1. In order to comply with the objectives of this Directive,...	legally binding target	quantitative	minimum recycling target: 15 % by weight for wood by december 2008			(27) Generation of waste: total, hazardous, and categorised by type of waste management	27.2 Waste management	a) waste to material recycling	94/0062	European Parliament and the Council	1994	EUROPEAN PARLIAMENT AND COUNCIL DIRECTIVE 94/62/EC of 20 December 1994 on packaging and packaging waste	European Union	Directive (EU)	09.14.2008

**Figure 11.** Example of a target set up for the FWC SI 27.2 (“waste to material recycling”)

These targets and thresholds specified in FWC-related policies can serve as meaningful references for interpreting and analysing ToSIA results. They will thus build an important basis for the policy analysis within EFORWOOD (see PD 1.1.7).

## 6 Content of the database and document analysis

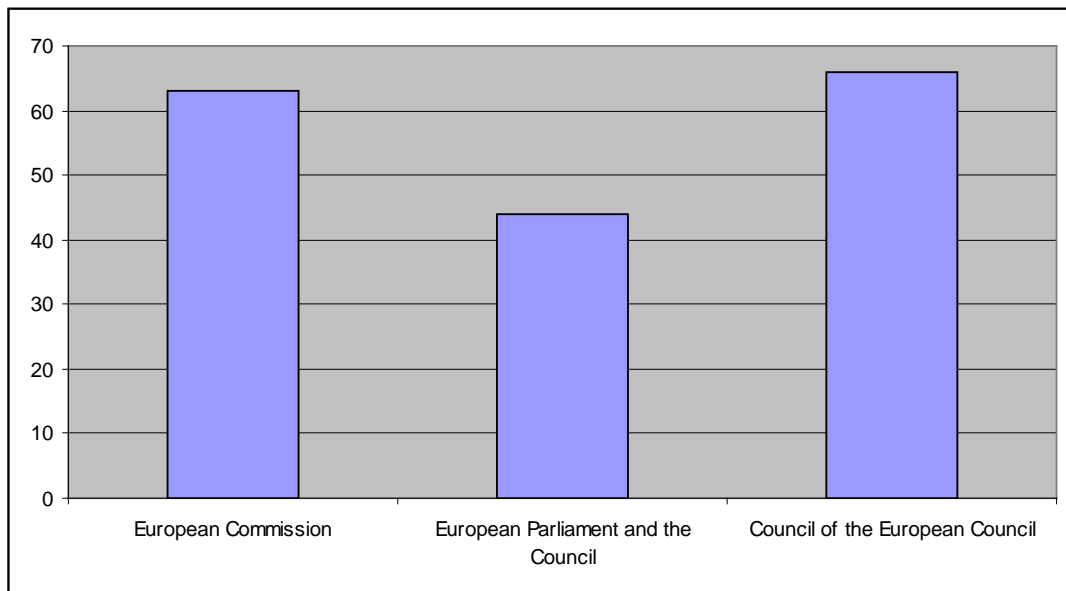
The database includes **235 policy documents** by June 2009. Of these documents, roughly three quarters are laws and policies issued by the European Union. The remaining quarter of documents consists mostly of international treaties from international conventions or organisations. The categories “Soft Law” and “Other” in the following figure (Figure 12) consist of both EU and other European or international policy documents.



**Figure 12.** Types of Policies in the EFORWOOD Policy Database

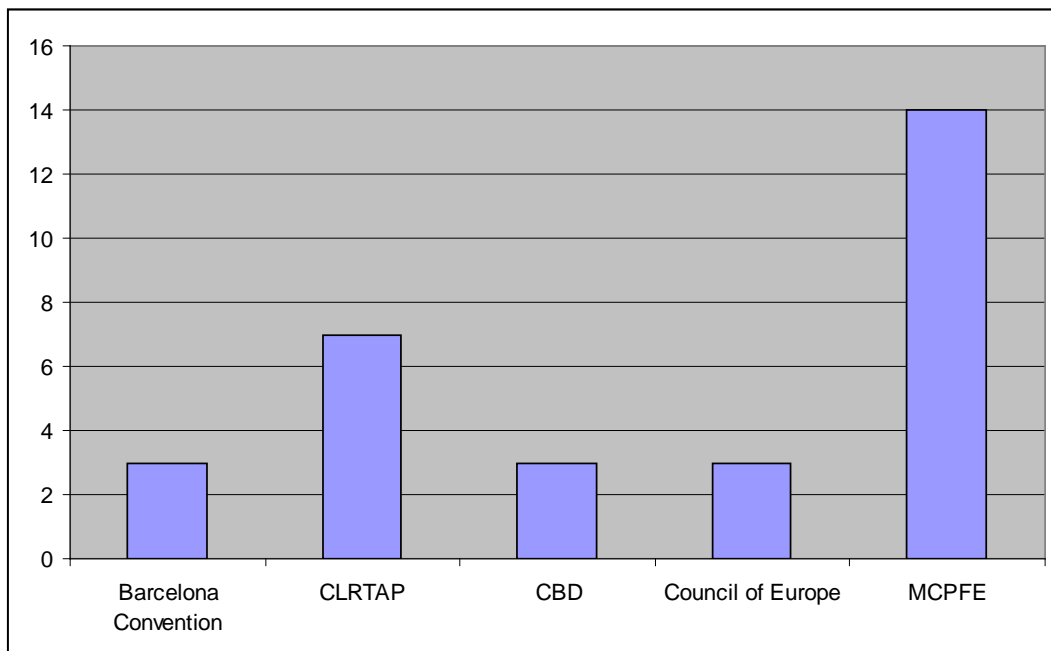
Concerning the EU policy documents, the numbers of documents issued by the various EU institutions are somewhat balanced. 66 of the EU FWC SI-related policy documents are published by the Council of the European Union (respectively its predecessor, the Council of the European Communities), whereas 44 of them come from the European Parliament and the Council and 63 from the European Commission (see Figure 13).





**Figure 13.** Number of FWC SI-related Policy Numbers issued by EU Institutions

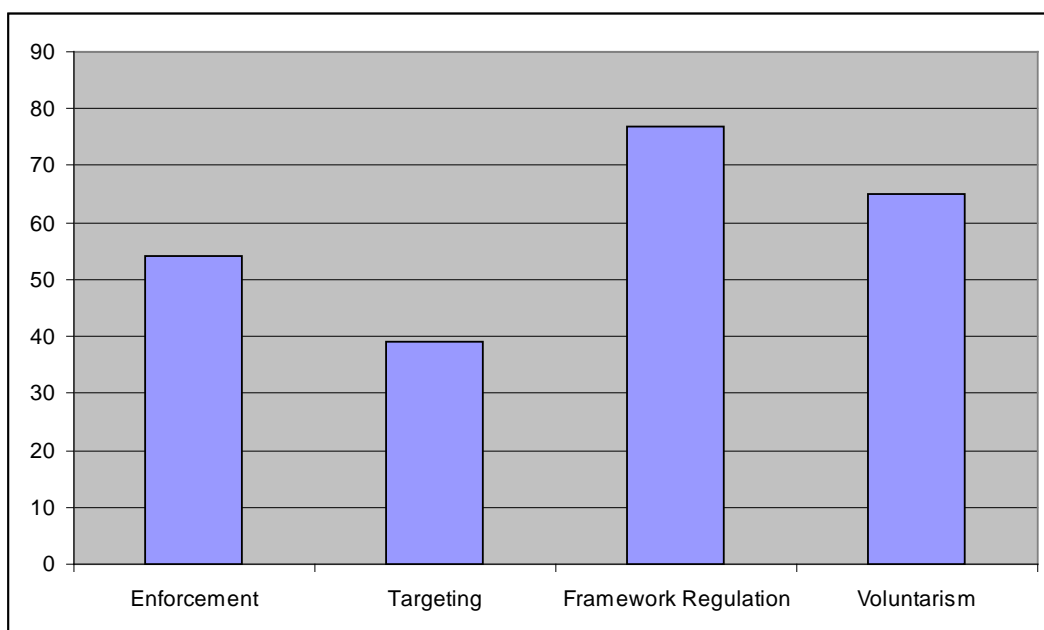
The next figure (Figure 14) shows the amount of FWC SI-related policy documents issued by other organisations, including only those that published more than two policy documents included in the database. Of these organisations, the Ministerial Conference for the Protection of Forests in Europe occupies the top position, having issued 14 FWC SI-related policy documents.



**Figure 14.** FWC SI-related policy documents issued by other European and international organisations

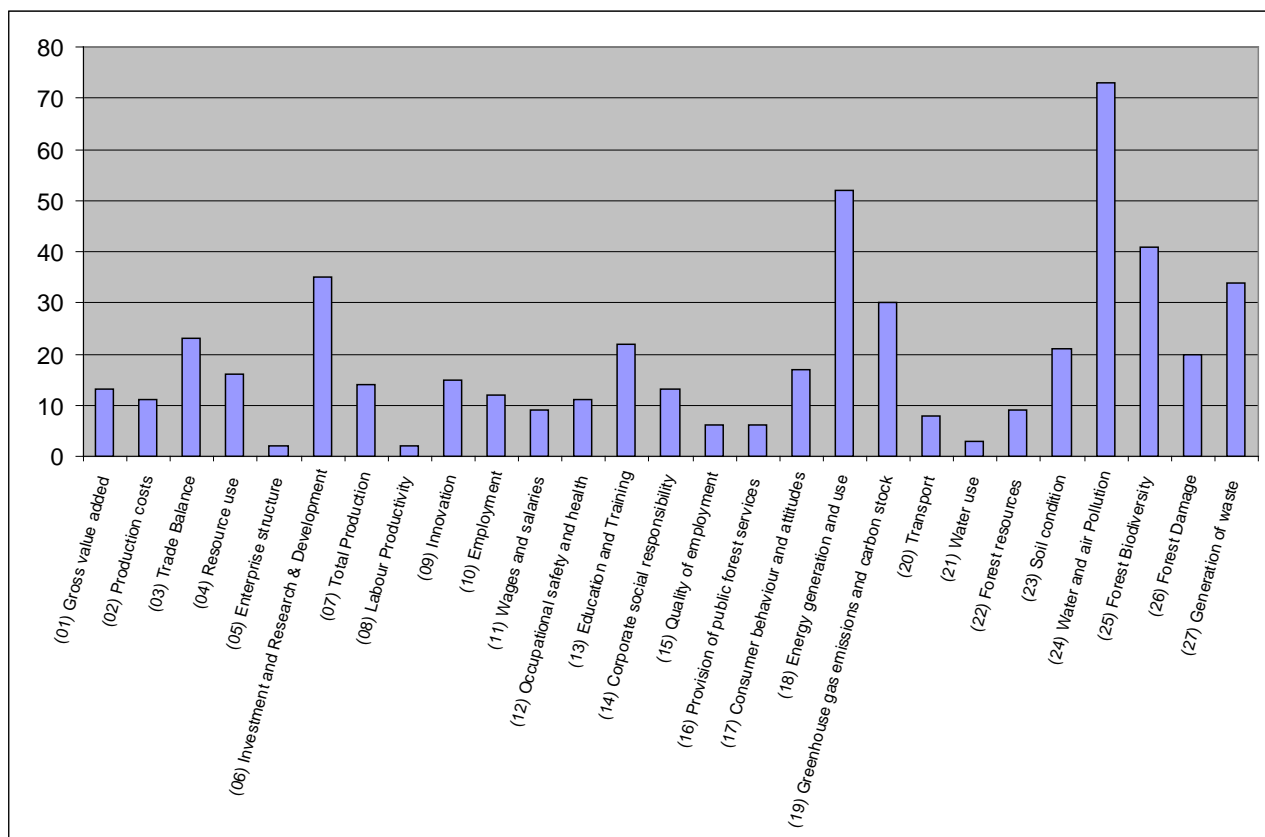
Among the other organisations having issued up to two FWC SI-related policy documents, there are various other influential organisations and institutions like the United Nations Forum on Forests, the United Nations Framework Convention on Climate Change, the Vienna Convention or the International Tropical Timber Organisation.

Regarding the mode of governance applied in the FWC SI-related policy documents in the database, the modes of framework regulation and voluntarism occupy the largest share. This may be due to the fact that we concentrated on European and international policy documents, because these obviously do leave more leeway to the addressees of the policies as regards their implementation. The modes of enforcement and targeting are a bit less often applied. However, in both cases the legally binding policy documents outnumber the non-legally binding ones (see Figure 15). This is due to the criterion mentioned in chapter 4 saying that we concentrated on legally binding legislation as regards the inclusion of policy documents into the database.



**Figure 15.** Modes of Governance applied in the FWC SI-related policies

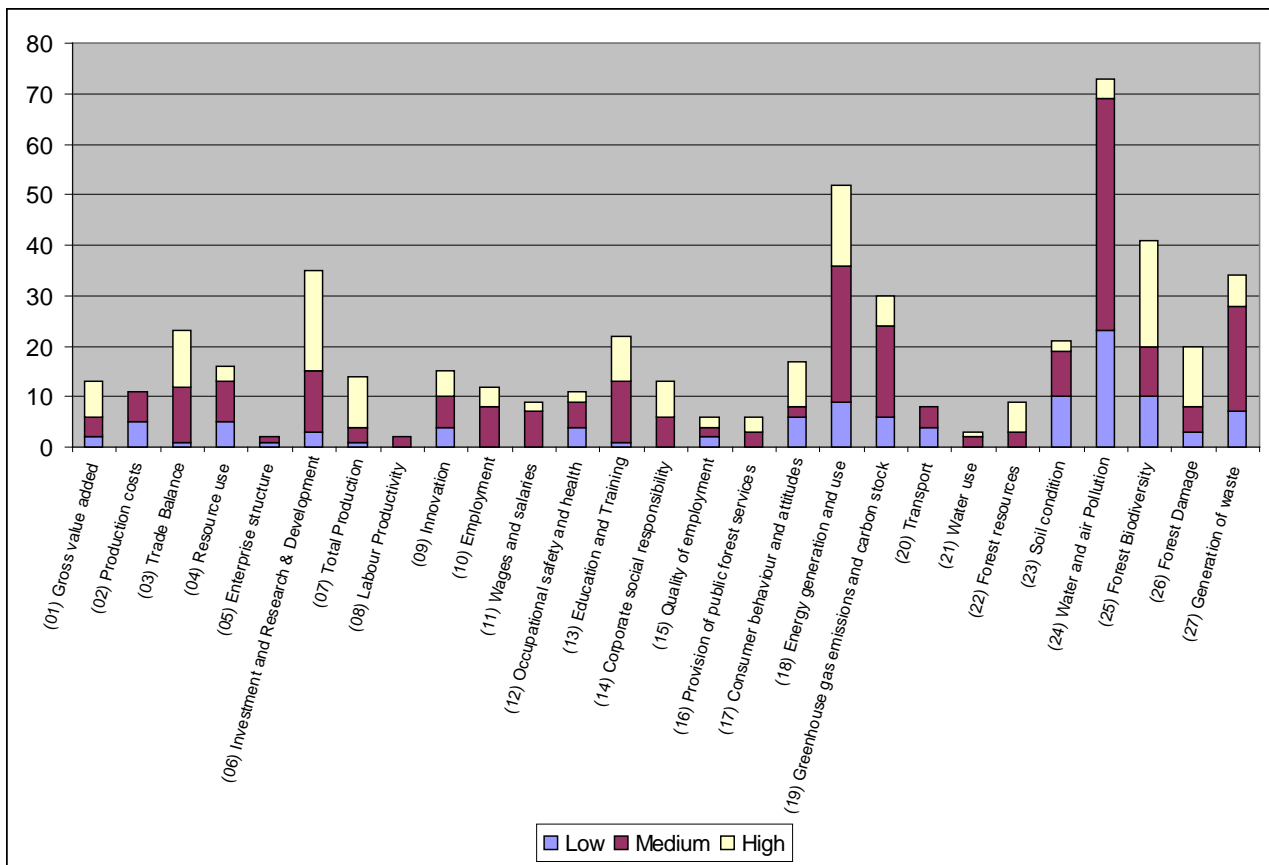
These 235 policy documents in the database are all somehow connected to the EFORWOOD FWC SI. Very often though, one policy document is not only connected to one FWC SI, but to two or even more. Therefore, there are a total of **518 of these “indicator uses”**.



**Figure 16.** References between FWC SI-related policy documents and indicators

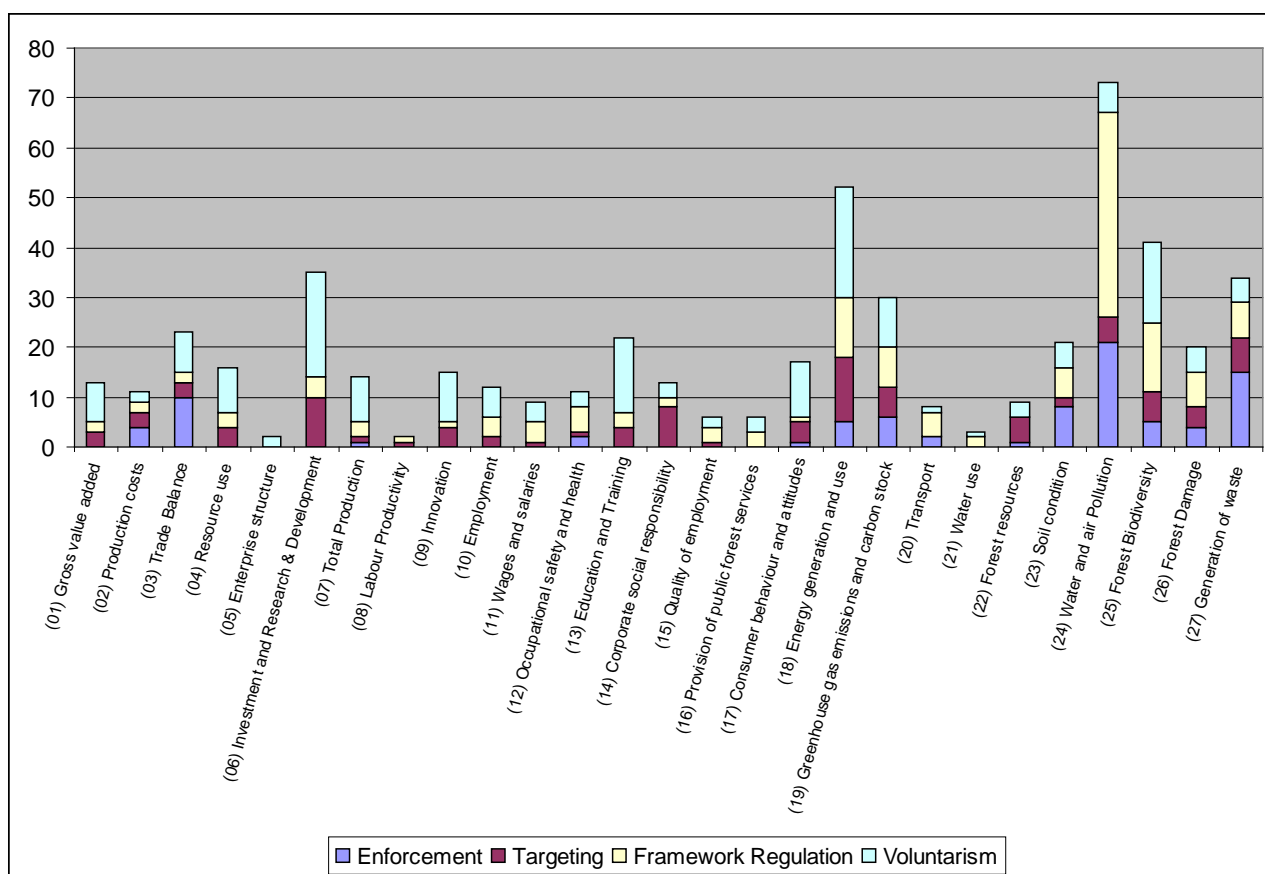
As can be seen in Figure 16, the various dimensions of FWC sustainability are very unevenly regulated in Europe. Of the ten FWC sustainability indicators 20 or more times referred to in the policy documents in the database not less than seven belong the environmental FWC SI. The issue of water and air pollution is by far the most regulated of the 27 FWC SI with 73 indicator uses. Regarding the economic and social dimension of FWC sustainability, only the issue of investments and research & development is referred to more than 30 times.

Concerning the relevance of the policies for the FWC sustainability indicators, most of the indicator uses have been judged to be of medium strength. Most of the times, this is due to the lack of forest specificity of many of the policies. For example, there are 73 European and international policies in the database dealing somewhat directly with water and/or air pollution. But only four of these are directly related to forests or the forest-based industry. Two prominent exceptions to this are the indicators of investments and research & development and of forest biodiversity, where even more than half of the indicator references have been evaluated to be of high relevance (Figure 17).



**Figure 17.** Relevance of policies to the EFORWOOD FWC SI

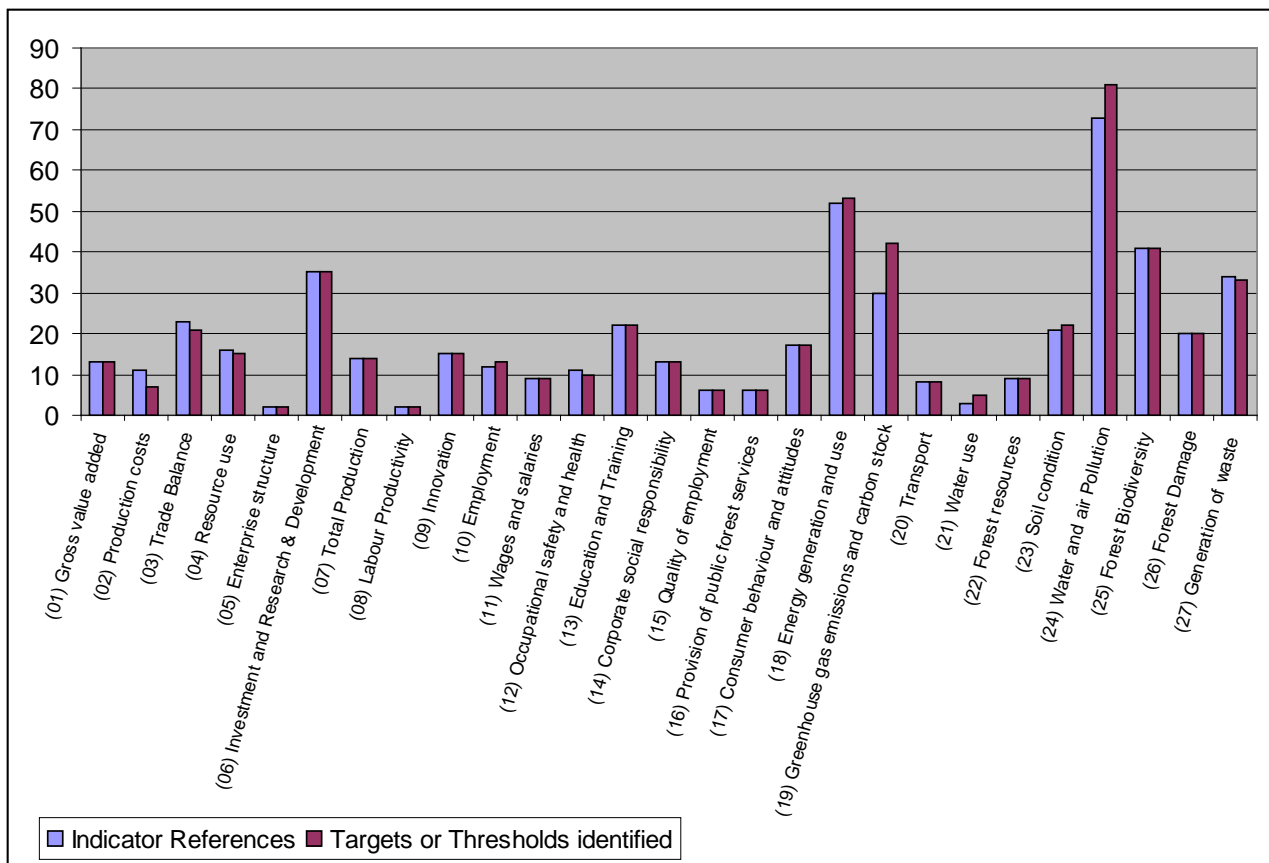
The indicator-specific analysis of the modes of governance applied in the FWC SI-related policy documents in the policy database also provides interesting results. Thus, again there is a big difference to be observed between the various dimensions of FWC sustainability. Figure 18 shows that very few legally binding policies refer to the economic and social indicators of FWC sustainability. These two dimensions are clearly dominated by the modes of targeting and voluntarism, i.e. the non-legally binding policy instruments. These two modes of governance are still very visible when it comes to the environmental indicators of FWC sustainability, but here it is much more balanced. Regarding the indicators of water and air pollution and generation of waste and waste management, for example, the legally binding modes of governance enforcement and framework regulation even clearly outnumber the two non-legally binding ones.



**Figure 18.** Modes of governance regarding the indicator references

Another result that can be observed in figure 18 is that policies based on the non-legally binding modes of governance appear to address a lot more issues than the legally binding policies. Out of the 518 indicator references in the policy database, 190 are based on policies applying the mode of voluntarism and only 145 on framework regulations. The same holds true for the policies of not leaving so much leeway when it comes to their implementation. Here 98 indicator references are based on policies applying the mode of targeting, whereas only 85 are based on enforcing policies. Thus, even though there are much less non-legally binding policies in the database (104 vs. 131 of 235 policies in total; see figure 15 on page 29), they refer to the FWC SI much more often than the legally binding ones (288 vs. 230 of 518 indicator references in total).

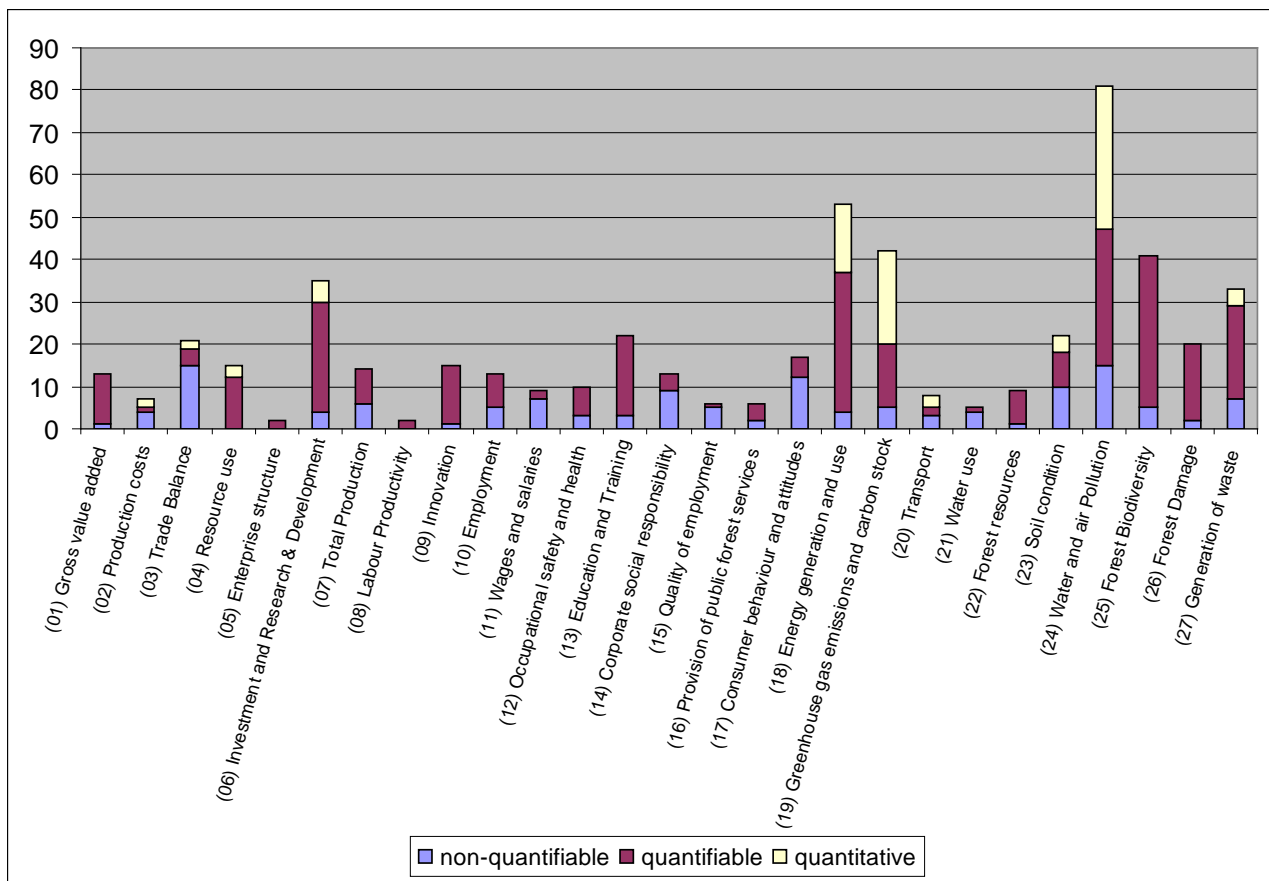
With regards to the complete sample of 518 indicator references, targets and/or thresholds have been identified within almost all the documents referring to these indicators. In some cases, more than one target and/or threshold has been found within one document. As a result, a list of **534 targets and thresholds** have been identified and included (see Figure 19).



**Figure 19.** Indicator References and Targets and Thresholds identified

These targets and thresholds include quantitative (exact targets or thresholds), quantifiable (e.g. increase/decrease) and non-quantifiable (qualitative) indicators. 95 quantitative targets or thresholds were identified for the 27 FWC SI. For some indicator classes, multiple thresholds/targets have been identified. 306 quantifiable targets were identified for all of the FWC-sustainability indicators. No quantifiable targets or thresholds are given here but the direction of change is specified as “maintain”, “increase” or “decrease”. 128 targets or thresholds for the FWC SI are non-quantifiable.

In the following (see Figure 20) an overview is given on the targets and thresholds that were identified for the indicators. The chart shows which forms of targets and thresholds were found for which indicators (quantitative, quantifiable and non-quantifiable).

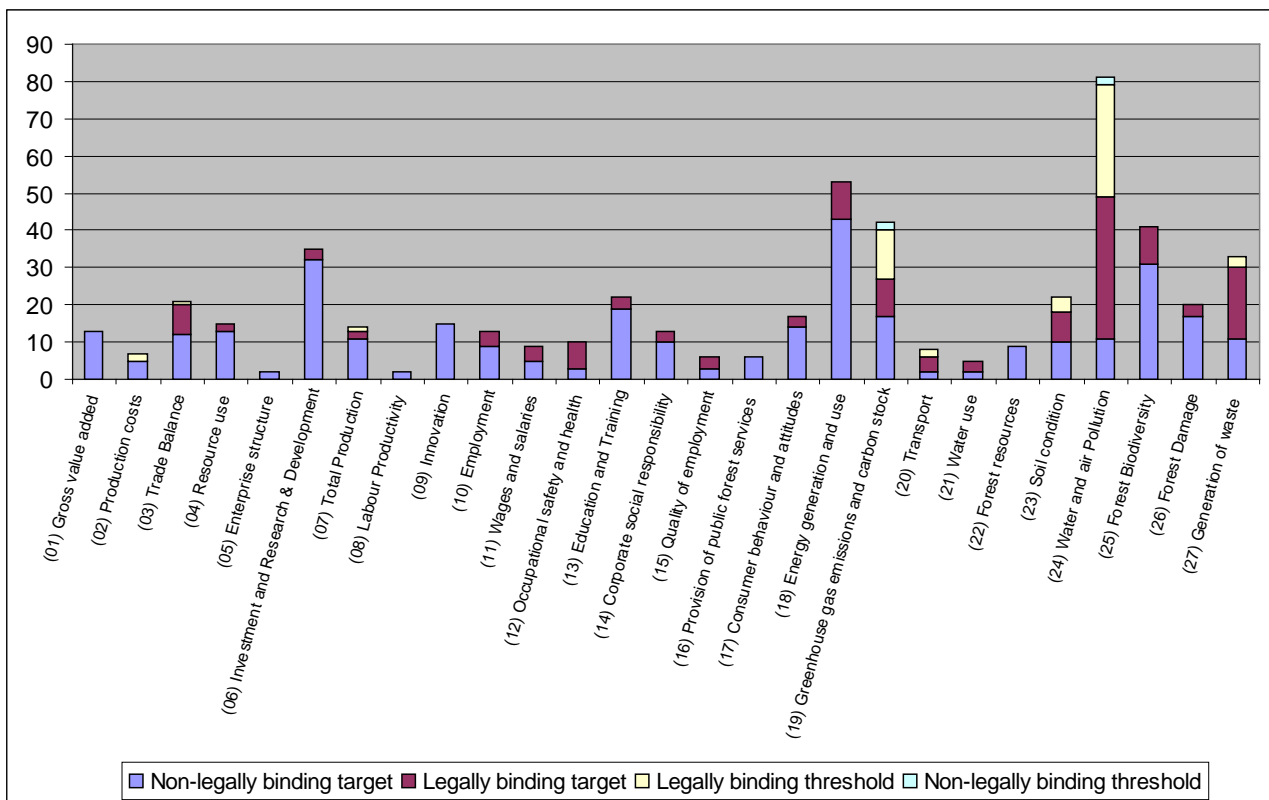


**Figure 20.** Forms of targets and thresholds identified for the FWC SI

The results depicted in Figure 20, show a remarkable difference between the economic and social dimension on the one hand and the environmental dimension of FWC sustainability on the other. While there are virtually no quantitative targets and thresholds set up for the economic and social FWC SI, they occupy a considerable share of the targets and thresholds set up for the environmental FWC SI. This may be due to the extended competencies of the EU in the realm of environmental legislation and policy in comparison to economic and social issues. Therefore, the EU rather sets up general frameworks and guidelines for the latter, instead of stipulating exact targets and thresholds in these policy areas.

The results concerning the type of targets and thresholds (legally binding threshold, legally binding target, non-legally binding target or non-legally binding threshold) do largely resemble the results according to the mode of governance of regulating FWC sustainability (see Figure 21). Thus, the economic and the social dimension of FWC sustainability are clearly dominated by non-legally binding targets (there are, however, no non-legally binding thresholds). 174 of the 220 targets and thresholds set up for these indicators are non-legally binding. This, however, is different regarding the environmental indicators of FWC sustainability. Here, the non-legally binding targets and

thresholds are just as many as the legally binding ones (157 vs. 157 of the 314 targets and thresholds set up for these indicators). For example, the indicator for water and air pollution is highly regulated through legally binding targets and thresholds (68 of the 81 targets and thresholds, which are set up for this indicator, are legally binding). This very much resembles the prevailing modes of governance in the various dimensions of FWC sustainability (see Figure 18 on page 32), where the non-legally binding modes of governance dominate the economic and social dimension, whereas the legally binding ones are much more visible regarding the environmental dimension of FWC sustainability.



**Figure 21.** Types of targets and thresholds identified for the FWC-SI

Not surprisingly, the environmental dimension of FWC sustainability is regulated much more through thresholds than the economic and social dimensions. In fact, as illustrated in figure 21 (sorted in accordance to the dimension of sustainability), there are no targets at all set up for social indicators of FWC sustainability and only four for economic indicators.



## 7 Concluding Remarks

There are several conclusions to be drawn from setting up the EFORWOOD policy database described in this document and analysing the included documents with the intention to determine targets and thresholds that relate to the EFORWOOD FWC-sustainability indicators.

First of all, the vast majority of international and European policies in the database do not explicitly deal with forests or forestry issues in Europe, but still influence the processes of the Forestry-Wood Chain and hence their sustainability. This is not much of a surprise since forestry and forest policy do not constitute a common European policy area as defined by the European treaties and remains an explicit member state competence. Therefore, the main instruments in this regard are the national forest programmes, which aim for a comprehensive approach towards forestry land use and a participatory approach, involving the various stakeholders. Nonetheless, the policies in the database are important to FWC-sustainability. In the end, this means that there is a huge difference between forest policies and FWC-related policies because the properties of a Forestry-Wood Chain are much more complex and multifaceted than forests and wood themselves. Thus, this policy database may almost be considered a general sustainability policy database for Europe, not merely a FWC-sustainability policy database. Even though there are some FWC-specific features that had to be considered while setting up this database, a general sustainability policy database for Europe would probably have a considerably similar content.

A second – and also not very surprising – conclusion refers to the origin of FWC-related policies in Europe. Thus, on the international and European policy level, the FWC in Europe is overwhelmingly determined by EU legislation. 173 of 235 policies in the database stem from EU legislation or policies. This is in line with the perception of an ever increasing density of regulation in Europe effectuated by EU legislation. As already mentioned in chapter two, the European Union (EU) is the major player in this realm, whereas other international institutions such as the United Nations or the Ministerial Conference on the Protection of Forests in Europe (MCPFE) rather draw up general frameworks instead of setting precise guidelines. It is evident that traditional forestry institutions emphasize sustainable forest management as an overall approach, balancing the social and environmental benefits of forestry with economic values for society. At the same time primarily environmental benefits provided by forests such as carbon sequestration, biodiversity and landscape protection are frequently addressed by other policy areas such as agriculture, environment and

energy. Especially with regard to the European Union, forestry actions appear to be fragmented into a range of policy areas.

Furthermore, the political instruments of traditional forestry institutions are mainly based on non-legally binding commitments. The Ministerial Conference on the Protection of Forests in Europe (MCPFE), currently the major policy institution at the pan-European level, is focused on policy implications at the national level on the basis of non-legally binding resolutions. At the same time other policy areas have developed legally binding commitments, for example in the form of European or global conventions (e.g. the biodiversity convention), dealing with issues related to forestry land use. This is especially true for the EU, which accounts for almost all binding legislation and binding targets or thresholds in the EFORWOOD policy database.

Speaking of density of regulation in the EU leads us to another conclusion regarding the content of the EFORWOOD policy database. Environmental policy is one of the most densely regulated policy areas in the EU. Since the beginning of the seventies a continuous expansion of environmental activities at European level can be observed. Environmental policy, at first seen as an insignificant appendage to economic integration, has thus become a central policy area of the EU. Its increased importance gets expressed by the far-reaching influence of EU legislation on the environmental policies of the Member States. Thus and due to the high density scheme and the large bandwidth of EU environmental policy, EU member states are often forced to adapt national regulations, policy instruments and management structures to European standards (Knill 2003). The high density of regulation in EU environmental policy also finds expression in the EFORWOOD policy database. The FWC-related policies referring to the environmental dimension of FWC-sustainability build the vast majority of the policies included in the database. A total of 291 of the 518 indicator references identified in the policy documents relate to environmental FWC-sustainability indicators. Thus, it's safe to say that, on the international and supranational policy level, the environmental one is by far the most regulated of the FWC-sustainability dimensions. This is mostly due to the division of competencies between the European Union and its member states. Thus, environmental policy belongs to the main competencies of the European Union, whereas economic policy and order and employment policy belong to the main competencies of the member states (Pülzl 2005). Therefore, the economic and social dimension of FWC sustainability might not be in generally less regulated, because local, regional, and national policies could make up for this possible lack of regulation. On the international level, however, this is definitely the case.

This distinction of competencies between the EU and its Member States regarding the economic and social dimension on the one hand and the environmental dimension on the other is not only reflected in the sheer amount of policies and indicator references, but also in the content of the latter. Due to this distinction, the EU often simply cannot issue legally binding policies or targets and thresholds on many of the social or economic issues. Furthermore there are also many more international organisations and institutions dealing with environmental issues than there are for social or economic concerns. For these reasons, the mode of governance applied for the economic and social dimension of FWC sustainability is overwhelmingly dominated by non-legally binding policies and targets and thresholds. Concerning the environmental dimension, the EU indeed has the capacity and right to issue legally binding policies and targets and thresholds and is widely making use of this. Therefore, there are comparatively many legally binding stipulations from the EU concerning the environmental indicators of FWC sustainability.

Finally, the EFORWOOD policy database delivers a detailed overview of the international and European legislation and policies (potentially) having an impact on FWC-sustainability in Europe. It thus also provides a profound basis for interpreting and further analysing ToSIA results in the EFORWOOD context. Nonetheless, it has to be remarked that it can by no means “explain” FWC-sustainability (i.e. ToSIA results). Firstly, because FWC-sustainability is dependent on many factors outside of the policy sphere and, secondly, because many policies that do influence FWC-sustainability in Europe, like forest policy, are still mainly formulated on the national level. Therefore, the connection between the FWC-related policies in the EFORWOOD policy database and FWC-sustainability (i.e. ToSIA results) must not be overestimated.

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## 9 Annex – Revised EFORWOOD FWC-sustainability indicators set

### Economic FWC-sustainability indicators

#### 1 Gross value added

<b>Full name of indicator (including subclasses):</b>	1. Gross value added (GVA) at factor cost and contribution to gross domestic product
<b>General FWC sustainability indicator subclasses:</b>	1.1. Gross value added at factor cost 1.2 contribution to Gross Domestic Product
<b>Measurement units:</b>	1.1 in € 1.2 in % of GDP

#### 2 Production cost

<b>Full name of indicator (including subclasses):</b>	2. Average production cost and share of cost of wood-based materials
<b>General FWC sustainability indicator subclasses:</b>	2.1 Average production cost in total 2.2 Share of cost of wood -based materials
<b>Measurement units:</b>	2.1 in € 2.2 in % of average production cost

#### 3 Trade balance

<b>Full name of indicator (including subclasses):</b>	3. Imports and exports of wood and products derived from wood, and net trade
<b>General FWC sustainability indicator subclasses:</b>	3.1. Imports of wood and products derived from wood, a) volume b) value c) share of imports in total volume consumed 3.2. Exports of wood and products derived from wood, a) volume b) value c) share of exports of total volume produced 3.3. Net trade in wood and products derived from wood a) volume b) value
<b>Measurement units:</b>	3.1.-3.3 a kg, m <sup>3</sup> , etc. (depending on product unit), [ton C in EFORWOOD] 3.1.-3.3 b € 3.1.-3.2 c %

#### 4 Resource use, incl. recycled material

<b>Full name of indicator (including subclasses):</b>	<b>4. Use of renewable and non-renewable materials, classified by virgin and recycled material</b>
<b>General FWC sustainability indicator subclasses:</b>	<p>4.1. volume of renewable materials in total, of which</p> <p>a) wood-based material in total, classified into</p> <p>i. of virgin origin</p> <p>ii. of recycled origin</p> <p>b) other renewable materials in total, classified into</p> <p>i. of virgin origin</p> <p>ii. of recycled origin</p> <p>4.2. volume of non-renewable materials in total, of which:</p> <p>a) of virgin origin</p> <p>b) of recycled origin</p>
<b>Measurement units</b>	Kg [measurement unit as used in EFORWOOD context]

#### 5 Forest sector enterprise structure

<b>Full name of indicator:</b>	<b>5. Number of forest holdings and forest-based enterprises classified by size classes</b>
<b>General FWC sustainability indicator subclasses:</b>	<p>5.1. number of forest holdings in total, and classified by</p> <p>a) public</p> <p>b) private</p> <p>5.2. average forest holding size, and classified by</p> <p>a) public</p> <p>b) private</p> <p>5.3. forest based enterprises classified by size classes:</p> <p>a) micro and small enterprise (0-49 employees),</p> <p>b) medium sized (50-249 employees),</p> <p>c) large enterprises (&gt;250 employees)</p>
<b>Measurement units:</b>	number per class

## 6 Investment and research & development

<b>Full name of indicator:</b>	6. Investment (gross fixed capital formation) and R&D expenditure
<b>General FWC sustainability indicator subclasses:</b>	6.1 Investment (gross fixed capital formation) 6.2. Research & Development expenditure in total, and classified by a) private expenditure b) public expenditure
<b>Measurement units:</b>	in €

## 7 Total production

<b>Full name of indicator:</b>	7. Production of goods and services
<b>General FWC sustainability indicator subclasses:</b>	7.1. Goods classified by: a) volume, b) value 7.2. Forest services (marketed)
<b>Measurement units:</b>	7.2.a) tonnes, kg, m <sup>3</sup> , etc. (depending on product) ; one unit per sub-category 7.2.b) € (price)

## 8 Productivity

<b>Full name of indicator:</b>	8. Labour productivity
<b>General FWC sustainability indicator subclasses:</b>	8. Annual production per employee of total forest sector, and per sub-sector
<b>Measurement units:</b>	m <sup>3</sup> / employee or t/employee (full time equivalent)

## 9 Innovation

<b>Full name of indicator:</b>	9. Share of forest-based enterprises with new or significantly improved products or processes, and share of turnover
<b>General FWC sustainability indicator subclasses:</b>	9.1 Share of forest-based enterprises with new or significantly improved goods or services 9.2 Share of forest-based enterprises with new or significantly improved production process, distribution method, or support activity for goods or services 9.3 Share of turnover from new or significantly improved products as a share of total turnover
<b>Measurement units:</b>	% of total forest-based sector and per NACE category

## Social FWC-sustainability indicators

### 10 Employment

<b>Full name of indicator (including subclasses):</b>	<b>10. Number of persons employed in total and by gender</b>
<b>General FWC sustainability indicator subclasses:</b>	10. Number of persons employed in total and classified by: <ul style="list-style-type: none"> <li>a) gender categories <ul style="list-style-type: none"> <li>i. male</li> <li>ii. female</li> </ul> </li> <li>b) employment on enterprise sites <ul style="list-style-type: none"> <li>i. located in rural areas</li> <li>ii. located in urban areas</li> </ul> </li> </ul>
<b>Measurement units:</b>	a) and b) absolute number and % of total (in full-time equivalents in reference year)

### 11 Wages and salaries

<b>Full name of indicator (including subclasses):</b>	<b>11. Wages and salaries (gross earnings) classified by gender and in relative terms</b>
<b>General FWC sustainability indicator subclasses:</b>	11.1 Wages and salaries classified by gender categories <ul style="list-style-type: none"> <li>a). male</li> <li>b) female</li> </ul> 11.2 average wages & salaries per employee relative to <ul style="list-style-type: none"> <li>a) country average</li> <li>b) weighted purchasing power parity</li> </ul>
<b>Measurement units:</b>	11.1 in € 11.2 in % relative to 9.2 a) and b)

### 12 Occupational safety and health

<b>Full name of indicator (including subclasses):</b>	<b>12. Frequency of occupational accidents and occupational diseases</b>
<b>General FWC sustainability indicator subclasses:</b>	12.1. Occupational accidents classified by: <ul style="list-style-type: none"> <li>a) non-fatal occupational accidents</li> <li>b) fatal occupational accidents</li> </ul> 12.2. Occupational diseases
<b>Measurement units:</b>	12.1. absolute numbers per 1000 employees 12.2. frequency of cases per number of persons exposed multiplied by number of years of exposure and in % per 1000 employees



### 13 Education and Training

<b>Full name of indicator</b>	<b>13. Education levels and training</b>
<b>General FWC sustainability indicator subclasses:</b>	13.1. Highest level of education of employees a) up to lower secondary education b) post secondary and tertiary education 13.2. Training time per employee
<b>Measurement units:</b>	13.1. number of employees per class and share of total; a): ISCED classes 1-2 [compulsory education]; b) ISCED classes 3-6 13.2. average hours / year and employee

### 14 Corporate social responsibility

<b>Full name of indicator (including subclasses):</b>	<b>14. Forest holdings and forest-based enterprises with third party certified management and share of wood sourced from third party certified sustainable production</b>
<b>General FWC sustainability indicator subclasses:</b>	14.1. Forest holdings and forest-based enterprises with third party certified management a) forest certification schemes b) environmental management system 14.2. Share of wood sourced from third party certified sustainable production
<b>Measurement units:</b>	14.1. number of enterprises 14.2. % of total volume sourced, per NACE category

### 15 Quality of employment

<b>Full name of indicator:</b>	<b>15. Persons employed part-time, temporary employed persons, and self-employed persons</b>
<b>General FWC sustainability indicator subclasses:</b>	15.1 persons employed part-time and employees with a contract of limited duration (annual average) in total, a) male b) female 15.2 self-employed persons
<b>Measurement units:</b>	15.1 % of total persons employed 15.2 % of total persons employed

## 16 Provision of public forest services

<b>Full name of indicator:</b>	16. Provision of public forest services
<b>General FWC sustainability indicator subclasses:</b>	16.1 Forest area designated for a) recreational use b) protective services 16.2 number of visits to forests
<b>Measurement units:</b>	16.1 in ha 16.2 in absolute numbers per ha of forests, per year

## 17 Consumer behaviour and attitudes

<b>Full name of indicator:</b>	17. Consumption of wood per capita and consumer attitudes towards forests and forest industry
<b>General FWC sustainability indicator subclasses:</b>	17.1 Apparent consumption of wood per capita 17.2 Share of population perceiving a) forest area, b) forest biodiversity, c) forest health as stable or increasing 17.3 Share of population perceiving forest industry to be a) environmentally friendly, b) an attractive employer
<b>Measurement units:</b>	17.1 in m <sup>3</sup> /caput 17.2 and 17.3 in % of ordinal classes, per country

## Environmental FWC-sustainability indicators

### 18 Energy generation and use

<b>Full name of indicator (including subclasses):</b>	<b>18. On-site energy generation (from renewables) and energy use classified by origin including the share of self-sufficiency</b>
<b>General FWC sustainability indicator subclasses:</b>	<p>18.1. On-site energy generation from renewables in total, and classified into</p> <ul style="list-style-type: none"> <li>a) heat</li> <li>b) electricity</li> <li>c) fuel</li> </ul> <p>18.2. Energy use in total and classified by</p> <ul style="list-style-type: none"> <li>a) heat in total, classified by origin: <ul style="list-style-type: none"> <li>i. renewable</li> <li>ii. non-renewable</li> </ul> </li> <li>b) electricity in total, classified by origin: <ul style="list-style-type: none"> <li>i. renewable</li> <li>ii. non-renewable</li> </ul> </li> <li>c) fuel in total, classified by origin: <ul style="list-style-type: none"> <li>i. renewable</li> <li>ii. non-renewable</li> </ul> </li> </ul> <p>18.3. Share of self-sufficiency</p>
<b>Measurement units:</b>	<p>18.1 and 18.2 in absolute numbers in energy terms (TJ)</p> <p>18.3 in %</p>

### 19 Greenhouse gas emissions and carbon stock

<b>Full name of indicator (including subclasses):</b>	<b>19. Greenhouse gas emissions and carbon stock</b>
<b>General FWC sustainability indicator subclasses:</b>	<p>19.1. Greenhouse gas emissions in total</p> <p>19.2. Carbon stock:</p> <ul style="list-style-type: none"> <li>a) in forests [classes as per IPCC guidelines]</li> <li>b) in wood products</li> <li>c) in landfill</li> </ul>
<b>Measurement units:</b>	CO <sub>2</sub> -equivalents;

## 20 Transport

<b>Full name of indicator (including subclasses):</b>	20. Transport volume and distance per mode of transport
<b>General FWC sustainability indicator subclasses:</b>	20.1. total tonnes and share of modal split 20.2. total tonne-kilometre and share of modal split
<b>Measurement units:</b>	20.1) tonnes per mode of transport and % 20.2) tonne-km per mode of transport and %

## 21 Water use

<b>Full name of indicator (including subclasses):</b>	21. Water use
<b>General FWC sustainability indicator subclasses:</b>	21.1 Water use (freshwater intake by industry) 21.2 Water use of the forest ecosystem a: Evapotranspiration from the forest ecosystem b: Groundwater recharge
<b>Measurement units:</b>	21.1 m <sup>3</sup> 21.2: m <sup>3</sup> ha <sup>-1</sup>

## 22 Forest resources

<b>Full name of indicator:</b>	22. Area of forest and other wooded land and related growing stock classified by type and by availability of wood supply as well as balance of increment and fellings
<b>General FWC sustainability indicator subclasses: (MCPFE)</b>	22.1. Area of forest and area of other wooded land 22.2. Growing stock classified by: a) forest types (predominantly conifers, predominantly broadleaved, mixed types) b) forest available for wood supply [as defined by UNECE/FAO] 22.3. Net increment [balance between increment & fellings]
<b>Measurement units:</b>	22.1.a) ha 22.2.a – 22.2b) m <sup>3</sup> (growing stock is measured over bark) 22.3) m <sup>3</sup>

### 23 Soil condition

<b>Full name of indicator (including subclasses):</b>	23. Soil condition as expressed by chemical soil properties, and soil compaction
<b>General FWC sustainability indicator subclasses:</b>	<p>23.1 Chemical soil properties related to soil acidity and eutrophication (pH, CEC, C/N, organic C, base saturation), classified by main soil types</p> <ul style="list-style-type: none"> <li>a) pH</li> <li>b) CEC</li> <li>c) C/N ratio</li> <li>d) organic C</li> <li>e) base saturation</li> <li>f) site nutrient budget averaged over total rotation period (N, P, K, Ca, Mg)</li> </ul> <p>23.2 Soil compaction from machine operations</p>
<b>Measurement units:</b>	<p>23.1</p> <ul style="list-style-type: none"> <li>a) pH classes</li> <li>b) cmol/kg</li> <li>c) ratio</li> <li>d) g/kg</li> <li>e) % (calculated as sum base cations/CEC)*100</li> <li>f) % difference over total rotation period</li> </ul> <p>23.2 soil density in kg dm<sup>-3</sup></p>

### 24 Water and air pollution

<b>Full name of indicator (including subclasses):</b>	24. Water pollution classified by organic substances and nutrients, and non-greenhouse gas emissions into air
<b>General FWC sustainability indicator subclasses:</b>	<p>24.1 Water pollution</p> <ul style="list-style-type: none"> <li>a) organic substances (biochemical oxygen demand)</li> <li>b) nutrients (N, P)</li> <li>c) acidity</li> </ul> <p>24.2. Non-greenhouse gas emissions into air (CO, NO<sub>x</sub>, SO<sub>2</sub>, NMVOC)</p>
<b>Measurement units:</b>	<p>24.1</p> <ul style="list-style-type: none"> <li>a) kg BOD5</li> <li>b) kg NTK</li> <li>c) pH classes</li> </ul> <p>24.2 kg</p>

## 25 Forest biodiversity

<b>Full name of indicator (including subclasses):</b>	25. Area of forest and other wooded land classified by number of tree species occurring and by forest type and by protection status
<b>General FWC sustainability indicator subclasses:</b>	<p>25.1. Area of forest and other wooded land classified by:</p> <ul style="list-style-type: none"> <li>a) number of tree species occurring <ul style="list-style-type: none"> <li>i) of which introduced [as specified in MCPFE]</li> </ul> </li> <li>b) forest types <ul style="list-style-type: none"> <li>i) predominantly conifers</li> <li>ii) predominantly broad leaved</li> <li>iii) mixed types</li> </ul> </li> </ul> <p>25.2. Volume of standing and of lying deadwood on forest and other wooded land in total, and classified by</p> <ul style="list-style-type: none"> <li>a) standing deadwood</li> <li>b) lying deadwood</li> </ul> <p>25.3. Protection status of area of forest and other wooded land</p>
<b>Measurement units:</b>	<p>25.1.a,b) total number per 1000 ha</p> <p>25.2. m<sup>3</sup> ha<sup>-1</sup></p> <p>25.3. total number per 1000 ha according to MCPFE Assessment Guidelines (<a href="http://www.mcpfe.org">www.mcpfe.org</a>)</p>

## 26 Forest damage

<b>Full name of indicator (including subclasses):</b>	26. Forest area with damage and damage induced wood supply
<b>General FWC sustainability indicator subclasses:</b>	<p>26.1 Area with damage classified by damaging agent</p> <ul style="list-style-type: none"> <li>a) biotic <ul style="list-style-type: none"> <li>i. insects and diseases</li> <li>ii. wildlife and grazing</li> </ul> </li> <li>b) abiotic <ul style="list-style-type: none"> <li>i. fire</li> <li>ii. storm, wind</li> <li>iii. snow, drought, mudflow, avalanche and other identifiable abiotic factors</li> </ul> </li> <li>c) human induced</li> </ul> <p>26.2 Damage-induced wood supply</p>
<b>Measurement units:</b>	<p>26.1 ha</p> <p>26.2 m<sup>3</sup></p>

## 27 Generation of waste

<b>Full name of indicator (including subclasses):</b>	27. Generation of waste: total, hazardous, and categorised by type of waste management
<b>General FWC sustainability indicator subclasses:</b>	27.1. Generation of waste in total and of which:: a) hazardous waste 27.2 Waste management a) waste to material recycling b) waste to incineration c) waste to landfill
<b>Measurement units:</b>	kg