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THE CONTRIBUTION OF EUROPEAN FOREST-RELATED POLICIES TO CLIMATE CHANGE MITIGATION: ENERGY SUBSTITUTION FIRST

Frederic Baron¹, Valentin Bellassen² and Mariana Deheza³

In a framework where no common forestry policy exists at the EU level (such as the Common Agriculture Policy for agriculture), this report lists EU policies that have an impact on climate change mitigation that can be achieved by the forestry sector. With the objective of analyzing the coherence of these policies, we have established a typology and a hierarchy firstly by laying out the legal status and the financial and institutional resources associated with each policy, and secondly by reviewing the objectives of each policy in regards to climate change mitigation in the forestry sector. We finally analyze potentials synergies and conflicts between them.

The consequences of each policy on climate change mitigation is assessed through three principal mitigation pathways in the forestry sector: carbon sequestration in forests, energy substitution (biomass, etc.), and what we refer to as the “harvested wood product use effect” (the sequestration of carbon in wood products and the substitution of more carbon-intensive materials with wood).

The forest-related EU policies analyzed in this report are found to be globally coherent in terms of shared objectives, defining an EU forestry mitigation strategy focused on energy substitution through:

- the Climate and Energy Package that does not address exclusively the forestry sector but has significant influence on energy substitution;
- the European Agriculture Fund for Rural Development (EAFRD), the most important fund concerning forestry. Among the eligible actions which touch upon climate and forestry, member states have favoured those supporting energy-substitution and to a lesser extent carbon sequestration in forests;

Non-mandatory policies such as forest strategies and the forest action plan have diversified objectives touching upon the three mitigation pathways. However their non-legally binding nature brings us to play down their importance.

In the end, despite the unbalanced attention given to the different mitigation options, policy objectives are nevertheless coordinated and often complementary in terms of climate change mitigation.

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ACRONYMS

CAP:	Common Agricultural Policy
CISFBI:	Communication on Innovative and Sustainable Forest-Based Industries
CITES:	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COP:	Conference Of the Parties
EAFRD:	European Agriculture Fund for Rural Development
EC:	European Council
EFDAC:	European Forest Data Center
EFFIS:	European Forest Fire Information System
EP:	European Parliament
EU:	European Union
EU ETS:	European Union Emission Trading Scheme
ERDF:	European Regional Development Fund
ESD:	Effort Sharing Decision
EUSF:	European Union Solidarity fund
FAP:	Forest Action Plan
FLEGT:	Forest Law Enforcement, Governance and Trades
FP7:	7 th Framework Program
GHG:	Green House Gas
HWP:	Harvested Wood Products
IEE:	Intelligent Energy – Europe
JRC:	Joint Research Center
LULUCF:	Land Use, Land Use Change and Forestry
MCPEF:	Ministerial Conferences on the Protection of Forests in Europe
NFP:	National Forest Program
R&D:	Research and Development
RDP:	Rural Development Program
RES:	Renewable energy Sources
SFC:	Standing Forestry Committee
SCPSI PAP:	Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan
UNFCCC:	United Nation Framework Convention on Climate Change
VPA:	Voluntary Partnership Agreement

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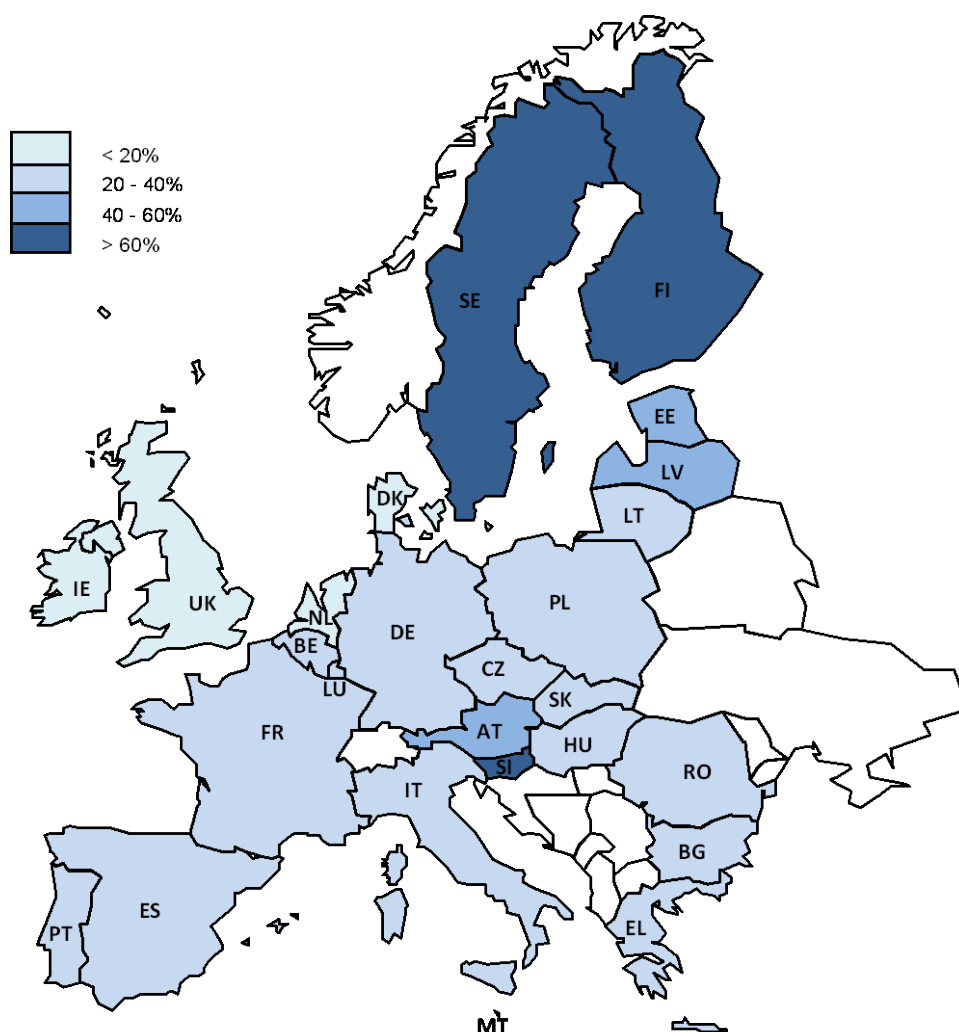
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INTRODUCTION

European forests strongly influence the European carbon budget, on one hand by providing wood which substitutes fossil fuels and energy-intensive materials, and on the other hand by sequestering carbon in forests and wood products. In 2010, European forests covered 157 million hectare (Mha), which represents 5% of the world's total forest cover, and 38% of the European Union (EU) territory. There is an important variability of the forest cover between member states, from 70% in Sweden down to 11% and 12% in Ireland and United Kingdom respectively (Figure 1).

Considering afforestation, natural forest expansion and deforestation, forest area in EU has expanded by more than 11 Mha since 1990, representing an average annual increase of 0.4%.

Figure 1 – Share of forest area related to national territories (%) within EU in 2010



Source: CDC Climat Research from Forest Europe, 2011

European forests also vary widely ecologically and their productivity and growth conditions vary over the continent. Annual forest sequestration slightly increased since 1990 and reached 429 MtCO₂ per year between 2005 and 2010 (Forest Europe, 2011). Forests are by far the largest contributor to the carbon balance of the Land Use, Land Use Change and Forestry (LULUCF, see II.A) sector which sequesters approximately 9% of the greenhouse gases emitted by others sectors of the EU economy (Standing Forestry Committee ad hoc working group VII, 2012).

However, European forests also play other important roles: economic – as they provide an important source of raw materials and renewable energy, environmental – through different services such as water treatment, air treatment, biodiversity conservation, etc., and social – as recreation areas or as aesthetic landscapes. Although representing only 1 % of the EU Gross Domestic Product, wood as a material is upstream of an important valuable chain involving, among others, furnishings, construction, printing and packaging. This diversity of functions, combined with a diversity of ecological forest types and forestry practices across the 27 member states, partially explains why there is no common forestry policy that would impose a coherence on the numerous policies which directly or indirectly impact forests and the forestry sector.

This complexity within the European policy framework regarding the forestry sector naturally brings up questions on the links between all these policies, in particular with regards the objectives of contribution to climate change mitigation. This report provides an overview of all European policies that directly or indirectly impact forests and the forestry sector. The objectives of these policies and the impact of their related measures are analyzed in order to identify their contribution in climate change mitigation and thus possible sources of incoherence. Part I provides the definitions and methods used in the report. Parts II to IV give an overview of EU forest-related policies and classify them based on their link and the strength of their influence on climate change mitigation: part II is dedicated to legally binding policies, while part III focuses on incentives/financial support tools and part IV deals with non-legally binding policies. Finally, part V synthesizes this analysis, showing that EU forest-related policies find their coherence around the support of wood energy use as the main contribution of the sector to climate mitigation.

I. GENERAL CONTEXT OF THE STUDY

A. The four climate change mitigation effects of forests

Under the United Nation Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol, annex I countries are committed to submit annual reports on greenhouse gas emissions and removals from different land-use categories and carbon pools, including forests. Forests contain large stocks of carbon in biomass, dead organic matter and soils. Although all these “pools” are affected by forest management, this study focuses on the biomass pool where the impact of management can be much stronger and faster (Arrouays et al., 2002; Lippke et al., 2011). This biomass pool can contribute to climate change mitigation through four mitigation effects:

- sequestering carbon in forests, by accumulating and maintaining carbon in forest ecosystems (afforestation⁴, improved regeneration⁵, productivity increase and limiting harvests, reducing losses by reducing fire and insects damages risks, ...);
- sequestering carbon in harvested wood products (HWP) (productivity increase, shift to long-life wood products, increased recycling, ...);
- substituting carbon-intensive raw materials (replacing high-energy intensive materials such as aluminium, concrete, ...);
- substituting fossil fuels with woody biomass.

Carbon sequestration in HWP often goes along the substitution of carbon-intensive raw materials and vice-versa. Thus, in this study, the two effects – sequestration in HWP and substitution of carbon-intensive raw material – are merged under the term “HWP effect”.

⁴ Afforestation consists in planting a forest on a piece of land that was not forested, such as a cropland or a pasture. Improved regeneration consists in forestry practices to help forest recovery after clear-cut, fire, windfall or other stand-replacing events.

⁵ Ibid.

B. Defining forestry, policies, and forest-related policies

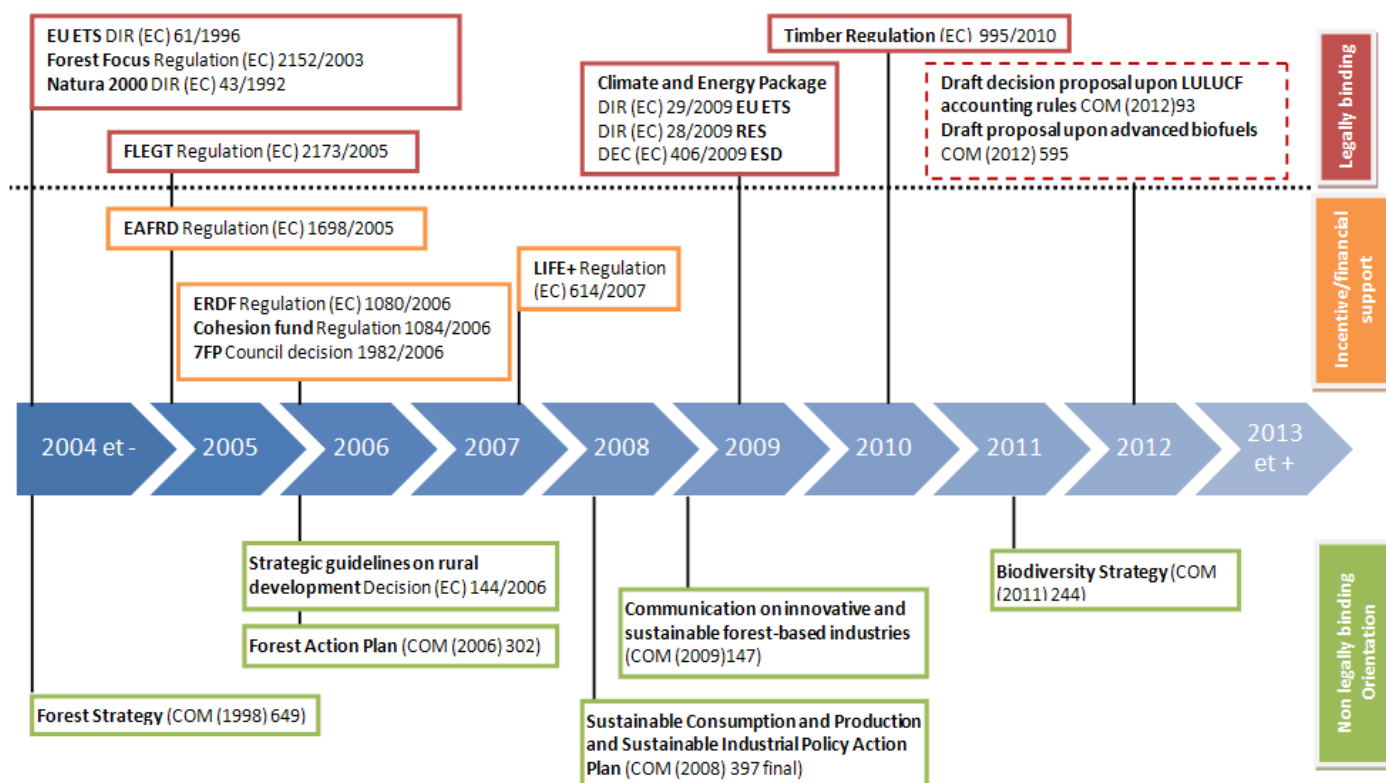
Throughout the report, the “forestry sector” refers to all processes from the production of wood to the sales of final wood products to consumers (regrouping forests, sawmills, forest-based industries etc.). With regards to policies, this overview not only covers explicit forest policies such as Forest Action Plans – which are few, but also trans-sectoral policies or policies mainly intended for other sectors which have a mitigation impact through the forestry sector, like the Climate and Energy Package. This ensemble constitutes the “forest-related” policies affecting climate mitigation.

European forest and forest-related “policies” include all communications, regulations, decisions and directives elaborated by the European Commission, the European Parliament (EP) or the European Council (EC). Thus, “policy” refers to legally binding provisions and commitments, guidelines or incentive mechanisms. The degrees of commitment and the binding nature of all those policies are organized in a hierarchy as follows:

- a **regulation** introduces an uniform rule, directly applicable to all the member states. It must be entirely respected by those to whom it applies (private persons, member states, community organs). The regulation fixes an objective and the means to reach it (e.g. the Common Agricultural Policy or CAP). Several funds have been created with regulation acts (e.g. the European Agriculture Fund for Rural Development or EAFRD, see IV.A), with overall objectives, but devoid of uniform and specific measures. Instead, these funds propose a list of actions and measures which are eligible to EU funding;
- a **directive** fixes policy objectives to be achieved by member states, to which it partly delegates the choice of means. This choice may be wide (e.g. Renewable Energy Directive, see II.A) or constrained (e.g. European Union Emission Trading Scheme (EU ETS) directive, see II.A). A directive may concern all member states, or only part of them. Directives are used to harmonize national legislations;
- a **decision** regulates a particular situation. A decision is usually taken to clarify or implement a given part of a directive or regulation;
- non-legally binding acts do not create legal obligations and mostly constitute a political statement. They express the position of institutions on a given problem. The European Commission produces numerous documents within this category: communications, green papers which launch a debate, white papers which propose a solution, action plans, reports, and working programs.

The identification and census of these policies, and the analysis conducted on this EU policy framework, highlight that three different statuses of “forest-related” policies exist: legally binding policies; incentives/financial support; and non-legally binding policies, functioning as simple orientations (Figure 2).

Figure 2 – Chronological implementation of European forest-related policies affecting climate mitigation



Dashed boxes include draft policies that are currently being debated.

The red color is associated with legally binding policies, the orange color with incentive and financial support, and the green color with non-mandatory orientation.

Source: CDC Climat Research

The analysis offered in this report relies on a literature review, mainly of EU official texts, and semi-directive interviews of relevant stakeholders. The first step was the identification of “forest-related” policies affecting climate mitigation, followed by a listing of the objectives of the policies identified, with a special attention on:

- The importance given to climate change mitigation: is it a priority (the main), a secondary objective or is there no clear mention of it in the official document despite identified impacts?
- The directness of the link between the policy and the role of the forestry sector in the objective (Table 1).

Table 1 – Definition of policies objectives regards for forestry

Nature of the links between policies and the forestry sector	Characteristics within the official text
Exclusive	No considerations for others sectors.
Non exclusive	Forestry is one sector considered, among other sectors; or There is no mention to forestry in the policy, yet the policy has an impact on one of the three mitigation options detailed before.

Source: CDC Climat Research

This first step of the study provided a list of policies identified as “forestry-related policy”, and a characterization and a typology of their objectives concerning climate change mitigation and the forestry sector (Table 2)⁶. Following this analysis this report further details each policy and its objectives, beginning with legally binding policies, then non mandatory policies and finally instrument and financial tools.

Table 2 – Overview of European forest-related policies affecting climate mitigation and their objectives

Current status	Forest-related policy	Objective typology on ...		Associated funds
		Climate change mitigation	The forestry sector	
Legally binding	Effort Sharing Decision	P	Not exclusive	
	Renewable energy Directive	P	Not exclusive	
	EU-ETS Directive	P	Not exclusive	
	LULUCF accounting rules	P	Exclusive	
	Proposal of the 17 th October 2012 on advanced biofuels	P	Not exclusive	
	Timber Regulation	N	Exclusive	
	FLEGT Regulation	N	Exclusive	
	Natura 2000	N	Not exclusive	EAFRD LIFE+
Non legally-binding Orientation	Forestry Strategy	S	Exclusive	LIFE + EAFRD FP7 ERFD Cohesion fund
	Forest Action Plan	S	Exclusive	
	Communication on Innovative and Sustainable Forest Based Industries	S	Exclusive	FP7 ERFD Cohesion fund
	Biodiversity Strategy	S	Not exclusive	LIFE+ EAFRD FP7
	Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan	N	Not exclusive	FP7
Incentive Financial aid	Regional cohesion (ERDF, Cohesion fund)	S	Not exclusive	
	Rural Development (EAFRD)	S	Not exclusive	
	Research and innovation (Forest Focus, LIFE +, 7FP)	S	Not exclusive	

P: Priority objective / S: Secondary objective / N: Not an objective

The color code refers to the Figure 2. The light red color means that both policies drafts aren't yet adopted by the EC, but that they aims to be legally binding.

Source: CDC Climat Research.

⁶ The EU Solidarity fund (European Council, 2002) was set up in 2002, following the wave of severe floods that affected Eastern Europe. It aims at helping the reconstruction of infrastructures damaged after important natural disasters such as forest fires. The objective of the fund is to complement the public efforts to recover non-insurable damages. The EUSF does not compensate damages to forests because forests are not considered infrastructures. It is thus not considered as a forest-related policy and is not included in the analysis. Forest regeneration after natural disturbance can however qualify for aid under other instruments, mostly the structural funds and the EAFRD (see IV.A).

II. EUROPEAN MANDATORY FOREST-RELATED POLICIES CONTRIBUTE TO CLIMATE CHANGE MITIGATION MAINLY THROUGH ENERGY SUBSTITUTION

Unlike in other sectors, such as the CAP for agriculture, there is no common and mandatory EU-forest policy. In the Treaty of Lisbon signed on December 13th, 2007, forestry remains a member state competence, to the contrary of agriculture and fisheries which largely fall under the perimeter of the Union with the related CAP and Common Fisheries Policy. Two main reasons lie behind this choice:

- several member states (Sweden, Finland, Germany etc.) consider that the forest sector has traditionally fared well within the market economy without EU policies or specific mechanisms to support it;
- forestry conditions, resources and practices vary widely between member states.

However there is a long history of the EU contributing to the implementation of sustainable forest management through common policies, based on the principle of subsidiarity and the concept of shared responsibility. Some EU mandatory policies impact the forestry sector but they are not exclusively restricted to it. Such is the case of the Climate and Energy Package, the EU flagship policy concerning climate change mitigation, notably through the attribution of emission reduction targets to all member states, and the development of the European carbon market. This mechanism mainly impacts the forestry sector by promoting wood as a renewable-energy source.

Other legally-binding policies are related to wood trade in the case of Forest Law Enforcement, Governance and Trades (FLEGT) and Timber Regulation and to biodiversity conservation with Natura 2000 and the upcoming Biodiversity Strategy. These policies tend to foster carbon sequestration in forests; but in terms of impact on climate change mitigation through the forestry sector, they do not match the Climate and Energy Package.

A. The Climate and Energy Package largely promotes wood use without much incentive for resource replenishment

In 2009, the EP and the EC adopted the Climate and Energy Package, setting three targets to be reached by 2020: reducing greenhouse gas emissions by 20%, improving energy efficiency by 20% and reaching 20% of renewable energies in the EU energy mix and a 10% share for renewable energy in the transport sector. This package contains 4 directives, one decision and one regulation. The decision and two directives concern mitigation of climate change through forestry:

- The EU ETS directive (2009/28/EC) revises the European Union Emission Trading Scheme (EU ETS), setting the rules for its third phase (2013-2020). The EU-ETS is a “cap-and-trade” system which limits the overall level of allowed emissions over its perimeter – power generation and large industries mainly – and allows participants to trade emission allowances. Up to an average of 13.5% of their 2008-2012 allocation, participants may use offset credits instead of allowances. Credits from projects related to biomass use are allowed, but not credits from projects that increase forest carbon stocks.
- Decision 406/2009/EC – “Effort Sharing Decision” or ESD – assigns a GHG emissions reduction target to each member state for the part of its emissions which are not covered by the EU ETS: transport (except aviation), buildings, agriculture, and small industrial installations. Similarly to businesses subject to the EU ETS, member states are allowed, to a certain extent, to use offset credits in order to meet their target. Contrary to the EU ETS, forestry credits are allowed.
- The Renewable Energy Sources (RES) directive (2009/28/EC) sets European and national objectives in terms of renewable energy sources, including woody biomass. This directive establishes criteria of “durability” that liquid biofuels produced in or imported to, the EU must meet in order to count towards the objective. No such obligation applies to solid biomass, for which only recommendations are listed. The article 17(9) of that Directive provides that the Commission

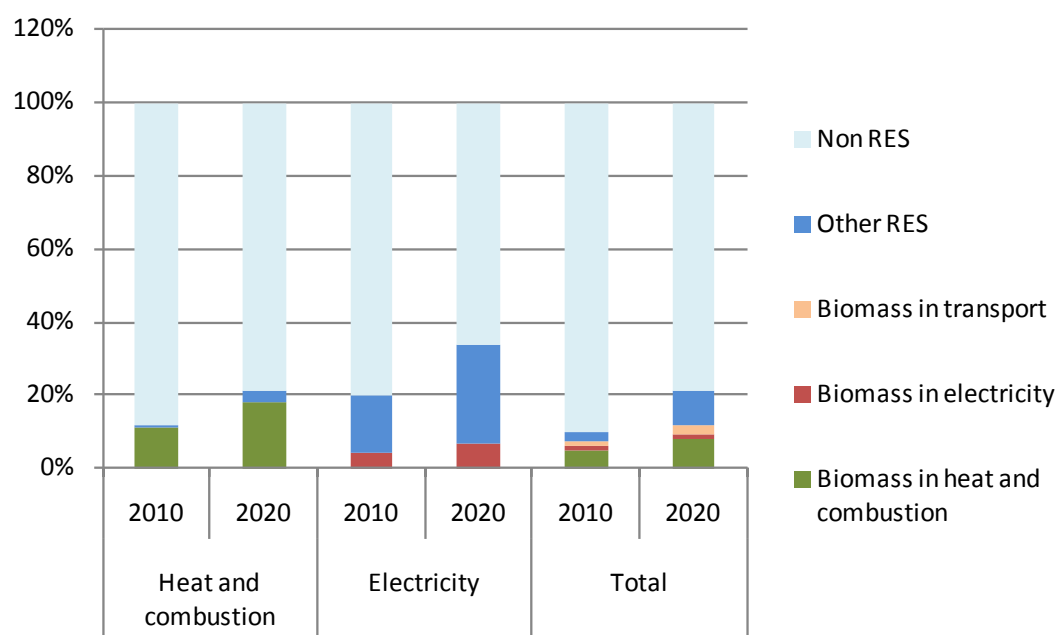
should report on requirements for a sustainability scheme for energy uses of biomass other than biofuels and bioliquids (i.e. solid and gaseous fuels in electricity, heating and cooling). The report from the European Commission and the European Council issued on February 25th, 2010, is intended to fulfil that obligation. Member States are invited to take into account recommendations related sustainability criteria, reporting and monitoring. These recommendations aim to promote the sustainable production and use of biomass, a well functioning internal market in biomass trade and to lift barriers to bio-energy development. The report considers that additional measures such as common sustainability criteria at EU level would be appropriate.

A clear advantage given to energy substitution ...

The main effect of the Climate and Energy Package on climate change mitigation through forestry comes from the RES and the EU ETS directives. On one hand, member states are committed to reach their EU-mandated targets set by the RES directive. Member states can carry out their own implementation levels (national, regional or local instruments, measures and policies) and apply measures of cooperation between one another (respectively articles 3 and 6 – 9 of the directive). But in the end, they can be prosecuted under the European Court of Justice if they do not reach their target in 2020 (Bellassen et Deheza, 2009).

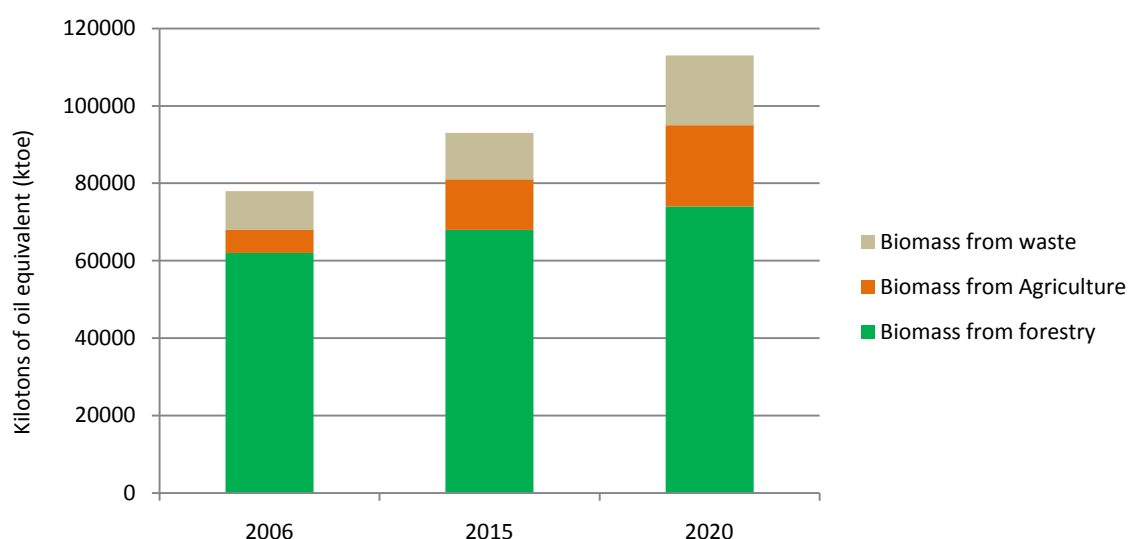
Most Europeans countries are planning to meet their renewable energy targets mainly through the combustion of woody biomass: biomass consumption for energy production is expected to double by 2020 (Figure 3), with 70% of biomass supply coming from forests (Figure 4).

Figure 3 – Biomass consumption perspective in 2020



Source: Langue (2012)

Figure 4 – Biomass supply perspective until 2020



Source: Languet (2012)

On the other hand, the EU ETS constitutes an economic instrument that further encourages large industrial facilities to use wood energy for heating and electricity production. As wood is assumed to have sequestered its carbon content from the atmosphere in the recent past, emissions from biomass burning are not counted. The EU ETS thus provides an economic incentive to substitute fossil fuels with wood. It also provides a comparative advantage to wood over more carbon-intensive materials such as cement, steel or plastic. As the carbon rent goes to the producers of these materials however, this comparative advantage has probably remained largely theoretical (Bellassen et Deheza, 2012).

Countries such as France, Germany, Italy, Sweden, Finland and Poland are already using large amounts of wood pellets for energy production. The European pellet industry still covered 81% of the EU demand in 2010; however, the gap between production and consumption in EU has increased 8-fold over the last three years, from only 262 250 tons in 2008 to 2 148 000 tons in 2010. According to Eurostat, the EU imported more than 2.6 million tons of pellets from non-EU countries in 2010, with 38% from Canada, 30% from United States of America, and 15% from Russia Federation. In a business-as-usual scenario, these imports are forecast to reach 16 million tons by 2020, mainly pushed by non-forested countries such as Denmark, Belgium, Netherlands, and the United Kingdom (Cocchi, 2011).

The impact of the transport emissions associated with wood imports, mostly by boat, is not included in calculating the effects of these policy incentives. This impact is however estimated to be of minor importance: the use of biomass coming from EU countries for heat and power production represents GHG saving ranging from 55 to 98 % compared to fossil fuels. In the case of imported biomass from tropical countries, these savings are still between 25% and 75% (European Commission, COM/2010/0011). These values assume that wood comes from sustainably managed forests and therefore do not take into account greenhouse gas emissions associated to land use change.

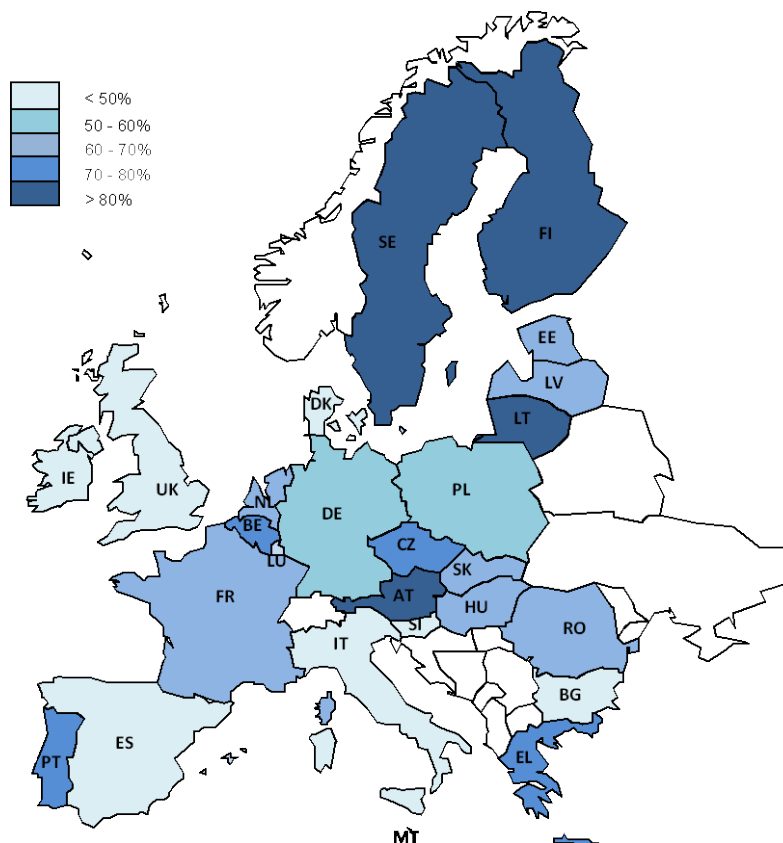
... to the expense of forest carbon sequestration

Although the ESD provides a small incentive for increasing or replenishing forest carbon stocks by allowing member states to use forestry offset credits to meet their target, the Climate and Energy Package appears to mostly have a negative impact on forest carbon sequestration. In the EU, current felling levels are still lower than net annual increment (Figure 5), indicating that there is probably still room for further harvest. However driven by the combination of high energy prices and climate mitigation policies such as the EU ETS and the RES directive, the soaring demand for biomass may reverse the picture in the near future: demand for wood biomass could outpace domestic supply as early as 2016 (Ellison et al., 2012).

This interpretation of the objectives of European policies does not assess all national legislation on sustainable forestry. Since forestry is not an EU policy, there is no explicit common policy or program

setting sustainable criteria for forest management. The different Ministerial Conferences on the Protection of Forests in Europe (MCPFE) aim to set criteria in order to guarantee sustainability in pan-European forests, but it is on a non-legally binding basis until now⁷, thus still respecting the subsidiarity principle. If sustainable forest management in the framework of national forest legislation may indeed reduce the risk of reduction in forest carbon storage, these economic or political incentives do not come from the community level.

Figure 5 – Average-felling rates of EU member states (in % of 1990/2000/2005/2010 average net annual increment in forests available for wood supply)



Source: CDC Climat Research from Forest Europe Organization, 2011.

New accounting rules for forestry in national greenhouse gas accounts

Although EU forests absorb 10% of annual emissions, carbon sequestration in forests and wood products is currently not included in EU targets. Due to the complexity of international accounting rules for the 2008-2012 period, the sector is also minimally involved in meeting EU commitments under the Kyoto Protocol (Bellassen & Deheza, 2009). Following the 17th Conference Of the Parties (COP) in Durban and the new commitments made by the parties under the Kyoto Protocol, a recent proposition of the European Commission (COM/2012/93) published in March 2012 outlines how LULUCF could be gradually incorporated in the EU climate policy, and proposes new accounting rules, substantially improving the visibility of the sector in national GHG accounts.

The communication is accompanied by a draft decision proposing two actions: first, a harmonized accounting framework for all member states, and second, a set of LULUCF Actions Plans prepared by the member states and submitted to the European Commission.

⁷ The Forest Europe organization in charge of the MCPFE is already working upon a pan-european legally binding agreement on sustainable management criteria, which may be launched by the end of 2013.

The accounting of the forest management balance becomes mandatory, without complex carry-over rules and ceilings⁸, which would contribute to the promotion of forest carbon sequestration. Article 7 of the communication also proposes to account for emissions from paper, wood panels and sawn wood. These new rules provide a small incentive for governments to increase the “HWP effect”: an increased use of HWP is now reflected in the national greenhouse gas inventories.

These incentives are estimated to be modest as no incentive mechanisms is currently associated with the proposed accounting rules. This proposal has been adopted by the EP the 12th of March 2013 after a series of discussions with the EC. For details on this proposal, see Bellassen and Deheza (2012).

An upcoming transition from “advanced” to “conventional” biofuels is promoted

The RES Directive established mandatory targets to be achieved by 2020 (a 20% overall share of renewable energy in the EU and a 10% share for renewable energy in the transport sector) and the contribution of biofuels from biomass towards these targets is expected to be significant (Figure 3). Whilst the RES Directive includes recommendations on the sustainability criteria, the GHG emissions associated with changes in the carbon stocks of land resulting from indirect changes in land use are not subject to reporting requirements under the current legislation.

Through the proposal issued on October 17th, 2012 for a new directive (COM(2012) 595 final), the European Commission invites to review the impact of indirect land-use change on GHG emissions and, if appropriate, propose ways to minimise it and at the same time to respect existing investments made in biofuel production from forest biomass.

The main features of this proposal are:

- the introduction of a limit to the contribution made from biofuels and bioliquids produced from food crops, such as those based on cereals and other starch rich crops, sugars and oil crops, to the Renewable Energy Directive targets to current consumption levels (without limiting the actual production or consumption);
- an enhanced incentive scheme in Article 3(4) to further promote “sustainable and advanced biofuels” from feedstocks that do not create an additional demand for land;
- introduction of reporting estimated emissions from carbon stock changes caused by indirect land-use change, based on the best available scientific evidence
- to increase the minimum greenhouse gas saving threshold for biofuels and bioliquids produced in new installations with effect from 1st July 2014 in order to improve the overall greenhouse gas balance of the biofuels and bioliquids consumed in the EU as well as discouraging further investments in installations with low greenhouse gas performance;

The aim is thus to limit the contribution that conventional biofuels (with a risk of land-use change emissions) make towards attainment of the targets in the RES Directive, and thus encourage a greater market penetration of “sustainable and advanced biofuels”. This proposal gives an advantage to biomass from forestry compared to biomass from agriculture, without any reduction on the existing investments and global targets related to biofuel production.

⁸ The only set limit is relatively generous: a maximum of 3.5% of national 1990 emissions (Bellassen et Deheza, 2012)

Table 3 – Climate & Energy Package and LULUCF accounting rules objective typology

	Climate Energy Package	LULUCF accounting rules ⁹	Proposal of the 17 th October 2012 on advanced biofuels
Link with the forestry sector	Not exclusive to forestry.	Not exclusive to forestry, concerns a wide range of land use and land use change (grazing land, cropland, revegetation etc.).	Not exclusive to forestry, concerns a wide range of land uses and land use changes.
Climate change mitigation objective	Primary (P): the priority objective is to reduce the overall greenhouse gas emissions of the Community by at least 20% below 1990 levels by 2020.		
Impact on energy substitution	++ The EU ETS, the ESD and the RES Directive set mandatory targets and incite wood energy use for heating and electricity production.	0 May incite forest protection but also forest recovery and hence increase wood supply over the long term.	++ This proposal gives an advantage to forest biomass over agriculture biomass, without any reduction on the investment needs and European targets for biofuel use.
Impact on forest sequestration	- It implicitly promotes wood harvest to meet demand for wood energy and wood material. The small incentive of forestry credit in the ESD is unlikely to balance the effect of increased wood demand.	+ Forest management accounting becomes mandatory and the simplified rules will make the design of incentive mechanisms easier, although concrete mechanisms are still largely lacking.	0 Unclear effect.
Impact on HWP effect	+ In theory, the EU ETS gives a comparative advantage to HWP compared to others more energy-intensive materials. Rent distribution may be hampering this theoretical effect in practice.	+ The new rules provide a small incentive to governments to increase the use of HWP by including this pool in the national greenhouse gas inventories.	0 Unclear effect.

-: slightly detrimental to the mitigation option; 0: no clear influence on the mitigation option; +: slightly favorable to the mitigation option; ++: strongly favorable to the mitigation option.

Source: CDC Climat Research.

B. FLEGT and the Timber Regulation are only referring to the legality of Forest Management

Forest Law Enforcement, Governance and Trades (FLEGT)

In response to international concerns on the impacts of illegal forest exploitation and wood trade, the EU adopted in 2003 the internal Forest Law Enforcement, Governance and Trades (FLEGT) action plan (Regulation 2173/2005/EC). The action plan contains a set of measures intended to influence jointly the supply and demand of legal wood that is wood harvest in sustainably managed forests.

The following actions aim to increase demand for legal wood:

- Encourage EU private companies to purchase policies guaranteeing that their wood imports come from legal sources;
- Promote the establishment by member states of national policies which strengthen controls of the legality of wood imports.

Some actions aim at helping developing countries to strengthen their capacities to supply legal wood:

⁹ As the red color indicates it, this draft proposal is considered to be mandatory because it aims to be legally-binding in his final version.

- Technical and financial support to improve the governance and to strengthen the capacities of the governmental and nongovernmental stakeholders in developing countries;
- Support governments of producing countries in their fight against illegal exploitation through bilateral agreements called Voluntary Partnership Agreements (VPAs).

VPAs are established on a voluntary basis: wood imports from countries that have not signed one are still accepted in the EU. They are however intended to provide an advantage to timber producing nations: increased access to the European market, increased tax revenues, improved international reputation, and higher level of support on enforcement tools to combat illegal logging and on political and financial governance reforms (European Forest Institute, 2007). These benefits and incentives may not be sufficiently important or publicized however as only three countries had signed a VPA as of November 1st, 2012 (Cameroon, Ghana and Republic of Congo). Entering into force in 2013, the Timber Regulation will be the first mandatory component of FLEGT.

The Timber Regulation

Passed in 2010 and entering into force in 2013, the Timber Regulation of the EP and EC (Regulation 995/2010/EC) imposes three main obligations to all operators selling timber or timber products in the EU¹⁰:

- Ban on illegally-harvested timber products;
- EU traders have to apply “due diligence” to their supply contracts, meaning that they must put in place procedures to ensure that their wood supply does not come from illegal sources;
- Economic operators and traders have to record all their suppliers and customers to guarantee the traceability of the timber products.

This regulation is legally binding for all member states and applies to both imported and national wood products. It reinforces the FLEGT action plan, considering a VPA signed under FLEGT as sufficient “due diligence” for all wood imports from a signatory country. The main interaction between those two wood market policies and climate change mitigation lies in improved forest management as one of the legal kinds of forest management. Indeed, improved forest management often enhances forest carbon stocks both in biomass and soils and increase their sequestration capacity through the implementation of good management practices – e.g. silvicultural treatments (tending operations, enrichment of gaps, etc.), species selection, and modification of rotation cycles.

¹⁰ This includes solid wood products, flooring, plywood, pulp and paper. Recycled products, as well as printed papers such as books, magazines and newspapers are not included. The product scope can be amended if necessary. FLEGT and CITES licensed wood products are included.

Table 4 – FLEGT and Timber regulation objective typology

	FLEGT	Timber regulation
Link with the forestry sector	Exclusive: concerns wood and wood products market and trade	
Climate change mitigation objective	No objective (N): there is no clear evidence within the official text that it aims at tackling climate change, despite the fact that sustainable forest management tends to foster forest carbon sequestration.	
Impact on energy substitution	0 Unclear effect.	
Impact on forest sequestration	0/+ Sustainable forest management tends to foster forest carbon sequestration. But both policies refer to the legality of wood products, which does not systematically cover all sustainable criteria.	
Impact on HWP effect	0 Unclear effect.	

0: no clear influence on the mitigation option; +: slightly favorable to the mitigation option;

Source: CDC Climat Research.

C. Biodiversity conservation policies have an unclear but probably marginal impact on climate change mitigation

This Natura 2000 policy dates from 1992 and of its purpose is to build a European ecological network of preservation areas, supplementing the EU Birds Directive launched earlier, in 1979 (1979/409/EC). The habitats directive (Directive 1992/43/EC) takes an integrated approach: ensuring the preservation of biodiversity but also promoting sustainable activities which support this preservation objective such as tourism, agriculture, forestry etc. The directive initially included a total of 59 types of rare forest habitats to be preserved. Besides habitats, the directive also identifies about 200 animal species, 180 species of birds, and more than 500 botanical species to be protected by setting up special protection zones. Several species are associated with forest habitats directly or through diverse sorts of landscapes such as wet areas or forest borders.

The directive includes legally binding objectives regarding the implementation of protected area. Following the subsidiarity principle, the directive only indicates the result to be achieved but it does not prescribe any concrete conservation measures. Hence, Natura 2000 does not prescribe management types for conservation areas. In particular, it is not possible at the EU level to restrict or intensify harvesting levels, influence the size of clearings, nor the timing of interventions, etc. These kinds of management constraints are negotiated at national and local level between the authorities in charge and the forestry stakeholders (European Commission, 2003). Accordingly, assessing the consequences of Natura 2000 conservation areas on climate change mitigation is a real challenge. Based on stakeholder interviews however, the policy seems to more often favor decreases rather than increases in harvest intensity. Natura 2000 is therefore classified here as having a small, yet positive, effect on carbon sequestration in forests and a small net negative effect on energy and material substitution.

In 2011, the European Commission proposed a new strategy to halt the loss of biodiversity and ecosystem services in the EU by 2020. The EP has adopted this Biodiversity Strategy in 2012 (Resolution 2011/2307(INI)). It does not contain any mandatory element and proposes, among others priority targets, to improve biodiversity through forestry, promoting a set of specific measures. Some of them impact the climate change mitigation capacity of European forests:

- encourage the adoption of Management Plans, inter alia through use of rural development measures (see □A) and the LIFE+ programme¹¹ (see □B);

¹¹ 23 Member States already have more than 60% of their forested areas under such plans (Resolution 2011/2307(INI)).

- maintain optimal levels of deadwood, taking into account regional variations such as fire risk or potential insect outbreaks;
- ecosystem-based measures to increase the resilience of forests against fires as part of forest fire prevention schemes, in line with activities carried out in the European Forest Fire Information System (EFFIS);
- specific measures developed for Natura 2000 forest sites;
- ensuring that afforestation complies with the Pan-European Operational Level Guidelines for sustainable forest management, in particular regarding the diversity of species, and climate change adaptation needs.

Table 5 – Natura 2000 and Biodiversity Strategy objectives typology

	Natura 2000 & Biodiversity Strategy ¹²
Link with the forestry sector	Not exclusive: some habitats and species to be conserved are not included in forest. But many forest ecosystems are directly concerned.
Climate change mitigation objective	No objective (N): both policies only aim at limiting biodiversity decrease.
Impact on energy substitution	0/- Unclear, yet Natura 2000 tends to limit harvest intensity and the Biodiversity Strategy would slightly hamper residue harvesting by promoting “optimal levels of deadwood”.
Impact on forest sequestration	0/+ Natura 2000 indirectly promotes carbon sequestration in forests to the expense of energy and material substitution as protected areas tend to put restrictions on harvest intensity. In addition, the Biodiversity Strategy promotes fire protection.
Impact on HWP effect	0 Unclear

-: slightly detrimental to the mitigation option; 0: no clear influence on the mitigation option; +: slightly favorable to the mitigation option;

Source: CDC Climat Research

III. CLIMATE CHANGE MITIGATION IS ONE AMONG MANY OBJECTIVES OF NON-MANDATORY EUROPEAN FORESTRY AND FOREST-RELATED POLICIES

The Forestry Strategy and the Forest Action Plan (FAP) are non-mandatory policies which exclusively deal with the forestry sector, as the Communication on innovative and sustainable forest-based industries in the EU (CISFBI). They put a roughly equal weight on the three mitigations options of the forestry sector. The sustainable consumption and production and sustainable industrial policy action plan – or SCPSI PAP – has no explicit objective related to climate change. Nevertheless it promotes sustainable patterns of production – sustainable forest management – and consumption.

These policies are not legally binding: they do not impose any additional target or strict objectives to member states. Moreover, climate change mitigation is only one of their objectives, among many others. For these two reasons, and they have a more limited impact on forest-related climate change mitigation.

¹² The Biodiversity strategy has been included in this table with Natura 2000 because their objectives analyses have the same conclusion in terms of impacts on climate change mitigation. Nevertheless, the Biodiversity Strategy is not mandatory, and should be colored in green, as it is represented in Table 2.

A. Forestry Strategy and the Forest Action Plan: fostering exchanges and sharing common orientations

In 1998, the European Commission released a communication on a “European Forestry Strategy”, describing the present state of forestry in the EU together with the measures needed in the sector (COM (1998) 648). This Forestry Strategy was endorsed by the Council in 1999 (Regulation 1999/C 56/01). This strategy stresses the multifunctionality of forests and places emphasis on the contribution of forests to economic and social development in rural areas and industries, as well as to the protection of the environment through biodiversity conservation and through climate change mitigation.

In 2005, the European Commission presented a report on the implementation of this Forestry Strategy (European Commission, 2005), highlighting the importance of improving the cooperation and coordination between producers, processors and users of wood products. It also proposed a Forest Action Plan (FAP) to address the threats identified in the Forestry Strategy such as climate change, pests, fires, air pollution, etc. The report recalls that, in line with the principle of subsidiarity, member states are responsible for planning and implementing National Forest Programs (NFP) or equivalent instruments. Accordingly, the FAP would only offer a common framework for national forestry initiatives, aiming at reinforcing coherence between all National Forest Plans (NFPs).

A five year FAP (COM(2006) 302) was adopted in 2006 for the 2007 – 2011 period. This plan is based on the Forestry Strategy and serves as an instrument of coordination between the activities and policies led at the EU level. The plan lists a series of key actions that can be carried out by member states independently according to their own specificities and priorities or jointly with the Commission through the Standing Forestry Committee (SFC)¹³. The SFC is meant to catalyze the implementation of the Forest Action Plan, facilitating exchanges of experience and strengthening cooperation between member states, and between national governments and stakeholders of the forestry sector. Occasionally, the SFC also issues recommendations on specific topics. Some of the keys actions introduced by the FAP are highly relevant to climate change mitigation (Table 6):

Table 6 – Keys actions of the Forest Action Plan related to climate change mitigation

Keys actions of the Forest Action Plan	
-	Key action 2: encourage research and technological development to enhance the competitiveness of EU forestry
-	Key action 3: exchange and assess experiences on the valuation and marketing of non-wood forest goods and services
-	Key action 4: promote the use of forest biomass for energy generation
-	Key action 5: foster the cooperation between forest owners and enhance education and training in forestry
-	Key action 6: facilitate EU compliance with the obligations on climate change mitigation of the UNFCCC and its Kyoto Protocol and encourage adaptation to the effects of climate change
-	Key action 8: work towards a European Forest Monitoring System
-	Key action 9: enhance the protection of EU forests
-	Key action 16: strengthen the EU profile in international forest-related processes
-	Key action 17: encourage the use of wood and other forest products coming from sustainable forest management

Source: CDC Climat Research from COM(2006) 302

The question of the climate change has become more important in the political debates involving forests since the adoption in 2006 of the FAP and the creation of an Ad Hoc Working Group III on climate change and forestry in 2009¹⁴. It proposes several forestry measures aimed at mitigating or adapting forests to

¹³ The Standing Forestry Committee (SFC) was set up by Decision 89/367 in 1989. It is hosted by the General Direction Agriculture of the Commission. It is composed of government officials from the member states, and by the Advisory Group on forestry and Cork.

¹⁴ In February 2009, the SFC adopted a mandate for an Ad Hoc Working Group on Climate Change and Forestry, aimed at identifying technical forestry measures and making recommendations concerning adaptation and mitigation of climate change.

climate change. Another working group of the SFC worked on the economic and social dimension of forest and forestry in the EU, providing some recommendations aimed at promoting the use of biomass for energy production:

- encourage member states to establish national biomass action plans;
- review the impact of the energy use of wood and wood residues on forest based industries;
- finance a campaign to inform farmers and forest owners about the properties of energy crops and the opportunities they offer;
- consider how best to take forward research into the optimization of agricultural and woody crops for energy purposes and biomass to energy conversion processes;
- explore how to develop a European spot market in pellets and chips;
- encourage and facilitate investments (i.e., equipment, processing, small heating plants) and promote the use of forest residues and biomass, particularly in fire-prone areas.

As there are no similar working groups on the two other mitigation effects, forest carbon sequestration and HWP effect, energy substitution seems to have a small edge within the FAP.

The 2009 mid-term evaluation of the FAP underlines the lack of link between the action plan and NFPs, and that the SFC attitude regarding national policies is more reactive than proactive. The Joint Research Center (JRC), through the European Forest Data Center (EFDAC), and the European Forest Fire Information System (EFFIS) are however highlighted as useful instruments for a future comprehensive monitoring system. The White Paper “Adapting to climate change” (COM(2009) 147) also emphasizes the need for a European monitoring system of forests and recommends that the FAP supports its establishment.

Hence, the EU Forestry Strategy is a reference document for the forestry measures in rural development, identifying challenges for EU forests and elaborating common objectives and principles for the EU and its member states. The Strategy and the related FAP are however lacking muscles: devoid of budget and obligations, they have not achieved their aim of harmonizing the NFPs (European Forest Institute, 2009). Moreover, these instruments are now partly outdated: since the adoption of the Strategy in 1998, EU forests have changed with, among other events, the enlargement of the EU in 2004 which increased on forest area 30% and further added to the diversity of EU forests. Several elements of legislation, tools and initiatives quoted in the Strategy are also outdated. An upcoming new Forest Strategy is currently being developed by the European Commission and the Standing Forestry Committee and should be officially launched by the end of 2013.

Table 7 – Forestry Strategy and Forest Action Plan objectives typology

Forestry Strategy and the Forest Action Plan	
Link the forestry sector	Exclusive: it includes all parts of the sector – forest owners, industries, wood traders etc.
Climate change mitigation objective	Secondary (S): climate change mitigation is only one part of the second main objective
Impact on energy substitution	+ Mainly through key action 4, the FAP promotes energy substitution. A working group is dedicated to this mitigation option.
Impact on forest sequestration	0/+ Mainly through key actions 8 & 9, the FAP promotes forest sequestration.
Impact on HWP effect	0/+ Mainly through key action 17, the FAP promotes HWP effect.

0: no clear influence on the mitigation option; +: slightly favorable to the mitigation option

Source: CDC Climat Research

B. CISFBI: supporting climate change mitigation through forest-based industries initiatives

Launched in 2008, the Communication COM(2008) 113 on innovative and sustainable forest-based industries in the EU (CISFBI) is complementary to the FAP, and aims to improve the long-term competitiveness of forest-based industries (Appendix 1). A working group including government officials, forest-owner organizations, forest-based industries, environmental NGOs, forest trade unions, traders and consumers groups, elaborated the document. In particular, the CISFBI lists the challenges faced by the paper, woodworking and printing sectors and proposes measures to tackle them. Some of these measures have an impact on climate change mitigation (Table 8).

Table 8 – Challenges and measures to improve the competitiveness of forest-based industries with impacts on climate change mitigation in the CISFBI

Challenges	Specific challenges	Proposed measures with impacts on climate change mitigation
Increasing conflict on the raw material	- Increasing demand in raw wood for renewable energy, combined with social pressure to decrease fellings for biodiversity requirements and recreation - Higher costs for the primary material, which represents 30% for the total cost for paper production and 70% for sawmills - Increase in wood imports	- Implement sustainable forest management, improve mobilization, reduce illegal fellings - Promote regeneration - Improve the balance between supply and demand of biomass between different uses
Impacts of climate change policies for forest-based industries	Higher gas and electricity prices (representing between 13 and 18% of total cost) due to greenhouse gas emissions reduction targets and the development of renewable energy sources	Include carbon storage in HWP in the national GHG inventories and thereby promote wood and paper recycling¹⁵
Innovation, Research and Development	Decreasing international competitiveness and lack of adaptation to new challenges	- Use opportunities within the 7th Framework Program (IV.D) for promoting innovative products and methods of production - Use the Cohesion Policy (IV.C) for investments in developing renewable energy technologies or improving innovation capacities

Source: CDC Climat Research from COM(2008) 113

¹⁵ The proposed measure on HWP accounting in national inventories has been taken up in the European Commission proposal on LULUCF accounting rules (see part □A).

Table 9 – CISFBI objective typology

	CISFBI
Objective on the forestry sector	Exclusive: only concerns forest-based industries.
Climate change mitigation objective	Secondary (S): increase the competitiveness of forest-based industries through climate change policies, in particular HWP accounting in GHG inventories.
Impact on energy substitution	+ Promotes sustainable forest management, increased mobilization of wood and reforestation as solutions to the gap between supply and demand for energy wood.
Impact on forest sequestration	+ Member states, industry and forest owners are encouraged to promote reforestation and active sustainable forest management in order to simultaneously contribute to mitigate climate change mitigation and increase wood supply.
Impact on HWP effect	+ Proposes to explore the advantages and challenges of including carbon storage in HWP in international rules on GHG accounting.

+: slightly favorable to the mitigation option; Source: CDC Climat Research

C. SCPSI PAP: slightly promoting climate change mitigation from production to consumption

The Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan or SCPSI PAP (COM/2008/0397) is a communication from the European Commission which aims at promoting sustainable patterns of production and consumption as a way to build an innovative and competitiveness industry through increased resource efficiency. The action plan functions as a dynamic framework of actions for a more virtuous product life cycles, from the energy and environmental performance improvement of products to their improved consumption:

- Creating new EcoDesign standards for a wider range of products, improving energy and environmental labelling, and incentives rewarding eco-friendly products;
- Encouraging eco-innovation for a better EU businesses adaptation;
- Supporting the competitiveness of eco-industries;
- Promoting sustainable industry internationally.

Indirectly, this communication is contributing both to the promotion of legal HWP and to increasing societal demand of less energy-intensive materials and wood consumption for energy.

Table 10 – SCPSI PAP objectives typology

	SCPSI PAP
Objective on the forestry sector	Not exclusive: concerns sustainable consumption of all products, not only HWP.
Climate change mitigation objective	No objective (N): there is no clear reference to climate change mitigation in the objectives provided by the official text.
Impact on energy substitution	0/+ Despite its neutrality concerning climate change mitigation objective, the action plan nevertheless promotes sustainable patterns of production such as sustainable forest management and consumption such as legal HWP use for industries and consumers, and legal wood for energy purpose.
Impact on forest sequestration	
Impact on HWP effect	

0: no clear influence on the mitigation option; +: slightly favorable to the mitigation option

Source: CDC Climat Research

IV. FOREST-RELATED INCENTIVES AND FINANCIAL INSTRUMENTS SUPPORT THE IMBALANCE BETWEEN MITIGATION OPTIONS SET BY THE OTHERS POLICIES

The European Agricultural Fund for Rural Development (EAFRD) obviously constitutes the most important European fund for forestry, and it finances several actions including some that contribute to greenhouse gas mitigation. Forecast expenditures outline that it strongly promotes energy substitution – as does the European Regional Development Fund (ERDF) – and to a lesser extent forest carbon sequestration. The LIFE+ program, with a much smaller budget, finances only innovative and pilot projects, and thus cannot be considered as a major financial instrument for climate change mitigation. With the creation of a specific fund, the Intelligent Energy – Europe (IEE), energetic issues seems to be also strongly promoted on the research and innovation side, despite the lack of information on the share of forestry projects within this fund.

A. The EAFRD: a funding tool with non-compulsory objectives mostly mobilized for energy substitution support

The EAFRD (Regulation 1698/2005/EC) is principally known as the most important instrument of the second pillar of the CAP, namely rural development. The EAFRD provides resources for the implementation of EU priorities set through the EU strategic guidelines for rural development (Council Decision 2006/144/EC). These strategic guidelines set the priorities for rural development in the EU and reflect the multiples roles of forest and agriculture in the rural economy, with social and environmental aspects. The rural development objectives try to establish at the European scale a link between the Goteborg sustainability goals¹⁶ and the renewed Lisbon¹⁷ objectives for growth and jobs.

As such, the EAFRD is also the main instrument at the Community level for the implementation of the EU Forestry Strategy and the FPA previously described. There are over 40 different measures in the EAFRD with 20 addressing forestry, of which 8 have objectives directly related to forests and the remaining twelve indirectly. Those measures are mainly grouped in axes 1 and 2 of the regulation, and partially in axe 3 (Table 11).

The EAFRD measures are integrated into the National Strategic Plans (NSP) of member states and their Rural Development Programs (RDP). RDPs can affect different scale (regional, sub-national and national), and each needs to be approved by the Commission. The NSP lays out, for the period 2007-2013, the priorities for the actions financed and promoted by the EAFRD in a given country. The EAFRD funded 88 RDP for 226 billion euros over the period 2007-2013. For most RDPs, a 50% co-funding at the national level is required to match the funding by EAFRD.

This operating mode follows the subsidiarity principle: member states can choose from the list of measures the those that they wish to address with their RDP. Several measures concern or have consequences on climate change mitigation (Table 11).

¹⁶ The sustainable development goals aim at improving the quality of life conditions in the EU over the long-term.

¹⁷ The Lisbon strategy tries to increase EU competitiveness while preserving and regenerating social cohesion and environmental quality. Innovation and employment are the two main objectives for a better growth.

Table 11 – Forest-related measures of the EAFRD concerning climate change mitigation

Axes	Measures, Article	Title	Actions to be financed	Number of RDPs addressing the measure
1 – Improving the competitiveness of the forestry sector	121, 26	Modernization of agricultural holdings	Establishment of short rotation coppices (SRC) ¹⁸ .	41
	122, 27	Improving the economic value of forests	Investments for harvesting equipment. Regeneration is not included except if the member state considers that it aims at changing forest structure and species composition in order to improve forest resilience and thus its economic viability. Forest certification.	50
	123, 28	Adding value to agricultural and forestry products	Micro-enterprise measures such as bioenergy production (woodchip and pellet production) or other industrial processing (sawmills).	69
	124, 29	Cooperation for development of new products, processes and technologies	Cooperation between forest owners, the processing industry and/or third parties to develop new woody products (design, product, process or technology development and tests).	41
Axes	Measures, Article	Title	Actions to be financed	Number of RDPs addressing the measure
2 – Improving the environment and the rural areas	221, 43	First afforestation of agricultural land	Afforestation on agricultural land with clear environmental objectives, including climate change mitigation.	66
	222, 44	First establishment of agro-forestry systems on agricultural land	Agro-forestry systems (establishment costs).	17
	223, 45	First afforestation of non-agricultural land	Afforestation of land not eligible under the measure 221.	41
	225, 47	Forest-environment payments	Compensation for ecosystem services provided beyond regional or national mandatory requirements.	28
	226, 48	Restoring forestry and introducing prevention actions	Preventive actions against natural disasters (does not include insect and pests diseases, except if they are linked to another natural disaster such as fire, windfall, drought or flood), and restoration of forestry potential.	60
3- Quality of life in rural areas and diversification of the rural economy	311, 53	Diversification to non-agricultural activities	Bio-energy production from woody biomass, or the development of a forest nursery.	35
	312, 54	Support for micro-enterprises	Bio-energy production from woody biomass and local wood processing and marketing. The support under this measure only applies to micro-enterprises	23
	321, 56	Basic services for the economy and rural population	Investments in small-scale infrastructure (including renewable energy and energy supply, energy networks, sewage systems).	21

Source: CDC Climat Research from Regulation 1698/2005/EC

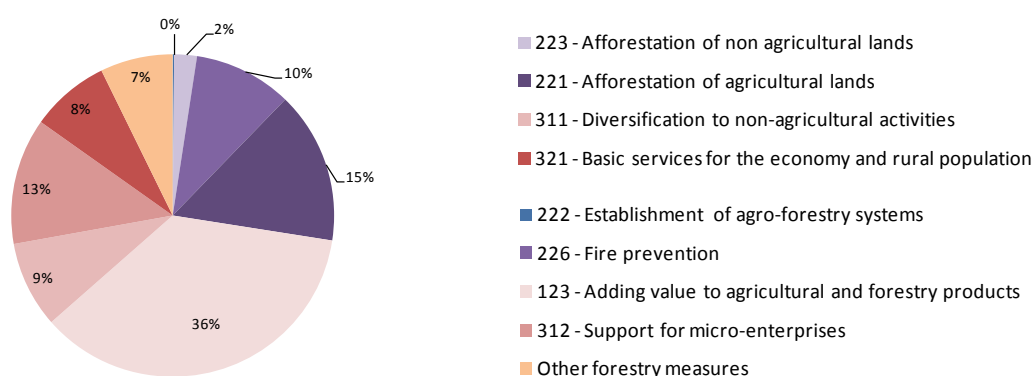
The EU rural development regulation aims at keeping balance between the three axes: at least 10% of the total EAFRD contribution to RDPs shall be devoted to axes 1 and 3, and at least 25% to axis 2. But because these measures are based on co-financing and member states do not give priority to forestry measures within the three axes, due to the competition with the agricultural sector.

¹⁸ Densely planted fast growing species harvested on a 3-5 years cycle. This is not included in measure 221 because SRC do not qualify as forests in most EU countries. Measure n°121 is not considered as a forestry measure but as an agricultural measure. In this report, it is considered as a measure with indirect impact on the forestry sector in terms of mitigation: this wood energy source from agriculture may reduce demand for "forest wood" and foster either carbon sequestration in forests or the HWP effect.

Concerning forestry measures, the EAFRD gives a clear precedence to energy substitution over the two other forest-related mitigation options (Figure 6): most of its forest-related measures are related to biomass and bioenergy production. More importantly, member states have truly seized these opportunities: 67% of EAFRD forecast expenditure – 11.6 billion euros – on forest-related measures for the 2007-2013 period is dedicated to four measures promoting energy wood (measures 123, 311, 312 and 321).

Figure 6 – EAFRD forecast spending on forest-related measures

(% of the expected total contribution for forestry measures: 16 billion euros for the 2007-2013 period)



Source: CDC Climat Research from European Commission, 2009a

The rural development policy also supports reforestation and the reduction of the impact of natural disasters on forest stocks, but to a much lower extent. Over the 2007-2013 period, the second pillar is forecast to allocate 2.9 billion euros for reforestation, corresponding to 240 000 hectares and 17% of the forecast expenditure on forest-related measures.

While current EU policies do not put requirements on the management of forest fires and natural disasters, the rural development policy provides funding opportunities for these activities in the EAFRD. In order to mobilize these funding sources, member states are required to establish national programs on prevention and restoration measures related to natural disasters. Protection and preservation of forest from natural disasters, such as fires, droughts or windfall, are carried out under measure 226 of the EAFRD. This measure represents 1.5% of the total EAFRD forecast expenditure on forest-related measures for the 2007-2013 period and is mainly used by Mediterranean member states in their national rural development program.

Table 12 - Strategic Guidelines for Rural Development & EAFRD Objectives Typology

	EU Strategic Guidelines for Rural Development & EAFRD
Link with the forestry sector	Not exclusive: some measures concern the forestry sector (afforestation, reforestation, restoration of forest, improvement of the economic value of forest etc.), but many others are related to agriculture.
Climate change mitigation objective	Secondary (S): climate change mitigation through forestry is one of the challenges of the EAFRD.
Impact on energy substitution	++ 1.7 billion euros per year to support small-scale infrastructure for energy production from biomass, and to a lesser extent directly the production of woody biomass.
Impact on forest sequestration	+ / ++ 415 million euros per year to support afforestation, reforestation and reduction of impact of natural disasters.
Impact on HWP effect	+ Promotes the development of new HWP (development, designing, process, and test).

+: slightly favorable to the mitigation option; ++: strongly favorable to the mitigation option.

Source: CDC Climat Research.

B. LIFE+: a small funding for R&D on all environmental issues

Created in 1992 with the objective of financing environmental protection in the EU, the LIFE program (Regulation 614/2007/EC) has financed 3 506 projects since 1992 corresponding to 2.5 billion euros. This program is the main funding instrument for the development and implementation of EU general environmental objectives, and in particular of the 6th Environmental Action Program for the period 2002-2012.

LIFE+ is operating over the period 2007-2013 with total budget of 2 billion euros to cover both the co-financing of projects (78% of the budget) and the operational expenditure of DG Environment (22% of the budget). It prolongs LIFE, LIFE II and LIFE III which operated between 1992 and 2006, but also replaces the Forest Focus Regulation (European Council et European Parliament, 2003) that established a Community scheme on monitoring of forests and environmental interactions to protect the Community's forests, and expired in 2006.

Each year, the European Commission launches a call for LIFE+ projects proposals. Each proposal should contribute to one of the three main themes of the program: nature and biodiversity, environmental policy and governance, information and communication. LIFE+ shall not finance measures that could be eligible in the scope of other Community financial instruments (article 9 of the regulation), including the EAFRD, funds from the Cohesion Policy (see below) and the 7th framework program for research (see below).

As the successor of the Forest Focus program, the main objective of LIFE+ concerning forestry is to provide information on climate change impacts for forest ecosystems. Mitigation and adaptation constitute the main themes tackled by the program, in part through forest fires monitoring and prevention. Thus the LIFE+ regulation describes five priority areas:

- collection of information on forests;
- harmonization of forest monitoring activities and data collection systems and enhancing their effectiveness;
- stimulation of synergies between forest-related issues and environmental initiatives and legislation (e.g. EU soil strategy (COM/2012/046), Natura 2000, Water Framework Directive (Directive 2000/60/EC), etc.);
- contribution to sustainable forest management, in particular by collecting data related to the improved Pan-European Indicators for sustainable forest management as adopted by the MCPFE Expert, Level Meeting 7-8 October 2002, Vienna, Austria (MCPEF, 2002));

- capacity-building at national and community level on coordination and guidance on forest monitoring.

In particular, the contribution of LIFE+ regarding forest monitoring prolongs Forest Focus through the development of the European forest common database for fire risk evaluation and monitoring: information is stored and managed within EFFIS, but provided by member states on a non-mandatory basis. Although the overall level of funding has been maintained between LIFE+ and its predecessors, Forest Focus funds are shared between member states on a non-competitive basis whereas LIFE+ selects projects on a competitive basis. With regards to pan-European forest monitoring, this mode of operation has been identified as a weakness in the mid-term evaluation of LIFE+ (European Commission, COM (2010) 516).

Table 13 – LIFE+ objectives typology

	LIFE+
Link with the forestry sector	Not exclusive: LIFE+ funds all types of environmental research and development projects, including some forest-related projects such as forest fire prevention.
Climate change mitigation objective	Secondary (S): all environmental issues, not only climate change mitigation.
Impact on energy substitution	0/+ Can co-finance innovative or pilot projects that contribute to the promotion of energy substitution, as long as they have positive impacts on other environmental components and cannot be financed by others fund (especially the Intelligent Energy Europe program).
Impact on forest sequestration	+ Most forest-related projects foster forest carbon sequestration, especially through forest fire protection and the financing of Natura 2000 areas, for a total expenditure of 5 million euros per year.
Impact on HWP effect	0/+ Can co-finance innovative or pilot projects that contribute to the promotion of the HWP effect, as long as they have positive impacts on other environmental components.

0: no clear influence on the mitigation option; +: slightly favorable to the mitigation option

Source: CDC Climat Research.

C. Cohesion Policy reinforces the EAFRD in eligible member states

As part of the Cohesion Policy of the EU, structural funds and the cohesion fund aim at increasing exchange, improving solidarity and equality between member states (in economic, social and environmental terms), and at the same time maintaining EU competitiveness in the world economy:

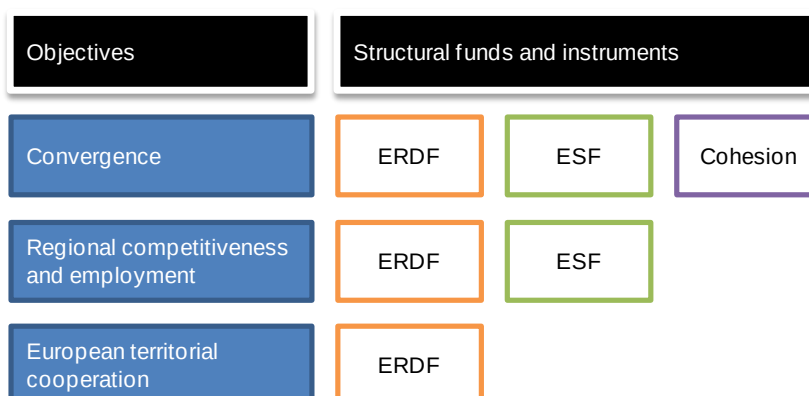
- The structural European Regional Development Fund (ERDF) (Regulation 1083/2006/EC) promotes economic and social cohesion between European regions by correcting inequalities and imbalances in regional development;
- The Cohesion Funds (Regulation 1083/2006/EC) are dedicated to the member states whose Gross National Income per capita are lower than 90 % of the community average. For the 2007-2013 period, this concerns Bulgaria, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia, Slovenia and Spain. It aims at reducing inequalities between countries by financing of transport and environmental projects. All sorts of projects related to energy efficiency, renewable energy use, and reforestation are counted as environmental projects.

Structural funds include the ERDF and the European Social Fund (ESF), which is not studied here as it does not concern forestry.

The Council Regulation (EC) N° 1083/2006 lays down general provisions for structural funds, defining the context, the objectives, rules and common criteria of eligibility for member states. These funds focus their

assistance on three thematic priority objectives: convergence, regional competitiveness and employment, and European territorial cooperation (Figure 7).

Figure 7 – Regional policy objectives, funds and instruments



Source: http://ec.europa.eu/regional_policy/how/index_en.cfm

Each of them has different fields of actions, and the precise mix of the actions chosen by each member state depends on regional priorities, following the subsidiarity principle. Sustainable development is a transversal objective of the regulation, and climate mitigation appears through several activities proposed (Table 14).

Table 14 – Cohesion Policy and climate change mitigation: indirect effect on forestry

Objective	Funds	Theme	Actions
Convergence and regional competitiveness	ERDF	Energy	Energy investments, including improvement of energy efficiency (measure 43) and the development of renewable energies (measure 41)
		Environmental protection and risk prevention	- Rehabilitation of the physical environment (reforestation) - Prevention of risks, including development and implementation of plans to prevent and cope with natural and technological risks (like forest fire)
Convergence	Cohesion fund	Energy	Intervention in areas related to energy efficiency and renewable energy (measures 41 and 43)

Source: CDC Climat Research from Regulation 1083/2006/EC

The Cohesion Policy allocates a total of 347 billion euros between for the current 2007-2013 period, with 250 billion euros (82%) and 50 billion euros (16%) for the convergence objective and the regional competitiveness and employment objective respectively. The importance of environmental measures is reflected by their financial allocation. During the previous 2000-2006 period, the ERDF spent 21% of its total allocation – corresponding to 25 billion euros – on environment-related interventions. The Cohesion fund also spent 16 billion euros on environment-related interventions.

Structural funds support renewable energy, and mainly biomass

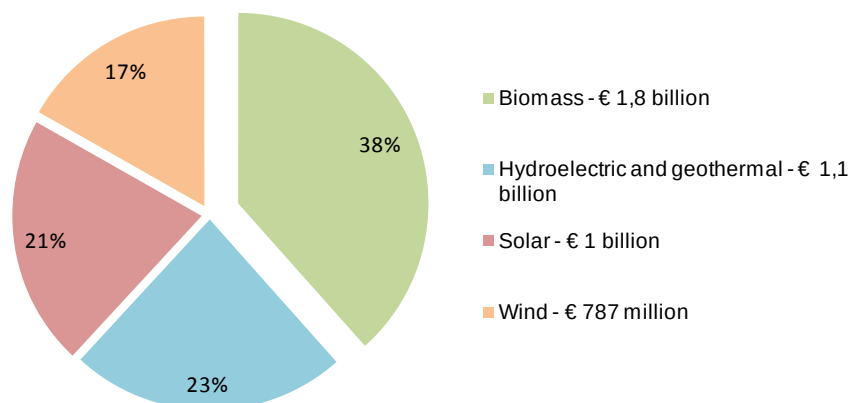
Under the convergence objective, the Cohesion Policy supports energy investments, including the development of renewable energy production from woody biomass (article 4.4 and 4.9). Environmental measures and activities are also listed under the regional competitiveness and employment objective (article 5.2.c), but the level of funding is lower. Each member state decides how to implement these objectives and strategic orientations at the national, regional or multi-regional scales through specific measures and programs identified within implementation documents.

Even if forestry and energy wood are not explicitly mentioned in the regulations of the structural funds, they can be relevant for some countries and regions according to their natural resources. Between 2000

and 2006, 1.1% of ERDF was allocated to forestry mainly through reforestation and prevention against forest fires programs, and 0.9% to renewable energy infrastructures (Ward, 2010).

For the current 2007-2013 period, 9 billion euros of forecast expenditure go towards actions and projects related to renewable energy or energy efficiency within the Cohesion Policy (Figure 8). Biomass is the most funded type of project among renewable energy projects.

Figure 8 – Allocation of funding for renewable energy in the Cohesion Policy for the period 2007-2013 (forecast)



Source: Skäringer (2011)

The use of HWP as a building material is included in energy efficiency measures for housing. A 2009 amendment of the ERDF regulation sets to 4% the part of national ERDF funding which can go to energy efficiency and renewable energy in the housing sector, including woody biomass use as energy source and raw material for insulation.

Table 15 – Cohesion Policy objectives typology

	Cohesion Policy
Link with the forestry sector	Not exclusive: there is no clear mention of the forestry sector within this policy, nevertheless it promotes the use of wood as a renewable energy source.
Climate change mitigation objective	Secondary (S): promotion of renewable energy use, energy efficiency and environmental risk prevention linked with climate change as parts of regional development and competitiveness increase priority objectives.
Impact on energy substitution	+ / ++ 100 million euros ¹⁹ per year from the cohesion funds and 156 million euros ²⁰ per year from the ERDF to promote energy investments (security of supply with the integration of environmental considerations), improves and stimulates energy efficiency and the development of renewable energies.
Impact on forest sequestration	+ / ++ 150 million euros ²¹ per year from the ERDF to support the elaboration of plans and prevention measures against forest fire. Also supports afforestation in some cases, but this action is negligible.
Impact on HWP effect	0 / + Unclear, but up to 4% of the national ERDF allocation can go to energy efficiency in the housing sector, including the use of wood as a construction material.

0: no clear influence on the mitigation option; +: slightly favorable to the mitigation option; ++: strongly favorable to the mitigation option.

¹⁹ Detailed information on the expenditure of the ERDF and cohesion funds is not available. This figure is therefore an approximation based on (Skäringer, 2011; Ward, 2010).

²⁰ Ibid.

²¹ Ibid.

D. Research programs: 7th framework program for research and IEE

Covering the period 2007 to 2013, the 7th Framework Program (FP7) (European Council et European Parliament, 2006) supports research as a way to boost growth, employment, and innovation in different sectors including forestry. Forestry support is mainly based on the stimulation of cooperation within a transnational framework through four priorities themes: i) food, agriculture and fisheries, and biotechnology; ii) nanosciences, nanotechnologies, materials & new production technologies; iii) energy including woody biomass use; iv) environment including climate change.

The Intelligent Energy – Europe (IEE) program was created in 2003 and now is running for its second period (2007-2013). It has been specially designed to support and finance research in energy efficiency, the rational use of energy and renewable resources including biomass.

Table 16 – FP7 objectives typology

	FP7	IEE
Link with the forestry sector	Not exclusive: all types of research projects.	Not exclusive: all types of projects related to energy efficiency or renewable energy.
Climate change mitigation objective	Secondary (S): aimed at supporting research on different themes, including energy efficiency and the environment.	
Impact on energy substitution	0/+ There's no clear advantage given to one mitigation options.	+
Impact on forest sequestration		0
Impact on HWP effect		0

Source: CDC Climat Research

V. FOREST-RELATED POLICIES WITH AN IMPACT ON CLIMATE MITIGATION HAVE COHERENT OBJECTIVES AND ARE FOCUSED ON ENERGY SUBSTITUTION

This section first analyses the coherence of the specific objectives and actions of each policy and instruments along each of the three mitigation options: carbon sequestration in forests, energy substitution and HWP effect. Within each mitigation option, forest-related policies tend to move in the same direction: mobilization of wood for use in energy substitution, and afforestation and fire protection for forest carbon sequestration. The interaction of these mitigation effects also reveals an overall coherence: while energy substitution and forest carbon sequestration could in principle be antagonistic, the policies mostly promote forest carbon sequestration actions that do not hamper, or even a synergetic with, energy wood use such as afforestation or fire prevention.

A. Forest-related policies consistently promote energy substitution

As demonstrated in the previous sections and summarized in Table 17, the Climate and Energy package and the EAFRD strongly support energy wood. The ERDF and the cohesion funds are also mobilized by member states to reach their emissions reduction and renewable energy targets using biomass as a

renewable energy source, although their impact is smaller than the first two policies²². Other policies also influence wood use for energy like CISFBI, although to a much lesser extent. Only two policies may be inconsistent with the promotion of energy wood, namely Natura 2000 and the Biodiversity Strategy, but they have either an unclear or a negligibly negative impact on energy wood. Accordingly, the mandatory objectives set by the directives, the policy statements of non-mandatory policies, and the tools and financing instruments set by EU display a strong coherence in promoting the energy substitution mitigation option.

Table 17 – European forest-related policies and energy substitution

Policy, regulation, communication	Climate change mitigation through forestry and substitution of non-renewable energy with wood biomass		Associated tools
	Influence on wood energy	Comment	
Climate and energy package	++	The EU-ETS, the ESD and the RES Directive set mandatory targets and incite wood energy use for heating and electricity production.	-
LULUCF accounting rules	0	May incite forest protection but also forest recovery and hence increase wood supply over the long term.	-
Proposal of the 17th October 2012 on advanced biofuels	+	This proposal gives an advantage to forest biomass over agriculture biomass, without reducing the European targets related to biofuel use.	-
Timber Regulation and FLEGT Regulation	0	Unclear effect.	-
Natura 2000 & Biodiversity Strategy	0/-	Unclear, yet Natura 2000 tends to limit harvest intensity and the Biodiversity Strategy would slightly hamper residue harvesting by promoting "optimal levels of deadwood".	LIFE+ EAFRD
Forestry Strategy and Forest Action Plan	+	Mainly through key action 4, the FAP promotes energy substitution. A working group is dedicated to this mitigation option.	FP7 IEE- EPIC Structural funds
CISFBI	+	Promotes sustainable forest management, increased mobilization of wood and afforestation as solutions to the gap between supply and demand for wood energy.	FP7 Structural funds
SCPSIPAP	0/+	Despite neutrality concerning the climate change mitigation objective, the action plan nevertheless promotes HWP use for energy, industries and consumers.	-
Community strategic guidelines for Rural Development	++	1.7 billion euros per year to support small-scale infrastructure for energy production from biomass, and to a lesser extent directly the production of woody biomass.	EAFRD
LIFE+	0/+	Can co-finance innovative or pilot projects that contribute to the promotion of energy substitution, as long as they have positive impacts on other environmental components and cannot be financed by other fund (especially the Intelligent Energy Europe program).	-

²² We do recognize that a sound assessment about the impact/effect of these different financial instruments is necessary. Listing the budgets earmarked is not enough to assess the weight of measures that promotes climate change mitigation at EU level. It however helps to understand the decisions taken at the national level and thus gives one approach and a proof of the type of incentive given by the European political system.

Policy, regulation, communication	Climate change mitigation through forestry and substitution of non-renewable energy with wood biomass		Associated tools
	Influence on wood energy	Comment	
Cohesion Policy	+ / ++	100 million euros ²³ per year from the cohesion funds and 156 million euros ²⁴ per year from the ERDF to promote energy investments (security of supply with the integration of environmental considerations), improves and stimulates energy efficiency and the development of renewable energies.	ERFD Cohesion fund
FP7 / IEE	+	IEE is specially designed to support and finance research on energy efficiency, the rational use of energy and renewable resources including biomass.	-

-: slightly detrimental to carbon sequestration in forests; 0: no clear influence on wood energy; +: slightly favorable to wood energy; ++: strongly favorable to wood energy.

Source: CDC Climat Research

B. Carbon sequestration in forests: harvest intensification, afforestation and fire protection

On the one hand, several policies mentioned previously include measures related to carbon sequestration in forests: the EAFRD promotes afforestation and the restoration of degraded forests, LIFE+ promotes the prevention of forest fires, CISFBI and the FAP promote sustainable forest management. Interestingly however, these measures are not systematically presented as fulfilling a climate mitigation objective.

On the other hand, the policies with an explicit climate mitigation objective such as the Climate & Energy Package incite wood harvest and hence probably a decrease in forest carbon stocks in the quasi absence of counterbalancing incentives on wood resource management such as improved regeneration or improved forest management. Only Natura 2000 and the new LULUCF accounting rules could provide some counterweight. Yet, the impact of the first is unclear and the impact of the second is yet to be assessed as the rules and related action plans are still under consideration by the European Council.

As a result, although the framework for forest-related policies has an unclear or negative impact on carbon sequestration in forests overall (Table 18), it is *coherent*: indeed the policies promoting forest carbon sequestration do not constitute an obstacle to wood harvest, and hence the wood supply for energy or material substitution. This is probably due to the fact that these measures are often not exclusively or even not explicitly targeted to mitigate climate change. To the contrary, these policies promote afforestation and fire prevention, which can constitute an increase in wood supply.

Table 18 – European forestry policies and forest sequestration

Policy, regulation, communication	Climate change mitigation through forestry and sequestration in forests		Associated tools
	Influence on sequestration in forests	Comment	
Climate and Energy Package	-	It implicitly promotes wood harvest to meet demand for wood energy and wood material. The small incentive of forestry credit in the ESD is unlikely to balance the effect of increased wood demand.	
LULUCF accounting rules	+	Forest management accounting becomes mandatory and the simplified rules will make the design of incentive mechanisms easier, although concrete mechanisms are still largely lacking.	-
Proposal of the 17 th October 2012 on	0	Unclear effect	-

²³ Detailed information on the expenditure of the ERDF and cohesion funds. This figure is therefore an approximation based on (Skäringer, 2011; Ward, 2010)

²⁴ Ibid.

Policy, regulation, communication	Climate change mitigation through forestry and sequestration in forests		Associated tools
	Influence on sequestration in forests	Comment	
advanced biofuels			
Timber Regulation FLEGT Regulation	0/+	Sustainable forest management tends to foster forest carbon sequestration.	- -
Natura 2000 Biodiversity Strategy	0/+	Natura 2000 indirectly promotes carbon sequestration in forests to the expense of energy and material substitution as protected areas tend to put restrictions on harvest intensity. In addition, the Biodiversity Strategy promotes fire protection.	LIFE+ EAFRD
Forestry Strategy and Forest Action Plan	0/+	Mainly through key actions 8 & 9, the FAP promotes forest sequestration.	EAFRD LIFE+ Structural funds
CISFBI	+	Member states, industry and forest owners are encouraged, to facilitate and promote afforestation and active sustainable forest management in order to contribute to mitigate climate change and restore biodiversity while increasing wood supply.	EAFRD Structural funds
SCPSIPAP	0/+	Despite neutrality concerning climate change mitigation objectives, the action plan nevertheless promotes sustainable patterns of production such as sustainable forest management.	-
Community strategic guidelines for Rural Development	+ / ++	415 million euros per year to support afforestation, reforestation and reduction of impact of natural disasters.	EAFRD
LIFE+	+	Most forest-related projects foster forest carbon sequestration, especially through forest fire protection and the financing of Natura 2000 areas, for a total expenditure of 5 million euros per year.	-
Cohesion Policy	+ / ++	150 million euros ²⁵ per year from the ERDF to support the elaboration of plans and prevention measures against forest fire. Also supports afforestation in some cases, but this action is negligible.	ERFD Cohesion fund
FP7 / IEE	0/+	There's no clear advantage given to one mitigation options.	-

*-: slightly detrimental to carbon sequestration in forests; 0: no clear influence on carbon sequestration in forests; +: slightly favorable to carbon sequestration in forests; ++: strongly favorable to carbon sequestration in forests.
The color code refers to the Figure 2. The light red color means that both policies drafts are not yet adopted by the EC, but that they aims to be legally binding.*

Source: CDC Climat Research.

C. Sequestration in HWP and material substitution: the neglected mitigation effect

Until recently, HWP were not acknowledged in international carbon accounting and instantaneous oxidation was the baseline to measure forest emissions. Thus the carbon sequestration effect of HWP was not accounted for over the first commitment period of the Kyoto Protocol. This could partially explain why no policy instrument strongly incites this carbon mitigation option (Table 19). In particular, the absence of clear and specific provisions on HWP in the Forestry Strategy and in the FAP under a climate change mitigation objective explains the absence of direct measures on this topic in the EAFRD, even if it can contribute to HWP development under the competitiveness objective. However the upcoming new accounting rules for the LULUCF sector and the CISFBI suggest the beginning of higher commitment to and considerations for the HWP effect.

²⁵ Ibid.

Table 19 – European forestry policies and HWP effect

Policy, regulation, communication	Climate change mitigation through forestry and HWP effect		Associated tools
	Influence on mitigation through HWP	Comment	
Climate and Energy Package	+	In theory, the EU ETS gives a comparative advantage to HWP compared to others more energy-intensive materials. Rent distribution may be hampering this theoretical effect in practice.	-
LULUCF accounting rules	+	The new rules provide a small incentive to governments to increase the use of HWP by including this pool in the national greenhouse gas inventories.	-
Proposal of the 17 th October 2012 on advanced biofuels	0	Unclear effect	-
Timber Regulation and FLEGT Regulation	0	Unclear effect.	-
Natura 2000 and Biodiversity Strategy	0	Unclear effect.	LIFE+ EAFRD
Forestry Strategy and Forest Action Plan	0/+	Mainly through key action 17, the FAP promotes HWP effect.	FP7 IEE- EPIC
CISFBI	+	Proposes to explore the advantages and challenges of including carbon storage in HWP in international rules on GHG accounting.	FP7 Structural funds
SCPSIPAP	0/+	Despite neutrality concerning climate change mitigation objectives, the action plan nevertheless promotes sustainable patterns of production such as sustainable forest management.	-
Community strategic guidelines for Rural Development	+	Promotes the development of new HWP (development, designing, process, and test).	EAFRD
LIFE+	0/+	Can co-finance innovative or pilot projects that contribute to the promotion of the HWP effect, as long as they have positive impacts on other environmental components.	-
Cohesion Policy	0 / +	Unclear, but up to 4% of the national ERDF allocation can go to energy efficiency in the housing sector, including the use of wood as a construction material.	ERFD Cohesion fund
FP7 / IEE	0/+	There's no clear advantage given to one mitigation options.	-

-: slightly detrimental to the HWP effect; 0: no clear influence on the HWP effect; +: slightly favorable to the HWP effect; ++: strongly favorable to the HWP effect.

The color code refers to the Figure 2. The light red color means that both policies drafts are not yet adopted by the EC, but that they aim to be legally binding.

Source: CDC Climat Research

D. The complex framework of EU forest-related policies is coherent in terms of objectives and focused on wood energy

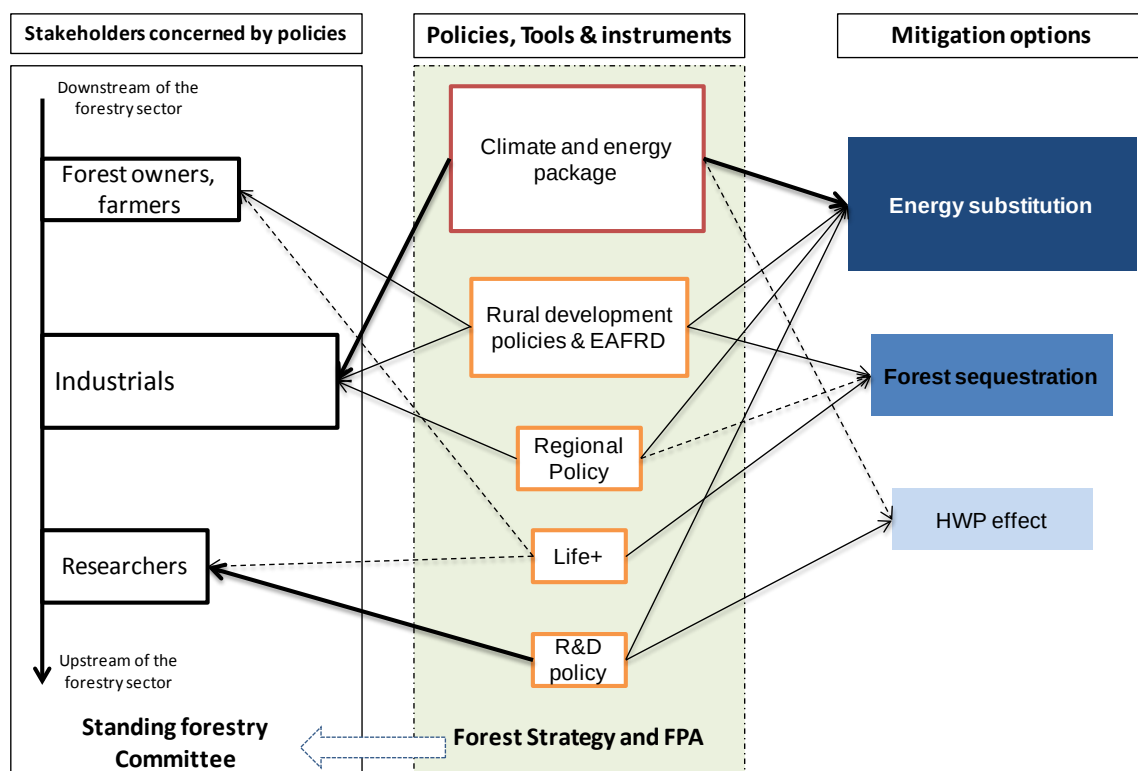
The previous analysis of the different forest-related policies and their impact on the three forestry mitigation options can be narrowed down to three key results:

- the policies which exclusively concern the forestry sector – the Forestry Strategy, the Forest Action Plan and the CISFBI – have many objectives other than climate change mitigation, affect many stakeholders both upstream and downstream of the wood value chain, and not mandatory;
- the mandatory Climate and Energy Package, strictly confined to climatic and energy considerations, but not exclusively through the forestry sector, provides strong incentives for wood energy use. Its mandatory targets supported by large financing tools such as the EAFRD and the ERDF;
- other policies, more or less connected to the forestry sector and climate change mitigation, do not stand out as major tools regarding climate change mitigation in the forestry sector.

As a result, there is a clear imbalance towards energy substitution, mainly as a consequence of the policies status (mandatory or not). The subsidiarity principle which occupies so much room in EU policies exclusively dedicated to forestry thus appears to be only partially achieved: cross-sectoral policies and financing tools such as the Climate and Energy Package and the EAFRD are indeed the main drivers, although principally indirectly, of the contribution of the forestry sector to climate change mitigation.

Interestingly, this imbalance towards wood energy arises from the real coordination and coherence of the objectives assigned by the various policies: policies impacting the two other mitigation effects are designed to complement rather than moderate the mobilization of wood for energy production. Policies promoting forest carbon sequestration are focused on afforestation and fire prevention rather than on conservation areas, while those promoting HWP, potentially competing with wood energy, are almost neglected in EU forest-related policies. This imbalance between the policies also translates into an imbalance in terms of stakeholder involvement: industries are much more affected by these forest-related policies than forest owners, farmers or researchers although co-financed projects, plans or programmes by the EAFRD or the Cohesion fund require an environmental assessment and a stakeholder consultation in the decision-making process (Appendix 2).

Figure 9 – Relative importance of stakeholders, mitigation options and policies in the EU



Box size marks the relative importance within each column, simple lines indicate impacts of policies objectives, dotted lines indicate lower impacts, and large lines indicate strong impacts.

Source: CDC Climat Research.

E. Coherence of policies objectives does not necessarily imply optimization of impacts

The policy framework is coherent and geared towards energy substitution. Indeed policy objectives are often complementary, and at least coordinated and homogenous. This does not mean that this global strategy identified for the contribution of the forestry sector to climate change mitigation is optimal. A more balanced framework, or a framework focused on other mitigation effects such as HWP or forest carbon sequestration may be more efficient in attenuating climate change and respecting at the same time the others functions assigned to forests. Optimizing the climate mitigation contribution of the sector is however another research question to which there is no easy answer.

A few elements nevertheless appear to be neglected in the EU forest-related policy framework.

- While there is a binding harmonized approach on sustainability criteria for liquid biofuels, only recommendations exist for solid biomass. Thus, no sustainability criteria guarantee that the mitigation effect obtained through energy or material substitution does not come at the expense of forest carbon stocks (Dossche, 2010a). European forests are already subject to sustainable management based upon criteria and indicators from MCPFE process organized by the Forest Europe organization, but only on a non-legally binding basis until now²⁶. Domestic supply is in principle guaranteed as sustainable through the certification of most EU forests. A PEFC certificate indeed guarantees the replenishment of forests after harvest. Yet, it does not prevent all management changes detrimental to forest carbon stocks, such as shorter rotations. Regarding wood imports, FLEGT and the Timber regulation are focused on legality, not on sustainability. Although sustainability and legality tend to converge, this is not always the case, and the import of unsustainable legal wood would result in carbon leakage: the mitigation effect of wood use for energy in the EU may be obtained at the expense of the mitigation effect of carbon storage in foreign forests.
- The EU policy framework does not include any instrument or tool for the coordination and monitoring of national fire prevention budgets, knowledge and responsibilities. As a result, total costs of prevention policies are unknown at EU level due to fragmentation of measures and budgets. Moreover, as natural disasters easily cross borders, the lack of coordination in prevention activities and monitoring may also lead to inefficiencies.
- Despite the objective of protecting forest from all kinds of natural disasters in the FAP, most EU policies focus on forest fires and little attention is paid to damages from insects, diseases and windfall.
- There is no policy for recovering from crisis. The Solidarity fund, which finances post-disaster recovery, does not have a forestry component. While the EAFRD can support forest regrowth? under precise conditions, its resources are pre-defined and therefore not suited to “crisis response” after important forest fires and other damages. Structural funds and LIFE+, in the same way, are not suited to accidental expenditure.
- The funding of afforestation programs is not subject to sustainability criteria. (Dossche, 2010b) indicates that in some member states a large proportion of funding allocated to afforestation went to plantations without any constraints in terms of species and management regimes. This lack of criteria is incoherent with policies on natural risk mitigation and can also increase the emissions from carbon sequestered in the soil.

²⁶ Forest Europe is already working upon a pan-european legally binding agreement on sustainable management criteria, which may be launched by the end of 2013.

VI. CONCLUSION

In the Lisbon Treaty signed in 2007, forestry remains a member state competence, contrary to agriculture or fisheries. An unintended consequence of the absence of a common forest policy, together with the multifunctionality of forest, is that the contribution of the forestry sector to climate change mitigation is driven by multi-sectoral policies such as the Rural Development Policy, the Regional Policy, and the Climate and Energy Package. Adding forest-related policies with a smaller yet real impact on climate change mitigation such as FLEGT, the Timber regulation, Natura 2000, the Biodiversity strategy, the CISFBI, LIFE+ and 7FP results in a complex framework of policies, with different objectives, tools and instruments.

This framework of forest-related EU policies is found to be globally coherent in terms of objectives, defining a EU mitigation strategy focused on energy substitution. Interestingly, this imbalance towards wood energy arises from a real coordination of the objectives assigned by the various frameworks: policies impacting the two other mitigation pathways, forest carbon sequestration and the HWP effect, are designed to complement rather than moderate the mobilization of wood for energy production. Policies promoting forest carbon sequestration are focused on afforestation and fire prevention rather than on conservation areas. Moreover, the potential for HWP to compete with wood energy is virtually unaddressed in EU forest-related policies.

Nevertheless, the identified coherence does not indicate that the strategy identified for the contribution of the forestry sector to climate change mitigation is optimal. A more balanced framework, or a framework furthering the role of other mitigation effects such as HWP or forest carbon sequestration could improve the efficiency of climate change mitigation efforts as a whole. However, as seen above, optimizing the climate mitigation contribution of the sector is, however, another research question to which there is no easy answer given the complex framework of cross-sectoral policies influence forestry in the European Union. This study, without being a real evaluation of all the forest-related policies, however offers a wide analysis of the incentives stemming from the different objectives that concern climate change mitigation. It does not pretend to be an in-depth analysis of the impacts and practical effects of these policies on the forestry sector.

APPENDICES

A.Appendix 1 – The competitiveness of forest-based industries and their role in climate change mitigation

Forest-based industries annually process products worth € 365 billion euro with an added value of € 120 billion, representing a major contribution to the EU's GDP. They provide more than 3 million jobs in 344 000 enterprises (European Commission, COM(2008) 113), and play a key role in maintaining sustainable employment in rural areas. This can be compared for example to the automotive sector that has an annual turnover of € 780 billion and a value added of over € 140 billion, employing over 2 million people (European Commission, COM(2008) 113). Forest-based industries have an obvious impact on climate change mitigation: this impact is clearly positive in terms of the stock of carbon sequestered in HWP and on the substitution of other materials or fuels. It may be less clear on the stock of carbon in forests: an increase in demand for wood can at the same time increase the felling rate – and thus decrease the stock of carbon in forests – and stimulate afforestation or active regeneration – which may mitigate the aforementioned decrease.

Incentives to use HWP are implicitly provided in the EU-ETS through of two substitution effects (energy and material). However, the sequestration of carbon in HWP is not accounted for, nor directly incentivized. Several options exist nevertheless to increase carbon stocks in wood products:

- Wood and paper products can be recycled into the same or new products (in Europe, recovered paper amounts more than 70% of annual paper production and this recycling rate has the increase);
- Extend the lifespan of wood products and thus their use and the carbon storage, with less energy consumption for replacement through new materials;
- Promote the use of wood in buildings and construction following national regulations;
- Invest in research for developing new wood products and applications, improving their process efficiency, extending product life spans.

B.Appendix 2 – Environmental assessment of projects, plans and programmes

Environmental assessment is a procedure that ensures that the environmental implications of decisions are taken into account before the decisions are made. Environmental assessment can be undertaken for individual projects, such as a dam, motorway, airport or factory, on the basis of Directive 2011/92/EU (known as 'Environmental Impact Assessment' – EIA Directive) or for public plans or programmes on the basis of Directive 2001/42/EC (known as 'Strategic Environmental Assessment' – SEA Directive). The common principle of both directives is to ensure that plans, programmes and projects likely to have significant effects on the environment are subject to an environmental assessment, prior to their approval or authorization. Consultation with the public is a key feature of environmental assessment procedures.

The directives on Environmental Assessment aim to provide a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation of projects, plans and programmes with a view to reduce their environmental impact. They ensure public participation in decision-making and thereby strengthen the quality of decisions. The projects and programmes co-financed by the EU (included the EAFRD and the Cohesion Fund) are required to comply with the EIA and SEA Directives.

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