Core Theme 6

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Biomass Mobilisation and Sustainability

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CA-RES CONCERTED ACTION RENEWABLE ENERGY SOURCES DIRECTIVE

1 In a Nutshell

Unlike all other Core Themes (CT) in the Concerted Action for the Renewable Energy Sources Directive (CA-RES), which is aimed at supporting the implementation of the RES Directive, this CT6 on biomass mobilisation and sustainability has no articles in the directive to implement. CT6 was instead created to respond to the spirit of the full RES framework directive, a directive aimed at fostering the increased share of renewable energy.

The scope of CT6 covers the mobilisation of all kinds of biomass[1]. Biomass is a very diverse resource and can be categorised as originating from agriculture, forest or waste. Furthermore, biomass has an important role in all three end use sectors (heating and cooling, electricity and transport[2]). Biomass comes from many different sources and can be used in many different ways.

During the course of CA-RES, it has become increasingly clear that biomass mobilisation is closely intertwined also with other policy areas than energy; this is obvious for forest biomass, agricultural biomass and waste. A holistic view is needed, and CT6 has contributed to increasing the awareness and understanding between the disciplines of energy and agriculture, forestry and waste amongst policy makers.

For a long time, biomass has been a key source of renewable energy in many Member States (MS). Biomass is also the energy source that contributes the most to the share of renewable energy in the EU today and in the projections for 2020.

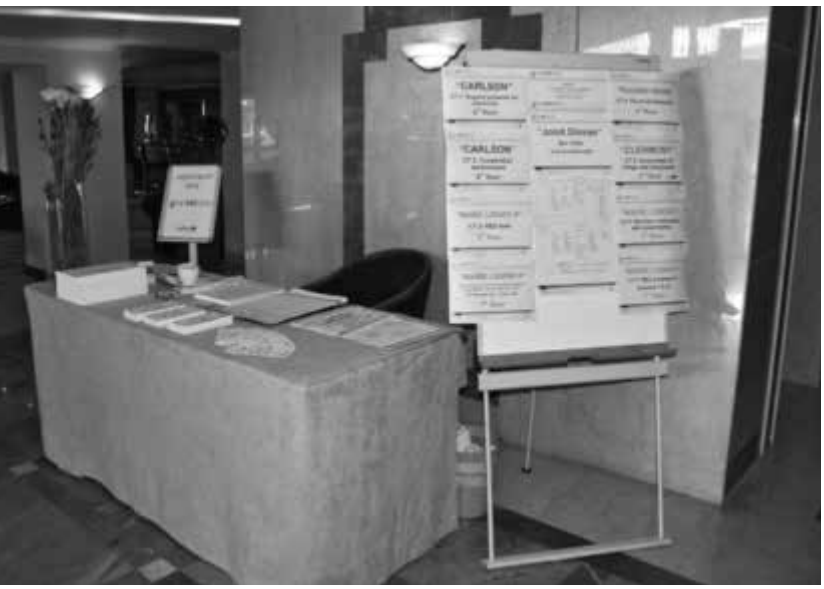
However, there are large differences between MS and CT6 has contributed to an increased awareness and understanding of the different landscapes of biomass and bioenergy in MS. MS differ in what resource bases they have and how these are used/developed/managed, how far bioenergy development has come and how much biomass they use for energy purposes (and other purposes) and how they use it (electricity, heating, cooling, transport, conversion efficiencies, use of wastes and residues etc.), and which policies and measures MS have chosen along the whole biomass value chains. There are also large differences between MS in existing energy infrastructure and therefore also large cultural differences. This means that there is not one size or solution that fits all in the continued biomass and bioenergy mobilisation, but Member States can learn from each other.

1 The RES directive defines 'biomass' as the biodegradable fraction of products, waste and residues from biological origin from agriculture (including vegetal and animal substances), forestry and related industries including fisheries and aquaculture, as well as the biodegradable fraction of industrial and municipal waste.

2 Transport however is handled by another Core Theme, i.e. CT7: RES in Transport.

An overall objective of CT6 has also been to exchange information and experience on the policy matters of importance in relation to biomass mobilisation and sustainability. During the second phase of CA-RES, CT6 has covered a wide range of topics. This publication serves to provide an overview and sample of the main topics covered:

- 2013 Malta: Agricultural biomass
- 2014 Rome: Forest biomass
- 2014 Budapest: Sustainability
- 2015 Dublin: Heating and cooling
- 2015 Cyprus: Sustainable forest management and aspects of competitiveness
- 2016 Vienna: Current policy developments affecting biomass mobilisation and sustainability



2 Topic in the Spotlight: Heating and Cooling

Heating and cooling was chosen as the main topic for CT6 in Dublin in May 2015. Heating and cooling (HC) is the largest energy end-use sector and accounts for roughly half of the EU's energy consumption, equivalent to transport and electricity combined. About 85% of the HC in EU is still fossil fuelled. Only about 15% of HC comes from renewable energy sources (RES), of which the vast majority is biomass.

In Dublin, CT6 acknowledged the importance of the heating and cooling sector and the significant role that biomass plays. We note that there are large differences between MS in the existing structure of the HC-sector and its RES share, but also many positive examples of current developments.

The heat market for the building stock in EU is dominated by fossil fuels in onsite boilers, which account for two-thirds of the heat supply. Natural gas is the main fossil source in those boilers, but oil and coal is also used. District heating (DH) only represents 13% of the heat supplied to buildings in EU. There are large differences between MS in the market share of district heating; however, there are DH networks in all but two Member States. MS can be grouped into five general categories reflecting current integration levels of district heating, see the table below.

	MS[3]	DH integration level
Consolidation	DK, EE, FI, LT, LV, SE	Very high
Expansion	AT, DE, FR, IT, SI	Medium
New development	BE, IE, LU, NL, UK	Low or medium
Refurbishment	BG, CZ, HU, PL, RO, SK	Medium or high
"Out-of-scope"	CY, EL, ES, MT, PT	No or low

SOURCE: Heat Roadmap Europe

There is also a large difference between MS in the share of RES in DH. In Sweden, for example, the fossil share in DH has been reduced to only 14%, while there are many MS with fossil shares in district heating of around 90%.

3 Only EU27 was included; hence HR, IC and NO were not part of the Table.

The HC sector and DH has largely been overlooked. This is true e.g. in scenarios exploring the energy future. The EU Commission's (COM) Energy Roadmap to 2050 only considers a 10% share of DH in 2050 compared to a 13% market share already today. One reason for this could be the local and regional nature of HC and of DH. DH is however promoted by the EED and RES directives, and it is an efficient heat source. District heating is also a very good way of enabling the use of RES including biomass. A large part of the RES in DH today is biomass; in the future, it will probably be increases in e.g. waste heat, geothermal and solar heating in the district heating sector.

From a RES point of view, DH is very flexible and allows the use of many different kinds of RES and many different kinds of biomass. This means that local and regional renewable and biomass resources can be put to use through DH. Another reason and barrier, perhaps especially in countries with currently low integration levels of district heating, could be the competition from and notion about already established fossil fuel based technologies and companies.

In Dublin, CT6 contributed to sharing some more light on HC and DH, in particular biomass-DH, and also put the topic in context. CT6 shared knowledge, experiences and good examples of developments of biomass-DH and RES-shares in HC. Ahead of the meeting, a comprehensive questionnaire was sent to MS with questions on the status and development of HC in MS; political will and targets for restructuring or converting the HC-sector, strategies, policies and measures; district heating; local and regional mobilisation; waste to energy; and examples of actual implemented projects/success case studies/good practices for local/regional biomass sourcing of new DH or for conversion of fossil DH to biomass.

A representative of the Halmstad University, Sweden gave a presentation on the heat supply within EU28. He painted the energy system context and also presented the Heat Roadmap Europe initiative and the IEE Stratego project. It was concluded that more proper energy modelling of European heat supply is achieved by mapping regional and local possibilities. Furthermore, the most expensive end use energy efficiency measures can be avoided by using district heating as an energy efficiency tool. DH has higher competitiveness in a future more energy efficient Europe.

The use of biomass and other renewables expand at high growth rates in the European district heating systems. A few concrete cases of biomass district heating in Europe were also given. The representative of the Halmstad University described the SE case of DH development as well as a number of current biomass district heating projects in EE, DK and NL.

Four MS, representing different DH integration levels and conditions, held presentations and shared their experiences of biomass-DH. One of the "consolidation"-MS with a high level of DH described their aim to reduce the dependency of imported gas. They had found that it is possible to obtain most of the energy from renewable and local energy resources. Development of renewable capacity in this regard not only creates energy independence and promotes the use of local resources, but also contributes to social and economic well-being, is a tool in the fight against climate change and reduces negative environmental impacts. They recently increased their national target for heat generation from biomass (including waste) to 60% by 2017 and 70% by 2021 (from 33% in 2013). The increased share of RES in the DH sector will mainly be achieved by using high efficiency biomass CHP technologies in the two biggest cities. Among the enabling conditions were also a high import of electricity (ca. 70%); ineffective waste management (> 70% of waste is landfilled); ineffective use or no use of CHP based on useful heat demand; and the assessed potential of domestic biomass (incl. straw, firewood, wood processing waste, logging waste, short rotation plants, grey adler, pre-commercial thinning of forest, and municipal waste) is well over what they project to use in 2020.

The heating and cooling sector and district heating has largely been overlooked, partly because of its local and regional nature. There are many advantages with district heating. It allows making use of waste heat in industry, in waste incineration, and in electricity production. From a RES point of view, DH is also very flexible and allows the use of many different kinds of RES and many different kinds of biomass.

This means that local and regional renewable and biomass resources can be put to use through DH, including unrefined biomass fuels and waste. DH is also energy and resource efficient, and improves air quality. District heating has proven to be a good decarbonisation tool and it can also be used to reduce gas dependency. Combined power production from DH provides non-intermittent base load electricity. Political will, competitiveness and local and regional planning are important to foster a continued increase of RES-DH.

3 Challenge Meets Solution

During the second phase of CA-RES, Core Theme 6 covered a wide range of topics. This publication serves to provide an overview and sample of the main topics covered.

Biomass is very diverse: in the Renewable Energy Directive (RED), biomass is grouped into agricultural biomass, forest biomass and waste. To be able to go into more depth into the various types of biomass and its characteristics, it was decided to dedicate one full meeting for each of these three types of biomass. The last meeting of CA-RES I was devoted to biomass from waste. In CA-RES II, participants therefore continued with focusing on agricultural biomass in Malta in 2013 and on forest biomass in Rome in 2014. In the RED, energy is divided into three sectors, i.e. electricity, heating and cooling, and transport [4]. Heating and cooling (HC) is the largest energy sector in the EU, and biomass is the largest renewable energy source in HC. We therefore decided to dedicate a meeting to also going into more depth into heating and cooling:

- 2013 Malta: Agricultural biomass
- 2014 Rome: Forest biomass
- 2014 Budapest: Sustainability
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Agricultural Biomass (Malta 2013)

The 2013 meeting in Malta focussed on agricultural biomass. The Malta questionnaire to MS featured questions on strategy, agricultural biomass use (in 2011 and in fulfilling the 2020 target), main agricultural feedstocks, production paths and uses, support to agricultural biomass, the competitiveness of agricultural biomass and main barriers, as well as challenges and concerns. Furthermore, four MS held presentations on agrobiomass during the CT6 parallel sessions in Malta.

Once again, participants concluded that there are large differences between MS. In one of the MS that presented its case, the support for agricultural biomass for energy started because of overcapacity in agriculture (i.e. farmers were earlier paid not to produce) and it was seen as a way to handle the overcapacity in the agriculture sector. Farm-based biogas plants producing electricity from maize is now the main agricultural biomass in this MS. This is because there has been a relatively higher support to crops in the feed-in electricity tariffs, and probably also due to farmer recognition of maize. Challenges ahead for this MS were in increasing efficiency through increased heating and in increasing the use of agricultural residues (such as straw and manure). There was also a debate on the efficiency of upgrading to biomethane and on the competing uses of land and biomass.

4 Transport, however, is handled by another Core Theme, i.e. CT7 RES in Transport.

Another MS that presented its case also has a large share of arable land. In 2012, in order to increase the use of domestic agricultural biomass, this MS introduced a measure that defined a required weight percentage of agricultural biomass in the weight of biomass directed to combustion processes in order to get support. This unfortunately did not have the desired effect; instead, the Member State has seen an increase in the import of agricultural biomass such as palm kernel shell, karite nutshell and sunflower husk.

In another MS that held a presentation, RES is viewed as an opportunity for the agricultural sector and they have had generous RES support especially for RES-E. One specific effect of RES-E support on agriculture was highlighted, namely the competition of arable land between agricultural biomass and PV (photovoltaic) plants. Agriculture suffers a long-term crisis and an income support for farmers offered by bioenergy can be a help to the maintenance and development of the sector. The MS concluded that it is necessary to distinguish between renewable technologies that are a supplement to the farmers' income (as is the case of biogas) from renewable technologies that are a replacement of agricultural income (such as photovoltaic).

In most Member States, agricultural biomass represents a small share of the total biomass use and this is probably not going to change to 2020 with current support measures. Many support systems in MS are "cost effective", which in many cases means that agricultural biomass is not used to a large extent since there is biomass (or other RES) with lower costs available on the market. There are, however, some exemptions on EU level where agricultural biomass, e.g. such as maize, has been competitive due to support.

From the answers to the questionnaire, CT6 participants also concluded that there are large differences between MS regarding what agricultural biomass feedstocks are most commonly used. For biogas production, maize and manure seem to be the most common feedstocks from the agricultural sector. For heat and/or electricity generation, residues such as olive kernels, straw (husk, hay and stalks) and residues from the wine sector are also commonly used. Bioliquids from oil seeds are also used to some extent, but short rotation coppice such as willow is still used in very small amounts in the MS. Agricultural biomass used so far seems mainly to be crops and residues that traditionally has been handled by farmers before, such as maize, straw and manure.

Bioenergy from agricultural residues, such as straw and manure, also faces the problem of not being economically viable. Agricultural biomass for energy purposes is still under development in most MS. But there are often several reasons for starting such projects (e.g. better management of animal manure, rural development etc.), so replacement of fossil fuels is often only one of several reasons. Energy security, decrease of import, rural development, waste solutions etc. are benefits that are not reflected in market prices, but might in some cases or in the future be considered so valuable that agricultural biomass achieves enough "support" to be competitive.

Agricultural land in the European Union is diminishing due to increased productivity and the abandoned land is increasing. If the demand doesn't grow as the supply grows, prices go down. When prices go down, growing crops on the least competitive land might cost more for the farmer than it brings in and thus the crop is taken out of production.

A new market like energy might make it interesting for the farmers to keep cultivating their land. Agricultural land used to produce biomass for energy today, could be used to produce biomass for food, feed, energy and raw material (for e.g. the chemical industry) in the future (2050).

To keep agricultural land productive we also need to handle climate change. Climate change is increasingly viewed as a current and future cause of hunger and poverty through e.g. increasing drought, flooding, and changing climatic patterns requiring a shift in crops and farming practices that may not be easily accomplished.

Besides substituting fossil fuels there are other possible positive climate effects of energy crops. Cultivating reed canary grass on organic soils may decrease greenhouse gas emissions from such systems. Cultivation of short rotation coppice may increase the carbon content of mineral soils. Furthermore, biogas production from manure decreases greenhouse gas emissions from manure management. Cultivating perennial energy crops can also benefit biodiversity if the cultivations are situated on good locations.

Forest Biomass (Rome 2014)

Biomass comes from forestry, agriculture and waste, and at the second meeting of CA-RES II, CT6 participants took a closer look at one of these three main biomass areas, namely forest biomass.

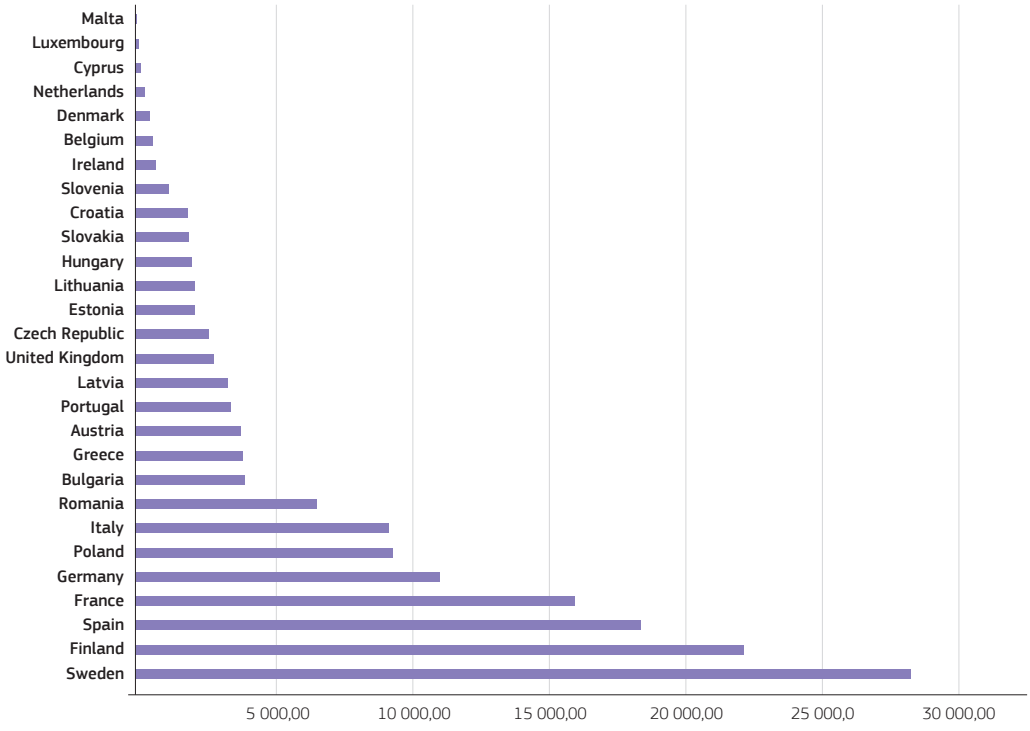
Forest biomass consists of direct biomass from the forest and indirect biomass from forest industry. The direct biomass could be e.g. forestry residues such as tops and branches from logging and forest management activities or traditional firewood. The indirect biomass include residues from e.g. saw mills, wood working, furniture industry and the pulp and paper industry (such as black liquor, bark etc.). As forest biomass feedstock we also include recovered (post-consumer) wood, landscaping wood, short rotation wood (Salix etc.) and pruning residues. Forest biomass is sometimes refined into pellets or briquettes. Even when focusing only on forest biomass it is clear that biomass is diverse and complex.

Biomass mobilisation issues are closely intertwined also with other policy areas than energy; this is obvious also for forest biomass. Forest and forestry policy is in the competence of the Member States. Forestry resources, however, are affected by other policy areas determined at EU level (such as environment, agriculture, climate and energy etc.). There is also comprehensive global and international cooperation on forestry issues. Forests are resources with multiple benefits and purposes. Trees are long-lived, benefits currently obtained by society and sectors reflect wise decisions by our predecessors. In Rome, CT6 has contributed to increasing the awareness and understanding between the disciplines of energy and forest among policy makers.

The forests in Europe are increasing both in extent (area) and in volume. The annual increment is higher than the felling. At EU level fellings are 60% of the net annual increment from forests available for wood supply. All MS have an annual forest growth that exceeds the annual felling. In some MS the forest growth is much larger than the felling. About 37% of the EU land area is made up of forest land, and forest cover has increased in the last decades (34% year 1990, 36% year 2000).

There are however large differences between MS in the amount and share of forest land. FI has the highest share of forest land (73%) and SE the next highest (69%), but there are also MS with only ca. 11% forest land.

FIGURE 1: Forest Land Area per MS (1000 ha)



SOURCE: FAO (Food and Agriculture Organization of the United Nations) Statistics Division

Ahead of the meeting, a questionnaire was sent to MS which included questions on the forest resource, strategy, main forest biomass feedstocks, production chains and uses, competitiveness and potentials, main policies and measures for mobilisation and main barriers, challenges and concerns.

Forest biomass is the largest RES in both heating as well as in final energy consumption in most MS. But there are large differences between Member States. The amount and share of forest land differ between MS, as well as the type of forests, the climatic and geographic conditions, and forest management practices. Forest ownership structures vary from small family holdings, to state forests, to estates owned by companies as part of industrial wood supply chains. MS are at different stages of market solutions. There are also large differences between MS in existing energy infrastructure such as share of district heating and CHP or individual heating, and the share of fossil fuels. This means that there is not one size or solution that fits all in the continued forest biomass mobilisation, but Member States can learn from each other.

Direct forest biomass in the form of traditional firewood was the largest form of forest biomass in 10 out of the 15 MS that answered the questionnaire: in three MS, indirect forest biomass in the form of residues from forest industry was the largest feedstock, and in two of the MS, direct forest biomass in the form of forest residues such as tops and branches was the predominant feedstock.

We asked MS in what feedstock category they see the most promising potential to increase mobilisation. Seven out of the 15 MS indicated that the most promising potential lies in the direct forest biomass in form of forestry residues such as tops and branches. Several MS also pointed out that the annual increment is not harvested, and that there are substantial harvesting reserves left. The current removal is well below the estimated maximum sustainable removal level. In addition, recovered wood, biomass grown on arable land, firewood, indirect biomass (pellets and briquettes) and landscaping wood were indicated by some MS as important future sources.

Perhaps counterintuitive, but one issue that was evident from the MS presentations in Rome was the importance of a viable forest industry and demand for industrial round wood for other purposes than energy for the forest biomass mobilisation for energy purposes. A well working forest industry demanding round wood gives, e.g. incentives for residue harvest and residues from forest industry processes.

Key factors include modern and effective forest industries, low administrative costs for the actors, good forest ownership structures and mobilisation of forest owners, proper choices of policy instruments and market solutions, and competitiveness towards fossil alternatives. There is a physical potential in EU forests to increase utilisation. The work on mobilisation of forest biomass need a long-term perspective and should continue.

The COM 2014 Sustainability Report (Budapest 2014)

In the end of July 2014, the European Commission (COM) published a Commission staff working document[5] (SWD) on the state of play on the sustainability of solid and gaseous biomass used for electricity, heating and cooling in the EU. For this reason, sustainability was chosen as the topic for the CT6 meeting in November 2014. In the RES Directive (RED) from 2009, COM wrote that they would revisit the issue of sustainability of solid and gaseous biomass, which they did in 2010 when COM gave recommendations on sustainability criteria for those Member States that planned or already had adopted national requirements. COM wrote that they would revisit the issue again in 2011, but it took until 2014. In Budapest, COM held a short presentation on their report and MS had possibilities to ask questions, comment and discuss issues covered by the report.

5 SWD(2014) 259 final

In their new report, the COM reviews the state of play of the sustainability of solid and gaseous biomass for electricity, heating and cooling in the EU. COM looks at the development of the biomass use up to 2020 and beyond, considers whether existing national biomass sustainability criteria regulations are an obstacle to the internal market or not, and analyses potential sustainability risks (such as unsustainable feedstock production, emissions from land use, land use change and forestry (LULUCF), lifecycle GHG emissions performance, indirect impacts (such as competition for raw materials and with existing uses, cascading, ILUC), inefficient conversion, and air emissions) and discusses how these are currently being addressed at EU level.

COM concludes in their report that biomass for heat and power has an important role for meeting the 2020 climate and energy targets, and for the post-2020 period. COM also concludes that currently a limited number of MS have adopted broadly consistent sustainability schemes and no apparent internal market barriers have been identified thus far. To facilitate convergence of national schemes, MS can use the standardised GHG methodology and default values, and recommendations given by COM in their 2010 report.

The vast majority of the biomass used today in the EU for heat and power provides significant GHG savings compared to fossil fuels.

Ahead of the meeting a questionnaire was sent to MS with questions on issues covered in the COM 2014 Sustainability Report. MS were asked to prepare questions to COM on their report and comments and questions were given and discussed at the meeting. One example concerned the so called fossil fuel comparator. Greenhouse gas (GHG) performance of biomass chains were expressed as savings relative to a fossil fuel comparator (FFC). In the COM 2010 report, the FFC was calculated as the EU average of fossil electricity, heating and cooling. In the 2014 report, the FFC was calculated taking into account the future "likely" evolution of fossil energy markets. In the 2014 report the FFC was therefore lower than in the 2010 report. The lower the FFC is the worse biomass is perceived compared to fossil fuels. One comment that was made was that the emissions in the biomass production chain are calculated with current values (not future likely predictions). Another comment was that the fuel mix considered in the FFC seemed to be biased in favour of fossil fuels.

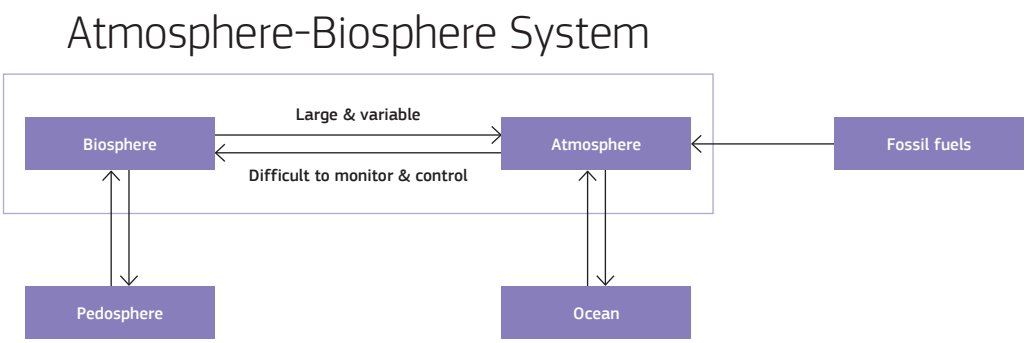
Cascading was mentioned in the COM 2014 report and the so-called concept of cascading was discussed during the CT6 meeting in Budapest. Cascading is a word that has emerged lately, but that is rather undefined and more of a theoretical idea that means different things for different stakeholders. Most MS believed that price signals and free markets are the best policy for resource efficiency in this sense. Regulated allocation or other types of market interventions, aiming at limiting demand or supply for e.g. certain sectors would be highly counterproductive and would hinder a transition into a cost efficient bioeconomy. A few MS instead believed that regulations of different sorts is the way to go; three MS had regulations in place handling the conflict of use between sectors.

Three Member States presented their (existing or planned) national (or regional) sustainability criteria systems for discussion at the Budapest meeting. Few MS have opted to introduce such schemes.

Forests, Bioenergy, Land Use and Climate Change Mitigation (Budapest 2014)

Historically, CO_2 emissions from land use change (primarily the conversion of natural ecosystems to agricultural land) have contributed significantly to the increase in accumulated atmospheric CO_2 emissions. However, CO_2 emissions associated with fossil fuel use now since long dominates and presently contributes roughly 90 percent of total annual CO_2 emissions. Stabilization of atmospheric CO_2 concentrations at levels proposed in relation to the 2-degree target requires drastic changes in the way the global energy system functions. The effect of strongly reduced LUC emissions was shown to be relatively small, compared to what is required for reaching such stabilization targets. It was also noted that options for moving atmospheric carbon to the biosphere can provide benefits, but cannot solve the climate problem; there is too small capacity and uncertain storage. Instead: We need to stop injecting fossil carbon into the highly dynamic and strongly coupled atmosphere-biosphere system. When energy is generated from fossil fuels, this increases total carbon in the biosphere-atmosphere system and is essentially permanent.

FIGURE 2: We need to stop injecting fossil carbon into the highly dynamic and strongly coupled atmosphere-biosphere system



SOURCE: Göran Berndes, Associate Professor at the Department of Energy and Environment, Chalmers University of Technology, and international Task Leader of IEA Bioenergy Task 43 on Biomass Feedstocks for Energy Markets.

Biomass combustion for bioenergy emits biogenic carbon that is part of a biogenic carbon cycle. As long as forests regrow, the total amount of carbon in the biosphere-atmosphere system remains approximately the same (with small increases if and when fossil fuels are used to obtain, process, and transport the biomass).

The long-term GHG benefits of substituting fossil fuels with forest bioenergy will greatly surpass those of carbon sequestration in forests because net carbon accumulation in the no-harvest scenarios will slow substantially as forests reach maturity, whereas the benefits of substituting fossil fuels with forest bioenergy will keep accumulating at a steady pace.

The concept of emission space was introduced and how to use the remaining space for GHG emissions was proposed as a strategic question to address for societies. In this context it was noted that development of new energy and transport systems will take time and the development process will in itself be associated with GHG emissions. Some of the emission space might be required for developing a bioenergy industry capable of providing renewable and climate friendly energy services for the world on a long term.

Heating and Cooling (Dublin 2015)

See Chapter 2 “Topic in the Spotlight” for more information on the topic.

Sustainable Forest Management (Cyprus 2015)

CT6 has previously noted that it is important that energy policy makers talk to the people dealing with forests. This is also true when it comes to getting insights into what forests and sustainable forest management is, and the processes that already exist around sustainable forest management (SFM). The forestry sector has worked hard to agree and implement concepts of sustainable forest management worldwide for decades.

The UNFAO (Food and Agriculture Organization of the United Nations) regularly monitors the world’s forests and their management and uses through the Global Forest Resources Assessment (FRA). The FRA already started in 1948 and is produced every five years to provide a consistent approach to describing the world’s forests and how they are changing. The latest FRA 2015 synthesis report provides data and analysis covering 234 countries and territories. The FRA is coordinated by the FAO and in cooperation with regional partners[6].

6 The Central African Forest Commission (COMIFAC/OFAC), FOREST EUROPE, the International Tropical Timber Organization (ITTO), the Montréal Process, and the United Nations Economic Commission for Europe (UNECE).

At regional level, FOREST EUROPE is the pan-European high-level political process for dialogue and cooperation on forest policies in Europe. FOREST EUROPE develops common strategies for its signatories (46 European countries and the EU) on how to protect and sustainably manage the forests. Since 1990, the collaboration of the ministers responsible for forests in Europe has led to achievements such as guidelines, criteria and indicators for SFM, which were first adopted in 1998. Through the FOREST EUROPE process, all MS have adopted a common definition of SFM and a common set of criteria and indicators (C&I) of SFM, and are committed to practice sustainable forest management.

The EU Standing Forestry Committee (SFC), set up in 1989, represents forestry administrations of the EU Member States. In September 2015, the Standing Forestry Committee endorsed a report on SFM criteria and indicators[7] aimed at being applied in different policy contexts regardless of the end use of biomass. An ad hoc Working Group (WG) of the SFC had been set up with the principal aim to identify objective, ambitious and demonstrable SFM criteria that could be applied to all forests. The corresponding indicators should be applicable for the purpose of different EU policies when there is a need to refer to sustainable forest management and to demonstrate this is being achieved through the provision of appropriate evidence. The WG stressed the importance of building on existing international reporting, and particularly highlighted the FAO's Global Forest Resource Assessment and the State of Europe's Forests[8] as relevant starting points. A short, interim list of key indicators was produced:

HORIZONTAL (ec-env-soc)	Forest area (1.1), growing stock (1.2), increments and fellings (3.1), forests under management plan or equivalent instruments (3.5) and protective forests (5.1 and 5.2)
ENVIRONMENTAL	Forest damage (2.4), carbon stock (1.4), protected forests (4.9) complemented with a possible indicator on Natura 2000, deadwood (4.5) and tree specles composition (4.1)
SOCIO-ECONOMIC	Net revenue (6.3), workforce (6.5), bioenergy production (6.9), wood consumption (6.7) and trade in wood (6.8)

SOURCE: Standing Forestry Committee Ad Hoc Working Group on Sustainable Forest Management (2015): Criteria & Indicators. Final Report. 30 July 2015.

Most countries and stakeholders considered that the most appropriate level to ensure forests are being managed under SFM principles is the national level. Rather than setting targets, most experts in the WG recommended that trends should be followed at national level. A risk-based approach might be considered, whereas a higher risk estimated at the national level would then require further evidence, e.g. market-based instruments.

Most members of the SFC WG were against new legislation in this area in general. Rather the WG encourages making further efforts to ensure full implementation of the existing relevant legislative acts and initiatives, in particular the EU Timber Regulation[9], the EU FLEGT Voluntary Partnership Agreements, the FLEGT Action Plan, and the Birds and Habitat directives.

7 http://ec.europa.eu/agriculture/forest/publications/index_en.htm

8 http://www.foresteurope.org/reporting_SFM

9 The EU Timber Regulation (EUTR) means that placing illegally harvested timber and products derived from such timber (such as forest biomass fuels) on the EU market is prohibited. Both timber and timber products produced in the EU and those imported from outside are covered by the legislation.

The global forest area amounts to almost 4 billion ha (31% of global land area). The world's forests continue to shrink as populations increase and forest land is converted to agriculture and other uses, but the rate of net global forest loss has been cut by more than 50 percent. The biggest forest area loss over the last five year period occurred in the tropics, particularly in Africa and South America. In 2011, the European Commission launched the study "The Impact of EU Consumption on Deforestation". The study showed that reduced forests are connected to poverty, population increase and forest land converted to agriculture. The majority of crops and livestock products associated with deforestation are not traded internationally. The EU import and consumption is equivalent to deforestation of 9 million ha (converted to agriculture), representing 7% of the deforestation. Soy, meat and palm oil for food and feed were identified as playing a major role. But trade of wood was not. The conclusion of this is that ensuring sustainability of imports of soy, meat and palm oil might have an effect on deforestation.

Net forest area however also increased in many countries and territories. The forests in EU grow more than ever. Swedish forestry, for example, has demonstrated that growth and production is not static, but can respond to increasing demand by increasing production of timber, pulp wood and bioenergy simultaneously, while maintaining carbon stock. Compared to 100 years ago, the annual harvest in Sweden has almost doubled, while still adding some 80 million cubic meters of stem volume per year to the standing forest stock.

Aspects of Competitiveness (Cyprus 2015)

Bioenergy needs to be competitive against and have good conditions compared to the fossil energy we aim to phase out. There are large differences between MS in how much bioenergy there is in their energy systems. This situation in MS is only to a lesser extent depending on actual physical biomass assets (forest etc.) in the respective MS. Rather, it is the economic and other conditions for the biomass compared to the fossil that is crucial.

It has also become increasingly clear that administrative costs, burdens, evidence, detailed regulations, barriers that if any ought to be placed on the fossil fuels instead increasingly are placed on bioenergy fuels.

There are major untapped domestic biomass resources within EU MS, such as forest and industry residues, and waste etc. Furthermore, forests have increased in the EU in the long term: the increment in growing stock is larger than the felling. Also, forests are not static or passive systems, instead forests are dynamic and the growth is possible to impact.

The economic sustainability, rather than the ecological or the social sustainability, presents the weak link that should be further addressed. Biomass mobilisation requires favourable and facilitating environments and conditions for the biomass along the whole value chains.

Current Policy Developments Affecting Biomass Mobilisation and Sustainability (Vienna 2016)

For the CT6 meeting in Vienna in May 2016, the overarching topic was: current policy developments affecting biomass mobilisation and sustainability.

COM was invited to give an update on current policy developments at EU-level affecting biomass mobilisation and sustainability, be it forest, agro or waste biomass, and to share some information on ongoing COM studies. Furthermore, the public COM consultation "A sustainable bioenergy policy for the period after 2020" had closed the week before and we had asked MS to answer two questions from that public consultation dealing with the perception of different types of bioenergy and MS views on the effectiveness and efficiency of current policies. The MS answers to these questions were presented and then discussed in groups. Several MS had though not yet answered the consultation or had responded to the consultation by not answering the questions but rather enclosing a document.

Ahead of the meeting a questionnaire was sent to MS. One of the questions concerned current policy developments at MS level affecting biomass mobilisation. MS were asked if there had been any major policy developments recently in their MS increasing the mobilisation of or the demand for or improving the competitiveness of biomass compared to fossil fuels.

A few months ahead of the COP21 meeting in Paris last year, a new energy transition law was passed in France, which included a substantial increase in the carbon tax on fossil fuel use, and this was given as an example to illustrate important developments in MS.

In December 2015, the COP21 took place in Paris under the United Nations Framework Convention on Climate Change (UNFCCC). Emissions and removals relating to land use, land use change and forestry (LULUCF) is one of the sectors[10] that are part of the reporting under the climate convention UNFCCC. An expert from the Swedish University of Agricultural Sciences was invited to give us an insight into the international reporting of LULUCF. LULUCF is an inventory sector that covers anthropogenic emissions and removals/uptakes of GHGs resulting from changes in terrestrial carbon stocks. It covers the carbon pools of living biomass (above and below ground), dead organic matter (dead wood and litter) and organic soil carbon for specified land categories. All emissions from biomass are reported in the LULUCF-sector, regardless of where they occur. Hence that also includes biomass for energy and harvested wood products. This is yet another cross-over policy issue that is important for policy makers to be aware of and understand. The biogenic CO_2 is part of a cycle where the photosynthesis takes up or removes CO_2 from the atmosphere and respiration, decomposition and harvesting etc. emits CO_2.

10 The reporting is separated into five sectors: Energy; Industrial processes and product use (IPPU); Agriculture; Land use, land use change and forestry (LULUCF); Waste.

The Ecodesign Directive[11] establishes a framework for setting requirements on performance of energy-related products. The requirements are set per product group through EU regulations, directly applicable in all EU countries. The Ecodesign regulations are intended to set minimum energy efficiency requirements of products and ban the most energy and resource-intensive products on the EU market. The requirements may also apply to other properties such as e.g. noise, life-span or information requirements on hazardous substances. The Ecodesign Directive and regulations applies to new applications, i.e. when placed on the market and/or put into service.

COM recently adopted two Ecodesign regulations affecting biomass, one regarding solid fuel boilers (SFB, for installations ≤ 500kW) and one on solid fuel local space heaters (SFLSH, ≤ 50kW). Aspects that were identified as significant and were therefore included as requirements for these product groups were energy efficiency and emissions of particulate matter, organic gaseous compounds (OGC), carbon monoxide and nitrogen oxides (NOx) in the use phase. The requirements in the regulations enter into force 2020 and 2022 respectively, aiming to provide sufficient time for manufacturers to redesign their products. The energy labelling comes into force in 2017 and 2018.

Ahead of the meeting, MS were asked to answer questions pertaining to impacts of these Ecodesign regulations as well as how MS had been or were planning to handle related issues and implications of these new regulations.

MS were asked if they currently had any national requirements covering the items in the new Ecodesign regulations and how the biomass-fuelled SFB and SFLSH products that currently are being sold in their MS relate to the requirements in the new Ecodesign regulations. We also asked what cost increases in the products that were foreseen due to the new requirements and what possible impacts it would have on the development of biomass heating (SFB, SFLSH). MS were also asked if they have, or have had in the past, or plan to introduce any measures to facilitate either the replacement of old biomass SFB and SFLSH with new ones or the purchase of new ones (such as investment subsidies, replacement programmes or similar). And lastly, MS were asked if they were planning or investigating the possibility to set or revise national requirements regarding efficiency or emissions so as to introduce the Ecodesign requirements as requirements in national legislation earlier than 2020 resp. 2022 for SFB and/or SFLSH.

As part of the 3rd session in Vienna, we had a presentation on Ecodesign and discussed MS views on possible impacts on biomass mobilisation and sustainability, and current or planned policies and measures in MS to handle related issues and implications of these new regulations.

11 Dir 2009/125/EC http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0125&from=SV

The EU has recently also adopted the Medium combustion plant directive (MCP) and CT6 participants briefly touched upon that as well. MCP was adopted in November 2015 and regulates pollutant emissions from the combustion of fuels in both new and existing combustion plants of medium size (between 1 and 50 MW). The new directive includes compulsory registration of medium combustion plants, specific emission limits for sulphur dioxide (SO_2), nitrogen oxides (NOx) and dust, and rules to monitor carbon monoxide (CO). The MCP directive will have to be transposed by MS by December 2017. COM will regularly report on the implementation of the MCP directive, and will address further issues, such as energy efficiency and carbon monoxide emissions, as foreseen under its review clauses.

In order to limit air pollution, the European Community has policies in place limiting individual sources, but also national totals of atmospheric emissions of certain pollutants. The MCP directive fills the regulatory gap at EU level between large combustion plants (> 50 MWth), covered under the Industrial Emissions Directive (IED) and smaller appliances (heaters and boilers <1 MWth) covered by the Ecodesign Directive. The National Emission Ceilings Directive addresses the national totals of atmospheric emissions and is currently being reviewed as part of the Clean Air Policy Package.

There was also a short CT6 stock-taking of CA-RES and the main topics of the 11 previous CT6 meetings in CA-RES I and II were recapitulated.

4 Abbreviations

Participating countries are referred to according to their two-letter country codes as defined by ISO 3166-1 alpha-2 standard (AT – Austria, BE – Belgium, etc.).

Abbreviation	Meaning
CA-RES	Concerted Action on the Renewable Energy Sources Directive
CA-RES I	Phase 1 of the Concerted Action on the Renewable Energy Sources Directive
CA-RES II	Concerted Action on the Renewable Energy Sources Directive
CHP	Combined Heat and Power
C & I	Criteria and Indicators
CO	Carbon monoxide
CO_2	Carbon dioxide
COM	European Commission
COMIFAC	Central African Forest Commission (also abbreviated as OFAC)

Abbreviation	Meaning
COP21	United Nations Framework Convention on Climate Change, 21st Conference of the Parties
CT	Core Theme
CT6	Core Theme 6 on Biomass Mobilisation and Sustainability
DH	District heating
EU	European Union
EED	Energy Efficiency Directive (2012/27/EU)
EUTR	EU Timber Regulation
FAO	Food and Agriculture Organisation of the United Nations
FFC	Fossil fuel comparator
FRA	Forest Resources Assessment
GHG	Greenhouse Gas
HC	Heating and cooling
IED	Industrial Emissions Directive
IEE	Intelligent Energy Europe program
ILUC	Indirect land use change
IPPU	Industrial processes and product use
ITTO	International Tropical Timber Organisation
LUC	Land use change
LULUCF	Land use, land use change, forestry
MCP	Medium combustion plant directive
MS	Member State
NOx	Nitrogen oxide
OGC	Organic gaseous compounds
PV	Photovoltaic
RED	Renewable Energy Directive (2009/28/EC)
RES	Renewable Energy Sources
RES-E	Renewable Energy Sources in Electricity
SFB	Solid fuel boilers
SFC	Standing Forestry Committee
SFLSH	Solid fuel local space heaters
SFM	Sustainable forest management
SO_2	Sulphur dioxide
SWD	Staff Working Document
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
WG	Working Group

This is a public CA-RES report

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The Concerted Action to support the implementation of the RES Directive 2009/28/EC (CA-RES) was launched with the participation of the responsible authorities from 30 EU countries and supported by Intelligent Energy Europe (IEE) in July 2010 to provide a structured and confidential dialogue on how to address the cost-effective implementation of the RES Directive 2009/28/EC.

For further information please visit **www.ca-res.eu**