EUBIONET3

Solutions for biomass fuel market barriers and raw material availability - IEE/07/777/SI2.499477

Country report of different criteria for sustainability and certification of biomass and solid, liquid and gaseous biofuels

Sweden

Work package 4.3

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Content

Preface

This publication is part of the EUBIONET III Project (Solutions for biomass fuel market barriers and raw material availability - IEE/07/777/SI2.499477, www.eubionet.net) funded by the European Union's Intelligent Energy Programme. EUBIONETII is coordinated by VTT and other partners are Danish Technological Institute, DTI (Denmark), Energy Centre Bratislava, ECB (Slovakia), Ekodoma (Latvia), Fachagentur Nachwachsende Rohstoffe e.V., FNR (Germany), Swedish University of Agricultural Sciences, SLU (Sweden), Brno University of Technology,UPEI VUT (Czech), Norwegian University of Life Sciences, UMB (Norway), Centre wallon de Recherches agronomiques, CRA-W (Belgium), BLT-HBLuFA Francisco Josephinum, FJ-BLT (Austria), European Biomass Association, AEBIOM (Belgium), Centre for Renewable Energy Sources, CRES (Greece), Utrecht University, UU (Netherlands), University of Florence, UNIFI (Italy), Lithuanian Energy Institute, LEI (Lithuania), Imperial College of Science, Imperial (UK), Centro da Biomassa para a Energia, CBE (Portugal), Energy Restructuring Agency, ApE (Slovenia), Andalusian Energy Agency, AAE (Spain). EUBIONET III project will run 2008 – 2011.

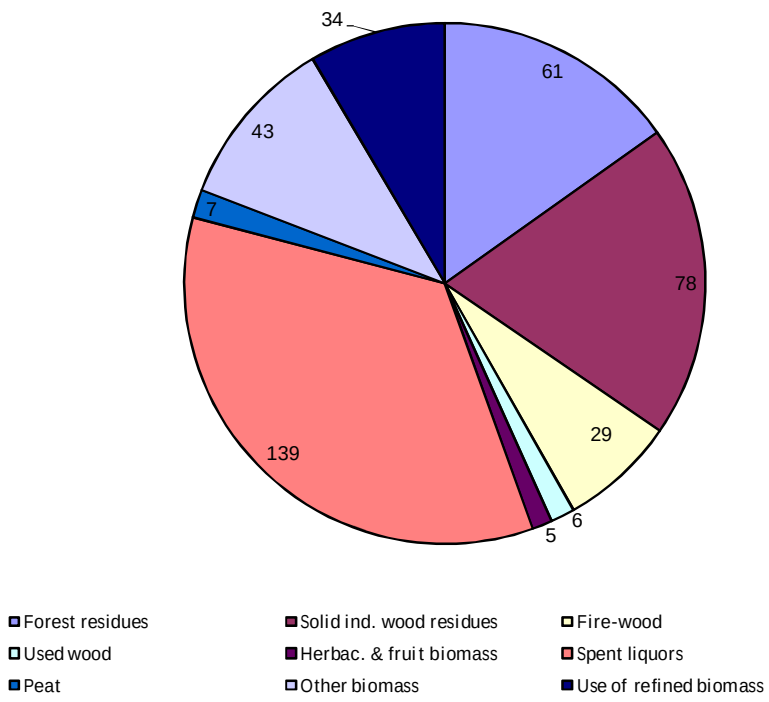
The main objective of the project is to increase the use of biomass based fuels in the EU by finding ways to overcome the market barriers. The purpose is to promote international trade of biomass fuels to help demand and supply meet each other, while at the same time the availability of industrial raw material is to be secured at reasonable price. The EUBIONET III project will in the long run boost sustainable, transparent international biomass fuel trade, secure the most cost efficient and value-adding use of biomass for energy and industry, boost the investments on best practice technologies and new services on biomass heat sector and enhance sustainable and fair international trade of biomass fuels.

Svetlana Ladanai, Olle Olsson & Johan Vinterbäck, Uppsala, November 2009

1 General outline of bioenergy production and use in Sweden

1.1 Total bioenergy use in Sweden

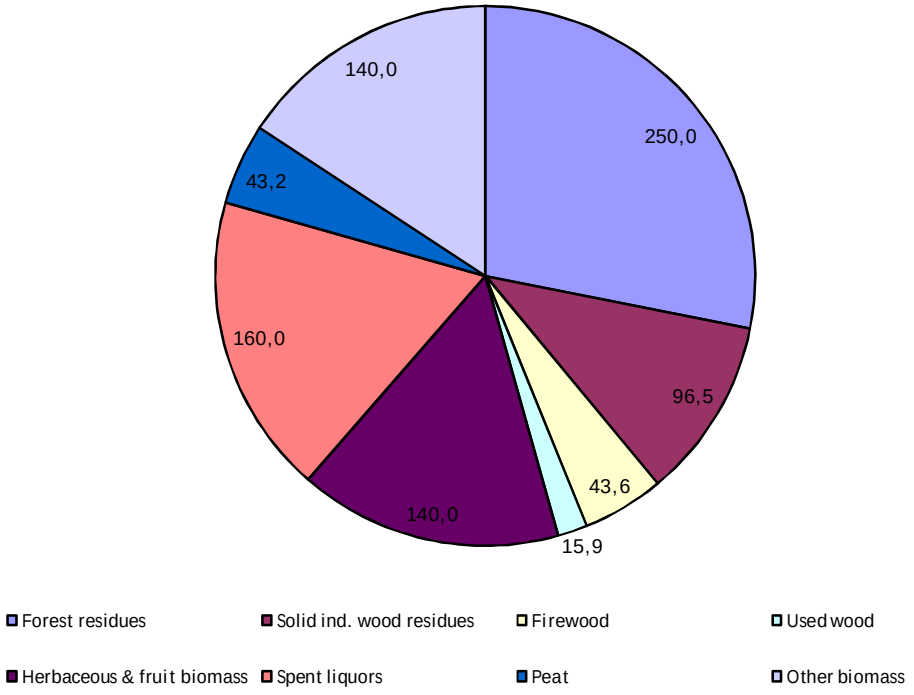
Pie 1. Swedish bioenergy use in 2006 [in PJ] [2]



In addition to Sweden's own targets, the European Council set an overall target in March 2007 of 20 % of energy to be supplied from renewable sources by 2020, as compared to the corresponding level of 8.5% in 2005. In January 2008, the Commission published a proposal [1] as to how the 20% target should be apportioned between the various member states.

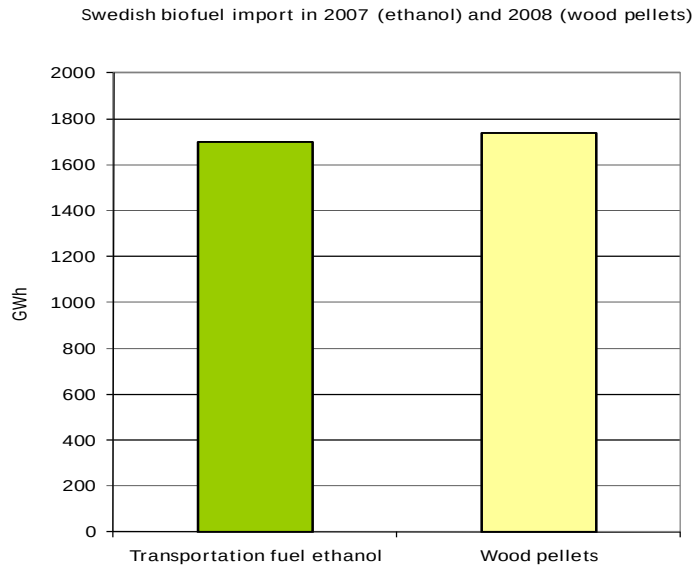
1.2 Main feedstock used for bioenergy production

Pie 1. Techno-economic potential for feedstock used in Sweden for bioenergy production [in PJ]. [2]



1.3 Import of solid and liquid biofuels into Sweden

Graph 1. Amount of domestically produced and imported biofuels [in PJ] in Sweden [1,3].



2 Development of National Action Plans for RED

The Environmental Objectives Council has been instructed by the Government to evaluate the environmental quality targets. The Council presented its report, 'Sweden's Environmental Objectives: No time to lose' in 2008. In its report, the Council notes that work in several of the areas that Sweden can influence is going in the right direction, but that the pace of the work is not sufficient to ensure that the targets will be met by 2020. The Reduced Climate Impact target is regarded as being very difficult, or impossible to achieve. The Swedish Energy Agency's 'Energy as an environmental target' report was one of those reviewed by the Council, proposing among its views that energy should be treated as a comprehensive environmental target. The Agency believes that it is important that all sectors of society should have a greater understanding of the importance of energy aspects on development and of the environmental effects associated with the supply and use of energy

Note: Preparations for National Action Plan in Sweden are under progress.

2.1 Stakeholder involvement

Table 1. Stakeholder groups involvement in the development of the National Action Plan in Sweden [to be included].

Stakeholder groups	Involved (Y/N)	List names of stakeholders (if known)
Government		
NGOs		
Academia		
Traders		
Industry: producers		
Industry: end-users		

3 Development of a CEN standard on sustainable bioenergy

Threre are Swedish experts in all of the 6 CEN TC 383 working groups.

Bil Sweden, Elforsk, Energimyndigheten, Jordbruksverket, LRF, SEKAB, Neova, Svebio och Svenska Petroleuminstitutet are financing and involved in one or several of the CEN TC 383 working groups at present. The new SIS committee cold "Sustainability criteria for biomass for energy consumption" SIS/TK 526.

4 Initiatives or systems to guarantee sustainability of biomass feedstock from forest

Table 2. Initiatives or existing systems in [country] that (aim to) have principles (and related criteria and indicators) to guarantee the sustainability of biomass feedstock from forest (residues).

Name of system or initiative*	Implemented (Y/N):	National (N) or interna-tional (I)	Number of users (% or in numbers)
Swedish PEFC Co-operative	Y	I	240 users [8] 30% of forest is PEFC certified. In october 2005 66878000 ha were PEFC certified in Sweden at 23120 estates [7]
Swedish FSC-Council	Y	I	The Swedish FSC Council Interest Group consists of 100 or so companies, organisations and private persons who have declared their support for the FSC certification of forestry[6].

** Only provide details of (maximum) <u>two main national</u> systems or initiatives in your country in appendix.*

In Sweden productive forest land is 22,9 milj. ha according to Swedish National Forest Inventory [4] and 28,4 milj. ha forest land according to FAO [5]

5 Initiatives or systems to guarantee sustainability of biomass feedstock from agriculture

Table 3. Initiatives or existing systems in [country] that (aim to) have principles (and related criteria and indicators) to guarantee the sustainability of energy crop production from agriculture.

Name of system or initiative*	Implemented (Y/N):	National (N) or interna-tional (I)	Number of users (% or in numbers)
Svanen	y	NORDEN	
Bra miljöval	y	N	18/HOUSE in 1997, 599 products market with Bra miljöval at present
KRAV	y	N	5.235 produkter certifierade enligt KRAVs regler, vilket bedöms vara ca 90 % av de ekologiska produkterna i Sverige[9].

** Only provide details of (maximum) two main national systems or initiatives in your country in appendix.*

The total agricultural area in Sweden is 3136.00*1000 ha[10]

Market share for organic products is approximately 3% in Sweden. In 2000, 11% of Sweden's arable land was either certified organic or was using the national support program for organic farming. Sweden is second only to Austria in terms of percentage of total agricultural land used for organic farming. ECO Trade, a Swedish farmers cooperative is the primary exporter and importer of organic grains. Products from within the EU can be imported into Sweden and sold as organic, provided it is processed by an operator registered with an approved EU Organic Certification body [11].

6 Initiatives or systems to guarantee sustainability of bioenergy from heat and power

Since the beginning of the 1990s, several different systems intended to support the production of electricity from renewable energy sources have come and sometimes gone. They have included investment grants for the production of electricity from biomass, wind power and small-scale hydro power, as well as an operational subsidy for electricity generated from wind power, known as the environmental bonus (note: of all renewables, biomass is least subsidised overall).

In 2003 a new support system started for renewable electricity production, based on trading in electricity certificates for renewable electricity. The certificate trading system is complemented for wind power production by environmental bonus which, in 2005, amounted to 9 öre/kWh (about 0.01 €/kWh) for onshore production and 16 öre/kWh (about 0.018 €/kWh) for offshore production. It is intended that a progressive reduction of this subsidy would take place.

The electricity certificate system is intended to reduce the production costs and support the development of new production in the long-term by creating competition between different types of renewable electricity production. Producers receive one certificate unit for each MWh of renewable electricity that they produce. Qualifying renewables are electricity from wind power, solar energy, geothermal energy, certain biofuels, wave energy and certain hydro power.

With effect from 1st April 2004, electricity produced from peat in cogeneration plants has also qualified for certificates - controversially so, because some would say peat is a 'slow' renewable, taking centuries to renew itself. All electricity users, with the exception of energy intensive industries, are required to buy certificates corresponding to a certain percentage of their electricity use. In 2005, users had to buy certificates corresponding to 10.4 % of their electricity use. The proportion of certificates that users are required to buy (their quota obligation) varies from year to year: During 2005, the average price of one unit of electricity certificate was SEK 216 (€23).

The aim of the certificate trading system is to produce a greater proportion of the country's electricity from renewable sources, an increase by 10 TWh between 2002 and 2010 is the indicative target. In June 2006, Parliament decided on changes in the electricity certificate system. The target for renewable electricity Production was raised by 17 TWh for the target year 2016 (as compared with production in 2002), and extending the life of the scheme itself to 2030. Quota obligations have been set for this entire period, and the number of allocated certificates was adjusted for the period 2007-2010.

Currently representing 7% market share, the district heating has a realistic potential to be doubled by 2020 (up to 14%) whilst the biomass input has a potential to be tripled. AEBIOM has issued a list of recommendations for the district heating sector to be used in the national renewable energy action plans (NREAP)

Sweden is known for its district heating systems, which provide hot water either used directly or to heat buildings, to homes, businesses and public buildings. They are often based on efficient co-generation plants, the development of which is a top priority for Sweden. These systems consumed around 40.5 MWh of biomass based energy in 2006.

The country also has a thriving and rapidly growing pellet sector, with households preferring the convenient fuel over other heating methods that have now become far more expensive (heating oil, natural gas, electric heating). Combined, large and small pellet heating systems consumed 8.0 MWh worth of biomass in 2006.

Finally, biogas is a leading green energy sector, yielding a whopping 250 GWh of heat and electricity in 2006. The use of liquid biofuels for transport has been growing steadily, with 376,000 cubic meters of ethanol used in low mixtures (250,000m³), high mixtures (E85: 110,000m³) and the remainder in Sweden's famous ethanol buses (previous post). Biodiesel consumption was 61,000 cubic meters in 2006 Initiatives or systems to guarantee sustainability of biofuels for transportation

7 Initiatives or systems to guarantee sustainability of biofuels for transportation

Verified Sustainable Ethanol Initiative is an effort to physically guarantee Swedish consumers that they are filling up with good ethanol and to increase the offering of verified sustainable ethanol in close collaboration with the Brazilian sugar industry.

Swedish bioenergy company SEKAB was presented the prestigious “Sustainable Bioethanol Award” for its development of verified sustainable ethanol and the technology for bioethanol based on cellulose at an event in Brussels including the world’s foremost leaders in biofuels. A British company, Green Power Conferences, lies behind the prize, which was awarded for the first time at the 2009 World Biofuels Markets Conference and Exhibition in Brussels. An independent jury comprising seven international researchers and scientists were responsible for the choice of SEKAB in the bioethanol category from a number of nominated companies [12].

SEKAB has a core business with green chemicals and diesel replacements based on ethanol. The company is also a world leader in development of technology and production processes for ethanol from cellulose, with a pilot plant in operation since 2004. Its main office and pilot plant are in Örnsköldsvik, Sweden. The company’s goal is to create the prerequisites for - and actively contribute towards - tomorrow’s sustainable transports with the help of long-term sustainable alternative fuels.

Verified Sustainable Ethanol Initiative

Together with Brazilian ethanol producers, the Swedish company SEKAB has developed the Verified Sustainable Ethanol Initiative over the past year. The verified and traceable ethanol is available in Swedish pumps since August 2008. An independent international company will be performing on-site checks to make sure the producers are meeting the system's requirements.

Sweden is far ahead of most EU countries on use of biofuel. As use of ethanol increases there is an increasing demand for sustainability declarations and certification. As the ongoing EU process seems to be dragging on, the trade associations. BioAlcohol Fuel Foundation (BAFF), which represents the ethanol market in Sweden, and UNICA, which represents the sugar-cane industry in Brazil, have agreed to jointly drive a process with the aim of shifting the entire Brazilian ethanol industry towards more sustainable production.

8 First initiatives in implementing sustainability criteria for biomass and bioenergy

Table 4. Companies[1] that started to prepare for implementing sustainability criteria in their production or trade of biomass and bioenergy.

Name company	Has to fulfill RED criteria (Y/N)?	Preparatory steps taken (as of September 2009)
Södra	N	Green forest management and green license card for felling-worker

References

1. *Annon.* 2008. Energy in Swede. Swedish Energy Agency, Eskilstuna, Sweden

2. *Olsson, O.* et al. (2009), EUBIONET III WP2 Biomass Fuel trade in Europe, Country Report: Sweden

3. Annon. Swedish Association of Pellet Producers, ”Leveransstatistik Sverigemarknaden” Available at: http://www.pelletsindustrin.org/web/Leveransstatistik.aspx) bn

4. *Annon 2008. Swedish National Forest Inventory, Forestry Statistics 2008.*

5. FAO, Food and Agriculture Organization of the United Nations: essential documents, statistics, maps and multimedia resources. Available at http://faostat.fao.org/site/626/default.aspx#ancor

6. Comparative database of forest certification schemes. Available at http://www.forestrycertification.info/phpprograms/createpdf/getpdfdata.php3

7. http://www.pefc.org/internet/resources/5_1185_1308_file.1510.pdf

8. http://www.pefc.se/index.asp?pageid=16819

9. http://www.krav.se/Documents/arsredovisning/Arsredovisning2008.pdf

10. http://faostat.fao.org/site/377/DesktopDefault.aspx?PageID=377#ancor

11. http://organic.usask.ca/reports/SE.pdf

12. http://www.hallbaretanol.se/default.asp?id=1062

Appendix 1 – Initiatives or systems to guarantee sustainability of biomass feedstock from forest

(to be filled in by country partner)

Name <u>national</u> system or initiative:

General characteristics:	
Initiator system:	
Coordinating party:	
Initiation – duration:	
Grade of integration	
Geographical coverage:	
Scope (feedstock included):	
Value chain	

Mission or objective:		
…	Principles included:	Y/N
	Criteria included:	Y/N
	Indicators included:	Y/N

Context (i.e. legal requirement, related policies):
Current status of system:
Planned activities:

Structure of the system or initiative:	
Stakeholder participation:	
Commitment:	
Stakeholder integration:	

Monitoring performance:	
Chain of custody mechanism:	
Verification mechanisms:	
Further information:	
Removal of trade barriers	
Costs:	

List of principles included:	
1	
2	
3	
….	

References:	
Website:	

List of criteria and indicators:

Criteria	Indicators:	Methodology used:	Databases used:

Appendix 2 – Initiatives or systems to guarantee sustainability of biomass feedstock from agriculture

(to be filled in by country partner)

Name <u>national</u> system or initiative:

General characteristics:	
Initiator system:	
Coordinating party:	
Initiation – duration:	
Grade of integration	
Geographical coverage:	
Scope (feedstock included):	
Value chain	

Mission or objective:		
…	Principles included:	Y/N
	Criteria included:	Y/N
	Indicators included:	Y/N

Context (i.e. legal requirement, related policies):
Current status of system:
Planned activities:

Structure of the system or initiative:	
Stakeholder participation:	
Commitment:	
Stakeholder integration:	

Monitoring performance:	
Chain of custody mechanism:	
Verification mechanisms:	
Further information:	
Removal of trade barriers	
Costs:	

List of principles included:	
1	
2	
3	
….	

References:	
Website:	

List of criteria and indicators:

Criteria	Indicators:	Methodology used:	Databases used:

Appendix 3 – Initiatives or systems to guarantee sustainability of bioenergy from heat and power

(to be filled in by country partner)

Name <u>national</u> system or initiative:

General characteristics:			
Initiator system:			
Coordinating party:			
Initiation – duration:			
Grade of integration			
Geographical coverage:			
Scope (feedstock included):			
Value chain			
Mission or objective:			
…		Principles included:	Y/N
		Criteria included:	Y/N
		Indicators included:	Y/N
Context (i.e. legal requirement, related policies):			
Current status of system:			
Planned activities:			

Structure of the system or initiative:	
Stakeholder participation:	
Commitment:	
Stakeholder integration:	

Monitoring performance:	
Chain of custody mechanism:	
Verification mechanisms:	
Further information:	
Removal of trade barriers	
Costs:	

List of principles included:	
1	
2	
3	
….	

References:	
Website:	

List of criteria and indicators:

Criteria	Indicators:	Methodology used:	Databases used:

Appendix 4 – Initiatives or systems to guarantee sustainability of biofuels for transportation

(to be filled in by country partner)

Name <u>national</u> system or initiative:

General characteristics:	
Initiator system:	
Coordinating party:	
Initiation – duration:	
Grade of integration	
Geographical coverage:	
Scope (feedstock included):	
Value chain	

Mission or objective:		
…	Principles included:	Y/N
	Criteria included:	Y/N
	Indicators included:	Y/N

Context (i.e. legal requirement, related policies):
Current status of system:
Planned activities:

Structure of the system or initiative:	
Stakeholder participation:	
Commitment:	
Stakeholder integration:	

Monitoring performance:	
Chain of custody mechanism:	
Verification mechanisms:	
Further information:	
Removal of trade barriers	
Costs:	

List of principles included:	
1	
2	
3	
….	

References:	
Website:	

List of criteria and indicators:

Criteria	Indicators:	Methodology used:	Databases used: