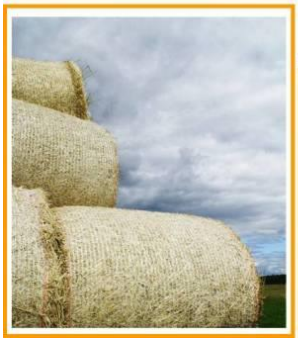





SolidStandards

Enhancing the implementation of quality and sustainability standards and certification schemes for solid biofuels (EIE/11/218)



D6.5
European Industry Position Paper

Co-funded by the Intelligent Energy Europe Programme of the European Union

The SolidStandards project

The SolidStandards project addresses ongoing and recent developments related to solid biofuel quality and sustainability issues, in particular the development of related standards and certification systems. In the SolidStandards project, solid biofuel industry players will be informed and trained in the field of standards and certification and their feedback will be collected and provided to the related standardization committees and policy makers.

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About this document

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Table of contents

Table of contents 3
Foreword 5
1. Description European solid biofuels market/industry 7
1.1. Introduction 7
1.2. General figures 7
1.3. Short description of the market/industry per country 8
1.3.1. Austria 8
1.3.2. Bulgaria 8
1.3.3. Croatia 8
1.3.4. Czech Republic 9
1.3.5. Denmark 10
1.3.6. Finland 12
1.3.7. Germany 12
1.3.8. Lithuania 13
1.3.9. The Netherlands 13
1.3.10. Poland 14
2. Standardization activities 14
2.1. Active national mirror committees per country 14
2.2. Standardization activities per country 15
2.2.1. Austria 15
2.2.2. Bulgaria 16
2.2.3. Croatia 17
2.2.4. Czech Republic 18
2.2.5. Denmark 19
2.2.6. Finland 20
2.2.7. Germany 22
2.2.8. Lithuania 23
2.2.9. Netherlands 24
2.2.10. Poland 26
3. Certification activities and certification needs 29
3.1. Austria 29
3.2. Bulgaria 29
3.3. Croatia 30
3.4. Czech Republic 30
3.5. Denmark 31
3.6. Finland 31
3.7. Germany 32
3.8. Lithuania 33
3.9. The Netherlands 34

3.10. Poland 35
4. The most significant general findings and conclusion 37
4.1. Austria 37
4.2. Bulgaria 37
4.3. Croatia 37
4.4. Czech Republic 38
4.5. Denmark 38
4.6. Finland 38
4.7. Germany 39
4.8. Lithuania 40
4.9. The Netherlands 40
4.10. Poland 40
4.11. Overall conclusion 41

Foreword

Introduction

CEN, the European Committee for Standardization, represented in this consortium by NEN, is interested in gathering the opinions of industry representatives for the development of new standards, the revision of existing standards, and the representation of European interests within international standardization (ISO) procedures. The SolidStandards project offers an excellent opportunity to collect a large number of viewpoints through direct contact with industry representatives. In addition, a broader, public approach has been applied to collect feedback from industry players other than those participating in trainings. Furthermore, experience gained through the project has been used to provide recommendations to CEN and the solid biofuel community how to cope with new developments on solid biofuel markets.

This specific Solid Standards task (6.5) is meant to achieve the following goals:

- To explain the industry points of view to standardization committees.
- To initiate and support the development of additional standards (e.g. on biomass storage).
- To increase the practical applicability of standards under development.
- To bring European industry viewpoints into ongoing CEN and ISO standardization processes.
- To provide the necessary feedback on existing standards in order to facilitate their revision in the future.

Content and scope of this position paper

- Chapter 1 describes the European solid biofuels market/industry. It is important to mention that it is not possible to provide a general overview for all of Europe. This position paper is limited to a description of 10 countries (all of them involved in the SolidStandards project). If a broader European overview is required, additional research/extension of the SolidStandards project, involving more countries, is necessary (this is not part of the current scope of the SolidStandards project).
- Chapter 2 gives insight in standardization activities and developments that are currently taking place for solid biofuels in these 10 countries. Also standardization needs per country are identified.
- Chapter 3 describes certification activities in these countries (however, most of the significant information can be found in SolidStandards deliverable 4.3 (that is exclusively about this topic. Input from by the national mirror committees and/or SolidStandards training sessions is used for this chapter.
- The most significant, general findings and outcomes are described in chapter 4.

Countries described in this position paper

This European industry position paper contains the feedback collection of:

1. Austria
2. Bulgaria
3. Croatia
4. Czech Republic
5. Denmark
6. Finland
7. Germany
8. Lithuania
9. The Netherlands
10. Poland

This position paper gives a general overview at country and at European level, and only contains the most significant results, recommendations and conclusions at European level. The national industry position papers contain more detailed country specific data.

Eight out of ten national industry position papers were delivered on schedule (July 2013). Finland and Denmark delivered their final position paper in November 2013 because the Mirror Committee meetings were scheduled later than July 2013. The final version of the European Industry Position paper was therefore delivered in December 2013. This means that input from eight countries is mostly based on data available in July 2013. This has practically not been updated afterwards. The Finnish and Danish information was added, based on what was delivered in November 2013.

Methodology

This paper is based on the outcome of the following SolidStandard tasks:

- Task 6.1: Information and feedback gathered during training sessions.
- Task 6.2: Information of the national industry position papers.
- Task 6.3: Information recommendations on standard development for solid biofuel storage.
- Task 6.4: Information about future developments impacting on the development of solid standards.

Follow up

The paper will eventually be distributed among the members of relevant technical committees (CEN/TC 335, CEN/TC 383, ISO/TC 238, ISO/TC 248). NEN will actively distribute this paper by directly contacting the members. It is agreed as project consortium that the other project partners will support NEN with dissemination.

1. Description European solid biofuels market/industry

1.1. Introduction

This chapter gives a general figures per country (general figures), as well as a short description per country in order to provide additional insight.

1.2. General figures

Table 1 provides an overview per country

Table 1.1 General figures per country (October 2013).

Country	AT	BG	CR	CZ	DE	DK	FI	LI	NL	PL
Solid biofuel trader and/or logistics providers										
- Wood pellets producers	30	30	7 or 8	20	41	9	21	>50	>5	40
- Wood briquette producers	>7	10	> 20	20		0	10		?	40
- Woodchips producers	> 200	14		50		200	600		>5	170
- Suppliers of wooden residues	?	?				0	<50		>15	?
- Log wood producers	> 150	?				500	2000		?	?
- Torrefaction products	?	?				0			4	?
- Non-woody pellets producers	?	?		30		0	<5		?	25
- Straw producers	?	?				30000	<5		?	?
- Non-woody briquette producers	?	?							?	280
Solid biofuel trader and/or logistics providers	**>100**	**54**	**1**	**120**	**> 600**	**30000**	**500**	**>50**	**?**	**240**
Solid biofuel users: small-medium sized (< 1 MW)										
- Electricity	?				85000			46	2135	**?**
- Heat	?				193000			29	2310	**?**
- Total	**161080**	**230**	**> 10000**	**600**	**278000**	**800000**	**1030**	**75**	**4445**	**1000000**
Solid biofuel users: large scale (> 1 MW)	**1000**	**3**		**80**	**540**				**2**	**130**
- (co-firing) plants			?						0	
- Waste Energy Plants			> 20						14	
- Total			**> 20**		**> 540**	**170**	**965**		**14**	
Consumer association	**> 2**	**1**	**?**	**2**	**?**	**4**	**1**	**1**	**?**	
Industrial association	**> 7**	**5**	**1**	**3**	**>10**	**5**	**4**	**1**	**>10**	**2**
Combustion, gasification or fuel production equipment manufacturers	**> 25**	**10**	**>2**		**>94**	**100**	**200**	**>10**	**1**	**50**
Certification, inspection or testing bodies	**3**	**1**	**1**	**3**	**>5**	**>5**	**10**	**5**	**>5**	**5**
Laboratory / Research organization	**> 9**	**7**	**3**	**12**	**>20**	**10**	**20**	**3**	**>10**	**8**

(source: National Industry Position papers of 10 project partners involved)

Significant outcomes (based on input from the 10 project partners) are:

- Wood pellets are produced in all the countries that are involved.
- Wood briquettes producers are located in Austria, Bulgaria, Czech Republic, Croatia and Finland, Poland.
- Finland and The Netherlands are the only countries providing data about wooden residues.
- Austria, Denmark, Finland (and Poland (number of producers not provided)) have producers for log wood (Finland has the most, namely 2,000 producers).
- Austria, Czech Republic, Denmark, Finland and Poland have a significant amount of woodchips producers, Bulgaria and The Netherlands a few.
- The Netherlands is the only country for which the amount of producers of torrefaction products was mentioned.
- Non-woody pellets are only produced in Czech Republic, Finland and Poland.
- Denmark and Finland are the only countries with straw*) producers (Denmark has a significant number of producers, namely 30,000) *) REMARK: Straw for heat-/electricity production
- Poland has the most small and medium-sized users (<1 MW), followed by The Netherlands. Germany and Austria also have a significant amount of small and medium-sized users, exceeding the amount of 100,000. The other countries have far less small and medium-sized. users
- Solid biofuels used by co-firing and or waste energy plants are located in Croatia, Germany, Denmark, Finland, The Netherlands and Poland.
- Consumer associations are involved in Austria, Bulgaria, Czech Republic, Denmark, Finland and Lithuania.

- Industrial associations are located in all countries.
- Combustion, gasification and fuel production equipment manufacturers are located in all countries except from Czech Republic.
- All countries have at least one certification, inspection or testing body.
- All countries have a couple of laboratories/research organisations (Germany the most, with over 20).

1.3. Short description of the market/industry per country

1.3.1. Austria

Being a heavily forested country the traditional use of wood (log wood) for heating has always been important in Austria. The kick off for technology development in this market segment came from the introduction of strict air pollution legislation in the beginning of the 1980ies. This forced companies to make significant efforts to reduce the emissions of wood boilers. At the same time Austria had started to enforce the installation of biomass district heating facilities - especially in rural communities, where households are provided with heat made from wood chips. In the 1990ies Austrian researchers and companies searched for a solution to develop a fully automated heating system for domestic use based on wood because over the last few decades many wood boilers had been replaced by oil or gas boilers through the rising demand for comfort. The idea and the first technical solutions for pelletizing wood and combustion of pellets came from the USA and Scandinavia. With the introduction of wood pellet boilers and stoves in the mid 1990ies a new high comfortable solution for heating with biomass was introduced and quickly became a huge success.

Austria is a growing market for solid biomass for heating purpose, and in the national industry position paper it is concluded that Austria is a net exporting country for wood pellets mainly exporting to Italy. On the other hand some residues from the sawmilling and pulp and paper industry originate in imports of sawn logs or industrial round wood. But it is difficult to track the exact amounts. 30 plants produce wood pellets in Austria in 2013.

The total of gross domestic energy consumption 2009 was 1354 PJ, of which 29.3 % are renewable energy and waste = 396,5 PJ). Gross domestic consumption of renewable energy sources in 2009 consisted of 58.9% of bioenergy.

1.3.2. Bulgaria

According to data from the National Statistical Institute for renewable energy sources - 2009 (http://www.nsi.bg/otrasal.php?otr=30&a1=2391&a2=2392#cont) primary energy production of firewood, wood waste and other solid waste is 697 thousand toe or over 65% of all renewable energy sources. The share of firewood, wood waste and other solid waste is 95.2% of final energy consumption (relative to all RES). Firewood used by consumers for heating up 7.4% of final energy consumption in 2009. The share of the technical potential of solid biomass is 34% of the total potential of renewable energy sources in Bulgaria.

1.3.3. Croatia

According to the data provided within the publication Energy in Croatia 2011 (statistical yearbook on energy production and consumption published by the Ministry of economy), the primary energy production from fuel wood and biomass for 2011 amounted to 26,74 PJ, which was 14,3% of total of 187,42. The Croatian total primary energy supply in 2011 amounted to 383,65 PJ, of which 19,23 PJ (5,0%) were supplied from fuel wood and biomass. The difference between production and supply from fuel wood and biomass of 7,51 PJ was exported.

The wood biomass market for energy purposes in Croatia is still in early stages of development except for logwood which has traditionally been used as a source for heating in households. One of the barriers for biomass market development is the lack of financial incentives for investing in wood pellet heating and biomass district heating, but in spite of that woodchips and pellets are gaining on its popularity based on accessibility of cheap biomass boilers from domestic production and development of local pellet production.

Small scale combustion of biomass is by far the most extensive application of bioenergy in Croatia and currently the majority of fuel wood is consumed within the household sector primarily for space and water heating. In areas where the gas grid does not reach, and where there is no district heating system, fuel wood is the main source of primary energy used for heating purposes. Most of this wood is cut from forests especially for energy purposes. Apart from heating, a substantial amount of wood is also used for cooking. Contrary to common practice in many other countries, in Croatia grills are predominantly fuelled by wood, instead of charcoal. Stated reasons for this are the low costs of fuel wood, specific food preparation methods, and tradition.

According to data for 2011 fuel wood contributes with approximately 3,5 % to the total primary energy supply. However, apart from the estimated total consumption on the national level, reliable statistics on fuel wood consumption at municipality levels were not available.

Large scale production of bioenergy takes place in the industry exclusively. Currently in Croatia there are only two biomass plants utilised for the heating of buildings in. However, there are several projects aiming to the building of biomass district heating plants for cities and municipalities which are under implementation phase.

Pellet production in Croatia has experienced significant growth in the last couple of years. Production of wood pellets started in a year 2006/07 as a result of fossil fuels prices growth and increased demand for pellets in EU market. Total installed production capacity has increased up to 276.800 t/y (2011). It is important to mention that most of the produced quantities (estimate is approximately 95%) of pellets in Croatia are currently being exported to other countries.
According to the data provided within the Statistical Yearbook of the Republic of Croatia for 2011 (published by the Croatian Bureau of Statistics, www.dzs.hr) the total production of fuel wood in Croatia in 2011 amounted to 1.030.000 m^3, with approximately 99% of this being broadleaf wood species. The total production of forest products (including fuel wood) in state owned and privately owned forests in Croatia for 2011 amounted to 4.438.000 m3.

1.3.4. Czech Republic

The national biofuels market in the Czech Republic has been constantly developing during the last years. This has been given mostly by positive feed-in tariffs, which were favourable to Czech Renewable Energy Sources (Czech RES). However, as the Energy Regulatory Office proclaimed, there should be a major drop in this support, which will endanger the further development. According to the statistics of Ministry of Industry and Trade of the Czech Republic (MIT) RES have contributed to primary electricity production in the year 2011 by 8,3 %.

The total potential for energy utilization of biomass is in firewood (mostly in pieces) and wood pellets combusted in local boilers, about 10 %, and this potential is under the present conditions of the logging in the CR already practically exhausted. The potential for residual wood suitable for combustion in larger energy sources represents about 27 % of the total potential and this will be fully depleted by forest primary producers already in the near future, the appropriate expansion of this group are the remains of primary and secondary wood processing (from wood and paper industry) and imports from neighboring countries.

Greatest potential remains in the residual agricultural biomass (straw and hay from the agricultural crop production), this potential is currently used in the CR only to a minimum extent. This category can also include residues from the food industry.

The majority of produced biofuels is being exported. This is the case for wood chips, wood and non-woody pellets and also for briquettes. Exports of those biofuels target mostly Germany and Austria. During the last years has however as well increased the import of biofuels, especially of pellets. The imports come predominantly from Germany.

In 2011 wood pellets production was 148.000 t/y, import was 19 t/y, export 111 t/y, and national use 56 t/y. Non-woody pellets are unlike the wood pellets mostly used for national utilization. In the year 2011 148 thousand tonnes of non-woody pellets have been produced. 25,000 t/y thousand have been imported, 7,000 t/y exported, and national consumption was 166,000 t/y of non-woody pellets.

The market with wood briquettes has been with few exceptions constant. The drop has been significant especially in the year 2008. However this has been the case only for the national consumption given by the price development. The exports remained unchanged. The non-woody briquettes production is marginal.

1.3.5. Denmark

Fuels from solid biomass has for decades constituted an important part of the total energy supply and the main part of the renewable energy supply in Denmark. According to the 2011 energy statistics from the Danish Energy Agency, solid biomass covers for 10% of the total primary energy generation and 62% of the renewable energy generation.

In a consumption view, 15% of the total energy consumption and 68% of the energy consumption based on renewables is covered by solid biomass.

Solid biofuels are used in all sizes of plants ranging from stoves and small boilers in private homes over medium sized plants in service and industry sectors and district heating up to application in large combustion plants generating electricity and heat at high efficiency levels.

Wood fuels now clearly account for the major part of the market, however Denmark is a large consumer of straw for energy. Through decades suppliers and plant owners have developed equipment that in an efficient way delivers on the politically dictated straw energy market. Danish straw fired CHP plants operate at advanced steam data and efficient straw combustion technology is one of the Danish success stories within solid biomass.

Danish suppliers offer technology for heating plants, CHP plants and auxiliary equipment in the above mentioned sizes and for all sorts of fuels. Outstanding is also the Danish experience with the development of thermal gasification of solid biomass for CHP purposes where both small scale wood fired CHP and large scale straw gasification for co-firing have proven many operational hours and are coming closer to commercial.

Combined heat and power generation is a hallmark of the Danish energy system and probably the most important single measure to help decouple growth and energy consumption/environmental load. Application of CHP technology has been possible due to the very widespread district heating systems that has also allowed for the application of solid biomass plants - especially pellet fired plants.

In Denmark more than half of the residential heat demand is supplied via district heating. The utilisations of wood pellets started in the district heating sector in the late 1980'es when coal fired heating plants were converted to use wood pellets. The annual pellet consumption

quickly reached around 100,000 tonnes and since the beginning of the 1990'es this has been the consumption level in the district heating sector.

From the mid 1990'es the wood pellet consumption in individual boilers for space heating in private dwellings, public institutions and other large buildings increased rapidly. The drivers would be fuel tax exemption (in combination with high taxes on fossil fuels for heating purposes) and from 1995 an investment subsidy scheme for wood fired combustion systems with a nominal capacity below 250 kW. During 10 years the wood pellet consumption had more than tripled which made the Danish market the second largest in Europe only exceeded by Sweden.

Based on a variety of drivers parts of the Danish utility sector started to show interest in co-firing wood pellets into PC boilers in the beginning of the new century. This resulted in a significant amount of wood pellets being utilised mainly in the advanced Avedøre 2 power plant south of Copenhagen.

Wood pellet production in Denmark started in the 1980'es based on the first experiences from US and Sweden and the feed pellet production in order to accommodate the demand from the district heating plants. The production was initially based on dry wood residues from the numerous wood processing industries. In the beginning of the century the national production capacity and actual production at around 200,000 t/y was able to cover half of the demand. In 2012 the production had decreased to around 100,000 t/y due to changes in the feedstock availability. As the demand has increased rapidly almost 2 million tonnes in 2012 - Denmark has become the world’s largest pellet importing country.

Efficient drivers provide for wood pellets being used in all sizes of combustion plants, from small boilers in single family houses and small block heating centrals over medium sized district heating plants up to large power plants producing power and heat for large district heating systems.

Around one fifth of the Danish wood pellet consumption is used in small and medium sized pellet boilers for heating purposes (2012). Pellets stoves are only slowly entering the market. District heating plants and power plants together account for the 4/5 of the present consumption. This share is, however, expected to change as further large growth is foreseen in the utility sector. In the residential heating market, the very high taxes on oil and gas for heating are the significant drivers. When the basic oil and gas prices are high too, pellet heating becomes very favourable.

New data published by the Danish Energy Agency reveals that the Danish market development has been strongly influenced by changes in political framework conditions. During the late 1990s the Danish market for residential pellets boilers was one of the most dynamic markets in Europe. A sudden change of policies was introduced by a new conservative/liberal government which cancelled all subsidies for renewable energies. This led to an immediate decline in the market growth after the year 2000.

Due to limited domestic feedstock for pellet production the amount of imported wood pellets is growing significantly; in 2012 95 % of the Danish wood pellet consumption is imported.

The framework conditions for electricity production based on renewables in Denmark is given by a feed-in tariff system, the implementation of the EU scheme for greenhouse gas emission allowance trading which has regulated CO2 emissions from January 2005 and a liberalized electricity market. Further the Biomass Agreement from 1993 sets a framework for use of biomass in large scale power plants; it works like a biomass quota system. To some extend, also feed-in tariff support applies. Since spring 2007 the pellet prices in Denmark have remained constant at a level which is low enough to encourage consumers to change for pellets and high enough to be attractive for suppliers.

1.3.6. Finland

In Finland solid biomass fuels are wood fuels from logging residues, small-size trees (thinnings) and stumps and industrial by-products from forest industry (e.g. bark, sawdust, chips), firewood, wood pellets and briquettes. Use of solid wood fuels in industry and energy production plants were 119.8 PJ (2.8 Mtoe) and in addition to these also black liquor is used in forest industry plants. Use of black liquor was 136.6 PJ (3.2 Mtoe) in 2012. Use of wood fuels in small-scale was 62.3 PJ (1.5 Mtoe). Use of firewood (log wood, 2.9 million stoves and fireplaces) is 90% of the total small-scale use, pellets 2% (about 15,000 units) and forest chips 8% (about 60,000 units). Total use of wood fuels was 318.7 PJ (7.8 Mtoe), which is 23% of total energy consumption in Finland in 2012. In Finland there are almost 1,000 places for bioenergy business, of which SMEs are 580.

More than 80% of solid wood fuels are used in plants with boiler output more than 20 MWth. Forest chips include chips from thinnings, roundwood, logging residues and stumps. In Finland small-scale use means biomass use in households and farms, usually with boiler output less than 50 kWth. Plants less than 1 MWth are usually small-district heating systems or heating of one public or industrial building.
In Finland pellets are mainly used in large building like airports, public and industrial buildings and tourist centres. Use of wood pellets is increasing in CHP plants in cofiring with coal in Helsinki.

1.3.7. Germany

The German solid biofuels industry in the last year was a noticeable rise in heat supply from all renewables in heat consumption from approx.135 TWh in 2011 to more than 144 TWh in 2012. Nevertheless, the share of 10.4 percent renewable energy sources in Germany's heat consumption remained at the level of 2011.

Biomass remained the dominant source of renewable heat with a share of around 91 percent and in total of around 131 TWh biomass supplied nearly seven percent more heat than in 2011. This is attributable in particular to the greater use of wood in private households in 2012, due to cold weather conditions.

Since 2000 one of the largest wood pellet markets worldwide could be established. Germany has 41 pellet-producing companies active at 59 different sites. The company “German Pellets” has an outstanding position with a production of approx. 800.000 tons pellets per year which is more than one third of the whole German pellet production of about 2.2 million tons in 2012. 1.7 million tons are used the rest is exported to the neighbour countries mainly to Austria, Italy and Denmark. Approximately 90% of the raw materials for pellets are saw-mill residues.

The market for wood chips is strongly regional influenced so the number of wood chips producers and traders is not known. In general perspective wood chips have a very low importance for the heat supply of private households (not even 1%). In larger wood chip heating systems and wood chip heating plants up to 1 MW thermal input, as they are typical for farms, in municipal and the industrial sector, about 10 million loose cubic meters are used. In heating biomass power plants larger than 1 MW approx. 40 million loose cubic meters of wood chips or shredded material are used. While in private heating systems and heating plants smaller than 1 MW the use of forest wood chips dominates, in larger plants used wood (waste wood) and industrial wood residues are predominant4.

Straw, miscanthus and other agroplants for fuels are of minor importance in the German market.

1.3.8. Lithuania

The total electricity consumption of Lithuania is ~ 10 TWh, total heat consumption – 20 TWh. Around 50 % of heat is produced in district heating and the other 50 % is produced in private households, public buildings, i.e. objects not connected to the district heating.
Electricity from renewable energy in 2011 had ~ 12 % of the market share, out of which ~ 4 % was produced from hydro energy, ~ 4 % - from wind and ~ 4 % from biomass/biogas. The bigger part, ~ 88 % of electricity was imported: ~ 8 % from the EU, and ~ 80 % from the Russian Federation.

In district heating from renewable energy in a form of solid biomass (wooden chips, firewood, straw and wood pellets,) was produced ~ 27 % of the market share, and in private households ~ 80 % of the market share (mainly in a form of firewood, wood briquettes, wood and straw pellets). Other 73 % of the district heating market share was produced from non-renewable energy, major part being natural imported gas (2012 data).

1.3.9. The Netherlands

Renewable energy accounted for 4.4% of total energy consumption in the Netherlands in 2012. Biomass accounts for more than 70% of all renewable energy, and wind power for slightly less than 20%. Other sources – hydropower, solar energy, geothermal energy and ambient heat – make only a small contribution. Electricity generated by wind turbines, hydropower plants, solar panels and biomass accounted for more than 10% of all electricity consumption in 2012, approximately a half percentage point more than in 2011. The share generated by wind turbines rose by 5% in 2012 owing to an increase in capacity. The share accounted for by biomass remained virtually static. Solar energy generation more than doubled, but it still represents no more than 2% of the overall production of renewable electricity. Renewable sources of energy continued to provide just over 3% of the Netherlands' heat in 2012. Consumption of renewable energy in the transport sector rose from 4.6% in 2011 to approximately 5% in 2012.

The main policy measure stimulating the use of renewable energy is the "SDE+" scheme (SDE stands for "Sustainable Energy Incentive"). The scheme covers the difference between the price of grey energy and the price of sustainable energy for a 5, 12 or 15-year period, depending on the technology used. The budget for renewable energy will increase gradually to EUR 3.8bn in 2020.

The parties agree that promoting the use of biomass by coal-fired power stations will not exceed the level of 25 PJ. In the context of the best possible use of biomass and strict sustainability criteria, methods will be elaborated for how the 25 PJ restriction on biomass, the type of support, and the possible use of a procurement procedure can be given shape within the SDE+.[1]

In The Netherlands large scale power plants use biomass for co-firing applications, especially wood pellets. The consumption of wood pellets by utilities is expected to increase in the near future, however a decline in consumption was noticed. But this will depend to a large extent on legislation (for e.g. possible introduction of a suppliers' obligation) and market changes.

The Dutch industry produces not enough wood pellets General figures for 2011 in the Netherlands are, the production of woodpellets is 700,000 t/y, production of woodchips and other woody biomass 0,15 Mt., production of Round wood 480,000 t/y, production of round fuel wood (for woodstove of household consumption) is 660,000 t/y. A total of 1,280,000 t/y

[1] Energy Agreement for Sustainable Growth, SER, October 2013

of woodpellets was imported in 2011. It can be concluded that The Netherlands is a net importing country for wood pellets. Wood pellets are imported mainly from Canada and the USA.

1.3.10. Poland

Renewable energy market in Poland was set up in 2005 as a result of accession to the European Union. Poland committed itself to have specific share of renewable energy in total amount of energy produced in the country (from 6% to 15% in 2020). It resulted in law obliging energy distributors to purchase at least 3,1% electricity deriving from renewables in 2005 up to 19% in 2020. The only possible way to increase the production of green energy, taking into account the structure of Polish power plants based on conventional energy sources, was utilisation of biomass in existing installations. In Poland co-firing of biomass with coal was (and still is) regarded as energy production from renewable sources. Until 2008 it was possible to use only wood biomass in co-firing process. However, in order to limit the use of wood biomass in co-firing process, it is obligatory since 2008 to co-fire biomass from agriculture and energy plantations at given levels – from 20% in 2008, 50% in 2012 up to 85 % from 2018. The annual obligation to increase the share of renewable energy and significant investments in infrastructure necessary to fulfil this share by energy sector resulted in long-term agreements for the supply of biomass. Biomass producers and suppliers had to make investments aimed at meeting the growing demand for solid biomass. As a result of these conditions, biomass production raised to approximately 2,700,000 t/yr.

2. Standardization activities

2.1. Active national mirror committees per country

There are active national mirror committees in the following countries

Country	Active national Mirror Committee(s)	Number of committee members	Feedback received
Austria	Yes, ONK 241, Energy from solid biomass	23	Yes
Bulgaria	No		
Croatia	Yes, Technical Committee 238 under HZN	4	No
Czech Republic	No, but has a working group no. 138	-	
Denmark	Yes, national committee S-358 Biofuels	7	Yes
Germany	Yes, mirror committee NA 062-05-82 AA Feste Biobrennstoffe	15	Yes
Finland	Yes, national mirror committee under SFS	11	Yes
Lithuania	Yes, national mirror committee under LST	?	Yes
The Netherlands	Yes, mirror committee 310029 Solid Biofuels under NEN	12	Yes
Poland	Yes, technical Committee 144 on Coke and Other Solid Formed Fuels	22	Yes

2.2. Standardization activities per country

Remark
In order to get a detailed insight in uptake of standards per topic per country, please take a look at each national position paper.

2.2.1. Austria

Description of standardization activities in Austria
In Austria the national committee ONK 241 “Energy from solid biomass” is mirror committee for CEN/TC 335 and ISO/TC 238. Before European and International standardization for solid biomass started to work on the topic of solid biomass, ONK 241 was one of the first to develop standards for wood chips, wood pellets and wood/bark briquettes.
23 members are listed in the mailing list of ONK 241 (dated April 2013); 9 of them represent company interests, e.g. boiler producers, chipper/shredder producers. No solid biomass producer is member of the national committee. 7 members come from interest groups, 6 from testing/research institutes and 1 member comes from the standardization institute itself; the latter represent solid biomass in general.

ONK 241 is an active committee with approximately 4 meetings per year. A major task during the last years was to comment European and now International standards on the basis of experience collected during the use of these standards. Members of ONK 241 are also in charge of developing new work item proposals (NWIP) for ISO/TC 238 about e.g. torrified pellets/briquettes. The input of the testing/research institutes in the standardization process is only possible through financed research projects on different topics and the financing of travel costs for the participation in international meetings. These costs are usually shared by different interest groups, which support the work of the national committee (sometimes even without being a member). This well working cooperation of testing/research institutes and different interest groups in the field of solid biomass is the main driving factor for the active participation of Austria in the standardization process.

Standardization – standards uptake and needs in Austria
Apart from the work on the international standardization, new national standards were developed, mostly as supplements to European standards. The already existing standard ÖNORM M 7137 concerning pellet storage was updated as a consequence of the ongoing CO-discussion. Other existing standards are subsequently updated if necessary.

Recently the need for a method to analyse the content of stones/mineral impurities in wood chips and hog fuel was discussed in national and international committees. It was decided that Austria is going to prepare a new work item proposal NWIP for ISO/TC 238 on that topic.

The national committee mentioned a need for the standardization of torrefied material on international level. This work is already in progress as Austria has developed NWIPs for torrefied wood pellets and briquettes for WG2 of the ISO standardization committee ISO/TC 238.

The European standard for the determination of particle size distribution ÖNORM EN 15149-1 has to be discussed again to clarify some details of the method. This work is in progress as part of WG4 of the ISO standardization committee ISO/TC 238.
Apart from that the national committee ONK 241 has satisfied the needs for new standards, e.g. on storage, maize cob and so on, in the past on national level already.

In the course of 2 trainings on wood chip quality 22 feedbacks were collected. Due to the small number of questionnaires a general overview is given on the implementation of European standards in Austria.

For pellets most producers are certified according to the certification programmes ENplus or DINplus. Both certification schemes are based on the ÖNORM EN 14961-2 and ÖNORM EN 15234-2; that is why the implementation of the European standards is already well advanced.

For all other solid biomass products the implementation of the new standards is still pending. For wood briquettes the implementation of ÖNORM EN 14961-3 and ÖNORM EN 15234-3 will take place 2013 due to the release of ÖNORM C 4006. For wood chips it is more difficult to prove the correct implementation of the European standards because no certification system exists. Nevertheless it can be noticed that due to the release of ÖNORM C 4005 and the training events in the course of the SolidStandards project the awareness of the new standards and the willingness to implement them has increased.
Standards for physical and chemical test methods are usually applied by laboratories and testing bodies. It can be assumed that accredited laboratories are working with the European standards. Company laboratories often still use different test methods; like e.g. the Lignotester for the determination of the mechanical durability of pellets.

2.2.2. Bulgaria

Description of standardization activities in Bulgaria
The Bulgarian Institute for Standardization (BDS) is the national executive body for standardization in the Republic of Bulgaria. BDS develops, accepts and approves Bulgarian standards, participates in the work of international and European organizations for standardization, as its main target is to defend the Bulgarian interests in that sphere.
Now the Bulgarian Industry in the field of biofuels in general wants to use all existing European standards about solid biofuels. There is not any Bulgarian certification organization at the moment.

Standardization – standards uptake and needs in Bulgaria
The implementation of the international standards for industry in Bulgaria can be very good opportunity from national point of view connected with the market conditions and development and sustainability in the field of solid biofuels production, transport and logistics. The main conclusions are as follows:

- Need for establishment of certification organisations which can make the process of standardization in Bulgaria.
- The parliament and government support in the field of establishment of low framework in the solid biofuels market including measures for standardization and certification.
- Overcome of normative, financial and political barriers for standardization and certification process in Bulgaria.
- Actively participation of Bulgarian Institute for Standardization (BDS) in the current EU standards implementation and the next standards acceptance and approval in the future.
- Creating of dissemination activities on national and regional level which will support the market players.

The participants in the training have given remarkable feedback regarding the necessity of using of all European standards for solid biofuels (by means of the questionnaire:

For wood pellets:
- EN 14961-1, Fuel specification and classes - Part 1: General requirements
- EN 14961-2, Fuel specification and classes - Part 2: Wood pellets for non-industrial use
  EN 15234-2, Fuel quality assurance - Part 2: Wood pellets for non-industrial use

For wood briquettes:
- EN 14961-3, Fuel specification and classes - Part 3: Wood briquettes for non-industrial use

For wood chips:
- EN 14961-1, Fuel specification and classes - Part 1: General requirements
- EN 14961-4, Fuel specification and classes - Part 4: Wood chips for non-industrial use

Firewood:
- EN 14961-1, Fuel specification and classes - Part 1: General requirements
- EN 14961-5, Fuel specification and classes - Part 5: Firewood for non-industrial use

2.2.3. Croatia

Description of standardization activities in Croatia

The standardization activities regarding solid biofuels in Croatia are coordinated by the Technical Committee 238 (TC 238) on Solid Biofuels established in December 2011 within the Croatian Standardization Institute (www.hzn.hr). Currently the following institutions are members of the TC 238:

- Faculty of Forestry, University of Zagreb (member from December 2011)
  - Prof. Željko Zečić is acting President of TC 238
- Ministry of Agriculture of the Republic of Croatia (member from December 2011)
- Croatian Forests Ltd. - Hrvatske šume d.o.o. (member from December 2011)
- North-West Croatia Regional Energy Agency (member from May 2013)

Standardization – standards uptake and needs in Croatia

TC 238 has adopted the standards on solid biofuels developed by the European Committee on Standardization as Croatian standards and has labelled them by adding HRN as a prefix (for example, standard EN 14961-1:2010 is labelled as HRN EN 14961-1:2010 Solid biofuels -- Fuel specifications and classes -- Part 1: General requirements). However, these standards have been adopted in original English language and at the moment the main activity of TC 238 is focused on the translation of the standards Croatian as well as unification of the relevant terminology on solid biofuels. This is especially important since different institutions and organisation have in the past used somewhat different terminology which could result in misunderstandings

The results presented in are based on the feedback received from two training events organised for solid biofuel producers in Croatia. Over 60 questionnaires were distributed and in total 18 were received back. The overall comment from all participants at the trainings was that the questions were very difficult for them to answer. Thus it can be concluded that the uptake of European standards on solid biofuels in Croatia is still at the very early stage. Part of the explanation for this can be found in the fact that, even though the EN standards were officially adopted as national standards, they are not yet translated in Croatian language. Most of the solid biofuel producers in Croatia are not very familiar with English (especially the technical wording included in the standards), meaning they have very little information on standards and this was one of the main conclusions from the trainings. This is also reflected by the difficulties in filling in the questionnaires they had at the trainings.

It can be concluded that the uptake of European standards on solid biofuels in Croatia is still at the very early stage. Part of the explanation for this can be found in the fact that, even though the EN standards were officially adopted as national standards, they are not yet translated in Croatian language. Most of the solid biofuel producers in Croatia are not very familiar with English (especially the technical wording included in the standards), meaning they have very little information on standards and this was one of the main conclusions from the trainings. This is also reflected by the difficulties in filling in the questionnaires they had at the trainings.

Croatian solid biofuels (primarily wood pellets) producers are in part motivated to apply the EU standards and obtain relevant certificates (primarily ENPlus). However, based on direct

communication and exchange of information with several Croatian solid biofuels producers, this is still not seen as a key issue in the near future.

Currently the most important need in order to widen the activities is to engage more representatives from other groups of stakeholders (solid biofuels producers, industry of wood fired boilers, consumers associations

2.2.4. Czech Republic

Description of standardization activities in Czech Republic
The Czech Office for Standards, Metrology and Testing (COS) is the national executive body for standardization in the Czech Republic. COS develops, accepts and approves Czech standards, participates in the work of international and European organizations for standardization, as its main target is to defend the Czech interests in that sphere.

The COS is also setting up work groups for the further development of those standards. The working group 138 is responsible for the implementation of standards for solid biofuels
The standards for solid biofuels are closely connected with the EU standards as those have been mostly implemented to national conditions.
Further standards, which have been implemented to national system are ČSN EN 15234-1 to ČSN EN 15234-6.

Standardization – standards uptake and needs in Czech Republic
The Czech market with biofuels is highly export oriented. Due to this, the actors on the Czech market are aware of many EU standards, which they as well use for their products. The further development of solid biofuel standards could lead to higher competitiveness on the EU market and to a more transparent national market.

The feedback from the participants has been rather poor (information was not received from a large group of participants).

The trained participants have a professional need and desire to be certified under the following EU standards for solid biofuels:

For wood pellets:
- EN 14961-1, Fuel specification and classes - Part 1: General requirements
- EN 14961-2, Fuel specification and classes - Part 2: Wood pellets for non industrial use
- ENplus
- DINplus

For wood briquettes:
- EN 14961-1, Fuel specification and classes - Part 1: General requirements
- EN 14961-3, Fuel specification and classes - Part 3: Wood briquettes for non industrial use

For wood chips:
- EN 14961-1, Fuel specification and classes - Part 1: General requirements
- EN 14961-4, Fuel specification and classes - Part 4: Wood chips for non industrial use

Firewood:
- EN 14961-1, Fuel specification and classes - Part 1: General requirements
- EN 14961-5, Fuel specification and classes - Part 5: Firewood for non industrial use

The main conclusions for the Czech Republic are as follows:
- Well-developed certification systems;
- Insufficiently developed national market;
- Overcome of normative, financial and political barriers for standardization and certification process in the Czech Republic;
- New possibilities of solid biofuel certifications (i.e. ENplus);
- Creating of dissemination activities on national and regional level which will support the market players.

2.2.5. Denmark

Description of standardization activities in Denmark
In Denmark the national committee S-358 Biofuels at the Danish Standards Foundation is the mirror committee for CEN/TC 335 and ISO/TC 238.
The committee meets once a year and the current members of the committee are representatives from:
- Daka Denmark A/S
- DONG Energy A/S
- Energy and Oil Forum, EOF
- FORCE Technology
- Novozymes A/S
- Danish Technological Institute
- Vattenfall A/S Generation Nordic, Thermal Power

Except from solid biofuel standards, members of the committee are also in other standards:
- CEN TC 19 Petroleum products, lubricants and related products
- CEN TC 383 Sustainably produced biomass for energy applications
- ISO TC 248 Project committee; Sustainability criteria for bioenergy"
- ISO TC 255 Biogas

Standardization – standards uptake and needs in Denmark
Quality standards are still not a very big issue in the Danish solid biofuels market.
At accredited laboratories such as FORCE Technology, fuels are analysed according to the respective standards, however in the market place, generally only a small choice of fuel properties are used in the daily trading and utilisation arrangements.

In the straw market, moisture content (i.e. the heating value) is the main parameter determining whether the consumer will accept the fuel or not as well as the fuel price.
Wood chips are also traded according to moisture content, however size distribution as well as a general indication of geographic origin matter.

The pellet market is currently the fastest growing part of the solid biomass business. In the small and medium scale markets pellets are to a wide extent purchased according to proprietary standards such as "HP-quality", "Stampemøllen" etc. and according to the consumer's previous experiences and positive appraisals from friends and colleagues. Some traders classify pellets alone according to the ash content.

This does, however, not imply that the pellets used in Denmark are of a low quality. If the consumer experiences problems with high ash content, problematic ash, slagging etc. it will be difficult for the dealer to continue operation for a longer period of time. Such branding is popular; however standards and certification schemes are increasingly being applied.

In the course of two trainings representatives from the Danish industry provided information and points of view on the uptake of standards. 37 respondents have used the feed back form

from the project and some have indicated the current and possible future application of existing EN standards.

The results of the feedback show a generally limited current uptake of standards in Denmark:
- 9 respondents indicate that they are using EN 14588 on terminology
- 14 respondents indicate that they are using the general part (Part 1) of EN 14961 on fuel specifications, while 10 indicate they are using Part 2 on wood pellets. There are less using the other parts
- 7 respondents indicate that they are using the general part (Part 1) of EN 15234 on quality assurance, while less are using the other parts
- 8-11 respondents indicate that they are using EN standards on sampling, determination of moisture content, calorific value, bulk density, particle size distribution and mechanical durability
- Less than 8 respondents indicate that they are currently using standards for determination of other properties than the above mentioned.
- Regarding the future application of standards, the following outcome from the respondents appears:
- 9 respondents indicate that they will be using EN 14588 on terminology - 6 of the respondents are currently not
- 14 respondents indicate that they will be using the general part (Part 1) of EN 14961 on fuel specifications, of these 8 are currently not. 14 indicate they will be using Part 2 on wood pellets, of these 11 are currently not doing so. There are lower indications on the future use of the other parts of EN 14961
- 13 respectively 12 respondents indicate that they will be using the general part (Part 1) and the wood pellet part (Part 2) of EN 15234 on quality assurance, of these 9 (in both cases) have indicated that they are not currently using the standards. There are lower indications on the future uptake of the other parts of EN 15234
- 15 respondents (of these 10 new) indicate that they will be using EN 14778 on solid biofuels sampling
- 7-10 respondents indicate that they are using EN standards on determination of moisture content, calorific value, bulk density, particle size distribution, mechanical durability and determination of total content of carbon, hydrogen and nitrogen
- Less than 7 respondents indicate that they will be using standards for determination of other properties than the above mentioned.

As to which of the current standards are very important to the biomass market in the opinion of the respondent, four indicate that parts of EN 14961 are important, while one indicate 15234-2. One respondent accentuate EN 14961-1 as "a tool which gives a common and unambiguous language for specification and characterization of the solid bio fuels". One indicate the importance of a number of more specific standards: EN 14774-2 (Simple determination of moisture), EN 15103 (Determination of bulk density), EN 15210 (Determination of mechanical durability) and EN 14775 (Determination of ash content). Two indicate DINplus and one A1 (which must be understood as ENplus).

2.2.6. Finland

Description of standardization activities in Finland

The Finnish Standards Association (SFS) is the central standardization organization that controls and co-ordinates national standardization work in Finland. In Finland, standardization activities have been distributed among the 12 affiliates of SFS, and, as the central organization, SFS supports their standardization work. SFS and its affiliates co-ordinate the participation of Finnish stakeholders in the European and international standardization work. Standardization of solid biofuels has been the responsibility of Finnish Forest Industry Federation during 2000 to 2012. Since 2013 responsibility has been moved to Kemesta ry, which is a new standardization association carrying out standardization work on the fields of e.g.: solid biofuels, biobased products, biotechnology, sustainability criteria

for bioenergy, transportable gas cylinders, paints and varnishes, plastics, explosives, furniture, and paper, board and pulps.

VTT has also developed together with Nordic peat countries and Russia, Nordtest guidelines for fuel peat NT ENVIR 009:2005: “Quality guidelines for fuel peat: Fuel classification and quality assurance, sampling and analysis of properties”, which is published in English, Swedish and Finnish.

Tapio and Metla have also developed Finnish measurement guidelines for energy wood .
The Finnish Mirror committee of Solid biofuels has participated actively in CEN/TC 335 and ISO/TC 238 standardization work. Finland through SFS is leading working group 2 in CEN/TC 335 (Fuel specifications and classes, fuel quality assurance) and working group 2 also in ISO/TC 238 (Fuel specifications and classes). The members of Finnish mirror committees have participated in working group meetings and commented draft standards.

It is also important to guide stakeholders on how to use standards. Associations of Finnish Bioenergy, Forest Industry Federation and Finnish energy industries have financed VTT to produce wood fuel guidelines which is based on EN-standards for solid biofuels. This guideline “Puupolttoaineiden laatuohje” (VTT-M-07608-13) was published in 27 November 2013 in national bioenergy days and guidelines included quality guidelines for forest fuel and “clean” industrial wood residues. Guideline also included training material of SolidStandards-project e.g. how to measure moisture content, bulk density and particle size distribution. This guideline will be used in Finnish market and estimation is about 90% of wood fuel markets will follow this. Domestic wood fuels like pellets, briquettes and firewood is excluded from guidelines.

Standardization – standards uptake and needs in Finland
The pellet and small-scale use committee of the Finnish Association of Bioenergy has proposed to SFS a new work item for national or international standardization on pellet storage for small scale use including safety issues. Based of that work could be Motiva Oy's published guidelines for small-scale pellet storage building. There have been two fatal accidents in pellet storage in Finland, and therefore this kind of standard is urgently needed. European Pellet Council (EPC) has also discussed the safety issues in pellet production and storage and there was last year an international seminar on this issue (http://www.pelletcouncil.eu/en/safety-workshop/). There is need for national implementation of safety issues, because building codes differ in different countries. Finland has experience of this field and has also been very active in developing Nordtest methods (www.nordicinnovation.org). VTT led a group, which developed Nordtest method 10: NT ENVIR 010:2008-10: “Guidelines for storing and handling of solid biofuels”, which include storage of wood chips, straw and pellets mainly in large scale. Domestic sector was excluded.

VTT distributed the SolidStandards questionnaire in three training events: general on 21 March 2012, firewood on 22 March 2012 and wood chips on 9-10 April 2013. During training events there was reserved time to fill in the questionnaire in the end of the programmes. All those, who filled in the questionnaires, also received a training certificate from VTT. In total 95 responses were received and the results were filled into the QuestBack internet system planned by NEN. There were not any comments on special standards only for wood chips and firewood. Most of the respondents answered special questions for wood chips or hog fuel (EN 14961-1 and 4). Also 9 answers were received for firewood (EN 14961-1 and 5). Most of the respondents complained that the questionnaire is too long. Answers for special standards are listed in chapter 4.3. of the national industry position paper of Finland.

Finnish needs are standards for:

- Torrefied products.
- Sampling of peat and wood, harmonization/standardization of quality assurance and sampling handling.
- Usage of stumps, traceability.
- Standardization of manual sampling method for different kind of unloading methods.
- guidelines for quality of work of the driver/sampler*.

* in Finland sampling of wood chips or hog fuel is carried out by truck drivers and there is need for simplified guidelines for this.

2.2.7. Germany

Description of standardization activities in Germany

The German Engineering Association (VDI) developed a guideline “Emission control - storage of wood pellets at the end-user - requirements for the storage room concerning safety aspects” was published in September 2012 as a draft version. Within this guideline, requirements for specification and design of pellet storage up to a capacity of about 100 tons are given. These requirements serve to prevent and mitigate potential issues or risks in pellet storage. They are based on the exclusive use of pellets according to EN 14961-2. The directive is aimed at all people that build operate or monitor a pellet store.

Martin Behr from the German Pellet association DEPV was deeply involved in the development of this guideline. Martin Behr is member of “CEN/TC 335 Solid Biofuels” and “ISO/TC 238 Solid Biofuels” and as well member of the “German mirror committee NA 062-05-82 AA Feste Biobrennstoffe”.

On the last committee meeting in January 2013 a company initiative for hydrothermal carbonization of biomass was presented. The committee is interested but a broader basis of companies has to be involved in this topic. It was agreed to check if the subject can be included in the same standard as “torrefaction”. In a first step information about possible fuel quality, end-user needs and the production process is needed. Besides that no further subjects are under development at the moment.

Terminology.

According to the questionnaire the market actors hardly use this standard yet but probably a greater number of them apply for it in the future.

Specification & classes

Most important standards developed by CEN/TC 335. These standards are basis for certification schemes (see chapter 3 of the national industry position paper of Germany).

Quality assurance

Play mainly a role for certification schemes (see also chapter3). Best implementation is the certification scheme ENplus for wood pellets. In other areas of solid biofuels, the implementation of quality assurance and certifications is more difficult. Reasons for this might be seen in the fragmented industry and the low degree of organization.

Sampling and sample preparation

There is nearly no implementation of the standards on the market because they are not applicable and functional tools for the users are missing.

Physical and mechanical properties

Since biofuel producers mostly use fast measuring methods for internal quality control (e.g. according to EN 15234) the scientific test methods defined in the testing standards, are mostly used by (accredited) biofuel lab. Participants of the workshops organized within the SolidStandards project mentioned the missing of appropriate quick test methods.

Chemical properties

The analysis of chemical properties for solid biofuel is very cost-intensive and complex. They don't have to be carried out for company internal quality control according to the quality assurance standards. The new testing standards for the chemical properties are not used by biofuel producers, only by biofuel labs, mainly involved into the testing for certification schemes. Currently only a few labs in Germany are accredited for the application of the standards (mainly in the pellet sector). Participants of the SolidStandards workshops asked for the implementation for an own laboratory.

Standardization – standards uptake and needs in Germany

Training participants think that there should be standards on health and security aspects for end-user pellet storages. The assessment of different risks is mentioned are related to dust explosion, off-gassing, self-ignition and fungi spores. Furthermore this counts for (mostly) wood briquettes and wood chips, but also (fewer mentioned) firewood, non-woody pellets (agro pellets, mixed pellets), straw (wheat and energy crops) and other biomass fuels

Results from the questionnaires and other criticized points within the discussions during the workshops can be found below:

- A need for further standardization is seen at field of hydrothermal carbonization of biomass (HTC).
- The development of a standard/guideline for the measurement of ash melting behaviour was once mentioned in the questionnaire.
- An own standard for industry-pellets was preferred by several participants.
- The subject of sustainability within the product and certification standards should be implemented and was mentioned more often during discussions.
- In the opinion of several participants there is a need for the development of practice-oriented methods for producers and consumers to measure and to verify product characteristics. In particular there is a need for suitable rapid test methods that are feasible on site or at least without extensive laboratory testing.
- The size-classes for wood chips in EN 14961 were criticized by lots of participants as "not suitable" in practice.

2.2.8. Lithuania

Description of standardization activities in Lithuania

In Lithuania there is one national mirror committee - Lithuanian standards board (LST). It was established by the Resolution No. 125 of 25 April 1990 of the Lithuanian Government. Lithuanian Standards Board is the budgetary institution of public administration functioning as National Standards Body (NSB) and within its competence taking part in establishing and implementing the policy of the Government of Lithuania within the standardization field, carrying out other functions provided by the Laws and other legal acts of Lithuania and taking active part in the activities of international and European standardization organizations by representing interests of Lithuanian economy

Regarding solid biofuels standardization in Lithuania, there was only one standard adopted by LST, namely LST 1986:2007 - Solid fuel - Fuel peat. This standard determines peat that is used for fuel and peat briquettes technical requirements, methods for the determination of its

qualities and technical supply conditions. Other standards were adopted for Lithuania from the Committee for European Standardization (CEN). Basically, they cover:

- Solid biofuels terminology, definitions and descriptions, methods for the determination of solid biofuels qualities, fuel specifications and classes, sampling and sample preparation, fuel quality assurance and conversion of analytical results from one basis to another;
- Solid recovered fuels terminology, definitions and descriptions, methods for the determination of solid recovered fuels qualities, fuel specifications and classes and quality management systems.
- Sustainability criteria for the production of biofuels and bioliquids for energy applications.

All these standards involve no obligation at national level.

Standardization – standards uptake and needs in Lithuania

A majority of trainings participants believe that there should be standards on health and security aspects for pellet storage at the end-users. They indicated that the risks may occur within dust explosion, - off-gassing or self-ignition and fungi spores (however, some participants indicated that such standards are not needed). Some participants think that similar initiatives are also needed for wood chips, firewood and non-woody fuels.

Based on training feedback it can be concluded that

- Standards about Terminology standards (EN 14588) are used the most (over 30 users)
- Standards about Fuel specification and classes standards are EN 14961-1 and EN 14961-2: Solid are more often (20+ users), but part 3-6 almost not.
- Quality assurance standards are used by a couple of users (1 up to 6)
- Standards about Physical and mechanical properties standards are hardly used (just 1 or 2 of users).
- Standards about Sampling, sample preparation and Chemical properties standards at the moment are not used by any of the trainings participants.

2.2.9. Netherlands

Description of standardization activities in The Netherlands

Activities of the national mirror committee 310 029 "Solid Biofuels" are aimed at contributing to and promoting the use of CEN and ISO standards related to solid biofuels in The Netherlands. Besides that, the committee monitors (first time) experiences by users of these standards. The committee handles all documents from CEN/TC 335, CEN/TC 343 and ISO/TC 238 for discussion and voting. The committee functions as technical platform for international standardization activities. Four working groups are under Dutch leadership (CEN/TC 335/WG 3 Sampling and sample preparation, CEN/TC 335/WG 5 Chemical test methods, CEN/TC 343/WG 3 Sampling, sample preparation and supplementary test methods, and ISO/TC 238/WG 5 Chemical test methods). The committee defines the Dutch positions towards CEN/TC 335, CEN/TC 343 and ISO/TC 238, and provides input for new standardization topics in the field of solid biofuels. In doing so, the committee actively submits comments during the finalization of the upgrading of CEN standards to ISO standards. The committee also follows the developments of CEN/TC 411 “Bio-based products”.

Standardization – standards uptake and needs in The Netherlands

The most relevant answers that were given related to wood pellet. The reason for this is that the Dutch training was mainly focussed on woodpellets.
The most significant results of the training/questionnaires are described below:

Terminology:

- 10 out of 30 participants already use - EN 14588: Solid biofuels – Terminology, definitions and descriptions. 7 participants indicated that they will use this standard in the future.

Classification system:

- 10 out of 30 participants use EN 14961-1 and all 10 think EN 14961-1 is useful for the description of the quality of the pellets. 3 participants indicate that they will use both standards in the future.
- 14 out of 30 participants think that fuel specifications according to EN 14961-2 match the needs of the market and 13 out of 30 participants agree with the requirements (threshold values) defined in EN 14961-2. 13 participants think that three quality classes for wood pellets are enough, 3 indicate that these classes are too few.

Quality assurance:

- 16 participants consider an integrated quality assurance system for production, trade and delivery of pellets (as defined in EN 15234-2) necessary and useful (13 participants think it is realizable).
- EN 14961-2 and EN plus are considered most valuable for to participants (participants give 43 points for both systems), ÖNorm M 7135 and DIN plus are considered less valuable (based on points, namely 17 resp. 21 points).
- During the interactive part of the training session on 3 June 2013, it appeared that standards for quality of biomass should be much more promoted. Some suppliers deliver poor quality biomass that gives the industry a bad name. It was recognized that installations are not functioning properly and are damaged by poor quality biomass. This has a negative impact for those who deliver good quality biomass (who all use standards). Some participants active in production or trade of wood pellets expressed their concern.
- During both training sessions (2012/2013) it was stated that security of delivery and quality of biomass is especially for smaller companies, with smaller quantities, an issue related to cost-effectiveness.

Sampling and sample preparation:

- 7 out of 30 participants already use both EN 14778 and EN 14780, while 2 indicate that they will use these standards in the future.
- During the training session on 6 and 7 June 2012 it appeared that the standards for analyses were considered good. It was stated that good standards are available for most analyses. But some aspects should be improved, namely (1) The dividing line between biomass and solid recovered fuel (SRF) is not always clear and it is therefore difficult to determine which standard must be used and (2) Implementation of the C14-method in analysis methods.

Physical and mechanical properties

- 6 out of 30 participants already use EN 14774-1 and EN 14774-2. 8 participants indicated that they will use these standards in the future.

Some new ideas/topics for solid biomass standards were mentioned during training events:

- Biogenic content (non-woody).
- Torrefaction and its products.
- Safety and health -issues related to transport and storage of solid biomass.

These aspects were also mentioned by the National Mirror Committee.

2.2.10. Poland

Description of standardization activities in Poland

Before the European standards were developed there had been no national standards on fuels from solid biomass in Poland. The existing gap in the system - due to the urgent need - was filled with the help of standards on fossil fuels (coal) adapted to biomass fuels. Adaptation activities were undertaken by the group of companies involved in energy production (mainly large power plants). One of the research institutions validated existing analytical procedures regarding coal and their usage in case of solid biomass fuels. The result of these works was implementation into laboratory practice 14 analytical procedures relating to the properties of biomass fuels.

Currently in Poland laboratories are in transition process between old methods and the ones set in the European standards. One of the leading institutions in this field is the Solid Biofuels Research Laboratory of the Institute of Wood Technology, where 24 European standards are used to assess the properties of solid biofuels. There is also a slow but growing interest in these standards expressed by solid biofuels producers.

Currently, 35 European Standards relating to solid biofuels have the status of Polish Standards (PN-EN).

Standardization – standards uptake and needs in Poland

In view of sometimes imprecise provisions set in Polish law regarding the use of biomass fuels for energy production in combustion processes, legible and clear records of EN 14961-1 specifying sources of biomass (wood biomass in particular) are a very useful tool for the proper classification of waste biomass intended for combustion. This situation is of particular importance in relation to the waste from chemically processed wood materials. The provisions of EN 14961-1 allowed to classify a significant group of residues (mainly residues from wood materials) as biomass accordingly defined by the Polish law. With expertise carried out based on the requirements of EN 14961-1 entrepreneurs gained satisfying solutions accepted by the governmental and self-governmental institutions.

It seems appropriate to extend the list of waste/residues types (given in the standard EN 14961-1) from which solid biofuels can be obtained as well as the list of waste/residues which definitely cannot be used to receive solid biofuels (e.g. wood waste containing creosote).

Currently, there is no significant interest in implementing quality assurance systems by companies engaged in solid biofuels production and trade. Ensuring fuel quality should be particularly important to small boiler manufacturers as the quality of solid biofuels significantly influences durability of their products. If e.g. guarantees on boilers depended on the quality of the fuel used, solid biofuel producers would implement adequate standards. Therefore, raising awareness on quality assurance system is an important issue, not only to biofuels users but at all stages of the supply chain.

Results of surveys carried out during training events under the SolidStandards project confirm these conclusions.

Based on feedback collected during the trainings it can be seen that the interest in implementing solid biofuel standards is relatively low. Out of 57 persons that gave their feedback filling in the questionnaire only 11 (ca. 20%) expressed their will to apply EN 14961-1 and EN 15234 in the future. The numbers regarding other parts of these standards were lower. Furthermore, even less participants (2-9) confirmed future implementation of standards concerning terminology, sampling, physical and chemical properties.

Some producers selling their products for co-firing are not willing to implement standards as the quality of their products may be relatively low. Moreover, certification is voluntary and the market is still characterised with low awareness. Some of the participants underlined that the standards should be available free to every market actor and implementation of these standards should be supported by a national institution.

The Polish solid biofuels market is relatively young, struggling with many problems, mainly economic. The implementation of a quality assurance system may be associated with yet another requirement that small companies will not be able to meet (also due to “bureaucracy” connected with introduction of quality standards). However, taking into account quality assurance systems are little known in Poland and few producers implement them, it is necessary to continue promoting measures for consistent improvement as in the near future it may occur that it is the quality that will be a crucial element for the survival of the company on the market.

It was not possible to obtain information on the application in laboratories’ procedures regarding the principles of sampling and sample preparation (as indicated in EN 14778 and EN 14780). Every institution in Poland assessing solid biofuels properties declared that biofuels samples for laboratory tests are prepared in a way that ensures their representativeness.

Analytical procedures set in the standards (EN) for the assessment of physical, mechanical and chemical properties are systematically implemented into laboratory practice by institutions assessing and classifying solid biofuels. Procedures defined in EN 14961 series as normative were implemented in the first place. The procedures meant as optional are the least applied ones (e.g. EN 15148, EN 15105, EN 15210-2, EN 15290, EN 16126).

In the following is listed what was mentioned in the questionnaire and other criticized points within the discussions during the workshops:

- A need for further standardization is seen at field of hydrothermal carbonization of biomass (HTC).
- Also the development of a standard/guideline for the measurement of ash melting behaviour was once mentioned in the questionnaire.
- An own standard for industry-pellets was preferred by several participants
- The subject of sustainability within the product and certification standards should be implemented and was mentioned more often during discussions.
- In the opinion of several participants there is a need for the development of practice-oriented methods for producers and consumers to measure and to verify product characteristics. In particular there is a need for suitable rapid test methods that are feasible on site or at least without extensive laboratory testing.
- The size-classes for wood chips in EN 14961 were criticized by lots of participants as “not suitable” in practice.

Other issues that could become subjects to standardization include:

- Quick measurement methods of moisture content - important in large power plants
- Quick measurement methods of solid biofuels properties applicable at industrial conditions
- Eligibility criteria for chemically treated/contaminated biomass for solid biofuels production (containing certain chemical substances - creosote and other)
  - the boundary between solid biofuel and recycled solid biofuel with prevailing share of biomass
  - acceptable level of contamination
  - methods for determination of the content of particular contamination types
- Methods for determination of contaminants disqualifying biomass for production of solid biofuels
  - e.g. solids content – plastic, metal elements
- Methods for determining biodegradability of biomass – an aspect included in legislation, required by authorities in Poland.

Based on the consultation with the representatives of the national mirror committee it seems that currently there is no need for standardized solutions for transport and storage of biomass (solid biofuels) observed.
Following issues could become subjects to standardization processes:

- principles for storage of biomass and solid biofuels particularly exposed to weather conditions,
- safety of staff handling biomass and solid biofuels at large storage facilities as well as dealing with transport:
  - to prevent health hazards to workers deriving from bio-organisms (mainly fungi and decay),
  - to prevent self-ignition and fire (wood biomass storages in particular),
  - to prevent dust explosions.

3. Certification activities and certification needs

3.1. Austria

Certification systems are common for wood pellets and wood briquettes, because these solid biofuels are mostly used by private customers, for whom it would be difficult to recognize the necessary quality. For wood chips and log wood on the other hand no certification systems are implemented due to the small structured direct marketing (producer to consumer) or the production for personal use only.

Before the relevant European standards were published in 2011 most wood pellet producers (nearly 100 %) were certified according to ÖNORM M 7135 and some additionally according to DINplus certification system (based on ÖNORM M 7135). Beginning 2011 the implementation of EN 14961-2 for the production of wood pellets started rapidly because DINplus certification system was adapted to the European standard and at the same time the ENplus certification system was introduced. At the moment there are only about 5 small pellet companies (less than 5 % of the production capacity in Austria), which have not yet implemented EN 14961-2. The Austrian pellet industry decided that there is no need for another “ÖNORM-certificate”. The pellet association proPellets Austria is involved in the development of ENplus through the European pellet council. The acceptance of the ENpluslable is very high; most pellet boiler and stoves already require ENplus pellets as a fuel to give a warranty.

Before the relevant European standards were published in 2011 many wood briquette producers were certified according to ÖNORM M 7135 and some additionally according to DIN 51731. With the release of ÖNORM C 4006 in February 2013 producers have the possibility to certify their briquette production based on EN 14961-3. The implementation of the European standard for all certified briquette producers will be finished end of 2013 at the latest. Other certification systems based on the European standard, like DINplus and ENplus for wood briquettes, could not be established until today.

For all other types of solid biomass no certification systems exist in Austria. For the receiving/measuring of wood chips and/or energy wood at the consumer´s site there are special guidelines (‘Kooperationsabkommen FPP, 1994’, ‘PHA Holzübernahmerichtlinie für Biobrennstoffe, 2003/2009’) available in Austria. The development of these guidelines was mainly required by the paper industry but they are also used by heating plants. The implementation of these guidelines can be trained by external trainers. There is the possibility to have an exam after the training and a yearly audit, in which the correct procedures according to these guidelines are checked. End of 2013 those guidelines probably will be adapted to European standards in the course of a project; this may lead to a certification system for the receiving/measuring of wood chips and/or energy wood.
Concerning sustainability PEFC and in some cases FSC certification systems are applied to guarantee a sustainable forest management and the chain of custody. For the solid biomass production there is no sustainability certificate required at the moment,

The general opinion of the training participants was that there is no need for a new quality system in the Austrian market, although it is important to watch the quality of solid biofuels.

3.2. Bulgaria

The participants in the training i.e. representatives of pellets and briquettes manufacturers, wood chips and firewood producers in the trainings would like to introduce quality certification schemes in their facilities in the future. During the trainings the necessity from general government policy and campaign in the field of standardization and certification process connected with solid biofuels is also indicated.

3.3. Croatia

The total area of forests and forested land in Croatia amounts to 2.688.687 ha, of which 2.106. 917 ha (approximately 78%) are owned by the Republic of Croatia and managed by the state owned company Hrvatske šume Ltd. The company employs about 10.000 workers, and is currently the only company in Croatia to have the FSC certificate in the Combined Forest Management and Chain of Custody category. The company has been actively involved in state owned forests certification from the year 2000, and the current certificate is valid from 2007 to 2012.

According to the available information on official website of FSC, in September 2011 in Croatia a total of 166 companies were registered to have a FSC certificate in the Chain of Custody category. The vast majority of these companies were registered within the wood-processing industry, such as sawmills, parquetted manufacturers, manufacturers of furniture, doors and windows and other wood products. According to the information on official website of PEFC, there are no companies in Croatia to have a PEFC certificate.

The most advanced fuel made from wood in Croatia regarding labeling/certification are wood pellets, mainly due to the fact that over 95% of the national production is exported mostly to EU countries. Due to this, Croatian pellet producers are forced to comply with relevant European and national norms and quality standards of countries where they are exporting their pellets and several Croatian producers has obtained quality labels (e.g. Pellet Gold, ENPlus, DIN plus). According to the information available from the European Pellet Council, at the moment two Croatian pellet producers have obtained the ENplus certificate, namely:

- Drvenjaca d.o.o., Fuzine;
- Moderator d.o.o., Udbina.

At the moment there are no national ENplus certification bodies in Croatia. There are several laboratories providing services of solid biofuels product testing, the most important being:

- Laboratory of Faculty of Forestry, University of Zagreb
- Laboratory of Forestry institute, Jastrebarsko
- Laboratory of Hrvatska elektroprivreda d.d. (Croatian electric utility company, owned by the state).

Very few information was received regarding quality certification issues and within the received questionnaires there were no suggestions or stated needs for new subjects for quality certification schemes.

Within the received questionnaires there were no suggestions or stated needs for new subjects for other standardization or certification issues.

3.4. Czech Republic

The participants in the training i.e. representatives of pellets and briquettes manufacturers, wood chips and firewood producers in the trainings would like to introduce quality certification schemes in their facilities in the future.

As the standardization of solid biofuels has a good tradition in the Czech Republic, there have not been any major needs for additional national implementation. The common standards have been implemented and major certificates are provided.

The feedback collection was discuses with the Czech Pellets Cluster, which holds the rights to the ENplus certification for the Czech Republic.
The meeting with the representatives of the Czech Pellets Cluster was held on 28th of June 2013 in Prague. The presence list includes the following representative of the Czech Pellets Cluster: Mr. Vladimír Stupavský – Chairman of the Czech Pellet Cluster.

The main discussion was connected with the high level and quality of the SolidStandards training, the need from implementation of all European standards for solid biofuel in the market, quality of sustainable certification schemes and sustainability and general policy of the government in the field of establishment of mechanisms and instruments for adopting of standards for national industry. Further has been discussed the newly implemented ENplus certificate, the experience of Czech actors with the certificate and the possibilities of its development for the future.

The participants in the training i.e. representatives of pellets and briquettes manufacturers, wood chips and firewood producers in the trainings would like to introduce quality certification schemes in their facilities in the future.

3.5. Denmark

While certification schemes for some parts of the biofuel supply chain are common - e.g. approvement of small scale biomass boilers and installers or quality management certification at large biomass plants - certification of fuel quality is not very widespread in Denmark due to the reasons described earlier.

Two Danish pellet manufacturers operate with a DINplus certification, however, one of them has now ceased production. The other also is certified according to ENplus. An ENplus certificate is also held by the pellet trader Ekman Denmark. There are currently no ENplus certification bodies or inspection bodies in Denmark.
More private Danish companies have considered providing fuel pellet certification. Danish Technological Institute (DTI) offers a quality assurance system which consists of repeated analysis of chemical and physical fuel properties according to the table below and a license to use the DTI name and logo for marketing purposes.

The newly founded Danish Biofuel Association is providing a biofuel quality label. The label is given to the member companies and assures that two very basic conditions are fulfilled: that the fuel holds properties in accordance with the stated declaration that the fuel is produced, imported and sold within / outside the realm of the law according to

The label entails no certification, the validity is based on the social responsibility in the community of the members. The Danish Biofuel Association is also the Danish ENplus licenser. Nordic Ecolabelling provides a "Swan Label" for wood pellets that certifies the environmental performance of the pellets. Currently no manufacturers operate under a licence of Nordic Ecolabelling. The labeling scheme is described in detail in a case study in work package 5 of the SolidStandards project.

3.6. Finland

To give an idea bout Finnish feedback based on the questionnaires:

3.4 Are you aware of certification systems (e.g., offered by German DINCERTCO or EN plus) for pellet logistics and transport companies?

- 4 yes answers

3.5 Do you think that this kind of certification would also be helpful in your country or at EU level?

- 9 Yes answers

3.6 Are you aware of the Austrian standard ÖNORM M 7137 on pellet storage silos and storage rooms for small end-users?

- 21 no

3.7 Do you think that this kind of standard is also needed in your country or at EU level?

- 0 answers received

3.8 Are you aware of certification systems (e.g. offered by German DINCERTCO) for pellet storage rooms and silos for small end-users?

- 20 no and 2 yes answers

3.9 Do you think that this kind of certification would also be helpful in your country or at EU level?

- 3 yes answers

Finland does not have any special certification for solid biofuels. Biomass fuel suppliers usually use ISO 9000 series for the certification of biomass fuel production.

Finland has a long history in applying a forest certification system. Approximately 95% of Finnish production forests are certified under the Finnish PEFC system. The Finnish system was endorsed for membership of PEFC in the year 2000. The Finnish PEFC system is maintained and developed by PEFC Finland – Finnish Forest Certification Council. The PEFC system includes requirements for forest management and use, verification of origin of wood raw material, as well as for the independence and competence of the auditors. The regulations regarding management and use are revised at five-year intervals. The Finnish PEFC standards are under a revision at the moment. Of all the forest certification systems, PEFC is the best adapted to the Finnish forestry environment, based on family ownership; in addition to individual forest owner certification PEFC also offers group certification, keeping costs reasonable even when the participating forests are small scale. Larger areas of forest owned by more than one owner mean that the group certification actions for environmental protection, for example, can be concentrated where they are most efficient. PEFC certification in Finland is carried out as regional group certification. “Regional” means that the geographical operating area of a Regional Forestry Centre defines a maximum coverage of one PEFC forest management certificate in Finland.

On each of the thirteen Forestry Centre areas the “group” means that all forest owners (owners of private family forests, company, municipality and parish owned forests as well as state owned forests) have access to the certification group.

The Finnish certification system (PEFC) includes also criteria for energy wood, which is applying also Tapio´s guidelines for energy wood.

Finland has also launched FSC forest certification system (Forest Stewardship Council) in 2012. Many Finnish companies are also applying this forest certification system, too.

3.7. Germany

At the moment mainly certification schemes for wood pellets are in use. For other solid biofuels certification schemes are under development or have to be developed.
Besides the certification schemes for solid biofuels sustainability forest certifications are widely used. Approximately two thirds of the forest area in Germany is certified. The worldwide operating certification system PEFC has approx. 7.4 million ha forests certified in Germany. Forest areas certified to sustainable FSC certification scheme in Germany are approx. 0.63 ha.

For Wood pellets:

- ENplus (by European pellet associations): This certification scheme has a wide spread in the pellet industry. It is very close to the requirements from the EN 15234-2 and is developed for all three classes of pellets. Also downstream users of the trade and

distribution sector are involved. In May 2013 23 pellet producing companies, representing 39 pellet production sites, have an ENplus certificate. Besides 70 traders and wholesalers with 300 distribution points are certified according to ENplus in Germany.

- DINplus (by DINcertco): The certification scheme DINplus is well established in Germany. The product requirements have been changed to class A1 of EN 14961-2. Recently DINcertco offers a product certification "DIN-Geprüft Industriepellets" for to industry pellets according to class B. The system is not oriented on EN 15234. Besides, the DINcertco database (www.dincerto.de) gives information about companies which are certified in the field of logistics "DINgeprüft Fachbetrieb Pelletlogistik" for six logistic companies and "DINgeprüft Pelletlagerbehälter" for one company which produces storage systems for (wood) pellets.
- Blauer Engel UZ 153: The certification system is for technical dryed wood chips and pellets. The product quality requirements are orientated at the EN 14961-1. The raw material needs to be certified either to FSC, PEFC or Naturland and the CO2-emissions for raw material transport, supply and processing are taken into account. One of the production requirements is an efficient drying method by using heat from renewable energy or industrial waste heat. Also the monitoring of dust emissions is carried out at the production. There are strict criteria for product quality to ensure efficient and clean combustion of wood fuels. One pellet producer is certified according to the scheme.

Feedback from training is:

- 12 participants' use the standard EN 15234-4 for wood chips for non-industrial use, 17 are probably going to apply in the future. In discussions during the workshops the participants named sometimes the problem that there are no standardized production processes. The quality of raw materials and the external conditions fluctuate widely, much more than for pellets. Except for the measurement of water content, there are no quick test methods for the objective assessment of quality parameters in the field (for example: size distribution).
- The EN 15234-6, Fuel quality assurance - Part 6: Non-woody pellets for non-industrial use
- This standard is used by 6 participants and probably going to apply for it in the future by 8. Especially mixed pellets are of interest by 3 participants.
- At the moment no certification scheme for non-woody pellets based on the agropellet standards exists. In the workshop new developed approaches (e.g. the label ENplusAgro, formulated within the MixBiopells project) have been presented.

3.8. Lithuania

According to the feedback from the questionnaires out of all mentioned quality standards and quality certification schemes (EN 14961-2, ÖNorm M 7135, DIN plus, EN plus, etc.) little trainings participants indicated that they are already using EN plus certification scheme. EN 14961-2, ÖNorm M 7135, DIN plus and EN plus quality standards and quality certification schemes were almost indicated of equal importance.

Description of applied certification systems for biofuels

In 2012 European Pellet Council (EPC) awarded association LITBIOMA with the exclusive right to license Lithuanian companies with ENplus brand. This is the only certification scheme implemented in Lithuania. So far, two companies have been ENplus certified – „Baltwood" Ltd and „Granulita" Ltd.

Association LITBIOMA considers ENplus certification system to be very important, however so far the certification process in Lithuania is rather slow.

Description of be players involved in the development and/or use certification of biofuels

Association LITBIOMA as a national association managing Enplus certification system in Lithuania is one of the main players involved in the development of this certification scheme. In order to strengthen the strategically important heat and electricity production and biofuel market in Lithuania, the association is actively collaborating with various public institutions, providing help to its members and safeguarding their interests.

First producers that are certified in Lithuania with ENplus:

“Baltwood” Ltd is a a part of „Grigiškės“ group of companies. It was established in year 2003 as a manufacturer of wooden pallets. Today the main company products include solid wood panels, sawn timber, wooden pallets, biofuel pellets and garden sheds. The company processes up to 100,000 m³ of softwood per year, the products are sold in domestic and foreign markets.

“Granulita” Ltd is a wood pellets producer, eith annual production of up to 50 000 t. Today the main aim oft he company is to produce ecological highest quality fuel, which is produced with the lowest possible costs.

Description of the relation to national legislation

Wood pellets standards set in the En plus certification system are European standards also adopted by LST. These standards are:

- *Solid biofuels - Fuel specifications and classes - Part 2: Wood pellets for non-industrial use*
- *Solid biofuels - Fuel quality assurance - Part 2: Wood pellets for non-industrial use*

Developments and expectations in the field of certification

As En plus quality certification system with time receives more interest, association LITBIOMA is expecting that the certification process will be *accelerated*. Furthermore, due to solid biofuels standards and certification systems becoming more and more recognized, it is also expected that other certification systems will also be implemented in Lithuania.

Applied sustainability certification schemes

The same En plus quality certification includes sustainability aspects of wood pellets.

3.9. The Netherlands

According to the feedback of the training participants they have most interest in NEN-EN 14961 and EN-plus (virtually similar scores).The participants have less (similar) interest in ÖNorm M 7135 and DIN plus.

Wood pellets for industrial use were for approximately 90% certified (Green Gold Label system and Laborelec system).

NTA 8080 (as mentioned earlier) is a voluntarily certification system, recognized by the European Commission under the European Renewable Energy Directive, that enables companies to demonstrate that the biomass that is produced, converted, traded or used complies with international criteria for sustainability. For an overview of registered companies with an NTA 8080 certificate the website www.sustainable-biomass.org can be checked. It was stated during both training sessions (2012/2013) that NTA 8080 should be even more promoted to become more accepted by the industry.

3.10. Poland

Acquiring certificates confirming compliance of the solid biofuels quality with the requirements of relevant standards is not a common practice in Poland. In December 2012, only three Polish producers of wood pellets had DINplus certificates issued by DINCertco GmbH. There is no confirmation of any Polish company certified with ENplus. Currently, two domestic solid biofuel producers hold certificates issued by the Institute of Wood Technology. The Institute is accredited to carry out certification activities of products (including solid biofuels).

The main obstacles to widespread use of certification schemes for biomass fuels in Poland are:

- economic barrier - relatively high costs associated with obtaining and maintaining certificates of compliance with standards what disqualifies mainly smaller solid biofuel producers;
- legal barrier - lack of appropriate quality requirements included in relevant legislation concerning solid biofuels used in Poland what discourages implementation of costly certification schemes.

On the other hand, imprecise provisions of Polish law relating to the combustion of biomass fuels (in particular chemically treated wood waste) caused many entrepreneurs to assess and classify their wood waste based on the requirements of EN 14961-1. Several companies have undertaken actions to obtain certificates of conformity of solid biofuels with the requirements of standards in order to acknowledge that despite the content of synthetic chemicals their materials can be acknowledged as solid biofuels and they fulfil required quality parameters. The intention of these producers is to prove that their products bear the characteristics of by-products and their combustion is safe to the environment. This aspect of certification seems to be quite important in Polish conditions.

International companies engaged in attestation and standardization activities try to meet expectations of their customers. However, taking into consideration the number of certificates issued for Polish companies lead to the conclusion that proposed rates for such services are not yet acceptable for an average producer.

The most common sustainability certification scheme in Poland is Forest Stewardship Council (FSC) forest management certification. Currently the scheme is at the stage of addressing pre-approval conditions by the Standards Development Group. Currently there are 19 certified forest areas and 933 CoC certificates issued.

PEFC (The Pan European Forest Certification Council) is the second certification scheme used in Poland. Almost 100 Forest and CoC certificates have been issued.

Since the introduction of EN standards on quality certification systems relatively short time has passed, therefore the national mirror committee does not have critical comments in this regard. After implementation of quality assurance systems and quality certification at several solid biofuels' producers, hopefully in the near future, it will be possible to gain experiences allowing to put any relevant suggestions in this regard.

The feedback gathered on the basis of questionnaire shows that most of the responders are not aware of standards or certification systems on transport and storage of biofuels. This includes 40 persons (over 90%) not aware of ÖNORM M 7136 on pellet transport and storage, 25 persons (over 54%) not aware of certification systems (offered by German DINCERTCO or EN plus) for pellet logistics and transport companies, 35 persons (76%) not aware of ÖNORM M 7137 on pellet storage silos and storage rooms for small end-users and

33 persons (71%) not aware of certification systems (offered by German DINCERTCO) for pellet storage rooms and silos for small end-users.

However, majority of responders think that these kinds of certification would be helpful in Poland or at the EU level. Most of the responders (43) also think that there should be standards on health and security aspects for pellet storage at the end-users and they also indicated that similar initiatives are needed mostly for wood briquettes (30 responders – 77%), wood chips (20 responders – 51%) and non-woody fuels (19 responders – 49%).

4. The most significant general findings and conclusion

4.1. Austria

- Dominant type of solid biofuels and purpose: traditional use of wood (log wood) for heating
- National mirror committee involved: ONK 241 “Energy from solid biomass” is mirror committee for CEN/TC 335 and ISO/TC 238.
- New standard development/standardization needs:
  - ÖNORM M 7137 concerning pellet storage was updated as a consequence of the ongoing CO-discussion.
  - Other existing standards are subsequently updated if necessary.
  - Recently the need for a method to analyse the content of stones/mineral impurities in wood chips and hog fuel was discussed in national and international committees. It was decided that Austria is going to prepare a new work item proposal NWIP for ISO/TC 238 on that topic. The national committee mentioned a need for the standardization of torrefied material on international level. This work is already in progress as Austria has developed NWIPs for torrefied wood pellets and briquettes for WG2 of the ISO standardization committee ISO/TC 238.
- Certification:
  - ÖNORM C 4006 to certify their briquette production based on EN 14961-3 and ENplus and DINplus for wood pellets
  - The implementation of the European standard for all certified briquette producers will be finished end of 2013 at the latest.
  - Other certification systems based on the European standard, like DINplus and ENplus for wood briquettes, could not be established until today. For all other types of solid biomass no certification systems exist in Austria.

4.2. Bulgaria

- Dominant type of solid biofuels and purpose:
  - Primary energy production of firewood, wood waste and other solid waste is 697 thousand toe or over 65% of all renewable energy sources.
  - The share of firewood, wood waste and other solid waste is 95.2% of final energy consumption (relative to all RES).
  - Firewood used by consumers for heating up 7.4% of final energy consumption in 2009.
- National mirror committee involved: n/a
- New standard development/standardization needs: Non new development/ standardization needs were mentioned. However, the necessity was mentioned of using of standards for wood pellets, wood briquettes, wood chips and firewood.
- Certification: (part of) The national industry likes to introduce quality certification schemes in their facilities in the future.

4.3. Croatia

- Dominant type of solid biofuels and purpose:
  - Primary energy production from fuel wood and biomass for 2011 amounted to 26,74 PJ, which was 14,3% of total of 187,42. The Croatian total primary energy supply in 2011 amounted to 383,65 PJ, of which 19,23 PJ (5,0%) were supplied from fuel wood and biomass.
  - The wood biomass market for energy purposes in Croatia is still in early stages of development except for logwood.
  - Small scale combustion of biomass is by far the most extensive application of bioenergy.

  - Currently in Croatia there are only two biomass plants utilised for the heating of buildings in.
  - Pellet production in Croatia has experienced significant growth in the last couple of years (estimate is approximately 95% is exported to other countries).
- National mirror committee involved: Technical Committee 238 under HZN
- New standard development/standardization needs:
  - It can be concluded that the uptake of European standards on solid biofuels in Croatia is still at the very early stage (one of the reasons is that they are not yet translated in Croatian language).
  - Croatian solid biofuels (primarily wood pellets) producers are in part motivated to apply the EU standards, this is still not seen as a key issue in the near future.
- Certification: Croatian solid biofuels (primarily wood pellets) producers are in part motivated to obtain relevant certificates (primarily ENPlus), this is still not seen as a key issue in the near future.

4.4. Czech Republic

- Dominant type of solid biofuels and purpose:
  - RES have contributed to primary electricity production in the year 2011 by 8,3 %.
  - The total potential for energy utilization of biomass is in firewood (mostly in pieces) and wood pellets combusted in local boilers, about 10 %. The potential for residual wood suitable for combustion in larger energy sources represents about 27 %.
- National mirror committee involved: n/a; Working group no. 138
- New standard development/standardization needs: The Czech market with biofuels is highly export oriented. Due to this, the actors on the Czech market are aware of many EU standards, which they as well use for their products.
- Certification: The participants in the training i.e. representatives of pellets and briquettes manufacturers, wood chips and firewood producers in the trainings would like to introduce quality certification schemes in their facilities in the future.

4.5. Denmark

- Dominant type of solid biofuels and purpose: Solid biomass covers for 10% of the total primary energy generation and 62% of the renewable energy generation. Wood fuels now clearly account for the major part of the market, however Denmark is a large consumer of straw for energy
- National mirror committee involved: national committee S-358 Biofuels
- New standard development/standardization needs:
  - Quality standards are still not a very big issue in the Danish solid biofuels market. This does, however, not imply that the pellets used in Denmark are of a low quality.
  - Generally only a small choice of fuel properties are used in the daily trading and utilisation arrangements.
- Certification: certification of fuel quality is not very widespread
  - In the straw market, moisture content (i.e. the heating value) is the main parameter Wood chips are also traded according to moisture content, however size distribution as well as a general indication of geographic origin matter. Some traders classify pellets alone according to the ash content.

4.6. Finland

- Dominant type of solid biofuels and purpose:
  - Total use of wood fuels was 318.7 PJ (7.8 Mtoe), which is 23% of total energy consumption in Finland in 2012.

  - Wood fuels from logging residues, small-size trees (thinnings) and stumps and industrial by-products from forest industry (e.g. bark, sawdust, chips), firewood, wood pellets and briquettes are dominantly used
- National mirror committee involved: national mirror committee under SFS
- New standard development/standardization needs
  - Standards for determination of fuel quality requirements and classes, moisture content, measurement of calorific value, ash content, particle size, bulk density and for sampling are considered important.
  - Finnish needs are standards fort torrefied products, sampling of peat and wood, harmonization/standardization of quality assurance and sampling handling,usage of stumps (traceability), standardization of manual sampling method for different kind of unloading methods, and guidelines for quality of work of the driver/sampler.
- Certification:
  - Finland does not have any special certification for solid biofuels. Biomass fuel suppliers usually use ISO 9000 series for the certification of biomass fuel production.
  - The Finnish certification system (PEFC) includes also criteria for energy wood, which is applying also Tapio´s guidelines for energy wood.
  - Finland has also launched FSC forest certification system (Forest Stewardship Council) in 2012. Many Finnish companies are also applying this forest certification system, too.

4.7. Germany

- Dominant type of solid biofuels and purpose:
  - The German solid biofuels industry in the last year was a noticeable rise in heat supply from all renewables in heat consumption from approx.135 TWh in 2011 to more than 144 TWh in 2012. Nevertheless, the share of 10.4 percent renewable energy sources in Germany's heat consumption remained at the level of 2011.
  - Biomass remained the dominant source of renewable heat with a share of around 91 percent and in total of around 131 TWh biomass supplied nearly seven percent more heat than in 2011. This is attributable in particular to the greater use of wood in private households in 2012, due to cold weather conditions.
  - Since 2000 one of the largest wood pellet markets worldwide could be established. Germany has 41 pellet-producing companies active at 59 different sites. The company “German Pellets” has an outstanding position with a production of approx. 800.000 tons pellets per year which is more than one third of the whole German pellet production of about 2.2 million tons in 2012. 1.7 million tons are used the rest is exported.
  - The market for wood chips is strongly regional influenced
- National mirror committee involved: mirror committee NA 062-05-82 AA Feste Biobrennstoffe.
- New standard development/standardization needs:
  - A need for further standardisation is seen at field of hydrothermal carbonization of biomass (HTC).
  - Also the development of a standard/guideline for the measurement of ash melting behaviour was once mentioned in the questionnaire.
  - A own standard for industry-pellets was preferred by several participants
  - The subject of sustainability within the product and certification standards should be implemented and was mentioned more often during discussions.
  - In the opinion of several participants there is a need for the development of practice-oriented methods for producers and consumers to measure and to verify product characteristics. In particular there is a need for suitable rapid test methods that are feasible on site or at least without extensive laboratory testing.
  - The size-classes for wood chips in EN 14961 were criticized by lots of participants as “not suitable” in practice.

- Certification: At the moment mainly certification schemes for wood pellets are in use. For other solid biofuels certification schemes are under development or have to be developed

4.8. Lithuania

- Dominant type of solid biofuels and purpose:
  - The total electricity consumption of Lithuania is 10 TWh in 2011 (4% from biomass/biogas (total market share renewable is 12 %).
  - Total heat consumption is 20 TWh. Around 50 % of heat is produced in district heating (renewable 27 % of the market share), and the other 50 % is produced in private households, public buildings, (not connected to the district heating; renewable 80 % of the market share).
  - District heating from wooden chips, firewood, straw and wood pellets.
- National mirror committee involved: national mirror committee - Lithuanian standards board (LST).
- New standard development/standardization needs:
  - Standards for fuel specification and classes standards are used, the other standards a little or not at all.
  - Standards on health and security aspects for pellet storage at the end-users, also for wood chips, firewood and non-woody fuels.
- Certification: ENplus brand. This is the only certification scheme implemented in Lithuania.

4.9. The Netherlands

- Dominant type of solid biofuels and purpose:
  - Renewable energy accounted for 4.4% of total energy consumption in the Netherlands in 2012.
  - Biomass accounts for more than 70% of all renewable energy
  - Large scale power plants use biomass for co-firing applications, especially wood pellets
- National mirror committee involved: national mirror committee 310 029 "Solid Biofuels"
- New standard development/standardization needs:
  - Standards for quality assurance and classification system are used the most, standards for terminology, sampling and sample preparation and physical and mechanical properties are used as well, but less.
  - New ideas/topics for solid biomass standards are biogenic content, torrefaction and its products and safety and health -issues related to transport and storage of solid biomass.
- Certification:
  - Wood pellets for industrial use were for approximately 90% certified (Green Gold Label system and Laborelec system).
  - NTA 8080 (as mentioned earlier) is a voluntarily certification system, used in The Netherlands and, recognized by the European Commission under the European Renewable Energy Directive, that enables companies to demonstrate that the biomass that is produced, converted, traded or used complies with international criteria for sustainability.

4.10. Poland

- Dominant type of solid biofuels and purpose: The renewable energy market in Poland was 6% in 2005 to 15% in 2020. At least 3,1% electricity deriving from renewables in 2005 up to 19% in 2020. In Poland co-firing of biomass with coal was (and still is) regarded as energy production from renewable sources. Until 2008 it was possible to use only wood biomass in co-firing process. However, in order to limit the use of wood biomass in co-firing process, it is obligatory since 2008 to co-fire biomass from

agriculture and energy plantations at given levels – from 20% in 2008, 50% in 2012 up to 85 % from 2018

- National mirror committee involved: Technical Committee 144 on Coke and Other Solid Formed FuelsNo

- New standard development/standardization needs:
  - Laboratories are in transition process between old methods and the ones set in the European standards. There is also a slow but growing interest in these standards expressed by solid biofuels producers. Currently, 35 European Standards relating to solid biofuels have the status of Polish Standards (PN-EN).
  - principles for storage of biomass and solid biofuels particularly exposed to weather conditions and safety of staff handling biomass and solid biofuels at large storage facilities as well as dealing with transport:
- Certification: Little application, namely DINplus certificates issued by DINCertco GmbH and certificates issued by the Institute of Wood Technology.

4.11. Overall conclusion

The overall conclusions can be found below:

This position paper gives an overview at European level and contains the most significant results, recommendations and conclusions at European level (i.e. Austria, Bulgaria, Croatia, Czech Republic, Denmark, Finland, Germany, Lithuania, The Netherlands and Poland).

Most of these countries have an active national mirror committee for the standardization of solid biofuels.

It can be concluded that some standards are used a lot in a couple of countries. But in some other countries are standards hardly used. The type of standards, and intensity of use, differs per country as well.

Some countries mention the need for standardization of health and safety related issues (storage, transport), and, to a lesser extent, also the need for standards about torrefaction.

Certification is used in some countries, in some countries not at all. The countries in which certification is used is mainly focussed on product quality, and in just a few countries on sustainability-related issues.

The national industry position papers can be checked for country specific data.