



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

Publications produced within this project can be downloaded from

[www.solidstandards.eu](http://www.solidstandards.eu)



## BACKGROUND

The European solid biofuel industry depends on stable and favourable legal and regulatory frameworks and the harmonisation of these frameworks on EU level is critical for the development of a common European market for solid biofuels. Quality and sustainability of solid biofuels are among the main issues to be addressed on EU level.

The quality of solid biofuels is critical to market development. Solid biofuels are produced from a variety of biomass with different origin, chemical and physical characteristics. Furthermore, production processes and solid biofuel handling largely influence solid biofuel quality. The creation of European quality standards for solid biofuels aims at facilitating the involvement of economic operators in the solid biofuel industry.



Sustainability of solid biofuel supply is necessary to ensure the full utilisation of potential environmental benefits offered by solid biofuel applications and to promote the public acceptance of solid biofuel technologies. At the moment, the sustainability of solid biofuels is addressed in a number of national and/or voluntary certification systems. Sustainability standards for biomass are also being developed in CEN/TC 383 and ISO/PC 248 and the European Commission currently evaluates the introduction of sustainability criteria also for solid biomass in addition to those already existing for liquid biofuels.

These initiatives largely impact on the work of practitioners along the whole biomass supply chain while the underlying processes and their outcomes are complicated and sometimes non-transparent. There is also the risk that the solid biofuel industry is not involved sufficiently in standardisation or legislation procedures.



The SolidStandards project addresses the on-going development of standards and certification systems for the quality and sustainability of solid biofuels.

The project aimed at enhancing the uptake of standards within the industry by providing training on standards implementation to solid biofuel producers across Europe. Furthermore, the project aimed at providing input to ongoing standardisation processes and policy decisions by gathering and providing industry feedback to standardisation committees and decision makers.



# ACTIVITIES & RESULTS

## 1. Training concept development

The core of the action is the development and testing of a common training concept for the solid biofuel industry on quality and sustainability standards and certification. Therefore the major result of the project is a fully developed and tested training material which enables solid biofuel producers and other solid biofuel industry players to apply standards and to participate in certification systems.

The training material consisted of a set of modules: two general modules and specific modules addressing different solid biofuels.

The general modules (General standardisation and feedback, General sustainability issues related to solid biofuel supply) serve as an overall information for the training participants on the standardisation of quality and sustainability of solid biofuels.

The specific modules for solid biofuels concentrate on the implementation of quality standards in the production process of the respective solid biofuel and include the following:

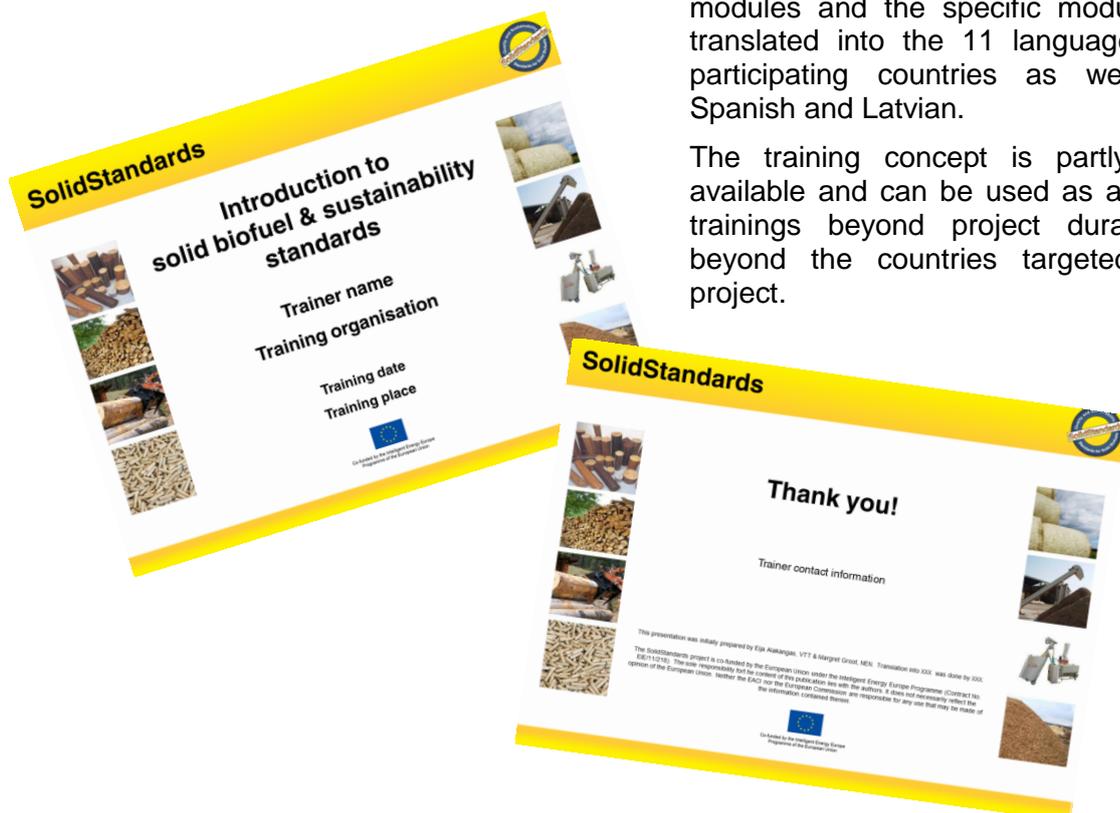
- Wood pellets module (EN 14961 Parts 1&2, EN 15234 Parts 1&2)
- Wood briquette module (EN 14961 Parts 1&3, EN 15234 Parts 1&3)
- Wood chips module (EN 14961 Parts 1&4, EN 15234 Parts 1&4)
- Firewood module (EN 14961 Parts 1&5, EN 15234 Parts 1&5)
- Non-woody pellets module (EN 14961 Parts 1&6, EN 15234 Parts 1&6)
- Straw module (Wheat and energy crops) (EN 14961-1, EN 15234-1)

For each solid biofuel, quality and sustainability issues along the whole supply chain, from raw material sourcing, solid biofuel production and logistics to end-user requirements are described.

Each module consists of a guidebook and a PowerPoint presentation with interactive parts, in which the implementation of standards in practice are discussed in working groups using case studies. Specific consultancy services are also offered. Participants are provided with the knowledge necessary to implement standards in their production process.

The training materials of the two general modules and the specific modules were translated into the 11 languages of the participating countries as well as to Spanish and Latvian.

The training concept is partly publicly available and can be used as a basis for trainings beyond project duration and beyond the countries targeted in this project.



## 2. Training implementation

The main activity within the proposed action is the organisation of trainings on solid biofuel quality and sustainability standardisation and certification. The goal of these events was to generally increase awareness for quality and sustainability issues and to enable companies to apply standards and to participate in certification systems. As the addressed topics are relevant for the whole supply chain, the target groups included solid biofuel producers, companies active in solid biofuel trade and logistics, and solid biofuel end-users (mainly medium to large scale). Furthermore, organisations involved in solid biofuel testing and certification, as well as combustion equipment manufacturers and heat and power producers also benefited from the trainings.

The trainings aimed at providing a common meeting and discussion platform for actors along solid biofuel supply chains and to increase the general awareness of quality and sustainability issues. 1 or 2-day events for each training were organised including presentations, case studies, practical training of fuel analyses (where possible), one-to-one meetings and feedback collection. In total, 34 training events were organised throughout the project duration in the following countries: Germany, Austria, Italy, Finland, the Netherlands, Bulgaria, Lithuania, the Czech Republic, Denmark, Poland, and Croatia.

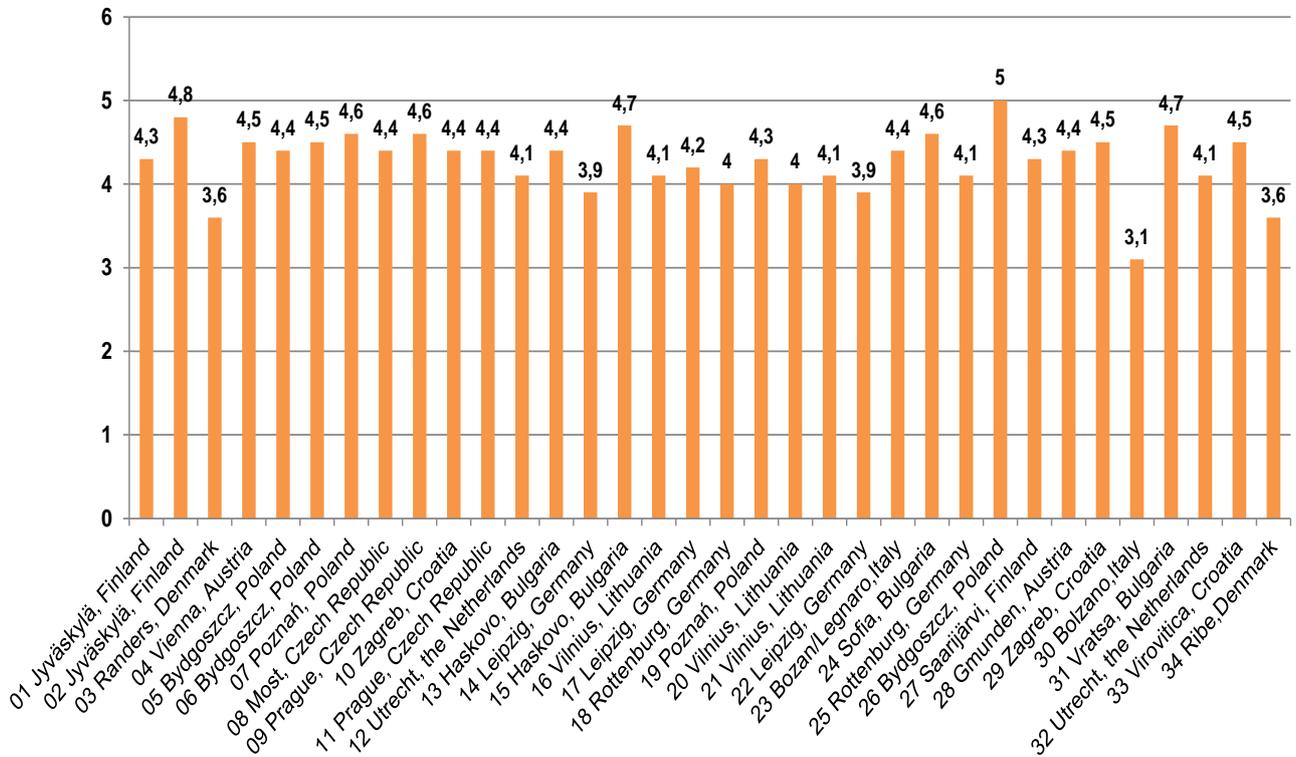
Other training events from outside the targeted countries have been organised during the project period in Spain by CIRCE and in Latvia by Forest and Wood Products Research and Development Institute.



Wood pellets	Briquettes	Wood chips	Firewood	Non-woody pellets
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	2012											2013						
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
AT		Wood chips												Wood chips				
FI	Firewood													Wood chips				
DE			Wood pellets						Wood chips	Non-woody pellets					Wood chips	Wood pellets		
NL				Wood pellets												Wood pellets		
BG			Wood pellets	Wood chips									Wood chips		Wood pellets			
LT								Wood chips	Wood pellets	Non-woody pellets								
CZ			Wood chips		Firewood	Wood pellets		Non-woody pellets										
DK			Wood pellets															Wood pellets
PL			Wood pellets	Non-woody pellets				Wood chips	Firewood		Wood pellets	Briquettes				Non-woody pellets	Wood pellets	
HR				Wood pellets								Wood chips					Firewood	
IT													Wood pellets		Wood chips			

Training schedule in the participating countries throughout the project duration



Evaluation of participants in the different training events

### 3. Implementation of quality standards in selected companies

The European standards on solid biofuel quality (EN 14961 series – solid biofuel specification and classes and EN 15234 series – quality assurance for solid biofuels) were planned to be implemented in 7 companies from 7 countries: Austria, Finland, Germany, Denmark, Poland, Bulgaria and Croatia. The 7 companies were selected according to company size, experience, state-of-the-art-equipment, raw material, references and eligibility.

For each company, a feasibility study including the necessary measures, testing equipment and services, and related costs was made. The solid biofuel product testing for compliance with appropriate parts of EN 14961 series has been implemented in all the 7 companies, but problems occurred when implementing the quality assurance standards following EN 15234 series in some of the selected companies which were mainly related to the type of solid biofuel.

With wood pellets, no problems were faced since the requirement for the standard implementation according to EN 15234-2 is the same requirement for wood pellet certification schemes such as ENplus, DINplus or others which are widely used in Europe. In this term, DBFZ (Germany) and REGEA (Croatia) had successfully supported two partnering companies to implement the EN 15234-2.



Wood chips classification and certification were more difficult. During the project it turned out that the product-standard EN 14961-1, basis for the quality assurance standard EN 15234-1, contains several unsuitable requirements especially for particle size. These discrepancies are changed in the ISO 17225-1 standard which will supersede the EN product-standard, probably in April 2014. The main problem is the high inhomogeneity of the material. Even generating a representative sample to analyse wood chip properties is far too expensive for most market actors. Usually contracts are bilateral and products are not promoted for small scale users. Contracts include instructions on storage and fuel specification requirements e.g. moisture content, impurities and particle size. Due to these reasons the EN standards were not implemented in the Austrian company.

Partner	Country	Pilot case
DBFZ	Germany	Production of wood pellets
VTT	Finland	Wood chips supply chain
REGEA	Croatia	Production of wood pellets
BAPE	Poland	Production of non-woody pellets
HFA	Austria	Production, trade & logistics of wood chips
ERATO	Bulgaria	Trade & Logistics of wood pellets & wood chips
FORCE	Denmark	End-use of wood chips in power generation

In Austria the recently published ÖNORM C 4005 for the specification of forest chips helps to support the classification of wood chips which is one of the key factors for the EN quality assurance.

In Finland, on basis of the upcoming ISO product standard EN ISO 17225-1 or 4 VTT was able to support the implementation of quality certification according to EN 15234-1 or EN 15234-4 along the wood chips supply chain for 700 kW district heating plant except for the requirement of cross sectional area of oversized particle which could not be met in all cases. VTT have even made a quality guidebook in Finnish for the selected company.

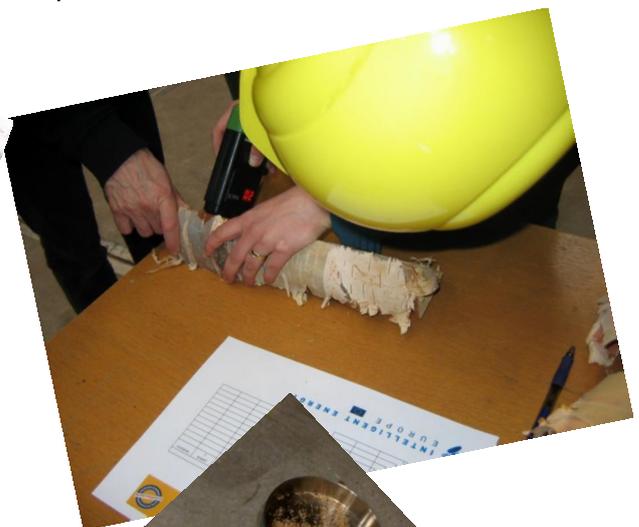
In EN ISO 17225-1 the cross sectional area is removed and only in EN ISO 17225-4 (for boilers less than 500 kW) it is still mandatory and values are even higher.

be fully implemented. An important barrier has been the costs of testing equipment and great uncertainty in the market due to yet unresolved national legislations. Nevertheless, the partner company is taking further measures towards implementation of quality assurance system in coming years.

In Bulgaria, the partner could not support the quality assurance standards implementation EN 15234 at the selected company due to external problems.

The process of standard implementation was documented and will serve as an example or best practice that can be followed by other European solid biofuel companies.

In order to spread the experience gained, each partner organised a workshop showing and discussing the experiences gained with the active involvement and participation of the companies who have benefited of the support in the implementation of the standards.



In Denmark, the project partner supported successfully the implementation of the quality assurance standards EN 15234 at the end-user stage of a wood chip supply chain. The principles and parts of the tools were adapted at the plant.

BAPE (Poland) showed that the production and quality measurement for non-woody pellets according to the standards are possible, but despite promising approaches the quality assurance standard EN 15234-6 could not



#### 4. Sustainability of solid biofuels

The further development of the European framework for solid biofuel sustainability is unclear. Related decisions by the European Commission are still under development. The SolidStandards project aimed at supporting these policy decisions with an evidence based approach and at assessing the practical applicability of sustainability frameworks developing in the course of the action.

The key activities in the project included the organisation of a workshop for key stakeholders in order to facilitate the discussions on mandatory versus voluntary sustainability criteria for solid biofuels.

There was a general agreement amongst all workshop participants that sustainability criteria are needed. The industry representatives stressed the need for EU-wide harmonized criteria, as differing national systems would effectively create significant market barriers. It was also agreed that the sustainability certification systems should not result in administrative burdens and high costs. It was proposed to use existing legislation for sustainability certification and look at lessons learned in the biofuel industry.



Furthermore, existing sustainability schemes were reviewed, assessed and tested for their applicability in practical case studies. Four case studies of sustainably certified solid biomass supply chains have been chosen as indicated in the table below.

A detailed investigation including all steps from sourcing the raw material, through all pre-processing steps to the end-user was investigated. The reports of the case studies are publically available.

Furthermore, a study on the impacts of implementing sustainability standards has been made and is also publically available.

Country	Company	Product	Scope	Chain
Germany	Westerwälder pellets	Wood pellets	Analysis of CO <sub>2</sub> footprint	Local supply to small-scale users (households)
Netherlands	RWE-Essent (GreenGoldLabel)	Wood pellets	Analysis of intercontinental supply chain from British Columbia (BC wood pellets) to coal power plant in the Netherlands	A few large producers and one very large end-consumer in the Netherlands
Finland	Kyyjärvi Energy cooperative	Wood chips	Certification system: EKOheat, part of EKOenergy label, managed by the Finnish Association for Nature Conservation	50 small producers and medium consumer (1-1,5 MWth boilers)
Denmark	Nordic Ecolabel	Wood pellets	Certification system: Svanen	Various producers to many small end-users

## 5. Input to standardisation processes

Both standardisation bodies and policy makers depend on industry feedback in order to create supportive administrative and regulatory frameworks for the development of solid biofuel markets.

This feedback which was collected from training participants and via several online tools was analysed and provided to relevant standardisation committees and policy makers.

In a first step, the outcome of the discussions as well as the feedback collected during the training events were compiled in national industry position papers by the respective national partners. The position papers represented the industry point of view on developing and existing standards and provided recommendations for improving the applicability of the standards derived from practical experience.

The position papers were then presented and discussed with the respective national mirror committee of CEN and ISO solid biofuel standardisation and one final industry position paper summarising the findings was elaborated. It included the following chapters:

- 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.
- Chapter 2 gives insight in standardisation activities and developments that are currently taking place for solid biofuels in the 10 countries. Standardisation needs per country are also identified.
- Chapter 3 describes certification activities in the 10 countries. The input by the national mirror committees and/or SolidStandards training sessions is included in this chapter.
- Chapter 4 includes the most significant, general findings and outcomes.

With the increasing use of solid biofuels in Europe, several issues related to solid

biofuel storage have emerged in recent years. A recommendation paper was compiled relating available results from ongoing research and projects in addition to findings from the SolidStandards project. The quality of biofuel storage containers, fire safety and health risks in small to large storage and during transport were also addressed in trainings and discussed with experts and industry representatives. Based on the feedback, this paper has been developed to give recommendations for the development of a common European approach towards ensuring quality, safety, security and health aspects of solid biofuel storage and handling. It includes the following chapters:

- Chapter 1 describes the scope, objective and research methodology.
- Chapter 2 gives an overview and description of available documents about quality, safety, security and health aspects of solid biofuel storage and transport.
- Chapter 3 provides suggestions for topics about the issues that can be standardised.
- Chapter 4 states conclusions and recommendations

Another result within the core of this project was an inventory of future developments and implications of solid biofuel standardisation and certification of sustainability and quality. The report of this inventory includes the following:

- A quantitative assessment of current (and near-future) imports of solid biofuel from outside the EU-27 for energy purposes,
- A qualitative identification of sustainability conflicts/issues,
- A discussion on the developments of using solid biomass for the production of 2<sup>nd</sup> generation biofuels, and the subsequent arising need to harmonise sustainability criteria for solid and liquid biofuels,
- Qualitative review of additional quality and sustainability issues of pre-treatment technologies such as torrefaction.

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