BioTrade2020plus

Supporting a Sustainable European Bioenergy Trade Strategy

Intelligent Energy Europe
IEE/13/577/SI2.675534

Deliverable 6.7

Report on the progress of BioTrade2020plus stakeholder consultations

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The BioTrade2020plus Project

Objectives

The main aim of BioTrade2020plus is to provide guidelines for the development of a **European Bioenergy Trade Strategy for 2020 and beyond** ensuring that imported biomass feedstock is sustainably sourced and used in an efficient way, while avoiding distortion of other (non-energy) markets. This will be accomplished by analyzing the potentials (technical, economical and sustainable) and assessing key sustainability risks of current and future lignocellulosic biomass and bioenergy carriers. Focus will be placed on wood chips, pellets, torrefied biomass and pyrolysis oil from current and potential future major sourcing regions of the world (Canada, US, Russia, Ukraine, Latin America, Asia and Sub-Saharan Africa).

BioTrade2020plus will thus provide support to the use of stable, sustainable, competitively priced and resource-efficient flows of imported biomass feedstock to the EU – a necessary pre-requisite for the development of the bio-based economy in Europe.

In order to achieve this objective close cooperation will be ensured with current international initiatives such as IEA Bioenergy Task 40 on "Sustainable International Bioenergy Trade - Securing Supply and Demand" and European projects such as Biomass Policies, S2BIOM, Biomass Trade Centers, DIA-CORE, and PELLCERT.

Activities

The following main activities are implemented in the framework of the BioTrade2020plus project:

- Assessment of **sustainable potentials of lignocellulosic biomass** in the main sourcing regions outside the EU
- Definition and application of sustainability criteria and indicators
- Analysis of the **main economic and market issues of biomass/bioenergy imports** to the EU from the target regions
- Development of a dedicated and **user friendly web-based GIS-tool** on lignocellulosic biomass resources from target regions
- **Information to European industries** to identify, quantify and mobilize sustainable lignocellulosic biomass resources from export regions
- **Policy advice on long-term strategies** to include sustainable biomass imports in European bioenergy markets
- **Involvement of stakeholders** through consultations and dedicated workshops

More information is available at the BioTrade2020plus website: **www.biotrade2020plus.eu**

About this document

This report corresponds to D1.1 – Quality Control Plan (QCP) of BioTrade2020+. It has been prepared by: CENER, through contributions of WIP, VITO, IINAS and Imperial Collage.

Start date of project:	01-03-2014
Duration:	30 months
Due date of deliverable:	Month 16
Actual submission date:	Month 25– March 2016

Work package	WP6
Task	Task 6.2
Lead contractor for this deliverable	CENER
Authors	Ines del Campo and David Sánchez,.
Collaborations	Luc Pelkmans, Rainer Janssen, Dominik Rutz, Leire Iriarte, Rocio Diaz-Chavez, Martin Junginger, Thuy Mai-Moulin

Dissemination Level		
PU	Public	x
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services):	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Version	**Date**	**Reason for modification**	**Status**
0.1	24/02/16	Preliminary version	
0.2	10/03/16	Inputs from partners	finished

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1. Introduction

BioTrade2020plus aims at strengthening links and information exchange between stakeholders involved in international sustainable biomass trade. For this reason among the several dissemination activities scheduled during the course of the project and under WP6 three stakeholder working groups have been established:

- WG1: Biomass importers and end-users (e.g. industries, representatives of competing markets, biomass traders, NGOs, policymakers)
- WG2; Biomass producers and exporters (e.g. agricultural, forestry and industrial sector in biomass producing countries, NGOs, policy makers in sourcing countries)
- WG3: Long-term strategies and support frameworks

The set-up, composition and establishment procedure of each working group is defined in the periodic deliverable 6.2 (Report of the set-up and engagement of working groups). Versions corresponding to M3, M6 and M12 are available in the project website (www.biotrade2020plus.eu)

As reported in D6.2, for each working group a series of telephone conferences are going to be periodically organized. All these conferences are aimed to collecting user requirements, provide feedbacks on initial inputs and assumptions and provide feedback and validate draft deliverables. Previously to the conference a background paper was sent to all participants in order to boost the contribution during the meetings. After these teleconferences brief minutes are prepared and circulate to all the participants in order to compile all the information gathered and discussed.

A former version of this document was published in January 2015 showing the main statements from the following three teleconferences:

- November 27th, 2014. Topic: key principles on biomass trade; Working Group 3
- December 5th, 2014. Topic: sustainability criteria and indicators; Working Group 2
- December 11th, 2014. Topic: sustainability criteria and indicators Working Group 2

During this period (January-July 2015), just one teleconference was carried out:

- 4. - January 27th, 2014. Topic: sustainability criteria and indicators Working Group 2

The participant list of this teleconference is shown in the Appendix 1.

The reason why no more teleconferences were arranged during this period was that project partners were deeply involved in the development and implementation of a joint-methodology to determine the sustainable biomass potentials in the selected sourcing regions. The development of this joint-methodology has taken a long time due to the occurrence of several deep discussions since it is a multifactorial assessment and, accordingly has led to some other delays in the planned consultations.

This report aims at compiling all the information extracted from this teleconference in order to have an overview and identify synergies and links between the stakeholders activities and the tasks developed under BioTrade2020plus. The opinions reflected here are not necessarily accepted by the majority of the participants neither by the consortium team.

2. Teleconference on Sustainability, 27 January 2015

2.1. Objective

The purpose of this teleconference was to discuss a series of statements related to the sustainability of biomass.
A summary of the main points discussed is shown below.

2.2. Discussion about the sustainability approach

The attendees were asked to give their opinion regarding each of the following specific points:

i) *Sustainability criteria and indicators and respective thresholds should apply to all feedstocks* ***regardless where they are consumed*** *(domestically or in third countries –exports-).*

- Sustainability criteria and indicators and respective thresholds might apply to all feedstocks regardless where they are consumed, but there might be exceptions.
- The point where the feedstock is transformed is very relevant.
- Different bioenergy carriers i.e. 1G biofuels vs. lignocellulosic material (i.e. wood chips, pellets) pose different sustainability challenges.

ii) *Sustainability requirements should be considered in the* ***full value chains*** *(e.g. include GHG emissions from processing or transport to the EU).*

iii) *Sustainability requirements should not only apply to biomass for bioenergy but to* ***all end uses****.*

Third countries might consider the compliance with EU sustainability criteria for biomass when exporting biomass for bioenergy uses.

The extension of those requirements to other sectors in the same country (i.e. pulp and paper sector) does not seem to be appropriate. There are also reluctances to introduce the same requirements as for bioenergy in domestic markets if they are not mandatory. Thus, it is not clear to which extent same feedsctocks for different end uses (i.e. bioenergy or pulp and paper) should comply with the same sustainability requirements.

Currently, in some context voluntary forest certification is applied. For example, in some countries such as the US, a share of the pulp and paper sector certifies the sustainability of their products through forest management certification (i.e. Sustainable Forestry Initiative).

*iv) To assess sustainability, **different type of indicators** should be considered: **Minimum requirements**: thresholds (or qualitative attributes) that should be met (resulting in "yes" only if the indicator meets the threshold or qualitative value). Example: thresholds for minimum GHG emissions levels.*

***Comparative to non-renewable reference**: can be compared with e.g. fossil fuel or non-renewable material reference. Example: indicators related to air emissions (PM_{10} and SO_2)*

***Comparative to other biomass**: can be compared to other biomass systems, in case the indicator is not relevant for non-renewable reference. Example: indicators related to soils*

***Descriptive**: provides information about key characteristics not easy to compare but relevant for assessing the value chain. Example: indicators related to participation and transparency.*

- In general, the proposed indicators make sense but how they are translated into "implementable" indicators is key. Specificities of feedstocks should be considered as well.
- The boundaries of the analysis and the units of the indicators have to be taken into account. This would keep away from confussing and masked results. An example of this is the number of jobs in any value chain, an inefficient value chain could result in higher number of jobs than a more efficient one with less but more qualified ones.
- To determine typical values a representative series of values has to be considered to take into account climatic variations. Regarding the type of feedstock we have to be very cautious and concerned about how the indicators are going to be implemented.
- A clear distinction between indicators proposed to be mandatory requirements and comparative/monitoring indicators has to be made.

*v) Based on those type of indicators, we would like to define the **ambition level of sustainability**: a "basic set" (the minimum list of issues that should be considered) and a "advanced set" (a more ambitious set of issues or thresholds) of sustainability requirements that should apply to imported biomass for bioenergy to EU. The consortium would like to know about:*

- *Whether you agree with these two approaches,*
- *Whether you would change the classification of any of the indicators.*
- *Whether those sets could be met in your region. Are there any feedstock or any practice that could be more sensitive?*
- *The measures that could be put in place to overcome potential barriers*

- The possibility to report about the indicators by the producers will depend on the type of requirements , the information available, and the associated costs.
- A big industry ("momentum") might be needed to report on these indicators. For certification and accreditation, a lot of work might be required but the question is if it is worth (i.e. expending 1 $ to certify a product that costs 0.1 $?).

vi) *Identify **practical implementation (or assurance) of sustainability** related issues, such as pathways to achieve sustainability, scale of activities, options for simplifications (low-risk areas), and the impact on costs:*

- *Which way do you foresee most effective to assure sustainable lignocellulosic biomass sourcing for exports?*
    - *Certified forest management*
    - *Controlled and mixed sourcing*
    - *Inspected compliance for stewardship plans and practices (for example with Best Management Plans)*
    - *Uninspected forest operations*
- *Should these pathways be simplified for small-scale activities?*
- *Is it possible to identify low-risk regions or countries where "less demanding" pathways might be applied? (i.e. require certified products in high-risk regions and allow "inspected compliance" where risks are lower).*
- *Do you think that the additional cost of demonstrating sustainability could be a trade barrier?*

- It might be challenging for different local bodies to oversee the amount of indicators proposed in the project.
- The sustainability requirements proposed by the project might be seen as trade barrier. The requirements for bioenergy are high while these requirements do not apply to the petroleum industry.

2.3. Statements

Herein the main key points extracted from these telconferences are shown:

- Not only predictions, scenarios and environmental considerations can be taken into account. Also the industry behind and the existing market have to be considered.
- Some of the indicators proposed in this project were previously created for first generation biofuels (and associated feedstocks) and now we have to reconsider them to be adapted for other bioenergy carriers (and associated feedstocks).
- Particularities associated to residues or specific crops to produce lignocellulosic materials have to be considered as well.

3. Review on Indonesian Case Study Report, January 2016

3.1. Objective

In December 2015, the Utrecht University finalised the final draft of the case study in Indonesia: "**Biomass Potentials from Palm Residues in Indonesia – Case study of Central Kalimantan**" as part of the six Case Studies under development within the BioTrade2020plus project.

Initially, a Telco was supposed to be organised to discuss with relevant stakeholders about the results of the case study in order to be incorporated in the final report to the European Commission. Although efforts had been made to engage stakeholders to the teleconference, there was only one interest from Michael Wild, Wild & Partners, Austria. Utrecht University therefore had asked Michael Wild to review the whole report and he accepted. More specifically, UU had addressed some points for Michael's review:

- Sustainability constraints
- Local use of palm residues
- Local demand for palm residues for energy production
- Production cost of palm residues

3.2. Main comments and points discussed in the review

In general, Michael Wild noted that the report has been carefully developed and the calculated potentials indicate useful information for biomass traders and suppliers.

- Michael Wild asked to look at the characteristics of trunks to be used as wood pellets as it is fibrous and perhaps not totally relevant for wood pellet production
- He provided some references for calorific values which are useful to check the energy potentials from palm residues
- Michael Wild also suggested to look at the costs of wood pellets in the market to compare with the calculated costs of palm pellets from Indonesia
  He mentioned that the calculated costs of palm pellets to be delivered to Europe are competitive.

3.3. Statements

- Indonesia has potentials to provide palm residues to be used for local use and export. Since demand for this potential is high in a number of countries in Asia, it is likely that Europe has to compete with these countries for pellets produced from palm residues.

4. Teleconference on US Case Study, 15 December 2015

4.1. Objective

The objective of this Teleconference was to discuss with key stakeholders from the USA about the results of the case study in order to be incorporated in the final report to the European Commission.
More specifically, the following questions where used as a basis for the teleconference:

- ***Question 1:*** Do overall results from the case study appear feasible to you?
- ***Question 2:*** Are quantities of available biomass feasible?
- ***Question 3:*** Have the right and sufficient constraints been taken into account?
- ***Question 4:*** Are price levels reasonable?
- ***Question 5:*** Do you have any other additions?

A summary of the main points discussed is shown below.

4.2. Main comments and points discussed in the teleconference

The teleconference started with a short introduction to the project by Gert-Jan Nabuurs. He gave an overview of the project, including the general methodology and the key points to be discussed in the teleconference.

Kevin Fingerman took over the US-SE case study. He listed the 11 states in the US South-East that comprised the geographical extent of the case study. Texas and Oklahoma have been excluded because they are not significant exporters. Dr. Fingerman indicated that the focus of the project was on the technical and sustainable availability of biomass independent of economic, infrastructure (e.g. pelletisation capacity), or supply chain constraints.

Historical biomass estimates have been drawn from the USFS Timber Products Output database. Categories considered in this study include pulp logs, logging residue, sawmill residue, and so-called “other removals.” The latter category refers to pre-commercial thinnings as well as land clearing operations, so this category is constrained to 50% utilisation in order to avoid inclusion of biomass from land clearing operations.

Technical potentials derived in this fashion have been spatially constrained to yield sustainable potentials. The primary criterion applied to calculate the sustainable potential was related to biodiversity conservation. The EC has expressed concern for biodiversity and GHG intensity, especially through its liquid biofuel policy framework, and given the EU’s current stance on the carbon neutrality of biomass combustion, biodiversity conservation appears to be the main constraint facing the US Southeast region in light of probable EU policy. Sustainability masks have been therefore based on Galik and Abt (2014) and the Rarity-Weighted Species Richness Index. Certain forest types have also been wholly or partially excluded for biodiversity conservation including Gum-cypress as well as 50 % of the oak-pine forest. It was pointed out that this is similar to the approach used in the Netherlands, where no more than 50% extraction is allowed on forests with greater than 40-year rotation period.

In order to determine export amounts, domestic demand has been modelled based on a USFS report by Howard (2013) and outputs from the Forest Products Module model. In the structural panel category, OSB could be in competition with bioenergy where plywood will not, so a rising OSB fraction of the structural panel market is projected.
A participant raised the concern that for some states (e.g. Virginia), excluding the above forests might reduce pellet availability. Another participant requested a clear map of the

areas excluded in the masking exercise, and the researchers will endeavour to create such a figure for inclusion in the report.

Some discussion commenced as to the primary drivers of limited pellet output and the speed at which supply chains could be put into place to mobilize this material. It was noted that market signals from the EU to the US will be essential to drive this market. It was also noted that the consortium did not consider the responses of land-owners to incentives, which could be an important driver going forward. These considerations were indicated to be outside of the scope of this analysis.

4.3. Statements

All the points discussed during the teleconference will be indicated clearly in the report, which will be finalized and distributed to participants in February.

5. Teleconference on Brazil Case Study, 19 January 2016

5.1. Objective

The objective of this Telco was to discuss with relevant stakeholders about the results of the case study in order to be incorporated in the final report to the European Commission. More specifically, the points to be addressed were:

- ***Question 1:*** What is the local use of sugarcane in the different regions, for bioenergy production and other uses? How will this develop towards 2030.
- ***Question 2***: More specifically, the net sustainable potential depends strongly on the local use of sugarcane straw for ethanol production. What are your views on the development of this market?
- ***Question 3***: Dedicated energy crops (such as switchgrass) are at the moment not included in the calculation of the available potential. Will dedicated energy crops (such as switchgrass) play a significant role in Brazil towards 2030?
- ***Question 4***: Do you have any information about the production cost for agricultural residues, mainly sugarcane and soybeans? – are current price estimates reasonable?
- ***Question 5:*** Do overall results and quantities of available biomass appear feasible to you
- ***Question 6:*** Were the right and sufficient sustainability constraints taken into account?
- ***Question 7:*** Do you have any other suggestions/additions?

5.2. Main comments and points discussed in the teleconference

Martin Junginger welcome all the participants and makes a brief introduction of the project (objectives, work packages and consortium) and then Lotte Visser starts the presentation of the results of the Brazilian Case Study (power point presentation).

After the presentation starts a round of comments.

Available agricultural residues

- Regarding the use of **sugarcane residues** Suani Coelho remarks one comment from UNICA in the last meeting: sugar alcohol industry in Brazil doesn't have interest in producing pellets, they prefer to produce 2nd generation biofuels. At the moment there`s only one ethanol plant (Granbio) that can use this residues (top & leaves).

Bagasse completely used in the boilers, no surplus at least in Sao Paulo (is 100% used).

- In the case of **rice residues,** the husk is used in the boilers and there are other residues that need to be left on the soil (sustainability constrain). It seems to be a low potential available but Suani will check.

Scenarios for agricultural residues

- When talking about scenarios for the availability of sugarcane **tops & leaves try** to be conservative **considering that 60% of the material should be left on the soil** (depends on type of the soil) and 40% can be used.
- Nowadays the amount of electricity sold to the grid by the ethanol industry is very limited. The Government is going to increase this amount through policies. Forecast to 2030, if there are policies to incentive the sale of electricity maybe all residues will be used for electricity production. Sao Paulo state will probably start this year a R&D 2-year project (funded by the Government) that evaluates the perspective of sugar mills to increase their electricity production capacity.

Forest residues

- Javier Escobar points out that for forest residues the situation is more or less the same than for agricultural residues. The big problem in forests is the location which sometimes makes transport by truck unfeasible, therefore they are left on the ground.

Pellet factories

- Is important to check the info about pellet production plants because in some cases the information about pellet production plants in Brazil is not reliable. Suani Coelho will try to send some information (contacts at University).

5.3. Statements

- The main problem in Brazil is logistics. Even in the more developed regions of the country the transport costs are so high that made unfeasible the use of the residues.
- Policy scenario is changing, therefore for the 2030 scenario the potential shown in this study might be a bit optimistic for sugarcane residues (depends of the on-coming policies,..).
- It is important to use reliable references for getting information up to date.

6. Teleconference on Ukraine Case Study, 19 February 2016

6.1. Objective

In December 2015, the Utrecht University finalised the first draft of the case study in Ukraine: "**Biomass Use and Potential for export to the European Union from 2015 to 2030 Ukraine – Case Study**" as part of the six Case Studies under development within the BioTrade2020plus project
The objective of this Telco was to discuss with relevant stakeholders about the results of the case study in order to be incorporated in the final report to the European Commission. More specifically, the points to be addressed were:

- Sustainability constraints
- Local use of agricultural residues
- Local demand for lignocellulosic biomass for energy production
- Pellet production capacity
- Production cost of pellets from agricultural residues

6.2. Main comments and points discussed in the teleconference

Martin Junginger welcomes all the participants and makes a brief introduction of the project (objectives, work packages and consortium). All participants gave a brief introduction on themselves and their organisations. Lotte Visser gave a presentation on the results of the Ukraine Case Study (power point presentation).
After the presentation starts a round of comments.

Biomass market

- The question was raised if it would not be better to transport bio-electricity than the solid biofuels to the EU, as the transport of electricity could be cheaper than the transport of biomass. The consortium acknowledges this idea, but in order to compare the Ukraine case study with the other BioTrade2020plus case studies, the option to export bio-electricity to the EU was not considered in the Case Study. This option would be only relevant to the Ukraine case study, as the distance to the counties of the other case studies are larger, making bio-electricity export impossible.
- It was mentioned, that the biomass market is currently changing rapidly, as the demand increases due to limited natural gas supply. It may happen that the internal market is soon absorbing the biomass potential of Ukraine.

Production of biomass in Ukraine

- The case study focuses on pellet production and its export potential. Why does it not include other advanced biofuels such as torrefied pellet or pyrolysis oil? The main reason it is the lack of reliable data about the production cost of these pre-treatment technologies.
- The generation of pellet plant capacity could be less of a barrier than currently assumed. If the demand for pellets increases, capacity can be generated quickly. Logistics on the other hand could be a barrier considering the high transport cost of local transport.

Transportation cost

- The transportation cost could be a big share of the final prices. The pellets must be transported from the production plant to Odessa harbour and then shipped to Rotterdam. The transportation cost to Odessa harbour alone is 20€/tonne. Cost to transport pellets to the Odessa harbour are 15 €/tonne from the Cherkasy region. Mr. Kees Huizinga offered to check the current assumptions on transport costs used for the Ukranian case study.
- Wood pellets are already transported by truck from Western Ukraine to Poland, this is a cost effective option for pellets from Ukraine.

Pellet production cost

- The costs for the pellet production is assumed at around 50€/ton in the Biotrade 2020 case study, which is rather high. The actual pellet price in Ukraine is lower, about 35€/ton. However,t his may be due to the fact that the investment costs of these existing pellet plants have already been written off. In the longer term, if the production grows, the cost could be within this range since new and larger capacity will likely be more expensive
- Currently there is no market for agri pellets, since there are issues with chlorine/alkali content.

Removal of the straw us soil fertilization

- Currently in Ukraine as little fertilizer as possible is used, mainly for economic reasons. Soil quality is monitored by farmers in order to safeguard yield and production, often 100% of the residues is left on the field.
- The study considers a minimum rate of straw left in order to maintain the organic matter into the soil. This is a controversial issue and depending on the model assumed, the optimum percentage could change widely. Although the Ukraine soils are rather fertile, in the long term, an intensive straw removal could be an extra cost for farmer in fertilization. On the other hand, if prices of residues would increase considerably, farmers would be encouraged to remove more organic material from the fields than is sustainable. This would be a risk.
- Removing wheat straw was deemed a bigger sustainability concern than removing maize straw, so the focus should be on using maize residues first. However, collecting wheat straw is easier than collecting maize straw.

6.3. Statements

- Ukraine has a big capacity to produce and export agro-pellets at a competitive price. Even so, an internal demand increase due to energy crises could change the expectation.

7. Consultations for the next period

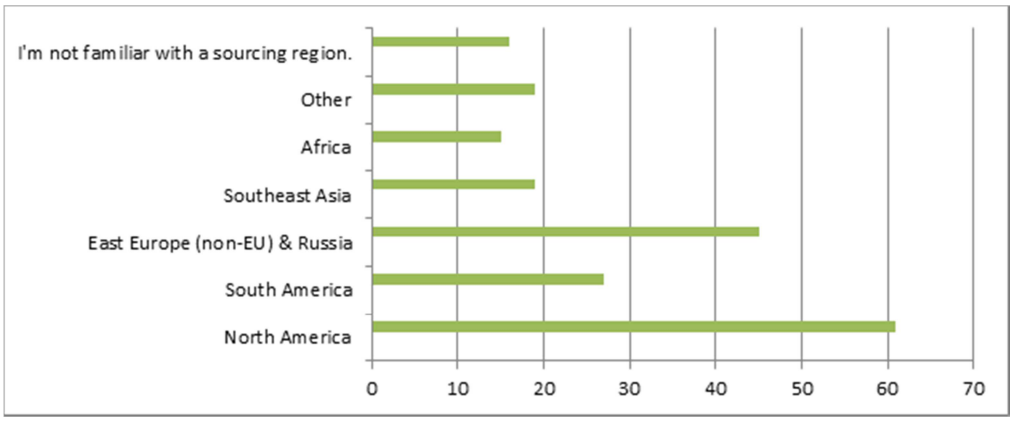
For the next period new additional teleconferences have been planned. The dates have to be fixed during the following weeks but preferably will be held during April-May 2016. These teleconferences will finish the discussion of the reports on the six case studies (developed under WP3) and more specifically on Colombia.
The main outcomes of these and other future teleconferences will be included in the following report on the progress of BioTrade2020plus stakeholder consultations which is due to month 30 (August 2016).

8. Survey on opportunities, risks and barriers of international trade

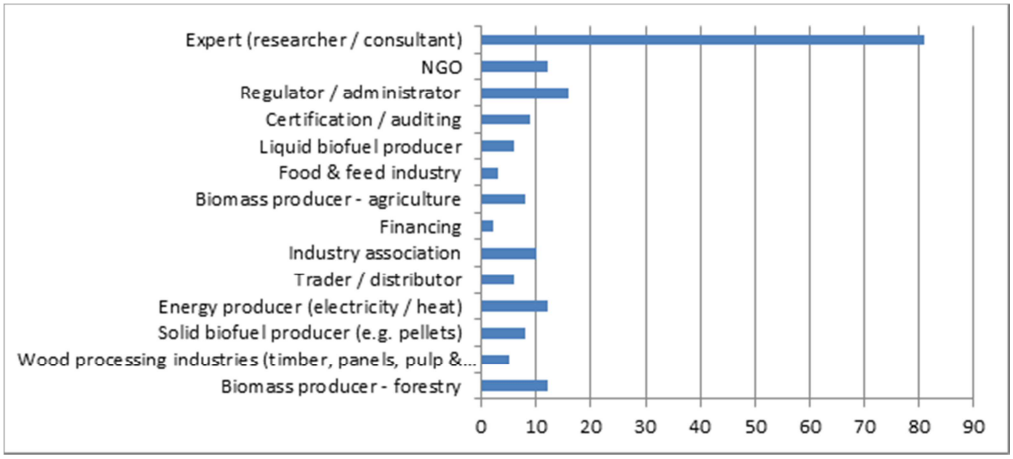
In April 2015 a BioTrade2020plus survey was launched on global level. The aim was to gather stakeholder's opinions in terms of opportunities, risks and barriers of international trade, key principles of sustainable trade, and potential policy options to deal with risks and barriers.
The survey was closed in mid-June, 129 responses were received.

Some general statistics related to the type of participants and their background are shown in the following figures:

Which sourcing regions are you most familiar with? (multiple selections possible)



In which type of organisation are you working? (multiple selections possible)



The results will be processed in the summer.

9. BioTrade2020plus Consortium

CENER – National Renewable Energy Centre, Biomass Department, Spain

Project Coordinator BioTrade2020plus

Contact persons: David Sánchez González & Inés del Campo Colmenar

Imperial – Imperial College London, Centre for Environmental Policy, United Kingdom

Contact persons: Dr Rocio Diaz-Chavez

DLO – Alterra, Wageningen University and Research, The Netherlands

Contact persons: Dr Gert-Jan Nabuurs & Dr Berien Elbersen & Dr Wolter Elbersen

IINAS – International Institute for Sustainability Analysis and Strategy GmbH, Germany

Contact person: Leire Iriarte & Uwe Fritsche

***VITO - Flemish Institute for Technological Research,* Belgium**

Contact persons: Luc Pelkmans

UU - Utrecht University, Faculty of Geosciences, Energy & Resources, Copernicus Institute of Sustainable Development, The Netherlands

Contact persons: Dr Martin Junginger & Thuy Mai-Moulin

WIP- WIP Renewable Energies, Germany

Contact persons: Dr Rainer Janssen & Dominik Rutz

10. Appendix 1:

Telco participants – January 27. 2015 16:00-17:00 CET.

Working group members, Advisory Board Members, Stakeholders:

- Kevin Vessey, SMU, Canada
- Jessica Brooks, USIPA, USA
- Jorge Hilbert, INTA, Argentina.

Participants of the BioTrade2020plus consortium:

- Leire Iriarte, IINAS, Spain, (Moderator), li@iinas.org
- Rocio Diaz-Chavez, Imperial College London, UK (Moderator), r.diaz-chavez@imperial.ac.uk
- Rainer Janssen, WIP, Germany (Facilitator), Dominik.Rutz@wip-munich.de
- Ines del Campo Colmenar, CENER, Spain (Rapporteur), idelcampo@cener.com
- Eduardo Otazu Vidart, CENER, Spain, eotazu@cener.com

Stakeholders excused:

- Mika Muinonen, Torrec Oy – Finland

Telco participants – December 15th. 2015 10:00-11:00 CET.

Working group members, Advisory Board Members, Stakeholders:

- Mr Michael Wild. Wild & Partners. Austria

Participants of the BioTrade2020plus consortium:

- Mr. Martin Junginger, Utrecht University, The Netherlands
- Mrs. Thuy-Mai Moulin.Utrecht University. The Netherlands

Telco participants – December 15. 2015 16:00-17:00 CET.

Working group members, Advisory Board Members, Stakeholders:

- Mr Mike Williams, Westervelt Company, USA
- Mr Robbert Malmsheimer, Syracuse, NY, USA
- Mr Todd Bush, CM Biomass, USA
- Ms Nadine Block, Sustainable Forestry Initiative Inc., USA

- Mr Tat Smith, University of Toronto, USA
- Mr Richard Peberdy, Drax Power, USA
- Mr Charles W. Becker, Virginia Department of Forestry, USA

Participants of the BioTrade2020plus consortium:

- Mr Kevin Fingerman, IINAS, Germany
- Leire Iriarte, IINAS, Spain, (Moderator),
- Mr Gert-Jan Nabuurs, Alterra, Wageningen University and Research, The Netherlands
- Mr Martin Junginger, Utrecht University, The Netherlands
- Ms Rocio Diaz-Chavez, Imperial College London, UK
- Mr Dominik Rutz, WIP Renewable Energies, Germany

Telco participants – January 19. 2016 16:00-17:00 CET.

Working group members, Advisory Board Members, Stakeholders:

- Suani Teixeira Coelho, University of São Paulo
- Javier Escobar, University of São Paulo

Participants of the BioTrade2020plus consortium:

- Mr. Martin Junginger, Utrecht University, The Netherlands
- Ms. Lotte Visser, Utrecht University, The Netherlands
- Ms. Ines del Campo Colmenar, CENER, Spain
- Ms. Rocio Diaz-Chavez, University College London, The UK
- Ms Leire Iriarte, IINAS, Germany

Stakeholders excused:

- Geraldine Kutas, UNICA Brussels (excused)
- Cynthia Martin, Albioma (excused)
- Celso Marcelo de Oliveira, ABIB Brazil
- Altair Negrello, Klabin Paper and Cellulose
- Rodrigo Rasga, Columbia Energia
- TCF Pellets

Telco participants – February 19. 2016 10:00-11:00 CET.

Working group members, Advisory Board Members, Stakeholders:

- Mr Semen Drahniev, SEC Biomass, Ukraine
- Mr Bogdan Dreihaupt, Control Union, Ukraine
- Mr Kees Huizinga, Kischenzi, Ukraine

Participants of the BioTrade2020plus consortium:

- Mr. Martin Junginger, Utrecht University, The Netherlands
- Ms. Lotte Visser, Utrecht University, The Netherlands
- Mr Wolter Elbersen, DLO, The Netherlands
- Mr David Sanchez Gonzalez, CENER, Spain
- Mr Dominik Rutz, WIP Renewable Energies, Germany
- Mr Rainer Janssen, WIP Renewable Energies, Germany

11. Appendix 2:

Sustainability criteria and indicators table

Theme	Criterion	Indicator			Ambition							
					Basic set				Advanced set			
		#	Indicator	Description	Minimum req	Comp. Non-renewable reference	Comp. Bio reference	Descriptive	Minimum req	Comp. Non-renewable reference	Comp. Bio reference	Descriptive
Environmental	1. Resource efficiency	1.1	Land Use Efficiency	Available bioenergy carriers (including by- and co-products along the bioenergy life cycles) per hectare of cultivated area			✓		✓			
		1.2	Secondary Resource Efficiency	Heating value of the bioenergy output divided by the heating value of the secondary resource (e.g. waste or residues). This indicator applies to bioenergy carriers stemming from the conversion of secondary biomass resources such as residues and wastes.			✓		✓			
		1.3	Energy Efficiency	Cumulative energy demand (all inputs (based on LHV primary energy), incl. renewable energy and biomass input, compared to the outputs		✓			✓			

		1.4	Functionality (Output service quality)	Economic value of the outputs (€/GJ x GJ energy carriers + €/ton x ton materials), compared to the economic value of the heat which could be produced from burning the (dried) primary inputs (reference = heat from NG ~ 10€/GJ); economic values are excl tax, for industrial customers						✓	✓	

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Environmental	2. Climate Change	2.1	GHG(CO_2eq) LCA, including LUC	GHG emissions during crop growth & harvesting, logistics, pretreatment and conversion, distribution, end use; in relation to the final output (combination of electricity, useful heat, biofuels & biomaterials)	✓				✓			
		2.2	Other GHG emissions	GHG from iLUC and C stock changes.		✓	✓		✓			
	3. Biodiversity	3.1	Protected areas and land with significant biodiversity values	Categories established by the RED	✓				✓			
		3.2	Biodiversity conservation and management	"Agrobiodiverse cultivation" (crop rotation; crop diversity in the landscape; avoidance of alien species) and amount of chemicals (pesticides/herbicides). Release of GMOs			✓		✓			
	4. Soil	4.1	Erosion	Probability of erosion where mitigation measures are not feasible			✓		✓			
		4.2	Soil Organic C	It depends on the type of crops (perennials and annual crops) and respective land management.			✓		✓			
		4.3	Soil Nutrient Balance	Probability of nutrient balance loss where mitigation measures are not feasible			✓		✓			

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Environmental	5. Water	5.1	Water availability and regional water stress	Water use in relation to TARWR (total actual renewable water resources), or average replenishment from natural flow in a watershed.						✓	✓	
		5.2	Water use efficiency	Water use for biomass production (cropping)+irrigation+processing						✓	✓	
		5.3	Water quality	Water quality: water pollution (nitrate, phosphorous, pesticides, BOD)						✓	✓	
	6. Air	6.1	SO_2 equivalents	life cycle emissions of SO2, NOx, NH3 and HCl/HF from bioenergy provision, expressed in SO2 equivalents and calculated in accordance to the life cycle emission methodology for GHG		✓	✓		✓			
		6.2	PM_{10}	Life cycle emissions of PM10 from bioenergy provision, expressed in PM10 equivalents and calculated in accordance to the life cycle emission methodology for GHG		✓	✓		✓			
Social	7. Participation and transparency	7.1	Effective participatory processes	Enable effective participation of all directly affected stakeholders by means of a due diligence consultation process, including Free Prior & Informed Consent (FPIC) when relevant								✓

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Social	7. Participation and transparency	7.2	Information transparency	Documentation necessary to inform stakeholder positions shall be made freely available to stakeholders in a timely, open, transparent and accessible manner								✓
	8. Secure tenure of land	8.1	Compliance with the VGGT to secure land tenure and ownership	Share of area or share of biomass that could be under secure land tenure, based on literature revision and national (or international) statistics.			✓		✓			
	9. Employment and labor conditions	9.1	Full direct jobs equivalents along the full value chain	Number of jobs from bioenergy (See the methodology of the GEF study)		✓	✓			✓	✓	
		9.2	Full direct jobs equivalent in the biomass consuming region (or country)	Number of jobs from bioenergy (See the methodology of the GEF study)		✓	✓			✓	✓	
		9.3	Human and Labor Rights	Adherence to ILO principles and voluntary standards. Not all countries are signatories of ILO	✓				✓			
		9.4	Occupational safety and health for workers		✓				✓			

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Social	10. Health risks	10.1	Risks to public health	i.e. noise level and accidents								✓
Social	11.Food and fuel security	11.1	Risks for negative impacts on price and supply of national food basket and fuelwood.	Based on the BEFS methodology (and literature references).			✓		✓			
Economic	12. Production costs	12.1	Levelized life-cycle cost, excluding subsidies (including CAPEX, OPEX)	Levelized life-cycle cost, excluding subsidies (See the methodology of the GEF study)		✓	✓			✓	✓	