BioTrade2020+
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IEA Bioenergy
Task 40: Sustainable International Bioenergy Trade

International workshop:

Towards sustainable international biomass trade strategies

Friday 24 October 2014, Brussels

Workshop Summary

Workshop background

Today in the European Union, the cost-effective achievement of existing and future bioenergy targets set in the legislation implies that in addition to using domestic sustainable and cost-competitive biomass potentials, European markets will also (partly) rely on sustainable and cheap(er) imports of biomass. Some well-positioned regions of the world are already playing a role in supplying biomass to the European markets and could become increasingly relevant in the near future.

This workshop aimed to bring people together to initiate discussions on how these trade strategies can be framed. The central points of discussion were (1) how to define sustainable export potentials, (2) which opportunities and risks are connected with biomass trade and how these can be addressed, and (3) which are the key principles that sustainable biomass trade should fulfil – one important point is the interaction between local use and exports in the sourcing regions.

Workshop organisation

This workshop was co-organised by the BioTrade2020+ project and IEA Bioenergy Task 40.

BioTrade2020plus

The main aim of the European project BioTrade2020plus is to provide guidelines for the development of a European Bioenergy Trade Strategy for 2020 and beyond. It shall ensure that imported biomass feedstock is sustainably sourced and used in an efficient way, while avoiding distortion of other markets. BioTrade2020plus is supported by the Intelligent Energy for Europe Programme of the European Commission. The project started in March 2014 and will continue until August 2016. www.biotrade2020plus.eu

IEA Bioenergy Task 40

Task 40 is an international working group under the IEA Bioenergy Implementing agreement. The group conducts studies and organizes events on various topics related to sustainable international bioenergy trade. www.bioenergytrade.org

Workshop summary

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All workshop presentations are available at the website:
http://www.biotrade2020plus.eu/news-events.html

Workshop Summary

The international workshop "Towards Sustainable International Biomass Trade Strategies", co-organised by the BioTrade2020+ consortium and IEA Bioenergy Task 40, was held on 24 October 2014 at VLEVA (Liaison Agency Flanders-Europe) in Brussels.

The workshop began with an introduction of the BioTrade2020+ project by **Luc Pelkmans (VITO)** and **David Sanchez (CENER)**. The project is currently in an early stage and some preliminary results have been produced. Pelkmans pointed out that this workshop provides opportunities for more than 60 stakeholders from a diverse background and different continents, including Europe, Africa, Asia, Australia, North America and South America to come together and initiate discussions on how trade strategies can be framed. The outcome of these discussions will be used as inputs for the project work. More details about the project are available on the project website (www.biotrade2020plus.eu).

Martin Junginger (UU), leader of IEA Bioenergy Task 40, presented an overview on the history and future expectation of biomass trade for energy. He revealed that in the past century, biomass consumed for energy purposes largely occurred locally. However, due to advanced pretreatment technologies, inter-continental trade became economically feasible around the year 2000 and has increased exponentially since then. In recent years, the EU has become the biggest importer of biomass energy, stimulated by a series of promoting policies in several Member States, but East Asia has emerged as a new market for biomass. Junginger indicated that last year there was about one million tonnes of pellets imported to Korea, mainly from Vietnam and Canada. "Without policy support, there will be very little bioenergy trade," Junginger stressed. For the future, Junginger pointed out that in order to make demand and supply for bioenergy meet, traded volumes will have to increase drastically, to levels of 100 million tonnes per year. Main exporting regions could be Latin America, Sub-Saharan Africa and Russia, main importing regions the OECD countries, China and India.

Last year, Task 40 has published a book "International Bioenergy Trade: History, status & outlook on securing sustainable bioenergy supply, demand and markets" which compiles lessons and insights on the trade of global bioenergy commodities. It is available for purchase on the Springer website.

Uwe Fritsche (IINAS) presented an overview of the methodological framework developed within the BioTrade2020+ project for the assessment of sustainable biomass export potentials consisting of the following 10 steps:

(1) *Selection of case studies*: Determine the most promising exporting countries to the EU-28, and respective lignocellulosic feedstocks to be exported from each country. The current selection of case studies includes South-East US, Brazil, Colombia, Indonesia, Ukraine, Kenya/Mozambique.

(2) *Technical potential*: Determine the total technical potential of given feedstocks in case study countries, taking into account current production of lignocellulosic biomass and land availability

(3) *Sustainable potential*: Determine the sustainable potential for basic (EU RED) and advanced economic, environmen-tal, social and institutional criteria

(4) *Market potential*: Determine the total market potential of a given feedstock in any country. Market potential is meant as the (market) conditions under which sustainable potentials could be mobilized.

(5) *Domestic demand*: Understand the demand of lignocellulosic feedstocks for energy and various uses at sourcing countries (e.g. traditional non-energy uses, traditional energy uses, new biomass applications).

(6) *Sustainable feedstock surplus*: Estimated as the market potential (4) minus domestic demand (5).

(7) *Global demand and supply*: Understand biomass demand and supply flows at global level

(8) *Net sustainable potential for exports to EU28*: Estimate final potential of feedstock to be exported to EU-28 that meet sustainability criteria

(9) *Biomass carriers and transport routes*: Define and select suitable biomass for export; identify technologies to treat specific feedstocks; design optimal transport routes.

(10) *Supply & demand cost curve, GHG balances of bioenergy imports*: Estimate total cost of biomass in the supply chains; combine with supply over time to create cost-supply curves; determine GHG emissions in whole supply chain.

Preliminary work on the application of the BioTrade2020+ methodology for the assessment of sustainable biomass export potentials to case studies in South-East US and Kenya/Mozambique was presented by **Leire Iriarte (IINAS)** and **Thuy Mai-Moulin (UU)**. In the two case studies, local demand is computed based on national data and projected using qualitative assessment instead of complex economic modeling. It was stressed by the workshop participants that local market conditions must be taken into account more carefully especially considering the cost and price issues. Furthermore, it was recommended to carefully distinguish between technical potential and sustainable potential in target regions. Finally, one workshop participant pointed out that by improving efficiency not only in production but also in local biomass usage (which is currently of very low efficiency), extra volume of biomass could be available for export.

Bah Saho (ECREEE - ECOWAS Centre for Renewable Energy and Energy Efficiency) presented an overview of the current status of biomass in the ECOWAS (Economic Community Of West African States) region which is dominated by widespread and unsustainable utilization of traditional biomass with almost 80% of the total energy consumption coming from traditional biomass and over 90% of the population using wood and charcoal for domestic cooking. In order to improve sustainability of biomass production and use in Africa, Bah Saho recommended several measures such as policy, legal and regulatory support of participatory and decentralised approaches, empowering of rural communities and private forest owners, capacity building for all stakeholders on sustainable forest management, as well as enhancing financing mechanism for the demonstration of sustainable biomass value chains.

Within the **break-out sessions** workshop participants were split into four groups for an interactive discussion on (1) how to translate technical potentials into sustainable potentials, (2) how to assess local demand, (3) opportunities and risks of international biomass trade and (4) key principles for sustainable trade and policy options.

Key outcomes of the break-out sessions are presented further on in this report.

In the afternoon session, Martin Junginger led the panel debate on "*Export or local use of biomass, is it a dilemma*?" joined by representatives of (potential) export regions, namely Patrick Lamers (INL, USA), Maria Almeida Aranha (UNICA, Brazil), Bah Saho (ECREEE, ECOWAS), and Michael Deutmeyer (Green Resources AS).

Michael Deutmeyer presented the activities of Green Resources AS in East Africa. The company is engaged in replanting forest on degraded forest and bush land in Tanzania, Mozambique and Kenya. Currently up to 40,000 ha have been replanted with the aim to expand up to 200,000 ha in the future. The company applies FSC certification and has created jobs and improved infrastructure for rural communities. Today, forest products only serve local market (e.g. charcoal), whereas oversea markets may be addressed in the future with large scale production of fibre.

Deutmeyer underlined the importance of involving and continuous negotiations with local stakeholders and communities to ensure successful implementation of biomass energy initiatives in Eastern Africa. Issues to be addressed and monitored include land rights, access to land as well as (traditional and potentially unauthorised) use of resources by the rural population. Significant efforts are needed to properly address potential conflicts between international companies developing biomass energy initiatives in Eastern Africa and the rural population.

Bah Saho (ECREEE) confirmed the interest of African countries to develop sustainable biomass projects in collaboration and partnership with international companies. In order to mobilise investment supportive and stable policy and regulatory frameworks need to be established and enforced by African Governments. However, biomass production shall not exclusively address export markets, as local demand for sustainable cooking fuels is very large in most African countries.

Maria Almeida Aranha (UNICA) presented an overview of the Brazilian bioenergy sector. In 2013, the total renewable energy share in the energy matrix in Brazil was 45%, with biomass energy accounting for 25%, and sugar cane based energy production alone for more than 15%.

In the electricity sector there is good complementarity between hydro power and biomass electricity production as the availability of bio-electricity corresponds to the dry season (with lower water levels in the reservoirs) in Brazil. In the past years the sugar cane biomass feedstock base has been largely increased due to phasing out the burning of fields (connected to manual harvesting) leading to an enhanced availability of sugar cane straw.

In addition to the use of sugar cane bagasse and straw for electricity generation, there are already several commercial plants commissioned for second generation biofuel production in Brazil (GranBio, Odebrecht and Inbicon, Petrobras). It is expected that large amounts of second generation biofuel will be produced from bagasse and straw in the near future.

Maria Almeida Aranha highlighted that the current development of the Brazilian bioenergy sector is largely triggered by domestic demand, but export could become an important factor, if external markets are becoming more attractive.

With respect to potential future woody biomass use in the US, **Patrick Lamers (INL)** reported that specific mandates have been set for the liquid biofuels sector (by the Energy Independence and Security Act (EISA), 2007), whereas mandates for renewable electricity only exist at state level and do not include sub-targets for bioenergy. Volumes mandated by EISA are 36 billion gallons (Bgal) of renewable fuels by 2022, of which 21 Bgal shall be advanced biofuel, 16 Bgal cellulosic biofuels, and 1 Bgal biomass based diesel.

According to recent studies, US woody biomass supply potential accounts for 140 Mt (million tonnes) compared to a projected demand in 2025 of about 100 Mt indicating significant opportunities for export. Lamers explained that the supply-demand dynamics in the US largely depends on private land owners who are not bound to any legislation but attracted by economic incentives.

For the production of advanced biofuels, currently biochemical conversion pathways using agricultural residues are more advanced than thermochemical conversion of woody biomass. Therefore, Lamers expects the demand for woody biomass to produce biofuels not to increase dramatically in the short term. Also the increased use of biomass to substitute coal is deemed unlikely, given the current opposition of NGOs and the ongoing use of shale gas to replace coal in the US. However, national demand for woody biomass may be stimulated by tax incentives if the industry creates new jobs, especially in rural areas.

Finally, Lamers suggested addressing urbanization as one scenario to be considered in the assessments performed within the BioTrade2020+ project, as urbanization is regarded as strong competitor on land-use.

The panel debate was concluded with the question on how to realistically determine land availability for bioenergy in potential export countries. For African countries Bah Saho stressed the importance of the implementation and enforcement of regulations and land use planning as well as a clear classification of forests and other land types. Maria Almeida Aranha pointed out that the Brazilian government has already performed a detailed land zoning initiative determining potential expansion areas for sugarcane in the future. According to this land management planning about 7.5% of arable land in Brazil can be utilized for sugar cane cultivation, with currently 1.5% being used. Lamers reported that large numbers of private land owners make decisions on land use based on market and revenue opportunities, thus potential land availability in the US is difficult to estimate.

Summary of the interactive break-out session

The audience was divided in 4 groups of around 15 people, taking into account people's background in terms of sectors and regions. Each group had a moderator and a rapporteur from the BioTrade2020+ consortium.

4 items were discussed in a timeframe of 1.5 hours:

1. How to translate technical potentials into sustainable potentials?
2. How to assess local demand?
3. Opportunities and risks of international biomass trade
4. Key principles for sustainable trade and policy options

1. How to translate technical potentials into sustainable potentials?

The translation of technical potentials into sustainable potentials for the selected countries (and respective feedstocks) is a key activity within the Biotrade2020+ project. In this session the aim was to collect stakeholder opinions regarding three statements:

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

The discussion on the 1st question concentrated on the following aspects:

- *No distinction in biomass utilization (for bioenergy, bioproducts, food, feed, fibre) when applying sustainability requirements* (so not only for energy as is often the case now). Most people agreed with this. However, this is not easy to implement and can only be done step by step.
- *Can we apply the same requirements/indicators/thresholds for domestic and imported biomass?* It was stressed that even if same general principles/criteria should apply, some specificity will be needed as countries have different backgrounds. One participant stated that *criteria (and principles)* should be generic and apply to all feedstocks and locations; narrowing down these principles into indicators can be region and feedstock specific. Example is the application of FSC and PEFC. Transparency is very important.
- *Can we expect that similar sustainability criteria are applied regardless where the biomass is consumed?* Different countries will have a different approach in this. We can't expect every country to adopt the same requirements for all types of biomass and all applications. Nevertheless it would be best to have a consistent approach, also to avoid leakage (unsustainable products being used in sectors or countries with low requirements).

Some other remarks of the participants:

- If applied to all biomass feedstocks and applications, sustainability requirements should also be applied to *fossil feedstocks*. Otherwise there is no level playing field.
- First focus on capacity building before we start to require tough sustainability criteria.

2. ***Sustainability requirements not only need to be taken into account when translating the technical potentials into sustainable potentials but should consider as well the <u>full value chains</u> (e.g. for GHG emissions derived from processing or transporting to EU).***

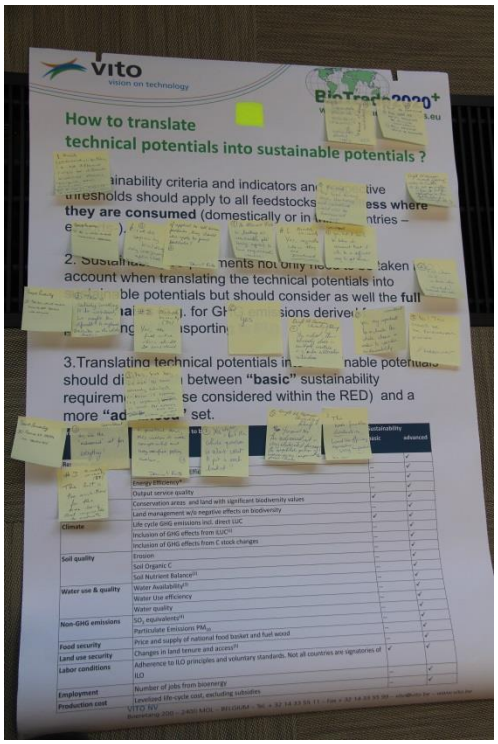
There were some discussions how far this value chain would reach: up to the EU harbour (where the biomass enters the EU market) or including end use:

- Some participants stated that we should focus on the sustainability of the feedstock production.
- Others would limit the value chain to the port of entrance (including pretreatment and transport). The end use is a different matter.
- Many participants felt that efficient end use also needs to be included to evaluate sustainability

One participant stated that there is a need to first have clear definitions of "technical potential", "sustainable potential" and "translating". It is also important to consider a "realistic potential".

3. ***Translating technical potentials into sustainable potentials should distinguish between <u>"basic"</u> sustainability requirements (those considered within the RED) and a more <u>"advanced"</u> set.***

There were differences of opinion: some participants wish to extend the criteria to the advanced set, others stated that this would be too ambitious, with some criteria difficult to evaluate. In case that the set of sustainable indicators would be too demanding, this may decrease the competitive position of bioenergy compared to fossil fuels. One group concluded that basic requirements are the ones to be applied on the market (maybe slightly extended, e.g. with social criteria and soil quality), the advanced set will serve for monitoring. For calculating sustainable potentials the advanced set can be used.



2. How to assess local demand?

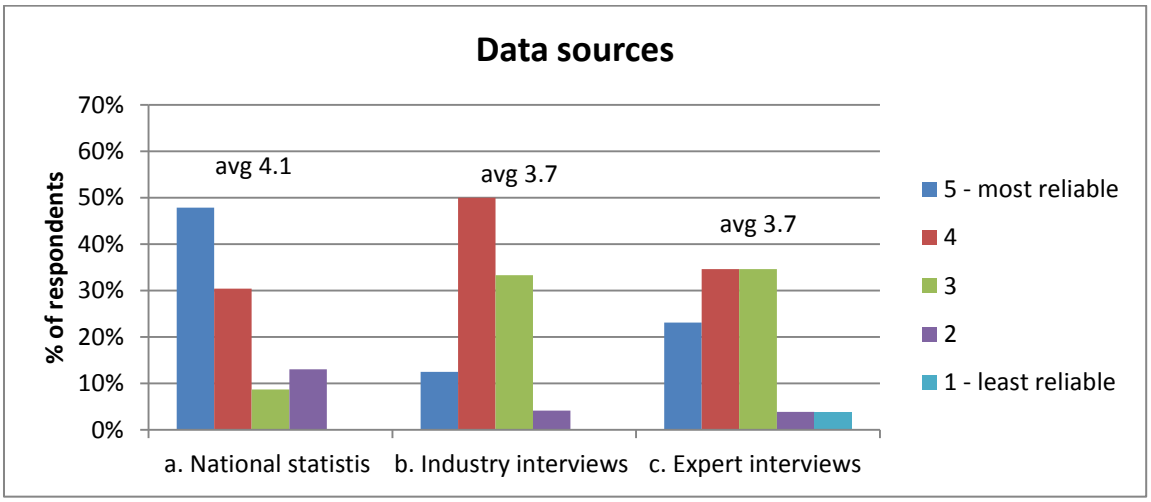
The local demand for energy and other uses at sourcing regions is assessed by investigating the use of lignocellulosic biomass for food, feed as well as traditional purposes (paper & pulp, construction material) and new material purposes (biochemical, plastics), use of lignocellulosic biomass for local traditional energy, and use of lignocellulosic biomass for local modern small scale and modern large scale energy uses that might already exist or arise in the future.

There are a number of data sources to support the assessment of local demands for lignocellulosic biomass. The BioTrade2020+ project will rely on national statistics, international projections (e.g., from IEA) as well as questionnaires and interviews with project partners and stakeholders in the international sourcing regions for the estimation. Furthermore, site survey is another method with assistance of project interns to collect data in those countries. Results of external reports and projects are equally used to ultimately achieve an overall estimation of domestic uses of dominant agricultural products, energy crops and forest feedstocks at present, in 2020 and in 2030.

1st question: How reliable do you assume the assessment of current (and future) local demand using the following methods:

a. *Based on national statistics (e.g. population, GDP, biomass uses for materials and energy by different users)*
b. *Interview and questionnaires with industries that use biomass for energy and other purposes*
c. *Interviews with experts to assess uses of biomass outside the formal economy (e.g. use of fuel wood by local people)*

The figure below shows the spreading of responses (with average scoring per data source, on a scale from 1 to 5).



National statistics score higher than interviews. Nevertheless it was frequently stated that a combination of different sources of information is needed. The reliability of the different methods is also country specific.

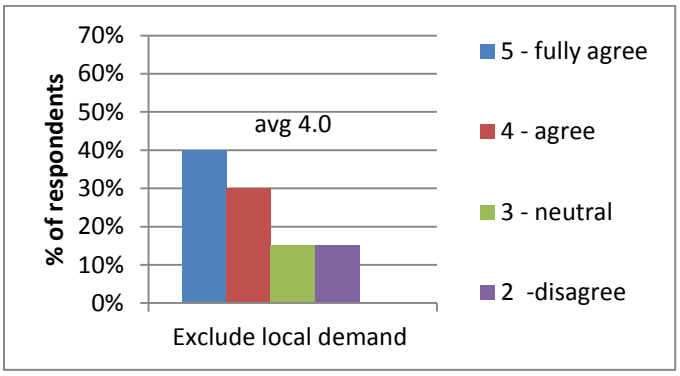
- *National statistics*: may be OK for OECD countries, but unreliable for less developed countries. A comment was that the methodologies of data collection / statistics change from time to time.
- *Interviews/questionnaires with industries*: data should be available, preferably from associations to get the whole picture. Strategic agenda from individual companies? It was stressed that this is a good data source, but results have to be handled with care as they may be biased.
- *Interviews with experts* (other biomass uses): relevant for small scale use. Methodology must be known. Indicative general view.

Other methods mentioned: policy target analysis; site surveys (time consuming); modelling; estimates of professionals; consultation. It was mentioned, that ideally all methods for information gathering should be applied in order to have the full picture.

2nd question: For the calculation of export potentials, we suggest to exclude local demand for biomass (for food & feed and material purposes, traditional energy or modern bioenergy purposes, both now and in the future). So local demand gets priority over exports. Do you agree with this approach?

The figure below shows the spreading of responses. 70% responded 'agree' or 'fully agree'. Nevertheless there were some critical remarks:

- How to deal with local inefficient and unsustainable use of biomass?
- It doesn't reflect market complexities, how markets work. This relates to a large number of variables (price, product, availability …).
- Added value should be the first priority.
- OK that domestic *residential* demand gets priority, not industrial demand (some products are locally produced for world markets).
- There are links between domestic markets and exports (they can reinforce each other, create flexibility).

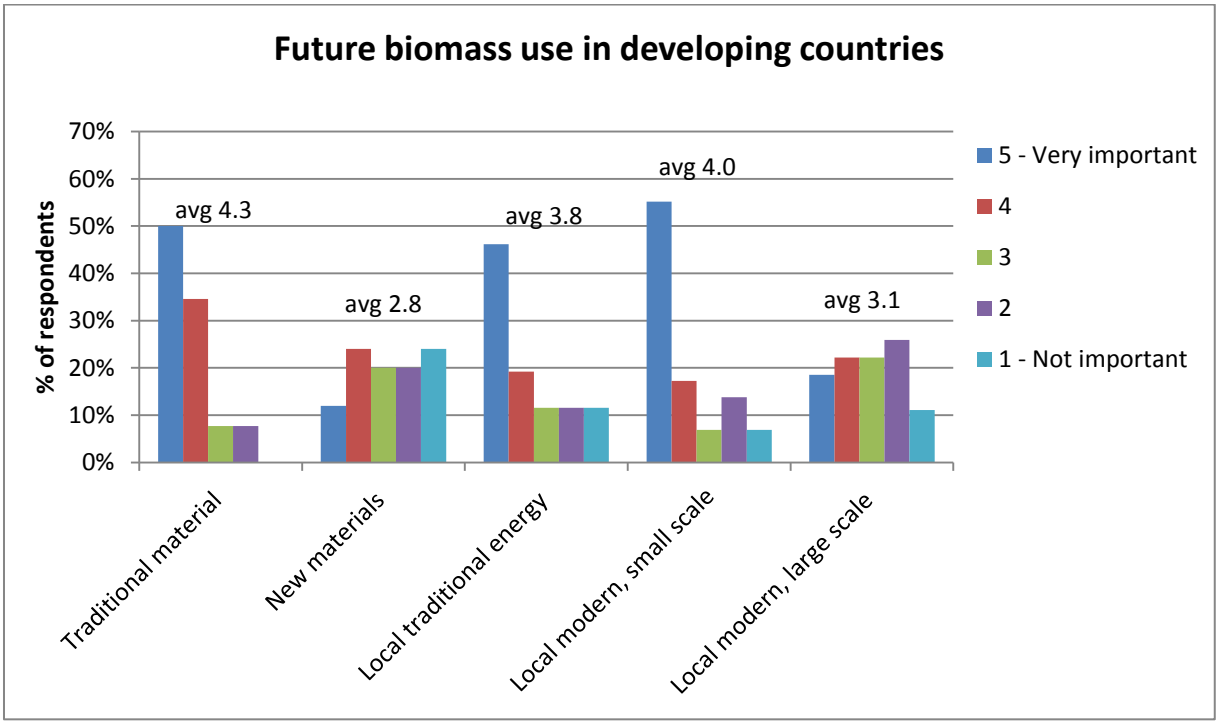


3rd question: How would you see the different applications of lignocellulosic biomass evolve in the future (by 2030)?

Distinction was made between developing countries and developed/OECD countries. The participants were asked to rate the following five types of biomass use according to their importance (market share).

- *Use of biomass for **traditional material purposes** (e.g. paper & pulp, construction material)*
- *Use of biomass for **new material purposes** (e.g. biochemical, plastics)*
- *Use of biomass for **local traditional energy use** (fuel wood)*
- *Use of biomass for **local modern, small scale use** (e.g. modern stoves, small-scale district heating)*
- *Use of biomass for **local modern, large scale use** (e.g. large-scale electricity production, 2nd generation biofuels)*

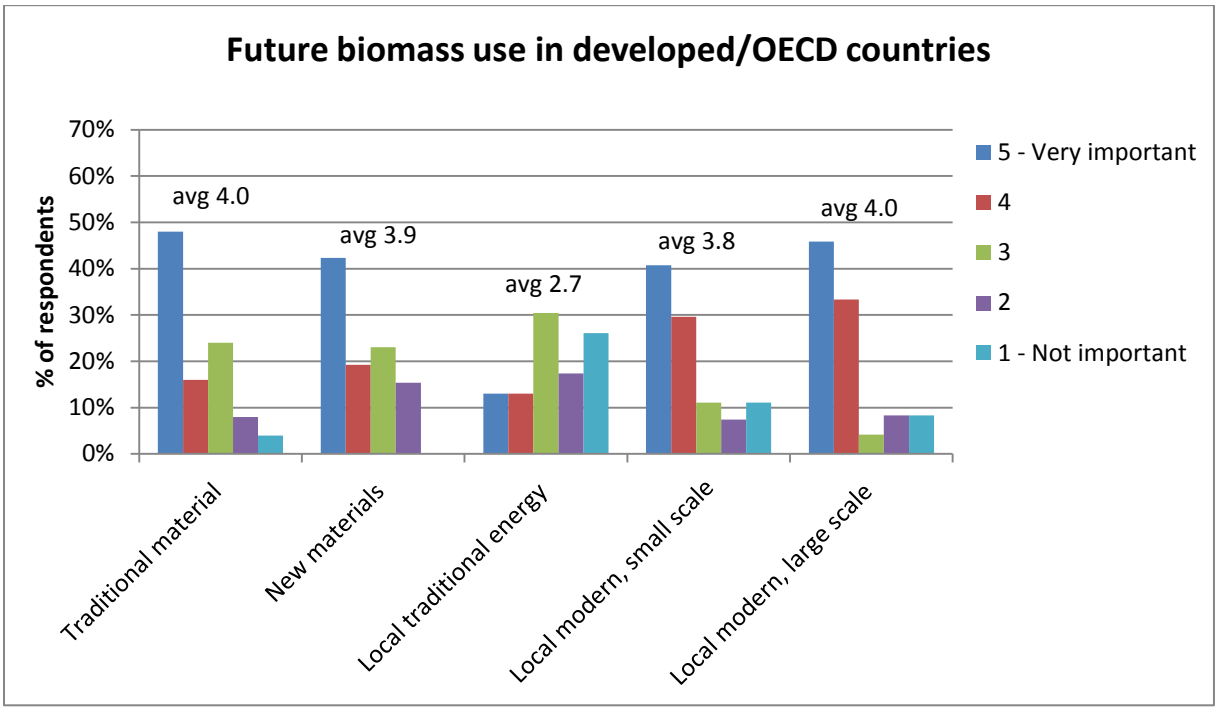
The following figures show the responses, including the averages (on a scale from 1 to 5).



The respondents rated *traditional material use*, *small scale modern use* and *traditional energy use* as most important in developing countries by 2030. Large scale modern installations and new material production were considered less important.

As a general remark it was stated that the expectations differ by region – we can't put all developing countries in one group. E.g. prospects for Latin America are very different from Southeast Asia or Africa.

For developed/OECD countries *local modern large scale use*, *traditional material*, *new materials* and *local modern small scale* were considered in the same range of importance. Local traditional energy was considered less important by 2030.



Some additional remarks:

- Synergies between traditional materials and new materials (new materials may be developed alongside traditional, e.g. in paper industry)
- Synergies between large scale biofuels and new materials (in biorefineries)
- Small scale: we should facilitate the transition from traditional (inefficient) local energy to modern small scale. Better statistics needed.

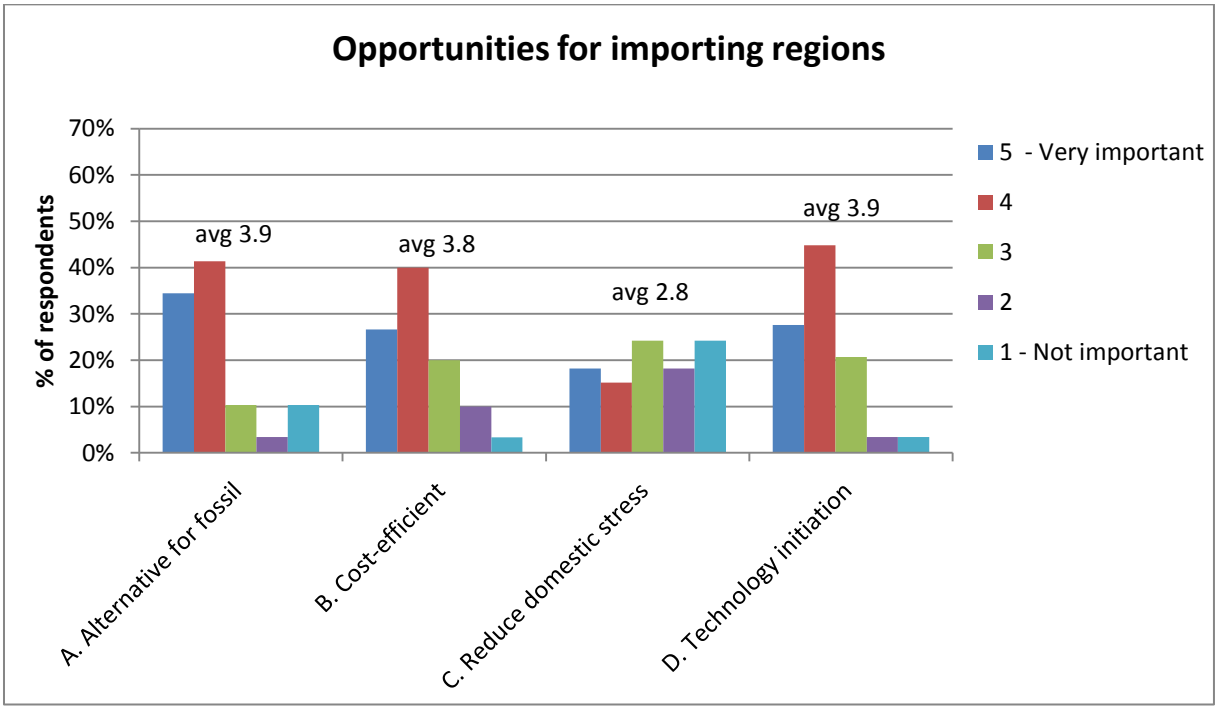
3. Opportunities and risks of international biomass trade

A number of potential opportunities and risks were provided. Distinction was made between opportunites/risks for importing regions (EU countries) and for exporting regions. The participants were asked to rate the opportunities and risks in terms of importance.

Opportunities for importing regions (EU):

A. *Biomass provides an alternative for fossil energy, and it is not weather dependent or intermittent. Imported biomass can contribute to this when domestic resources are limited.*
B. *Imported biomass can be a cost-efficient way to reach renewable energy targets.*
C. *Opening markets for imported biomass can reduce the stress on domestic biomass resources (e.g. for existing biomass processing industries)*
D. *EU countries can initiate technological solutions (e.g. advanced biofuels) which need high biomass volumes (which may not be available on the domestic market)*

The figure below shows the responses, including the averages (on a scale from 1 to 5)



Opportunities A, B and D were generally considered important to very important. The opinions on reducing domestic stress on biomass (Opp C) were mixed.

Some remarks of participants:

- Biomass production is also weather dependent and seasonal (Opp A). Nevertheless short term variability and storage options are totally different from solar or wind energy.
- Biomass is a good alternative when other renewables are not available/efficient (so not replacing, but additional to other renewables).
- Only looking at cost is too narrow and short term focused (Opp B).
- There may be hidden subsidies in the 'cost-efficient' imported biomass.

- Reasoning for UK import is lack of biomass supply and availability of large scale cheap biomass elsewhere. Market forces and cost dominate.
- Import reliance should be transitional, not long-term.
- Avoid protectionism, we can't prioritize local industries.
- Bioenergy should significantly reduce GHG emissions and replace fossil (in reality, i.e. including indirect effects). But we shouldn't build demand on imports.

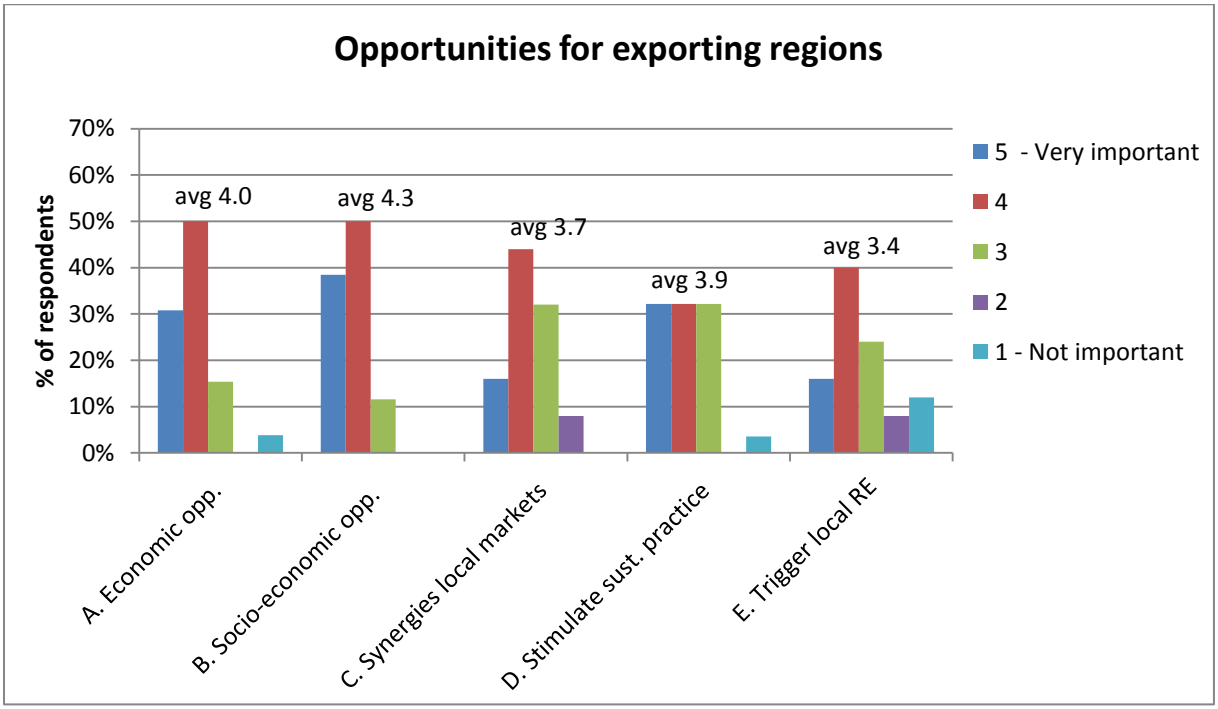
Additional opportunities for importing regions:

- Increase feedstock portfolio.
- Hedging against price hikes in local markets
- 3rd country development (stronger trade partners)
- Initiate sustainable resources for the bio-economy
- Imports can facilitate the development of local bioenergy infrastructure/development

Opportunities for exporting regions:

A. *Export markets create economic opportunities to market (abundant) local feedstocks*
B. *It creates socio-economic opportunities (incl. job creation) in forestry, agriculture, industry, …*
C. *There are synergies with local markets (e.g. forest products, wood processing industry, agricultural products)*
D. *Demand from outside the region will stimulate/trigger sustainable practices in forestry, agriculture, industry.*
E. *Initiating mobilization of biomass (with demand from outside the region) will trigger local production of renewable energy.*

The figure below shows the responses, including the averages (on a scale from 1 to 5)



Most people considered economic opportunities (A), socio-economic opportunities (B) and stimulation of sustainable practices (D) in exporting regions as important to very important. There was somewhat less agreement on local market synergies (C) and triggering local renewable energy (E).

Some remarks of participants:

- Local markets can be a driver for export (synergies).
- If sustainability criteria are required for traded biomass, this may stimulate sustainable practices (Opp D).

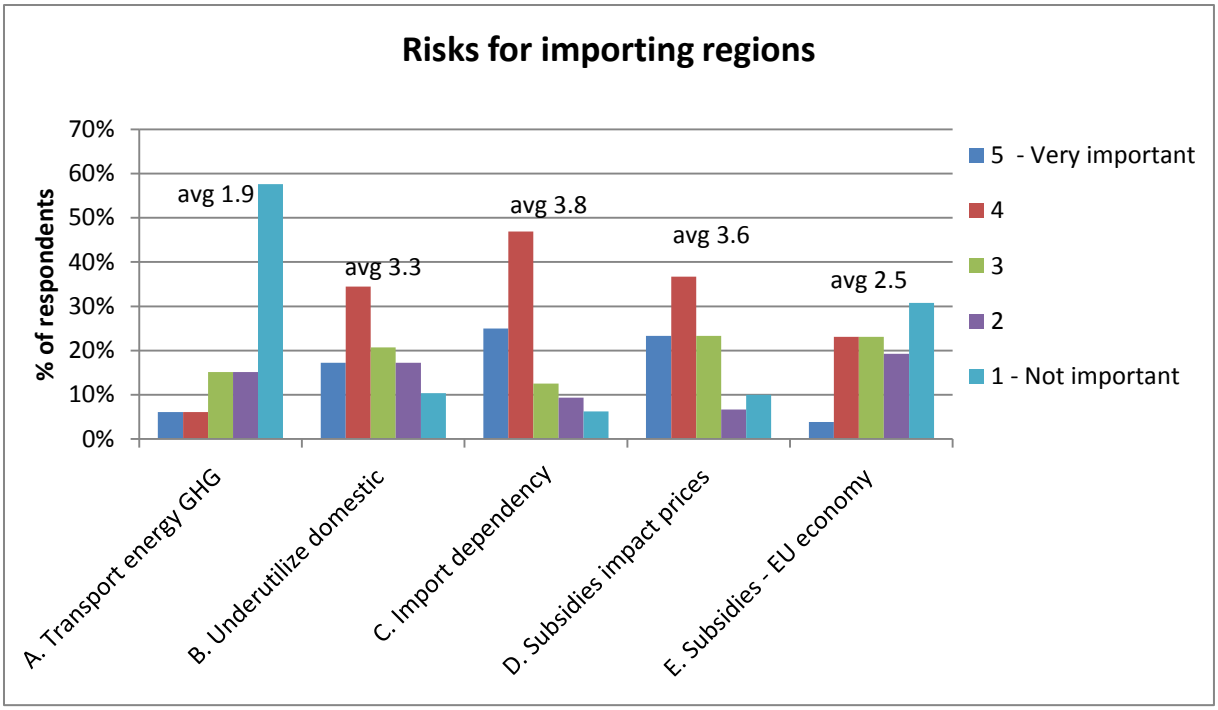
Additional opportunities for exporting regions:

- Improve attitudes and know-how of bioenergy options
- Increase local product portfolio
- Political tool to reduce energy dependency (see Ukraine & Russia)

Risks for importing regions (EU):

A. *A lot of energy is lost in transport, reducing the overall greenhouse gas performance, making it difficult to fulfil binding GHG criteria.*
B. *Domestic potential in the EU may be outcompeted by cheaper imports, leaving some of the domestic potential underutilized.*
C. *Relying on imported biomass only moves our problem of energy import dependency from one region to another – presents no real solution.*
D. *Demand from the energy side, and in particular the involved subsidies are impacting world market prices for other sectors. This creates an unlevel playing field.*
E. *European subsidies are flowing outside the EU, and do not contribute to the European economy.*

The figure below shows the responses, including the averages (on a scale from 1 to 5)



The answers show a wide divergence of the answers of participants. Risks C (import dependency) and D (subsidies impacting prices) were indicated as most important. Risk B (underutilize domestic resources) had more opponents. Risk E (EU subsidies flowing outside EU economy) was less supported, and for risk A (transport energy) most participants felt that this was of low importance.

Some remarks of participants:

- Risk A: Transport is a relatively small part of the overall GHG/energy consumption as overseas transport is very efficient. There is still an opportunity to decarbonize this part.
- Risk B: Domestic biomass can compete on price with imported biomass.
- Import from “cheap” countries (with low labour costs, low environmental constraints) may indeed outcompete EU resources and reduce the socio-economic benefits for domestic resources in the EU. There may be hidden subsidies, e.g. US state support for local economic development.
- Trade is as old as mankind. It will happen when it makes economic sense.
- Risk C (import dependency): we are now in a learning path.
- Risk D (subsidies and prices): ‘renewable carbon’ currently has different value in various sectors/end use purposes. If there was a common (and sufficiently high) price for carbon in the different markets the problem would be much less.
- Risk E (EU economy): also bring in energy efficiency by development of new industries
- Impact on economy needs to be analysed.

Additional risks for importing regions:

- Extend the life of co-firing installations, leading to longer reliance on coal for energy production.
- No international climate agreement creates a disadvantage (higher cost) for European sectors (no level playing field on global markets).

- Risk that sustainability criteria show unsatisfactory, either due to incomplete knowledge or limited data availability.
- Claim of GHG savings which are not justified.
- Volatilities in financial systems (e.g. currencies)

Risks for exporting regions:

A. *Additional demand for these types of biomass generates a risk of overexploitation in forestry and agriculture, resulting in biodiversity loss and a loss of carbon in forests and agricultural soils.*

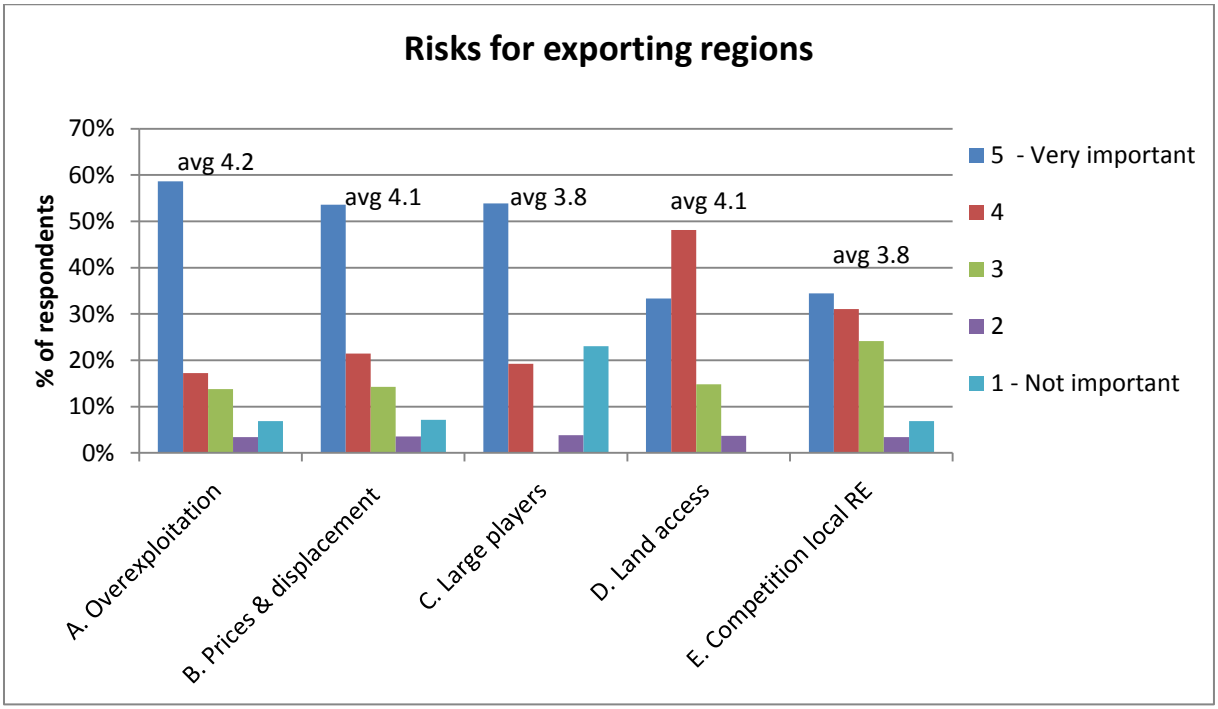
B. *Additional demand may increase prices for these feedstocks and lead to displacement, i.e. draw away feedstocks from existing local applications (e.g. paper, panel boards).*

C. *Focus of international trade is generally on large scale players. There may be limited opportunities for smallholders to access these new export markets.*

D. *There is a risk of 'land grabbing' of large players, moving away indigenous people or smallholders.*

E. *Claiming certain feedstocks for export may lower opportunities in sourcing regions, e.g. to use their own resources for energy production*

The figure below shows the responses, including the averages (on a scale from 1 to 5).



Most respondents agreed that these five identified risks were important to very important. There was a little lower support for risks C (large players) and E (competition local RE).

Some remarks of participants:

- Risks A, B & D: Risk of sustainability, land grabbing or displacement can be important for some countries, in some cases. There should be differentiation, e.g. depending on the existing policy framework and enforcement.
- Risk B & E: Needs investigation to quantify displacement.
- Displacement is possible; however, there is still room for development in low populated areas.
- Risk C: Different schemes (CoC rules) may be thresholds to participate, certainly for smallholders.
- Risk E: if local regulations are missing, they will not cease these opportunities

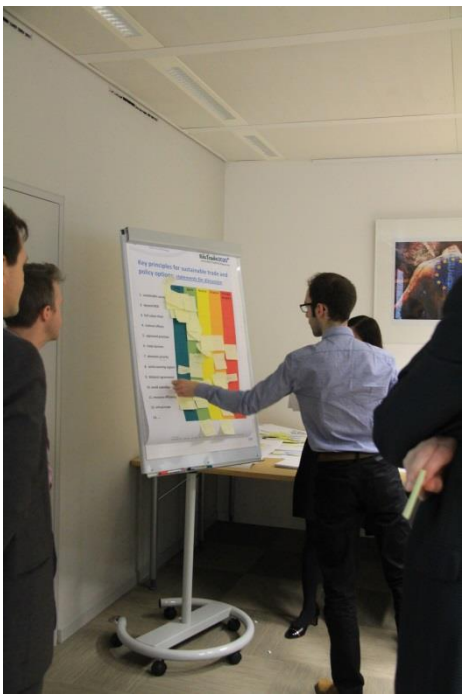
Additional risks for exporting regions:

- Dependency on multinational companies
- Changing frameworks & export conditions
- Volatilities in financial systems (e.g. currencies)

4. *Key principles for sustainable trade and policy options*

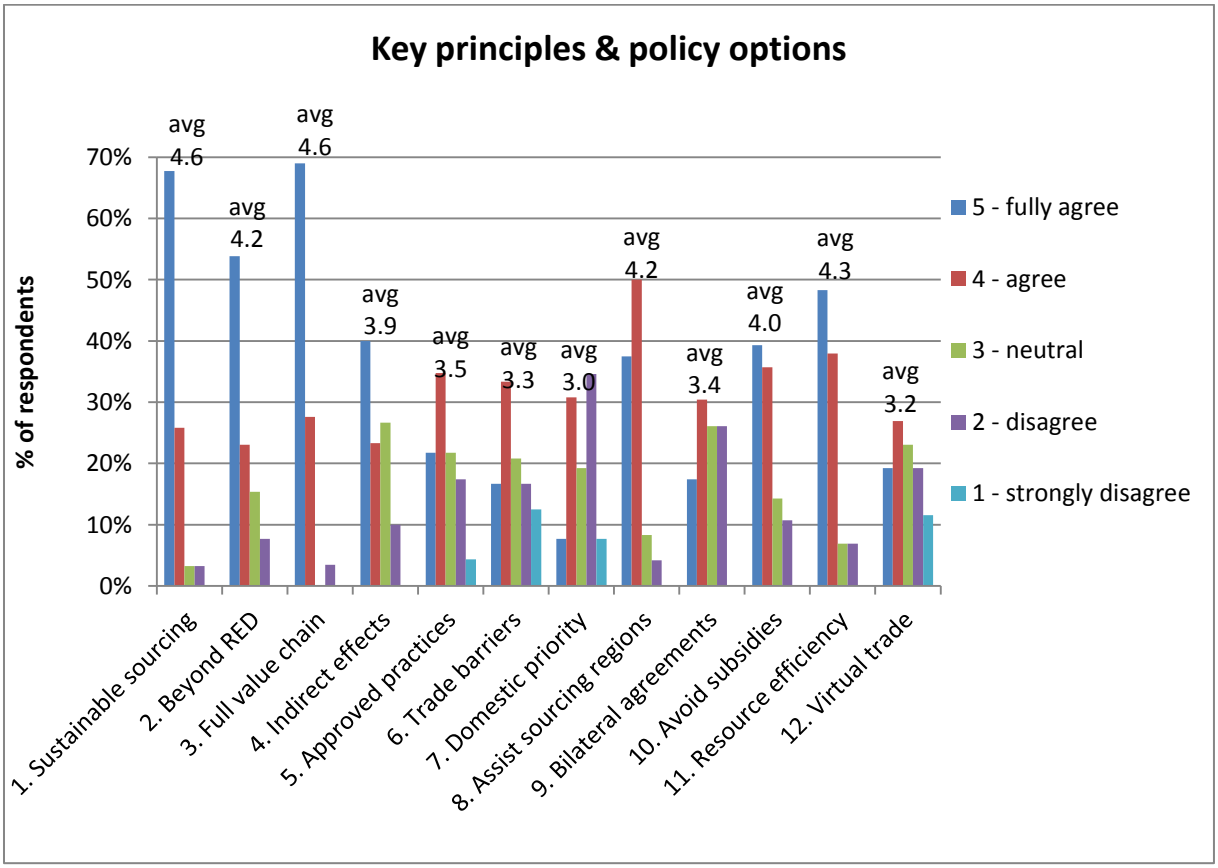
The following statements were presented, providing potential principles and policy options for sustainable trade of biomass. The participants were asked to rate if they agree or disagree with these statements.

1. ***Sustainable biomass sourcing*** *is a precondition for all imported biomass to the EU, and for all domestically sourced biomass, the same principles and criteria are to be applied.*
2. *Sustainability should go* ***beyond the RED criteria*** *(as defined for biofuels) and consider other fundamental aspects such as sound management in sourcing areas and social issues.*
3. *When applying performance-based sustainability requirements (e.g. for GHG, efficiency), these need to be based on the* ***full value chain*** *(= incl. production and logistics).*
4. *We need to understand and quantify* ***indirect effects*** *(e.g. iLUC, materials displacement) and include them in value chain assessments.*
5. *The EC and/or Member States should define* ***approved practices*** *that avoid/reduce negative indirect effects.*



6. *Markets should be open, **no** discrimination (~WTO) or **trade barriers** because of too demanding quality & sustainability requirements.*
7. *Renewable energy from **domestic** sources should have **priority** over imports.*
8. *The EC / Member States need to **assist sourcing regions** towards sustainable practices in biomass production and harvesting.*
9. *The EC should adopt **bilateral agreements** with sourcing regions to recognize existing legislation and management practices.*
10. *Member States need – at least in the longer-term - to **avoid subsidies** as these create market distortions.*
11. ***Resource efficiency** should be required as a basic principle (e.g. minimum overall efficiency), for locally produced and imported feedstock.*
12. *The EC / Member States should stimulate local developments in renewable energy or GHG savings in sourcing regions and create **virtual trade mechanisms** (see carbon markets, ETS mechanism) instead of physical trade.*

The following figure shows the responses for the 12 statements, with ratings on a scale from 1 to 5. Averages are also indicated.



There is most support for statements 1 (sustainable sourcing), 2 (beyond RED), 3 (full value chain), 8 (assist sourcing regions) and 11 (resource efficiency).

Some remarks of participants:

Statement 1 (sustainable sourcing): *94% agree / fully agree; 3% disagree*

- The statement should make distinction between (a) sustainable sourcing, (b) for all biomass applications
- Who defines what is sustainable or not?
- Region specificity?

Statement 2 (beyond RED): 77*% agree / fully agree; 8% disagree*

- RED criteria are only for biofuels, there should be harmonized sustainability criteria for all uses.
- How far beyond RED? Not too strict, it should be manageable for markets. The biomass sector shouldn't be overregulated.
- Social criteria should be included. Can be difficult for WTO.
- Use of biomass/resource efficiency should be included.
- Also include cascade use

Statement 3 (full value chain): *97% agree / fully agree; 3% disagree*

Statement 4 (indirect effects): 63% *agree / fully agree; 10% disagree*

- The statement should make distinction between (a) understanding (which is seen as very important), (b) quantifying, and (c) including iLUC factors in policies/assessments.
- Very important to understand and identify, however, quantifying in value chain assessment is difficult and risky to block market development. Caution!
- Only if this is also included for food, feed, materials and fossil fuels.
- We need a better approach than current methods (iLUC), which are very assumption dependent. Also need data that is difficult to collect.
- Indirect effects should be considered at the global level.

Statement 5 (approved practices): 57% *agree / fully agree; 21% disagree/strongly disagree*

- This is difficult and requires careful thought (e.g. regional difference). Appropriate practices may be different in different circumstances.
- Too prescriptive – principles and criteria should be sufficient.

Statement 6 (trade barriers): 50% *agree / fully agree; 30% disagree/strongly disagree*

- We must comply with WTO.
- The more sustainability criteria, the more difficult trade will be.
- We should find a balance between sufficiently strong quality and sustainability requirements (see statements 1-2-3) and market access.

Statement 7 (domestic priority over import): 39% *agree / fully agree; 43% disagree/strongly disagree*

- Difficult to enforce because of WTO.
- Maybe good to start domestic markets, but not necessary in the long term.
- Depends on a large number of variables.

Statement 8 (assist sourcing regions): 88*% agree / fully agree; 4% disagree*

- Very important to cooperate.
- Can be linked to statement 5 (approved practices).
- If we help countries to comply our requirements, do we subsidize their markets to be established? Requirement for sustainable practices should be reflected in the price we pay.

Statement 9 (bilateral agreements): 47*% agree / fully agree; 26% disagree*

- May help to open fair markets

Statement 10 (avoid subsidies): 75*% agree / fully agree; 11% disagree*

- tax differentiations related to external cost should be possible + subsidies to initiate promising technologies (should be limited in time)
- only if all support/subsidies can be avoided => as long as there are subsidies for fossil and nuclear energy …
- Depends on the way you use subsidy instruments.
- We should distinguish between short-term and long term subsidies and mechanisms. Agree that subsidies should be avoided for the *long term*.

Statement 11 (resource efficiency): 86*% agree / fully agree; 7% disagree*

- What is understood under resource efficiency? E.g. cascade use/ multipurpose use / energy efficiency
- Principle is OK, but should not be legally enforced.
- How does this work for developing countries?

Statement 12 (virtual trade mechanisms): 46% *agree / fully agree; 31% disagree/strongly disagree*

- High risk for misuse.

Additional suggestions:

- an overall key principle could be to increase efficiency and diversity at the same time (diversity in all systems: bio, market, political)
- full GHG balance
- level playing field with fossil fuels
- integration with other uses (food/feed/materials).
- sustainable use

Annex 1: Workshop Programme

8.45 Registration

9.15 Welcome and introduction

Luc Pelkmans (VITO) & David Sanchez (CENER, coordinator BioTrade2020plus)

9.30 Biomass trade for energy: history & future expectations

Martin Junginger (Utrecht University, Task Leader IEA Bioenergy Task 40)

9.45 Assessing sustainable biomass export potentials: methodological considerations

Uwe Fritsche (IINAS)

10.10 Case study: woody biomass from Southeast USA

Leire Iriarte (IINAS)

10.35 Introduction to the interactive workshop

Nathalie Devriendt (VITO)

10.45 Coffee break

11.00 Interactive workshop: break-out sessions to discuss the following topics:

- how to translate technical potentials into sustainable potentials?
- how to assess local demand?
- opportunities and risks of international biomass trade
- key principles for sustainable trade and policy options

12.30 Lunch

13.30 Case study in Africa, first results

Thuy Mai-Moulin (Utrecht University), Bah Saho (ECREEE)

14:00 Panel debate, representatives from (potential) export regions:

- export or local use of biomass, is it a dilemma?

Moderator: Martin Junginger (Utrecht University)

Panellists: Patrick Lamers (INL - USA), Maria Almeida Aranha (UNICA - Brazil), Bah Saho (ECREEE - Africa), Michael Deutmeyer (Green Carbon Group)

15.00 Reporting of the break-out sessions

Nathalie Devriendt (VITO)

15:20 Main conclusions

Luc Pelkmans (VITO)

15:30 Closing

Annex 2: Participant List

Maria	Almeida Aranha	UNICA	Belgium/Brazil
Viviane	Andre	European Commission, DG ENV	Belgium
Tom	Anthonis	2ZK Tuzetka	Belgium
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Angelos	Charlaftis	Epaphos Advisors Teamwork	Belgium
Vasileios	Chrysafidis	ProDessus	Belgium
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Steven	Wante	SITA	Belgium
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Annex 3: BioTrade2020+ Consortium

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