IEA Bioenergy

Strategic Intertask Study (Task 40/43/38):
Monitoring Sustainabiility Certification of Bioenergy

Survey on governance and certification of sustainable biomass and bioenergy

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Strategic Inter-Task Study:
Monitoring Sustainability Certification of Bioenergy
A cooperation between IEA Bioenergy Task 40, Task 43 and Task 38

Task 2: Survey on governance and certification of sustainable biomass and bioenergy

A study commissioned by IEA Bioenergy

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Strategic Inter-Task Study:
Monitoring Sustainability Certification of Bioenergy

At present numerous biomass and biofuel sustainability certification schemes are being developed or implemented by a variety of private and public organisations. Schemes are applicable to different feedstock production sectors (forests, agricultural crops), different bioenergy products (wood chips, pellets, ethanol, biodiesel, electricity), and whole or segments of supply chains. There are multiple challenges associated with the current status of sustainability certification, i.e. the proliferation of schemes has lead to – to name a few – confusion among actors involved, market distortion and trade barriers, an increase of commodity costs, questions on the adequacy of systems in place and how to develop systems that are effective and cost-efficient.

Within IEA Bioenergy a strategic study was initiated among Tasks 40, 43 and 38 to monitor the actual implementation process of sustainability certification of bioenergy. The study was executed between January 2012 and Feb 2013. Its main goals were to evaluate how stakeholders are affected by certification initiatives, quantify the anticipated impact on worldwide bioenergy trade, assess the level of coordination among schemes, and make recommendations to remove barriers which may depress markets and reduce sustainable trade. A worldwide survey was launched to investigate the operational experiences of people actively involved with any aspects of bioenergy production systems, including those engaged in biomass feedstock production, conversion into primary and secondary biofuel and bioenergy products, markets and trade. The survey placed a particular focus on the input of stakeholders on how systems can be improved to be more effective. Many people have responded - we have received over 200 survey responses, from all over the world.

The study has produced four reports, which are available on-line on the IEA Bioenergy website, and the sites of the participating tasks*:

- Task 1: Examining sustainability certification of bioenergy
- Task 2: Survey on governance and certification of sustainable biomass and bioenergy
- Task 3: Impacts of sustainability certification on bioenergy markets
- Task 4: Recommendations for improvement of sustainability certified markets

On Tuesday 12 March 2013 the main outcomes of the study were presented in a workshop, in connection to the World Biofuels Markets in Rotterdam.

* *www.ieabioenergy.com*
www.bioenergytrade.org *(Task 40, Sustainable Bioenergy Trade)*
www.ieabioenergytask43.org *(Task 43, Biomass Feedstocks for Energy Markets)*
http://www.ieabioenergy-task38.org *(Task 38, Climate Change Impacts)*

The authors would like to gratefully acknowledge the IEA Bioenergy Executive Committee for providing funding to make the project possible. We would especially like to thank the interviewees and the respondents of the survey, for providing thoughtful and engaging answers, and helping to move the discussion beyond the identification of problems, toward solutions.

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Disclaimer

1. Introduction

The use of biomass to substitute fossil fuels has increased over the last decade and with it, concerns over the sustainability of biomass production and use have grown as well. In many regions of the world, different governance mechanisms have arisen to ensure biomass and bioenergy sustainability at a number of levels. Those mechanisms may take the form of legislation, international agreements, jurisdictional guidelines, company policies, or market-based certification schemes. One important example is the European Union, which decided in 2009 to implement legislative sustainability criteria for liquid biofuels (included in the EU-RED). The sustainability criteria in the EU-RED must be adhered to in order for bioenergy production to count toward Member States' renewable energy targets. In the USA, the second Renewable Fuels Standard (RFS2) of 2007 similarly applies lifecycle greenhouse gas performance standards to ensure significant reductions of greenhouse gas emissions. Twelve sustainability schemes have been approved as meeting the criteria of EU RED. Other initiatives have designed similar sustainability criteria for solid biofuels, such as those included as part of the Renewables Obligation in the UK, or the Initiative Wood Pellet Buyers Group (IWPB), a group of seven leading utility companies who have designed a set of joint sustainability criteria for woody biomass sourcing and trading. Other systems serve to ensure sustainability of forest or agriculture-based feedstocks, regardless of the end use, such as the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification schemes (PEFC), which were established about 1993 and 1999, respectively. Several other relevant governance mechanisms exist as well.

As bioenergy can be produced from a wide variety of feedstocks, it is necessary for bioenergy users and producers to understand and navigate the sustainability requirements of the entire sector. More and more, bioenergy is a global market, with trade routes spanning several continents and involving many countries. Climate scenarios such as the Intergovernmental Panel on Climate Change (IPCC) rely heavily on dramatic increases of bioenergy production to substitute for fossil fuels. As bioenergy continues to increase in importance around the world, the scientific understanding of the impacts improves, and experiences with existing sustainability schemes are gained, newer sustainability criteria and schemes will likely develop. Issues of sustainability have high priority in the global community as people are asking questions such as:

- What standards are adequate to ensure sustainability?
- What is the right mix of voluntary and mandatory (legislated) approaches?
- How can we design systems that are effective and cost-efficient?

Several recent studies have explored these questions (e.g. van Dam and Junginger in 2011, Buytaert et al. 2011, Magar et al. 2011) and all have led to the conclusion that there are several problems with the current status of sustainability governance and certification. Van Dam and Junginger showed that there are several risks associated with certification, including high administrative burdens, increasing commodity costs, and applicability of criteria varying by location. Buytaert et al. stated a need for a comprehensive and reliable sustainability assessment tool to evaluate the environmental, social and economic performance of bioenergy production, after evaluating a host of current tools such as life cycle assessment (LCA) and criteria and indicators (C&I) and finding multiple shortcomings in each. In a study from the EU, Magar et al. determined that most respondents agreed on the importance of certification, but half the respondents felt that existing policies were adequate to ensure sustainability, while the other half did not. Similarly, the results of a public consultation held by the European Commission supported the need for comprehensive EU-wide sustainability criteria for solid bioenergy, and stressed the importance of consistency with existing criteria for liquid biofuels (Directorate-General of Energy 2011). Many respondents felt that national sustainability schemes had negative impacts on bioenergy trade and costs. However, some countries also oppose mandatory criteria, arguing that existing mechanisms in EU Member States are adequate. These

studies all indicate multiple challenges associated with the current status of sustainability certification, and a lack of consensus with regard to what is necessary to resolve those challenges.

The mission of IEA Bioenergy is to achieve a substantial bioenergy contribution to future global energy demands by accelerating the production and use of environmentally sound, socially acceptable and cost-competitive bioenergy on a sustainable basis. It is imperative that the systems put in place to ensure sustainability do not create unnecessary barriers to bioenergy development and trade, for example through undue complexity or unclear requirements.

To support sustainable bioenergy deployment in overcoming some of the challenges outlined above, IEA Bioenergy developed a survey to understand the views and opinions of market actors and others involved in all aspects of bioenergy production and trade. The survey places a particular focus on feedback from the respondents to suggest ways of improving the current situation.

The objectives of this study were to:

1. Determine the views and operational experiences of people involved in all aspects of bioenergy production systems, such as producers, traders, end-users, certifying bodies and auditors.

2. Evaluate how all actors along the bioenergy supply chain are affected by bioenergy related governance mechanisms, including binding and voluntary standards, legislation, regulation, and certification schemes.

3. Evaluate options for improving the effectiveness and cost-efficiency of governance and certification systems for sustainable bioenergy deployment.

This has been accomplished by developing a survey concerning three central themes: 1) existing governance and general sustainability challenges, 2) trade, markets and costs, and 3) challenges specific to voluntary certification schemes. It was hypothesized that responses might depend on the respondents' backgrounds, such as the capacity in which they are involved in the bioenergy supply chain, their geographical location or experiences, or the certification scheme or initiative for which answers are provided. This report presents and discusses the results from the survey, and gives preliminary suggestions on how to overcome major challenges identified by the respondents.

2. Methods

A survey was designed around three central themes, each with two or three sub-themes (see Appendix A for a copy of the full survey):

1) Existing governance and general sustainability challenges
    - Governance of the sustainability of bioenergy systems
    - Non-certified land
    - Harmonization and compliance
2) Trade, markets and costs
    - Trade and markets
    - Cost and adaptation
3) Challenges specific to voluntary certification schemes.
    - Standards and scheme development and revision
    - On-the-ground effectiveness of sustainability certification
    - Verification and auditing challenges

A set of questions was designed for each of the eight sub-themes, with questions in one section following logically from questions in the previous section. Another set of questions was designed to provide information about the respondents' backgrounds, hypothesizing that responses might depend on this. Such background information included:

- The capacities in which the respondents are involved in bioenergy and the duration of their experience within the bioenergy sector
- The sustainability governance and certification mechanisms with which they had experience and the duration of the their experiences with these mechanisms
- The location of the respondents, and the geographical regions from which they had experience

The respondents were given the option of answering only those sections and questions which they considered relevant to them. The only mandatory information collected was the respondent's capacities in relation to the bioenergy supply chain.

A list of potential respondents was compiled using existing lists of contacts from previous surveys, professional networks of the experts at IEA Bioenergy, and the internet. It was attempted to have all capacities and geographical regions well represented, although this was not always possible. The final list included 1102 potential respondents, with all capacities and geographical regions being represented. However, the composition is skewed towards Europe and North America (Appendix C). The invitation to participate was also distributed to a considerable number of potential respondents through newsletters of various organizations and projects, for which we did not have access to mailing lists. The final background composition of the invited persons thus cannot be determined.

The survey was built using SurveyGizmo software and hosted online. The invitation to participate was sent in May 2012. After an initial round of responses, the composition of the respondents was examined and an effort was made to engage those in underrepresented capacities, regions or certification schemes. The survey closed on the 15 September 2012 and included a total of 194 respondents. The first section of the survey had more respondents than the last section of the survey, but in general, there was some variation in the number of respondents answering specific questions within any section.

The distribution of the answers was analyzed within the entire respondent group and for similarities and differences among different sub-groups of respondents. Answers for the first theme have here been explored in relation to respondents' capacities, while answers for the third theme were explored in relation to the scheme or initiative with which the respondent was most familiar. Only overall answers were so far analyzed for the second theme.

For the analysis of the first theme, respondents of different capacities were sometimes combined because they were closely related (certification bodies and auditors, regulators and administrators, bioenergy and professional associations) or due to very few respondents within the individual groups (subcontractors and financing). For answering questions of the third theme, particularly many respondents (87, or 57%) selected one of the following systems: International Sustainability & Carbon Certification (ISCC), Roundtable on Sustainable Biofuels (RSB), FSC or a PEFC endorsed scheme (>10 respondents for each scheme/system). Questions of the third theme were therefore analyzed with regard to these schemes in particular, with other schemes being merged into one group, 'Other' (<10 respondents for each of 32 schemes/initiatives). For this report, differences among groups have not yet been tested statistically.

In the remainder of this report, many abbreviations are used throughout the text without explanation. A comprehensive list defining all abbreviations is available in Appendix D.

3. The respondents

3.1 Respondent capacities

Of the 194 respondents, many identified with several different capacities simultaneously. About half of the respondents identified as one capacity only while about one fifth identified with two capacities. About one fifth of the respondents participated in three or four capacities, and the remaining 10% of the respondents participated in several capacities.

All capacities defined in the survey were represented among the respondents (Fig. 1), with some capacities better represented than others. In total, 73 respondents participated as economic operators on the market (biomass, biofuel and energy producers, subcontractors and financing), 30 respondents were involved in certification (certification schemes, certifiers, or auditors) and 11 as administrators or regulators. Of those respondents not participating as economic operators, in certification, or as administrators and regulators, 30 respondents were from professional or bioenergy associations and 7 were from NGO organizations. Finally, 6 respondents participated in standard development, and 37 respondents participated as experts. It is important to note that people involved in many different capacities may also respond as "expert" due to their significant involvement in bioenergy development, but may have a different professional title. This may help to explain the dominance of "experts" in the respondents in Fig. 1. A similar effect was seen in the capacity of "standardization and standard development support".

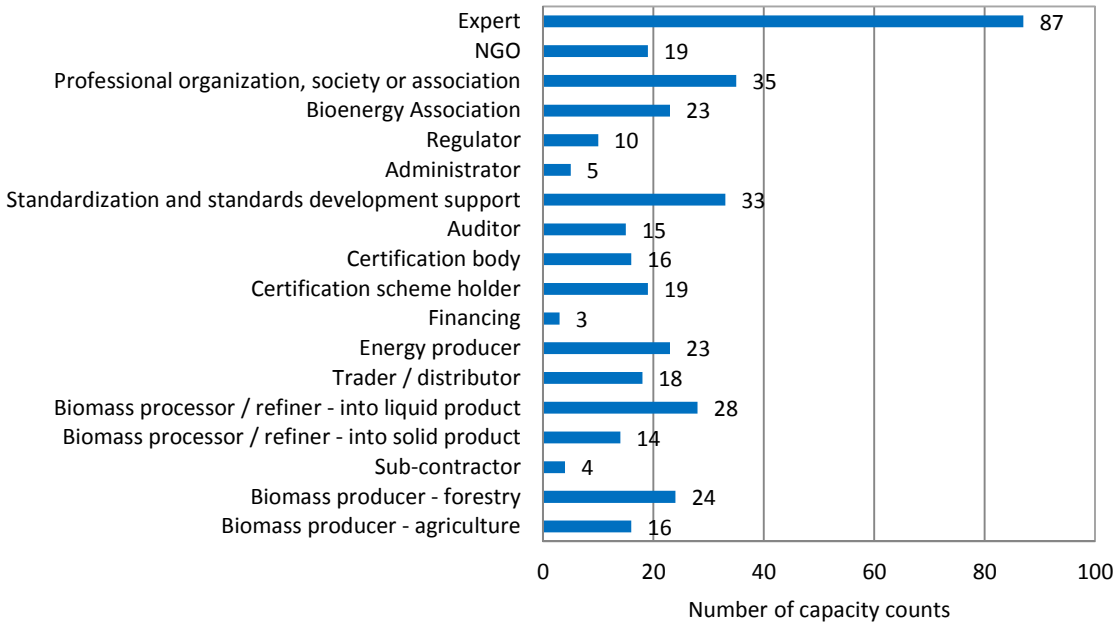

Figure 1. Number of respondents involved in different capacities. The total number of counted capacities was 392, while the number of respondents was 194.

Among the 194 respondents, 59% indicated having at least 5 years of experience with bioenergy generally, and 25% had 1-5 years of experience, and the remaining 16% less than one year of experience or none (some respondents had experience with, for example, forest certification but not bioenergy).

3.2 Governance and certification mechanisms

Of the 194 respondents, many had experience with several different governance and certification mechanism related to sustainable biomass, biofuel or bioenergy. The largest number of respondents (63%) had experiences with 1-4 different governance or certification mechanisms, while one fourth (23%) had experiences with >4 mechanisms. Some did not have experience with any of the listed governance or certification mechanisms (14%).

When asked which governance or certification mechanism the respondents had most experience with, a large part of the respondents replied that they had experiences with one of the schemes approved under EU RED[1] (93 respondents). Among these schemes, respondents most frequently had experience with RSB, ISCC, Bonsucro, REDCert, RTRS, and 2BSvs. Several respondents also had experience with a FSC (79 respondents) or a PEFC endorsed scheme (82 respondents). Among PEFC schemes, respondents most frequently had specific experience with SFI, CSA, ATFS and AFS. A considerable number of respondents had experience with schemes designed for pellets[2] (25 respondents), while 17 had experience with CSBP.

For the last section of the questionnaire, respondents were told to identify a particular scheme that they were evaluating in order to fill out the survey (Fig. 2), and 172 respondents did this. The majority of respondents were most familiar with the RSB, ISCC, FSC or a PEFC endorsed scheme. Among PEFC schemes, 10 respondents chose the SFI scheme specifically, while CSA, ATFS and AFS were chosen by 3 respondents respectively. Only a few other respondents mentioned a different PEFC scheme which they were answering for.

Among the 194 respondents, 28% indicated that they had at least 5 years' experience with governance and certification mechanisms related to biomass, biofuel or bioenergy, while 39% had 1-5 years of experience. As such, the respondent group overall had longer experience with bioenergy generally, than with governance and certification. However, some people had longer experience with certification (e.g. forest certification), but no experience with bioenergy. The lower number of respondents with certification experience is also reflected in a lower number of respondents for the third section of the survey and although 150 respondents selected a scheme, they generally did not respond to all questions in these sections.

[1] 1. ISCC (International Sustainability and Carbon Certification), 2. Bonsucro EU, 3. RTRS EU RED (Round Table on Responsible Soy EU RED), 4. RSB EU RED (Roundtable of Sustainable Biofuels EU RED), 5. 2BSvs (Biomass Biofuels voluntary scheme), 6. RBSA (Abengoa RED Bioenergy Sustainability Assurance), 7. Greenergy (Greenergy Brazilian Bioethanol verification programme), 8. Ensus voluntary scheme under RED for Ensus bioethanol production, 9. Red Tractor (Red Tractor Farm Assurance Combinable Crops & Sugar Beet Scheme), 10. SQC (Scottish Quality Farm Assured Combinable Crops (SQC) scheme), 11. REDCert, 12. NTA8080

[2] IWPB (Initiative Wood Pellet Buyers), Drax Power Limited, GGL (Green Gold Label, RWE-Essent), LBE (Laborelec, Electrabel), ENPlus, DINPlus, Umweltzeichen 38 (Austria).

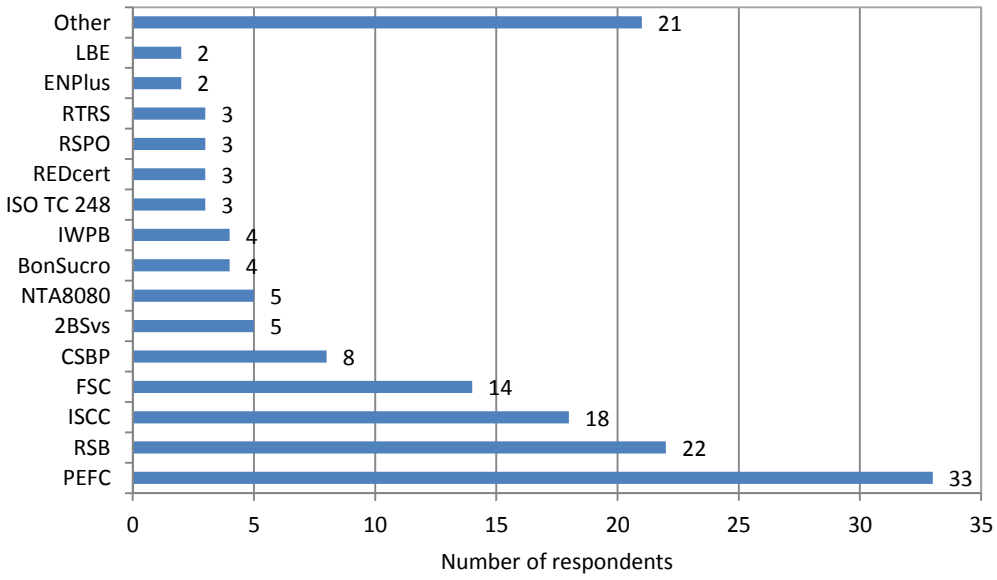

Figure 2. Respondents were asked to indicate which schemes they are most familiar with for section three of the survey. A total of 150 respondents selected a scheme. Only one respondent selected each schemes in the category 'Other', while two respondents answered section three without selecting a specific scheme.

3.3 Geographical regions

Of the 194 respondents, 12% had worldwide experience, 52% had experiences from one part of the world[3], while 27% has experiences from two to four parts of the world. In total, 49% of respondents had experiences from North America, 21% from Central and/or South America, 44% from one or more of the European regions, 15% from Asian regions, 11% from the Middle East and/or Africa (almost entirely Sub-Saharan Africa), and 8% from Oceania.

Most of the 194 respondents came from Europe and North America (85%). Other respondents were from South America, Asia or Oceania, but with no respondents from Africa (Fig. 3).

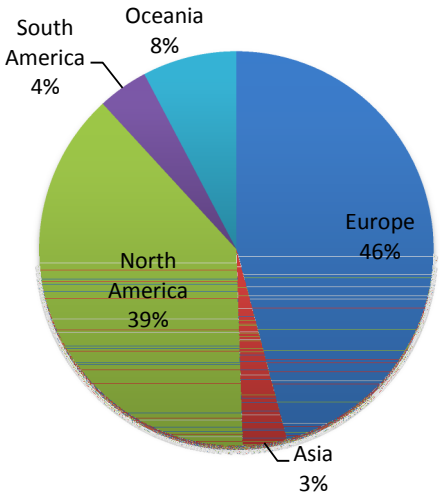

Figure 3. Geographical distribution of the respondents.

[3] North America, Central America, South America, West Europe, South Europe, North Europe, Central and East Europe, Russia and former USSR, Middle East, South Asia, South-East Asia, East Asia, North Africa, Sub-Saharan Africa, Oceania

4. Existing governance initiatives and general challenges

There exists a myriad of international and national conventions, regulations, initiatives, agreements and guidelines that directly or indirectly relate to sustainable biomass, biofuel and bioenergy. In the first part of this survey, it was examined to what degree respondents think these initiatives are adequate to ensure sustainability and which of those initiatives are most relevant, what can be done about non-certified land, whether there is a need for harmonization of these initiatives and what that might look like.

4.1 Governance of the sustainability of bioenergy systems

4.1.1 International and national initiatives

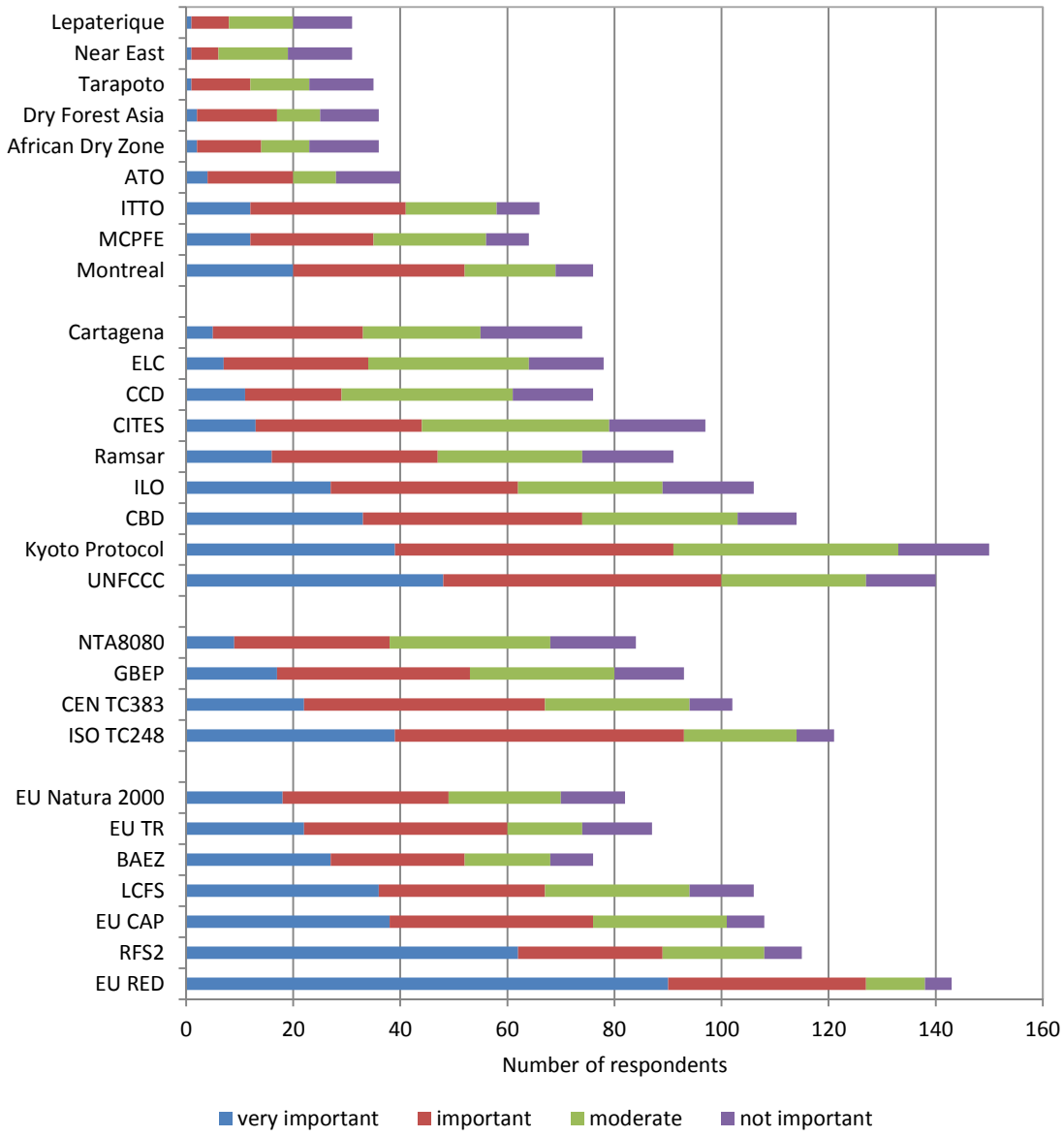

Figure 4. Distribution of respondents' scoring of the importance of different initiatives for meeting sustainability objectives for biomass, biofuel and bioenergy sustainability (excluding 'I don't know'). The lowest group of initiatives is legislative, the next standards, the third international conventions and the topmost group is international processes for sustainable forest management.

Respondents were asked to identify individual initiatives they believed are important for meeting sustainability objectives for bioenergy. In general, the EU RED (Renewable Energy Directive), RFS2 (US Renewable Fuel Standard 2), ISO TC 248 (sustainability criteria for bioenergy), the UNFCCC and the KP (Kyoto Protocol) were voted 'very important' or 'important' for meeting sustainability objectives (> 80 respondents, Fig. 4). In particular, the EU RED and RFS2 were voted 'very important' by more than 60 respondents. Of the respondents answering to the individual initiatives >60% of the respondents voted all regulatory mechanisms as 'very important' or 'important'. Among standards, this was the case for ISO TC 248 and its European correspondent CEN TC 383; among international conventions, UNFCCC, KP, CBD (Convention on Biological Diversity); and among international processes for sustainable forest management, Montreal, MCPFE and ITTO. An increasing percentage of respondents seem to vote 'not important' when moving from legislative initiatives to standards, over international conventions to international processes for sustainable forest management.

The diversity of answers is, however, large for all of the initiatives listed (Fig. 4); answers range from 'very important' to 'not important' for all of them. This could be due to differences among respondents, either in relation to capacity, related scheme or geographic regions. For example, the support for EU-RED is higher among respondents associated with EU approved schemes and schemes for pellets as compared to those respondents associated with forest certification schemes. The opposite is the case for the Montreal Process, affirming its importance to forest management.

4.1.2 Adequacy of existing initiatives

When asked whether the above mentioned legislation, processes, initiatives, rules and guidelines were adequate to ensure sustainability, most respondents answered 'no' (49%) while only half as many answered 'yes' (24%), revealing some consensus that those initiatives are not enough, but also that there are some divergences between opinions. In general, the reasons for believing that the existing initiatives are not adequate can be summarized into nine categories:

1. Existing initiatives are only adequate in some parts of the world
2. Other governance mechanisms than those listed in Fig. 4 are important and needed
3. The scope of the standards should be extended
4. Fewer schemes, more harmonization, better consistency, integration and coordination are needed
5. Some sustainability aspects are not addressed effectively
6. Some criteria need to be interpreted nationally or locally
7. There are some misconceptions about biological systems and management impacts
8. Implementation and enforcement should be improved
9. Stakeholders should be more involved, and stakeholder involvement should be balanced

Some of the divergent opinions that surfaced included whether national legislation and monitoring was essential. This was supported by many, but there was also a large group who did not think governments should be involved, preferring to allow the market to ensure sustainability. Another group supported the need for increased and complex criteria, while a second group thought that simplified criteria were needed. Integration and harmonization of sustainability requirements was suggested by many, while others stressed the need for differences in requirements in different regions.

4.1.3 The role of voluntary certification

The majority of the respondents believed that governance of biomass, biofuel and bioenergy sustainability should take form in a mix of both regulatory and voluntary mechanisms (Table 1). Voluntary certification is considered an essential measure by 48% of the respondents, and 19% believed that sub-contractor certification could contribute to ensuring sustainability goals for biomass, biofuels and bioenergy. Subcontractor certification may exist also in the absence of sustainable biomass, biofuel, or bioenergy certification, making it an alternative or supporting tool to consider when addressing concerns over non-certified land (Section 4.2).

Table 1. Respondents were asked which mechanisms are needed to meet the objectives of sustainable biomass, biofuel and bioenergy. The total number of respondents was 194.

Question	Distribution of responses			
Mix of requirements?	Strict regulations 19%	Voluntary guidelines 8%	A mix of both 50%	I don't know/ no answer 23%
Sub-contractor certification important?	Yes 20%	-	No 4%	I don't know/ no answer 76%
Voluntary certification important?	Yes 48%	-	No 17%	I don't know/ no answer 35%

Respondents were asked to provide reasons why they felt that voluntary certification was essential or non-essential. Respondents who believed that voluntary certification was essential overall indicated the following reasons for doing so:

1. To ensure credibility and efficiency
2. Higher standards of sustainability in voluntary certification
3. Voluntary standards are more adaptive, and can help facilitate adaptive management
4. Allows participation from operators in countries with weak institutional regulations
5. Provides a greater level of stakeholder involvement than regulation
6. These market-based instruments are more effective at achieving sustainability
7. Certification adds value to products and creates incentives for production of sustainable goods.

Those that did not think that voluntary certification was essential to ensure sustainability outlined the following reasons for believing so:

1. In developed countries, sustainability can be ensured without certification
2. Certification adds costs, often without any real environmental or social benefit
3. Certification can create market barriers to small operators
4. The enforcement of voluntary schemes is not strong enough
5. The cost-efficiency of bigger control systems (such as regulations, income tax, etc.) is higher than that for certification.

Of those that did not believe certification was essential, several respondents did believe that there was a role for voluntary certification. Some people indicated that certification was essential in the short term, but legal regulations to ensure sustainability should be the overall goal. It is worth noting that most voluntary certification schemes require adherence with applicable laws and regulations for the specific area of operation.

Respondents were also asked to identify where certification might be especially important. Certification was considered important worldwide by 38% of respondents (Table 2). Respondents from South and Central America recommended that voluntary certification is necessary worldwide, while the largest share of the respondents from Asia saw a particular need in Asia and South and Central America (Table 2). About 30-50% of the respondents from North America, Europe and Oceania recommended that voluntary certification is necessary worldwide, but many also mentioned specific regions, even if there was no clear trend with regard to which regions it was most important.

Table 2. The distribution of respondents votes on where voluntary certification is most important, shown for respondents from different regions and overall for all respondents.

	Respondents from….					
	North America	Europe	South and Central America	Oceania	Asia	Overall
Number of respondents	75	89	8	15	7	194
…..believe voluntary certification is important in the following regions (% of the respondents):						
Worldwide	32	38	88	47	29	38
North America	12	13	-	-	-	11
Europe	15	16	-	7	14	14
South and Central America	20	16	-	7	57	18
Russia and former USSR	13	9	-	13	14	11
Oceania	8	4	-	7	-	6
Asia	21	13	-	13	71	18
Africa and Middle East	17	12	-	13	29	14
I don't know/not relevant	35	38	13	40	29	36

4.2 Non-certified land

The majority of respondents indicated that non-certified land is a problem, for both agricultural and forestry-based bioenergy systems, with more respondents indicating that it was a problem for forestry than for agriculture (Fig. 5). Most respondents thought that non-certified land is a problem for both forestry and agriculture (47). A smaller number thought it was not a problem for either forestry or agriculture (12), while several respondents thought it was a problem for forestry, but did not know for agriculture (20). Among those believing that non-certified land is not a problem (forestry or agriculture), the arguments sometimes are that other governance measures addressing sustainability are already in place, or that fiber sourcing programs already deal with the problem (SFI), or they refer to the burden it would be for small operations to become certified.

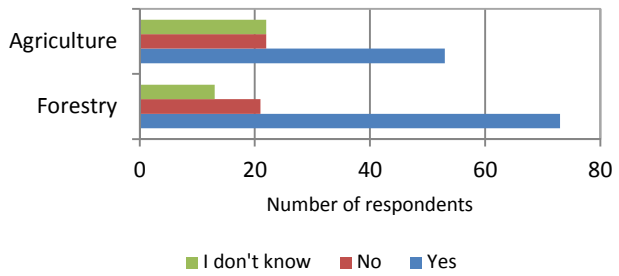

Figure 5. Respondents were asked to indicate whether non-certified land was a problem.

Respondents were asked to rate the effectiveness of a number of different alternatives to certification, in their ability to achieve sustainability of biomass and bioenergy production and trade

(Fig 6). Group certification, national verification and certification of entrepreneurs were among the support tools that were rated as most effective alternatives to ensure sustainability (about 50% of the respondents). Multilateral initiatives (such as the Global Bioenergy Partnership) and bilateral or multilateral agreements were not seen to be as effective as the other presented alternatives by a large number of respondents. Respondents also did not seem to support non-certification systems as a viable alternative. Examples of these systems include best practice guidelines, labeling systems, producer manuals, environmental or social impact assessments.

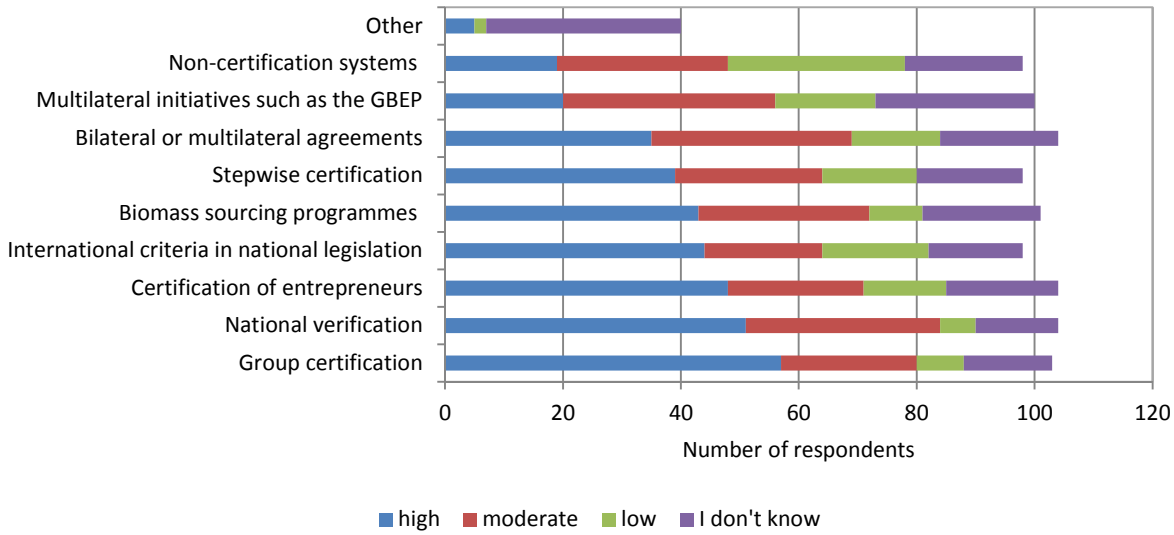

Figure 6. The perceived effectiveness of different alternative tools to certification in terms of achieving sustainability.

4.3 Harmonization and compliance

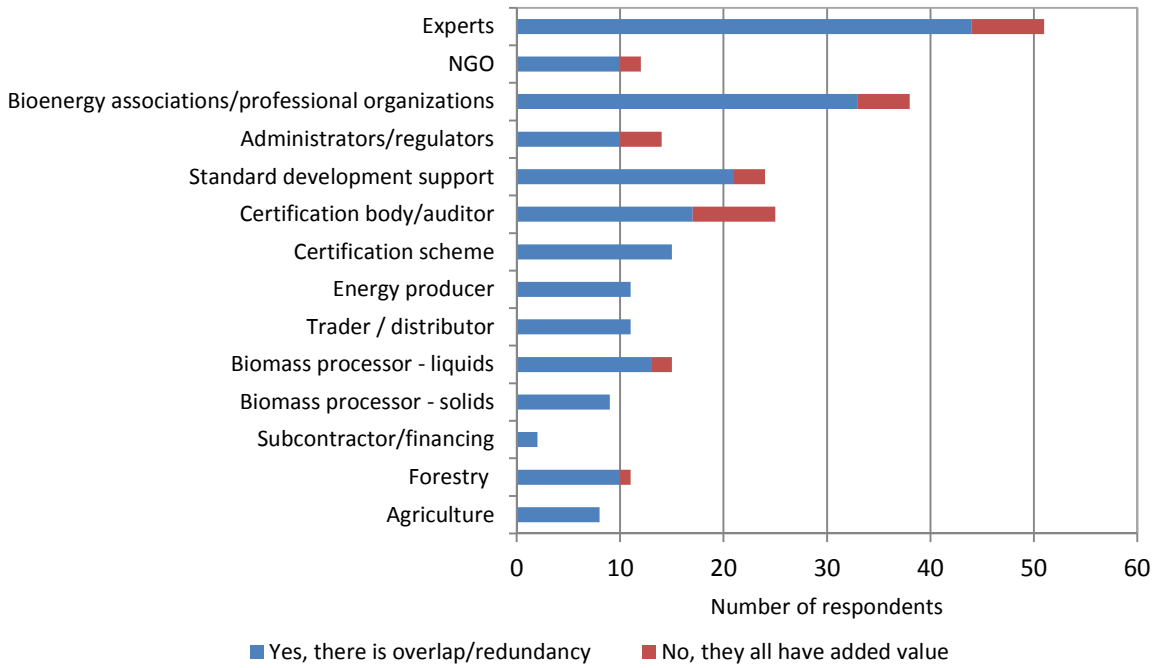

Figure 7. Respondents by capacity indicated whether there was redundancy in the current certification schemes and sustainability initiatives. 'I do not knows' left out.

When asked if they believed that there was redundancy in the multiple certification schemes and initiatives, an overwhelming majority of respondents (86%) answered yes, there is overlap or redundancy. Looking into the breakdown of responses by capacity (Fig. 7), the following groups were less inclined to agree that there was redundancy among schemes: experts, bioenergy associations, administrators and regulators, standard development support, certification bodies and auditors. Among these respondents it was commented that the larger number of schemes have value so that various experiences can be gained; that they are needed to address country specific conditions; and that competition is important in the market place in the absence of common international standards.

The respondents further indicated how the perceived redundancy caused problems in the market. The vast majority of respondents indicated that redundancy creates a lack of transparency in the market, and a lack of consistency due to different requirements. Respondents commented that there is confusion around definitions of sustainability. Auditing and accreditation requirements may also be quite different. Of 99 respondents, 62 also mentioned that the redundancy creates or reinforces trade barriers, while 26 said it does not. Few respondents believe that the redundancies in certification systems lead to an unwarranted discrimination in the use of raw materials.

The most supported solution to addressing the redundancies was through mutual recognition of different schemes (Fig. 8). Respondents also believed that introducing meta-standards endorsing existing voluntary systems and reducing the number of schemes were also important solutions to consider as well. Many of these suggestions are currently taking place in certain regions of the world, such as the EU-RED which has endorsed a number of voluntary schemes as meeting the necessary sustainability criteria for biofuels in the EU. Correspondingly, the IWPB is also working to develop meta-standards which will facilitate sustainable sourcing and trade of biomass for energy utilities in the EU.

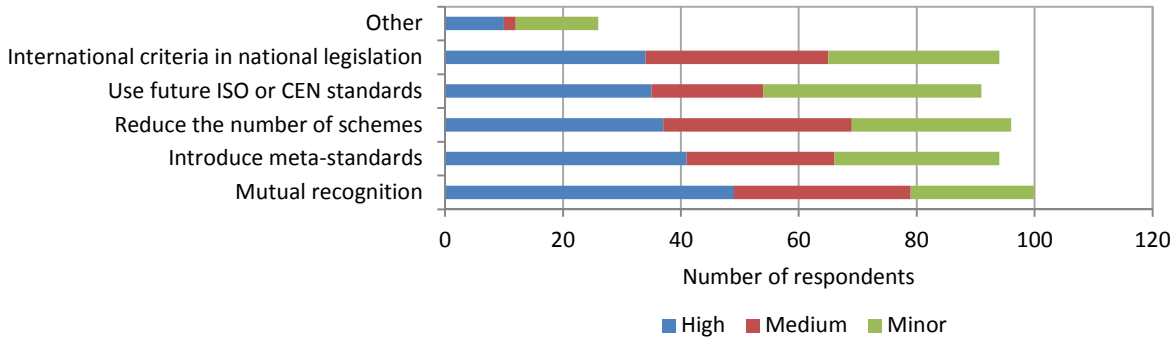

Figure 8. Respondents' opinions on which methods of harmonization would be most effective in solving the problems caused by redundancy of certification schemes and initiatives.

The ISO technical committee 248 is working to produce a set of international standards for sustainability (to be known as ISO 13065), with the intention of creating a universal definition of sustainability, and dictating which tools and methods are appropriate for verification, and the CEN technical committee 383 (to be known as EN 16214) is doing the same thing for Europe. Respondents in general were less supportive of this method of harmonization (Fig. 8).

When asked if there were any clear advantages in maintaining the diversity of schemes that existed, the respondents were closely split in their opinions, as 39% answered 'no' and 45% answered 'yes' to this question. Respondents seemed to see more advantages of keeping a diversity of schemes when asked in this manner, compared to the question asking if there is a redundancy among schemes. Especially those involved in forestry together with certification bodies and non-economic operators thought there could be advantages to keeping a diversity of schemes. It was mentioned that

diversity is needed to allow adaptation to national or local conditions, tailoring to different types of biomass, or to make full use of specific stakeholder competences. Other reasons mentioned are that competition among schemes provides an incentive for them to develop to become more relevant and cost efficient. Also, a diversity of schemes provides the users with a choice. Among those finding that there are no advantages, it is mentioned for example that more systems add cost, confusion and duplication.

Among respondents, 64% felt that there may be certain conflicting values between sectors or groups of economic operators that could hamper harmonization of certification schemes. For example, there may be different interests among traditional energy producers versus renewable energy producers, and between NGOs and certain certification schemes which they consider to be inadequate. There may also be conflicts of interests between different regions.

Respondents were asked to choose from a large list of international processes and protocols those which they believed voluntary certification schemes should comply with. The responses were similar to answers provided when respondents were asked which initiatives are important (Fig. 4).

Respondents were also asked to identify whether they thought their certification had met any difficulties in satisfying the requirements of those international initiatives and processes listed as important. More respondents indicated that they had not met difficulties in meeting the requirements of important international processes (35%) than those that indicated yes (25%), but a large group (40%) of respondents did not know. In particular, respondents involved in the forestry sector did not perceive difficulties satisfying international requirements (7 respondents), possibly indicating the maturity of forest-based certification systems. Those involved in standard development support especially experienced problems or difficulties in meeting the international requirements (>80%, 21 respondents out of 25).

5. Market, trade and costs

Section two of the survey explored whether the respondents had experienced any impacts to trade or markets due to changes in sustainability governance, and looks more closely at the costs associated with certification, and whether the associated costs of certification present a barrier for development of the market.

5.1 Trade and markets

Respondents were asked if they had observed any changes in the period of 2008 to 2012 in the production or trade flows as a result of the introduction of new sustainability governance for bioenergy. Some of those changes may include: changes in production system, type of crop grown, destination of products, feedstock origin, supply agreements, traded routes or volumes, etc. Respondents' answers were split, with 36 respondents saying 'yes' and 15 respondents saying 'no'. Those respondent groups that generally indicated they had seen a major change in production or trade included certification bodies and auditors, certification schemes, and standard development support.

Most respondents indicated that the changes to production or trade from 2008 and onwards generally had a positive or neutral effect to their business. Positive changes mentioned were that the introduction of sustainability governance had increased awareness of bioenergy sustainability and understanding of the carbon benefits, and had eliminated the worst GHG emitters from sustainable markets. Certification also led to positive learning within organizations, and maybe even to increased markets, distribution and production, and innovative solutions. Some reported that tracking and documentation was improved, even if this was also seen as an unnecessary burden by some. For some, the wood raw material availability had decreased due to sustainability and chain of custody requirements.

5.2 Cost and adaptation

5.2.1 The choice to certify

Respondents with uncertified products or businesses were asked to give the most important reasons for not choosing to certify. The most commonly chosen reasons were that certification conferred no significant advantage, that it was too costly to become certified, and that it caused undue administrative complexity (Fig. 9).

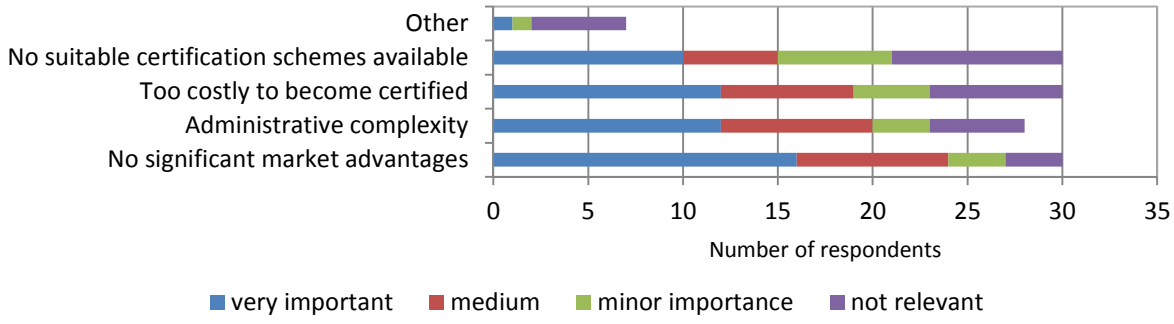

Figure 9. Respondents indicated which of the above reasons were most important in their choices to not obtain certification.

If respondents have chosen to seek certification, or are considering certification they were also asked to indicate their main motivations for choosing to do this. The most commonly chosen reasons were legislative requirements, and developing a green business profile, and general market access (Fig. 10).

Very few of the respondents considered "improving management systems" as a main motivation for seeking certification (Fig. 10), even if comments indicate that this is sometimes seen as one of the benefits once certification has taken place. Other motivations for seeking certification included the cost-benefit balance (i.e. if it pays off by gaining market access), concern for environment, habitat and wildlife, or to better their company reputation.

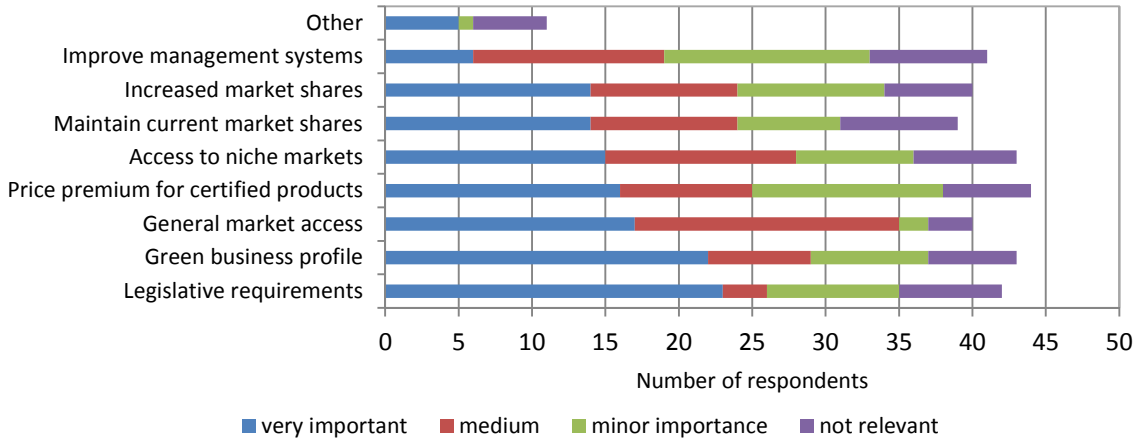

Figure 10. Respondents were asked to rank the above reasons for obtaining certification from very important to not relevant.

When asked whether regulatory requirements related to sustainability affected their decision to enter a market, 52% of respondents replied with a 'yes', and 29% of respondents said 'no'. As with certification, regulations can be a financial disincentive, with the cost of meeting the standards exceeding the economic benefit of entering the market.

5.2.2 Cost associated with certification

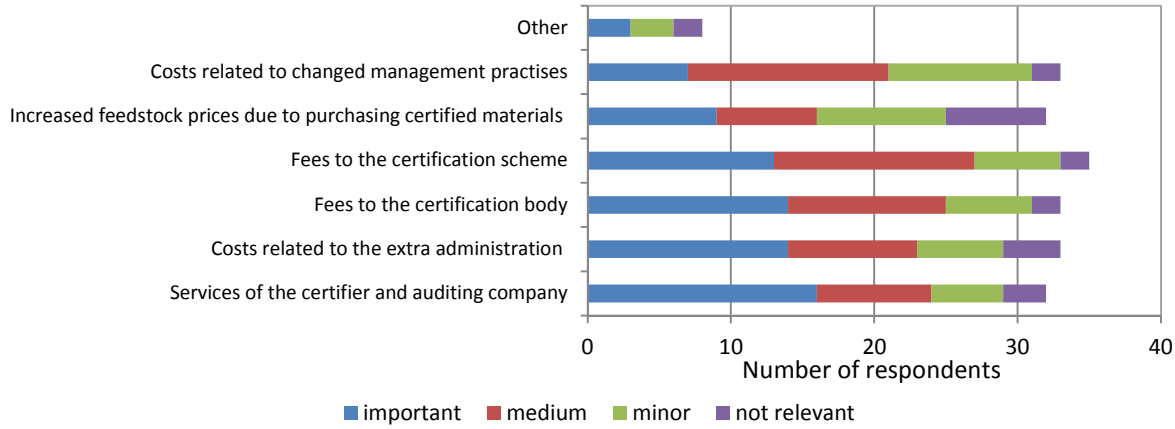

Figure 11. Respondents were asked to rank the most significant costs due to certification from the above options.

About 10 respondents gave information about the approximate costs of certification relative to unit biomass or biofuel produced, with the indicated costs ranging from 0.01-18 $/ton. It is unclear whether the large range in estimated costs stems from differences in which specific costs were included or from actual differences in costs of certification across regions or schemes. Respondents indicated that the most significant costs associated with pursuing certification were those for the services of the certifier and auditors, due to the extra administration and fees paid to the certification body (Fig 11). A few respondents commented that overregulation and multiple certifications also caused significant costs.

In general, respondents did find that the total cost of certification was significant compared to the value or profit margin of the biomass product or commodity (51% of respondents agreed with this statement, while 30% did not). Respondents indicated that in order to deal with costs associated with certification, the most common solutions or adjustments included changing feedstock suppliers to save money, or increasing commodity prices (Fig. 12). This demonstrates that certification can put pressure on feedstock suppliers, as operators are less likely to accept lower profits.

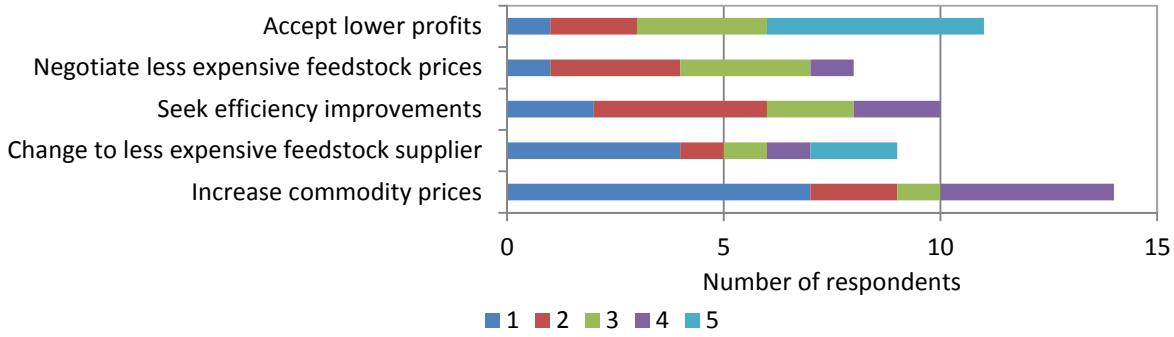

Figure 12. Respondents were asked to rank the above options as ways to mitigate increased costs of certification, with '1' being the most important option, and '5' the least important.

6. Challenges in voluntary certification

6.1 Standards and scheme development

Respondents were asked to identify which certification scheme they were most familiar with (Fig. 2), to answer questions about this scheme. Respondents were first asked whether the certification scheme with which they are familiar with had been revised in the past five years to increase its relevance to bioenergy. Most respondents said 'yes' (53%). Looking further into the individual schemes, the RSB, FSC, ISCC, RTRS, and SFI, were all specifically mentioned by many as having been revised within the past five years.

Respondents were then asked if they believed that their scheme needed to be revised for certain issues (Fig. 13). The three issues most commonly seen as requiring scheme or standard revision were future legislative requirements, sustainability criteria for land management, and that periodic reviews should be conducted. For all schemes, however, all issues received some support for revisions. GHG accounting got mixed responses as a large number of respondents felt that yes, GHG accounting needed to be better addressed, and another large group of respondents felt that GHG accounting was already included or not needed in their certification scheme. Some commented that GHG accounting methods were already well defined (e.g. by EU RED), were beyond the scope of the chosen scheme, or it was something that should be left to specialized schemes.

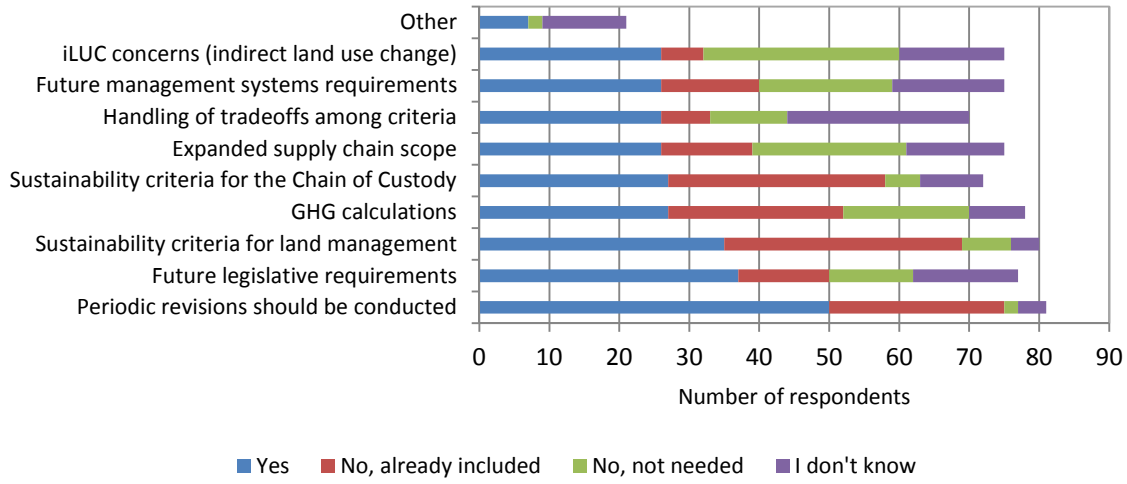

Figure 13. Respondents were asked to indicate whether their certification schemes should be revised to better address the above list of issues.

When asked whether they felt adequately involved in standard revisions and development, 63% of the respondents answered 'yes' and 25% 'no'. Looking deeper into the breakdown by selected scheme, over 70% of respondents most familiar with schemes like RSB, ISCC, and PEFC felt they were adequately involved (not including respondents answering 'I don't know). For FSC, this percentage was lower, but with only 9 respondents answering for this scheme.

When asked whether they felt that there was a proper balance of power among the different stakeholders within the selected scheme, 46% of the respondents said 'yes', 33% said 'no', while 21% were unsure. When looking at the breakdown among individual schemes, at least 50% of the respondents to RSB, ISCC, and PEFC schemes indicated 'yes', while this share was lower for the FSC, which also only had very few respondents to the question (7). For other schemes, about 40% indicated that they felt there was a proper balance among different stakeholders. For FSC, it is commented that corporate concerns are too heavily represented, and that too few people with practical experience are involved. This comment was echoed for RSB, in addition to small scale

operations not being well represented. Under-representation of small scale operations was also mentioned by one respondent as a problem for PEFC; while another mentioned that primary producers are not well represented. Among ISCC respondents, it is mentioned that too many administrators are involved, but too few NGO and industry stakeholders.

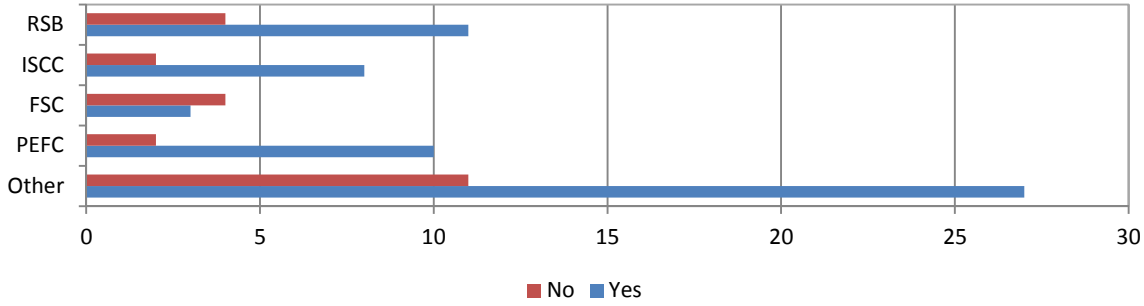

Figure 14. Respondents were asked to indicate whether they felt that they were adequately involved with the revisions and standard development of the above-listed certification systems. PEFC includes all respondents that chose PEFC endorsed schemes. Respondents answering 'I don't know' are not included here.

A majority of respondents (61%) indicated that there was a need to engage with other certification schemes and legislators to coordinate efforts and address issues, while 18% said there was no need. Respondents felt that collaboration with other schemes or legislators was critical to jointly meet sustainability criteria and goals along the supply chain, and ensuring consistent verification and auditing (Fig. 15).

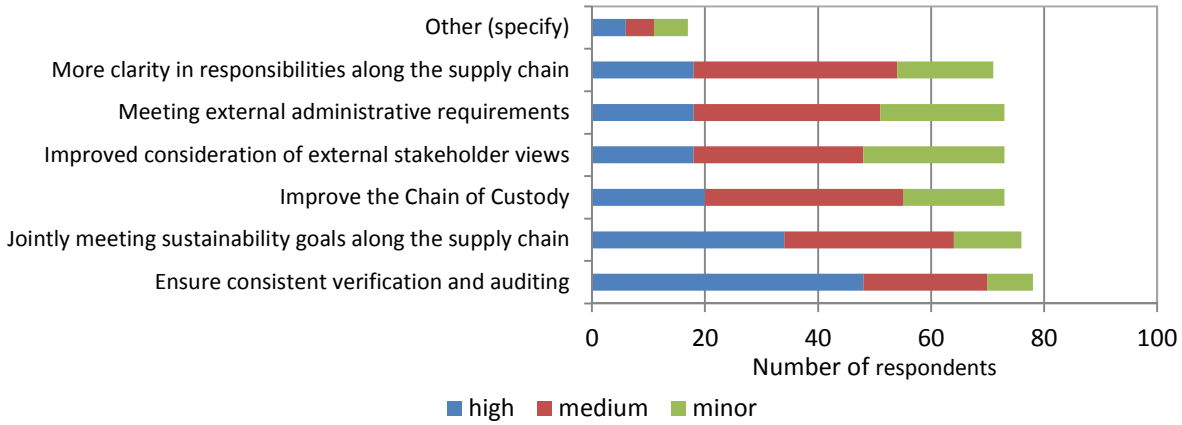

Figure 15. Respondents were asked to rank the importance of addressing the above issues in collaboration with other certification schemes.

6.2. On-the-ground effectiveness of sustainability certification

Respondents were asked to provide opinions on the effectiveness of certification, including monitoring, verification and falsification. When asked if they believed that their certification scheme was effective in addressing a number of sustainability criteria, the majority of respondents most familiar with RSB and ISCC believed that their certification system was effective in addressing GHG emission reduction and traceability, while less effective for land management criteria regarding soil and water (Fig. 16). Respondents most familiar with ISCC thought this scheme was relatively effective with regard to social values, while this less the case for those familiar with RSB.

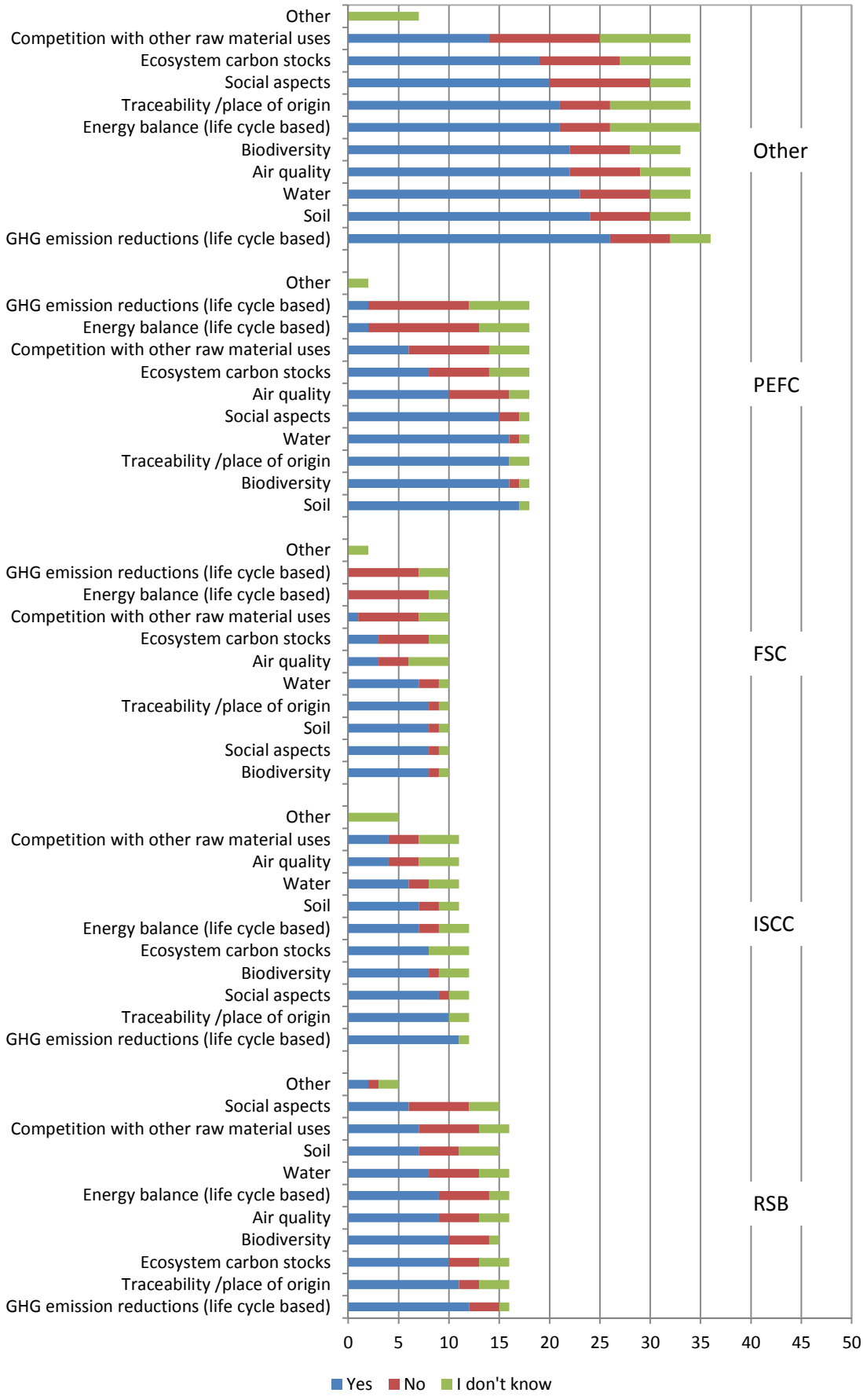

Figure 16. Respondents indicated which of the above sustainability issues were effectively addressed by their scheme

Respondents most familiar with forestry schemes believed their certification scheme was effective in meeting land management criteria (biodiversity, soil and water), traceability, and social aspects, while less effective for ecosystem carbon stocks. Not surprisingly, they believed that their scheme was not effective for LCA based criteria as GHG emission reductions and energy balances. . Respondents in general believe that their scheme is less effective in addressing the issue of competition for raw materials.

Respondents were asked if they thought that biomass or bioenergy certification had ever caused any unintended consequences, whether positive or negative, and 49% of respondents said 'yes' while 24% said 'no'. Many reported unintended positive consequences, while others thought it may cause worry over hypothetical impacts and created unrealistic expectations compared to other energy sources. Others mentioned that it slowed down bioenergy deployment due to complexity, concern over not meeting sustainability requirements, and increased costs. Specifically, the US RFS2 requirements were mentioned as potentially discouraging reforestation in areas where tree planting is needed to improve conservation efforts; RFS2 does not accept material from areas planted with trees after December 2007.

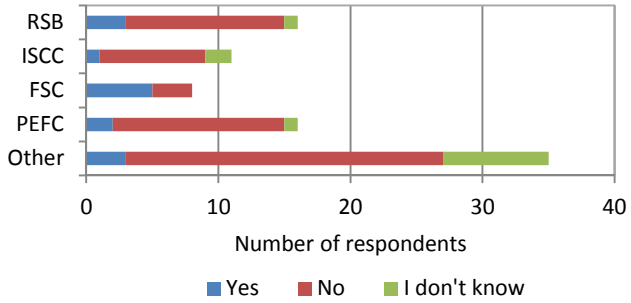

Figure 17. Respondents associated with particular schemes comment on falsification of claims. 'PEFC' includes all PEFC endorsed schemes.

When asked whether they had ever encountered attempts to falsify sustainability claims, 70% of all respondents answered 'no'. When looking at the response by certification scheme, however, most replied 'no' while more than 60% of respondents from FSC replied 'yes' (Fig. 17). A few respondents refer to the media for cases of falsification, while one comment by a FSC respondent specifies that multiple sales based on double invoicing systems or continued sales sometimes take place, despite certificate withdrawals, but that FSC seeks to address this problem through an 'Online Claims platform'. PEFC respondents mention logo use violations, or retailers claiming that material come from certified forest even if they do not have a CoC certification. It is also being mentioned that unintended falsification occurs due to lack of training in mass balance calculations.

6.3 Verification and auditing challenges

Respondents indicated that the most important aspect of effective auditing to ensure sustainability was auditor competence, with almost 60% of respondents supporting this as 'very important'. All individual schemes agreed with this statement, while also detecting and correcting non-compliances, auditing frequency, and sampling frequency, and were supported by many as being important factors to ensuring sustainability (39-48% indicated 'very important' and about 29-36% 'moderate'). ISCC respondents seemed, however, to consider auditing frequency and sampling intensity less important than RSB, FSC and PEFC-endorsed schemes.

Respondents were then asked to indicate, from a list of many sustainability issues, which ones were more difficult to audit (Fig. 18). The issue most difficult to audit seemed to be biodiversity, while social aspects, GHG emission reductions, and supply chain control systems were also seen as being particularly difficult to audit as well. Overall, respondents ranked air quality as the least difficult issue to audit. Looking at the different certification schemes, the responses to each individual sustainability criteria were quite mixed, but there seem to be challenges associated with most criteria in all schemes.

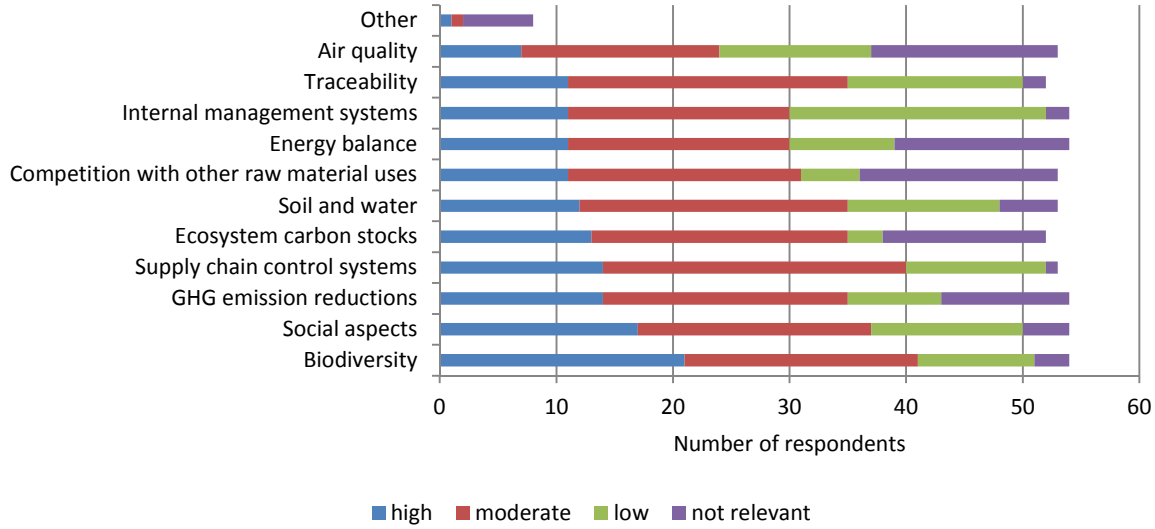

Figure 18. Respondents indicated which of the above sustainability issues were most difficult to audit. Note that several respondents most familiar with a forestry scheme (16 of the respondents to this question) indicated 'not relevant' for GHG emission reductions, energy balances, air quality and ecosystem carbon stocks.

Respondents overall rated biodiversity, soil and water, traceability and supply chain control systems as being the most costly of the criteria to verify, but answers were quite mixed among respondents associated with the different certification schemes. This may be due to differences among schemes, or it could simply be due to too few respondents to this question. Respondents were not given the opportunity to give comments regarding verification costs.

Following up on the topic of verification tools and auditing, respondents were asked to comment on whether there was a need to develop new or existing tools to improve auditing for a number of sustainability criteria. Across all criteria and schemes about 30-50% of respondents said 'yes'. For most criteria, slightly more respondents said 'no', with the exception of ecosystem carbon stocks, GHG emission reductions, and energy balances. For all criteria, 40-60% of the respondents most familiar with RSB believed there was a need to develop tools to improve methods of verification, while some respondents to forestry schemes also suggested a need to develop tools for GHG emission reductions. However, there were only few total respondents to this question, especially for FSC and ISCC.

When asked if there is consistency among the data, tools, models, or guidelines used for verification and auditing along the whole supply chain, respondents mentioned that there are inconsistencies between guidelines used in different regions e.g. North America and Europe. Respondents also indicated that there may be consistency along the supply chain within a certain scheme, but using different data, models and tools it is possible to come to different results. In some cases there are no written guidelines, and assessors instead use their experience with several standards and apply the same methodology to different sectors.

7. Discussion and summary

More than half of the respondents had at least 1-5 years of experience with bioenergy and certification systems, and most of the different stakeholder groups were represented in the survey. For this reason, we believe that the majority of respondents were knowledgeable and experienced with the issues of sustainability governance and bioenergy, and that the opinions contained within this survey are relevant and reliable. It is also significant to note, however, that 85% of respondents were from either North America or Europe, and most had experiences within those regions as well. This does create a geographical bias in the results, as we acknowledge that some major producing regions, such as Brazil and Argentina, and developing countries are underrepresented.

In surveying the views and operational experiences of people involved in all aspects of bioenergy production systems and related sustainability governance, we found agreement around several pivotal issues, including verification and auditing challenges, non-certified land, and the role of international initiatives. We also found major divergences in opinions on some of the biggest sustainability challenges and how to mitigate those challenges. This section summarizes the major findings from the survey, discusses the divergences of opinions, and points toward possible next steps for improvement of sustainability governance mechanisms.

7.1 Existing governance initiatives and general sustainability challenges

The first section of the survey explored the role of international and national governance initiatives and general sustainability challenges facing the bioenergy sector. The results of the survey revealed some overarching divergences of opinions in response to three key issues:

- Do we have enough sustainability governance mechanisms?
- What role should voluntary certification play?
- How can we deal with redundancy, lack of transparency and consistency?

7.1.1 Do we already have enough governance?

Over the past several decades, legislation, international conventions and processes, have been established to protect the environment and certain social values. These mechanisms are sometimes implemented in national legislation or through voluntary certification systems. Many of these initiatives also apply to the bioenergy sector, even if not specifically designed for that purpose. Newer legislative initiatives, designed specifically to address bioenergy concerns such as EU RED and RFS2 are considered very important for meeting sustainability objectives for bioenergy. There are, however, many actors that believe what we have in place already (i.e. legislation, regulations, guidelines, and voluntary certification) is enough to meet sustainability objectives for bioenergy, at least in some parts of the world (North America and Europe). One possible solution is the use of risk evaluation systems to determine the need for certification, as it is often done in financing, by private companies purchasing biomass from around the world, or will be done in relation to timber legality (EUTR).

Consider: It can be argued that voluntary certification is needed in places in Asia, Africa and South America due to weak existing sustainability governance (standards and/or enforcement), while systems in North America and Europe may only need fine-tuning. Could the need for voluntary certification be determined through measures such as risk evaluations?

7.1.2 What role should voluntary certification play?

Most respondents in our survey agreed that voluntary certification combined with legislation should play a significant role in meeting the goals for sustainable bioenergy. Many respondents considered voluntary certification to be more effective than legislation for ensuring bioenergy sustainability, while others found legislation to be more effective. It may be that the first group was considering the more detailed and stricter standards of many voluntary certification systems in their responses, while the latter group was considering the failure of voluntary certification to reach scale, the lower cost-efficiency of small control systems, and the weaker enforcement (of voluntary versus mandatory).

A scenario may exist, however, where legislation and voluntary certification are applied simultaneously with success. Generally, legislation is intended to be (and needs to be) simple to apply, and made to sit at a relatively high level (i.e. creates uniform regulations that can be applied at a national or international scale). Certification can be the tool that enables the higher-level regulations to be achieved on the ground by all actors involved in the supply chain. Voluntary certification schemes generally require compliance with regulations, but they are also more adaptable and inclusive of stakeholder input. Standard development is ongoing and engages with people at the management unit level, while including comprehensive adoption of requirements from international conventions and processes. Certification usually requires independent third party audits, which ensures that sustainability requirements are met. The EU has currently decided on legislative sustainability criteria for liquid biofuels, and accepts voluntary certification as a method of demonstrating compliance with their legislation. In these ways, certification is an enabling tool, allowing legislative goals to be realized at the level of management unit and decreasing the administrative burden on governments.

Correspondingly, some respondents who were more critical of the effectiveness of certification still saw certification systems as useful tools to operate in concert with developing legislative requirements, especially in places with weak legislation, or functioning as private systems offering more rigorous sustainability requirements, in addition to legislative requirements.

Consider: Voluntary certification may be one of the most effective ways of engaging stakeholders to achieve on-the-ground implementation of higher-level legislative sustainability goals. It may also play an important role as an innovative body that explores how sustainability levels can be continuously increased, as scientific developments proceed, with the ability to adapt faster than legislation or regulations. Legislative systems are ultimately needed, however, to reach scale and create unified protection across systems, regions and countries.

7.1.3 Redundancy, lack of transparency and consistency

The majority of respondents thought that there is a redundancy of governance initiatives with different sustainability definitions and standards, and with different levels of requirements in auditing and enforcement. This allows companies to shop among schemes, with schemes potentially being forced to compete on the price, rather than on their effectiveness in meeting sustainability goals. One proposed solution was to establish a unified, international standard, but many respondents also see advantages to keeping the diversity of schemes. Some argue that diversity is needed in the short term, to gain knowledge, while others believe it is critical that systems must differ due to differences in regional, national and local ecological and social conditions.

The differences in views may seem incompatible; however one potential solution may be to agree on an international standard, with consistent overall sustainability principles and criteria for all regions, but with national and local interpretation at the level where ecological and social contexts differ

greatly, similar to the format of the FSC sustainability principles. Such coordination may come from care in balancing what logically sits in government regulations and what should be included in certification systems, including, for example, that requirements of international conventions or jurisdictional guidelines be met.

Such processes are ongoing in relation to EU RED. Similarly, national PEFC systems are adjusted to meet PEFC minimum requirements. Mutual recognition among schemes may also contribute, with for example RSB being in the process of recognizing other schemes; recently the agricultural scheme SAN by the Rainforest Alliance was benchmarked against RSB standards, and recognized by RSB as meeting them. However, time and comprehensive communication is needed to link relevant systems at all levels and create consistency and transparency among them. Many initiatives have started to reach consensus at an even broader scale, e.g. GBEP and ISO TC 248, but it is still unclear how well such initiatives suit different regions, and how the linkage between those high-level standards and on-the-ground implementation and verification functions.

Consider: The diversity of schemes helps explore alternative models for how to meet sustainability goals for biomass, biofuel and bioenergy production and use, but the aim in the long-term is that systems converge up to a level that ensures consistency and transparency, without imposing meaningless requirements at lower national and local (operational) levels.

7.2 Markets, trade and costs

From section two of the survey concerning the effect of sustainability governance on bioenergy markets and trade, the following important issues stand out:

- Why do some companies experience positive effects of sustainability governance while others do not?
- How do companies adapt to extra costs and how are these distributed along the supply and value chain in a fair manner?
- How can certification become more cost-efficient, without relaxing sustainability targets?

7.2.1 Why positive and negative effects?

Many respondents indicated that their business had experienced positive changes as a result of the introduction of new sustainability governance for bioenergy production or trade. Some of the positive effects included improved internal systems, increased awareness of sustainability, and exclusion of the worst emitters from the market. Some also stated increased production and trade as a positive effect. Many respondents experienced a decrease in available raw material or increased administrative and economic burdens without any gains. Some found that there was no market incentive to seek certification, while others were seeking certification to gain market access or establish a green business profile. The drivers for sustainability certification were further examined in Task 3 of the inter-task project (Goh and Junginger 2012, draft), and may shed some light on why certain actors perceive positive effects while others do not. Differences among regions or respondent groups did not show particular trends in this area.

Consider: Certification may have positive, neutral or negative effects on market operators. This may vary depending on the region of production, the scale of operations (and thus the burden of cost), or the certification system that is being implemented. As certification moves toward a more harmonized or consistent set of standards, verification tools and methods, how can we make sure all actors experience positive benefits of certification?

7.2.2 How to obtain a fair distribution of costs?

Respondents indicated that they have adapted to the increased costs by seeking cheaper raw materials or increasing commodity prices. This raises the question about fair distribution of the sustainability costs along the supply chain, if mainly feedstock producers or end users carry the economic burden of certification. Group or stepwise certification may be ways of reducing costs of certification. Another may be to vary the costs based on the economic situation of the market operators in different regions. Government subsidies may also help to alleviate some of the financial burdens to the biomass or biofuel producers or energy end-users, even if it is more common that energy producers receive governmental subsidies (e.g. the Renewable Obligation Certificates in the UK). However, such subsidies can possibly still have an indirect effect of alleviating economic pressures in other parts of the supply chain.

Consider: The cost of certification is mainly carried by the biomass producers and end-users. Where costs are significant, there is a need to look at the fairness of the distribution of costs in the supply chain in relation to the profits obtained by various actors.

7.2.3 Effective and efficient also for small operations?

Some companies considered the costs of certification to be less significant while for others it was a decisive factor for not seeking certification. Several respondents emphasized that the certification costs per unit of material produced may differ significantly depending on the total volumes or land areas involved in the certificate. These different experiences may be rooted in the type of business, the specific geographical region or certification scheme, but the survey did not allow further analysis of this. It was shown in the literature (e.g. Vis et al. 2008) how much certification costs may depend on the size of a business; a theoretical calculation example indicated that differences in direct costs may be considerable, from 0.07-15 €/ton biomass for forest management units of 100-60000 ha.

It is important to consider how sustainability governance can be better designed to be cost-efficient, especially for smaller operators, while still remaining effective in meeting sustainability goals. Various approaches have been tried and they may all contribute, but are considered second choice by the survey respondents, compared to e.g. full certification or effective enforcement of legislation. Still, no alternative or supportive tools have demonstrated their universal effectiveness and efficiency when it comes to small scale operators.

Consider: The overall tradeoffs associated with certification include costs to companies that are certified versus the societal benefits associated with achieving sustainability goals. Further dialogue and development is needed to ensure solutions which balance tradeoffs among beneficiaries and those who must bear the costs directly or indirectly. Experiences from forest and agricultural certification that has the longest experience in dealing with such problems may be a useful place to start.

7.3 Challenges in voluntary certification

The third section of the survey revealed the following issues as challenges particular to voluntary certification systems:

- How should certification systems be revised to adequately address particular sustainability issues?
- How should stakeholders be engaged for the benefit of sustainable bioenergy deployment?

- How can verification and auditing tools and methods continue to improve, while also becoming more cost-efficient?

7.3.1 Need for scheme revisions?

For all schemes, many different types of revisions were supported by the respondents. Schemes approved under EU RED were often stated as weak in land management requirements (e.g. soil, water, and biodiversity) and social issues, while GHG and energy balances were usually seen as outside the scope of forestry certification schemes. Forest certification schemes are generally well-linked to international conventions and SFM processes and require compliance, while respondents from newer biofuel schemes to a larger degree are unsure about the linkages of their own schemes to other international initiatives.

An issue that is more generally seen as a problem is indirect land use changes; they are difficult to address at the level of management unit certification, but the issue is being explored by several organizations currently (e.g. ISO TC 248, CEN TC 383, and RSB, see e.g. Dehue et al. 2011). There is also an increased focus on traceability and verification of origin, and it is increasingly an issue that social criteria be a part of the chain of custody certification. Respondents generally recommended that schemes engage with other schemes or stakeholders in the supply chain to resolve such issues.

Consider: Relevant existing and newer certification schemes need to consider their role in biomass, biofuel and bioenergy certification, and develop in a manner that is coordinated with other initiatives. Forest and agricultural certification needs to consider criteria for greenhouse gas and energy balances and ecosystem carbon stocks, while newer schemes must consider especially criteria for land management and social values.

7.3.2 Is stakeholder involvement adequate?

The majority of respondents felt adequately involved in standard and scheme revisions, but a small group did not. In particular, respondents answering for the FSC scheme were not satisfied with their level of involvement. As FSC is usually considered as a scheme with high stakeholder involvement, this result may be due to higher expectations among FSC involved respondents. There were also comments from respondents suggesting that governments must make more of an effort to engage stakeholders.

One important question is how stakeholders can be further engaged to commit to meeting sustainability goals. One recent example is a meeting arranged by IEA Bioenergy in Quebec to discuss unintended effects for Canadian wood pellet exports to EU due to the potential exclusion of primary forests as an acceptable source of biomass fuel raw material for use in the EU. These EU sustainability criteria threaten to exclude Canadian wood pellets from European markets regardless of whether forests in Canada are managed under strict sustainability standards. The need to engage stakeholders is also apparent from some of the respondents' comments expressing that cases of false sustainability claims were sometimes due to lack of understanding of requirements and commitment.

Consider: There is a need for increased engagement and communication among stakeholders and certification schemes and decision makers to ensure meaningful solutions that do not lead to unintended effects for businesses, environment, and human beings, and to ensure stakeholders understanding and commitment.

7.3.3 Is there a need to improve verification and auditing methods?

Most respondents did consider the certification scheme with which they were most familiar as successful in meeting sustainability criteria; although a considerable minority did think there was a need to improve effectiveness. Improvements could take the form of improving tools and guidelines for verification, or by improving the quality of the auditing. Some felt that there was no need for new or improved tools and guidelines to support verification, but many others felt it was needed; a respondent commented that it was very frustrating that the data, tools, models or guidelines used for verification and auditing could sometimes give different results for the same situation.

There is currently no overview of the tools and guidelines being used for verification. One comment suggested that auditors sometimes use their own experience to evaluate criteria, rather than a standardized methodology. Information about standards, certification bodies and accreditation requirements are usually available from homepages of certification schemes, but this is often not the case for tools, models and guidelines used for verification. More transparency and cooperation is needed to obtain consistency in these tools and methodologies across schemes and certification bodies.

Consider: Data, tools, models and guidelines used for the purpose of verification may be consistent within schemes or certification companies, but there is a need to increase transparency and coordination among schemes and certification companies. This is necessary to ensure that companies being certified are not evaluated in a manner that leads to different results for the same issue, depending on the scheme or certification body. If the different results are due to higher or lower sustainability targets rather than inconsistency, this should be made clear.

8. Conclusions

Stakeholder experiences as expressed in this survey suggest that a majority of the respondents believe that the existing governance mechanisms are not enough to meeting goals for sustainable biomass, biofuels, and bioenergy. Although there are many recent initiatives to remedy this, such as increased sustainability criteria, improved coordination among parties, and newly developed certification systems, there is also now a perceived redundancy among newer systems designed for this purpose. The current state of many voluntary systems and legislative requirements can be seen as an unfolding situation in which a convergence among initiatives and in the development of tools is occurring slowly, aided by increased conversations such as this one and others mentioned in this report. Continued collaboration and coordination are needed to move toward meeting the sustainability requirements of the entire sector, so that all supply chains can operate efficiently and effectively. Standardization processes may be one method of moving closer toward harmonized, consistent sustainability standards for all supply chains.

It seems clear that a mix of voluntary certification schemes with 3rd party auditing plus mandatory governmental regulations will be needed in the long term due to the important role that each plays at different levels in achieving sustainable bioenergy systems. These governance mechanisms can be designed to be fully compatible. A consistent and transparent mix of systems is needed; it should take into account the ecological, social and economic differences among regions. This is especially important considering the global trade of bioenergy feedstocks, which is only going to increase in coming years. It is also important that the evolution of governance mechanisms occurs to allow smaller-scale operators to enjoy the same benefits of certification without facing undue economic hardships as a result of obtaining certification.

Even if communication across sectors has increased, driven by recent bioenergy developments, there are still crucial divergences in opinions and a lack of understanding between different groups of actors. The survey suggests a need for increased communication at all levels, to be able to identify the best possible solutions. Recent initiatives have been established to do this, and it appears that the process of moving toward harmonization and collaboration is ongoing, with efforts such as this paving the way toward the identification of much-needed solutions. These efforts will hopefully enable the bioenergy sector to achieve a real and substantial contribution to future energy demands, by producing an environmentally sound, socially acceptable and cost-competitive form of renewable energy.

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Appendix A: The survey

IEA Bioenergy survey on sustainability certification of biomass, biofuels and bioenergy

Introduction

Governance and certification of sustainable biomass and bioenergy

This survey is part of a study by IEA Bioenergy (www.ieabioenergy.com) to make recommendations for improving the effectiveness of governance and certification systems to benefit sustainable bioenergy deployment locally and globally. The survey investigates the operational experiences of people actively involved with any aspects of bioenergy production systems. This includes biomass feedstock production, conversion to primary and secondary biofuel and bioenergy products, markets and trade, as well as certifying organizations. We want to investigate how these sectors are affected by governance mechanisms that include binding and voluntary standards, legislation, regulations and certification schemes.

The full questionnaire will take around 30 minutes of your time.

Your responses will be treated as confidential and data from this research will be reported only in an aggregated form. The information you provide in the multiple-choice questions will be coded and remain confidential. All answers provided to open questions may be quoted, but always anonymously, unless you specifically request that you may not be quoted. If you feel uncomfortable answering a specific question, feel free to skip that question.

You can always save your survey and come back later (button on top of each page).

Please start the survey now by clicking the Next button below.

Your background (1/2)

1) Contact data

Last name: _____

First name: _____

Company: _____

Email: _____

2) In what capacity are you involved in the biomass, biofuel or bioenergy sector?*

Minimum one answer required, multiple selections allowed. For definitions, see below.

[ ] Biomass producer - agriculture

[ ] Biomass producer - forestry

[ ] Sub-contractor

[ ] Biomass processor / refiner - into solid product

[ ] Biomass processor / refiner - into liquid product

[ ] Trader / distributor

[ ] Energy producer

[ ] Financing

[ ] Certification scheme holder

[ ] Certification body

[ ] Auditor

[ ] Standardization and standards development support

[ ] Administrator

[ ] Regulator

[ ] Bioenergy Association

[ ] Professional organization, society or association

[ ] NGO

[ ] Expert

[ ] Show DEFINITIONS Question 2 options

- *Biomass producer - agriculture*: The land owner or manager of agricultural land. For example farmer, agricultural cooperative, owners and managers of energy crop farms, palm oil plantations and similar actors.
- *Biomass producer - forestry*: The land owner or manager of forest land. For example forest owner or manager, forestry co-operative, owners and managers of forestry plantations and similar actors.
- *Sub-contractor*: Entrepreneur contracted to perform for example planting, harvesting, chipping, pesticide application, transportation, etc. Includes both forestry and agricultural entrepreneurs, and transportation and storage, but for example not independent auditors hired by certifying companies.
- *Biomass processor/refiner - into solid product*: Producer of secondary solid biofuel products, for example wood chips, pellets, briquettes, charcoal etc.
- *Biomass processor/refiner - into liquid product:* Producer of secondary liquid biofuel products, for example vegetable oils, ethanol, biodiesel, etc.

- *Trader / distributor*: Organisation or person that buys and sells biomass or biomass products on a market. Such actors may also blend liquid biofuels.
- *Energy producer*: Producer of electricity and/or heat from biomass.
- *Financing*: involved as third party financing for bioenergy projects.
- *Certification scheme holder*: Existing or newly developing organizations or initiatives setting standards for sustainable biomass (including forest management and agriculture), biofuels or bioenergy.
- *Certification body*: Certifying company that evalutates companies in the bioenergy supply chain that seek independent verification of complicance to a standard, and issues certificates. Often hires auditors, or might employ auditors in some cases.
- *Auditor*: On-the-ground auditor of certification standards for sustainable bioenergy, including the chain of custody- initial and annual audits. May be an employee of a certification body or an independent consultant hired by a certification body.
- *Standardization and standards development support:* Actors involved in national or international standardization (e.g. ISO and CEN), or association or partnership dealing with social and environmental standards. The latter may work with companies, non-profits and governments to support their referencing and use of voluntary standards, and may also define codes of good practice for setting social and environmental Standards (e.g. ISEAL alliance, GBEP, GIZ).
- *Administrator*: Institution that enforces laws and regulations (set by the regulators) and in different ways regulates actors involved in the biomass, biofuel, and bioenergy sector and administrates legislation and regulations related to sustainable bioenergy systems. For example county administrative board, municipality, etc.
- *Regulator*: Jurisdictional institution at the regional, state, provincial, national, international, etc. level (e.g. the European Union, countries, Bundesländer in Germany, and states in the USA), which set laws and regulations relevant to sustainable bioenergy.
- *Bioenergy association*: Non-governmental organization actively involved in developing bioenergy systems, with different types of members, including economic operators on the market, but also e.g. consultants, researchers, and other individuals.
- *Professional organization, society or association*: Non-governmental professional organization with members being economic operators on the bioenergy markets.
- *NGO*: Non-governmental environmental organization
- *Expert*: Expert not listed above that provides advice on any aspect of sustainable bioenergy production systems, for example researcher, agricultural and forestry consultancy.

3) Please select those governance and certification mechanisms with which you have most experience.

Please check as many boxes as you think appropriate.

[ ] 2BSvs, Biomass Biofuels voluntary scheme

[ ] BonSucro / Better Sugarcane Initiative

[ ] CSBP, Council on sustainable biomass production

[ ] GlobalGAP

[ ] Greenergy, ethanol from Brazil to UK

[ ] IDB, Inter-American Development Bank: Biofuels Sustainability Scorecard

[ ] IFOAM, International Federation of Organic Agriculture Movements

[ ] ISCC, International Sustainability and Carbon Certification

[ ] NTA8080, Dutch Technical Norm for sustainable biomass for energy

[ ] RBSA, Abengoa RED Bioenergy Sustainability Assurance

[ ] REDcert

[ ] RSB, Roundtable on sustainable biofuels

[ ] RSPO, Roundtable on sustainable palm oil

[ ] RTRS, Roundtable on responsible soy

[ ] SAN/RA, Sustainable Agricultural Network / Rainforest Alliance

[ ] SBA, Sustainable Biodiesel Alliance USA

[ ] SEKAB, sustainable ethanol from Brazil to Sweden

[ ] IWPB, Initiative for Wood Pellet Buyers

[ ] Drax Power Limited

[ ] GGL, Green Gold Label (RWE-Essent)

[ ] LBE, Laborelec / Electrabel

[ ] FSC, Forest Stewardship Council

[ ] PEFC, Programme for the Endorsement of Forest Certification Schemes

[ ] AFS, Australian Forestry Standard

[ ] ATFS, American Tree Farm System

[ ] ATO/ITTO, African Timber Organisations - International Tropical Timber Organization

[ ] CerFlor, Brasil

[ ] CertFlor, Chile

[ ] CSA, Canadian Standards Association (PEFC endorsed)

[ ] FCR, Russian National Council of Forestry Certification

[ ] LEI, Lembaga Ekolabel Indonesia

[ ] MCPFE, SFM criteria from Ministerial Conferences on Protection of Forests in Europe

[ ] MTCC, Malaysian Timber Certification Council

[ ] PAFC, Pan African Forest Certification Scheme

[ ] RAC, Rainforest Alliance Certified

[ ] RA-HCVF, High Conservation Value Forest

[ ] RA-SLV, SmartLogging Verification

[ ] RA-SS, Sustainable Sourcing

[ ] RA-SSLAM, SmartSource Legality Assessment & Monitoring

[ ] RA-TLV, Timber Legality Verification

[ ] SFI, Sustainable Forestry Initiative (PEFC endorsed)

[ ] TREES, Community Forestry and Enterprise Development

[ ] None

[ ] Other

Your background (2/2)

4) How many years of experience do you have?

	no experience	< 1 year	1-5 years	> 5 years
with biomass / bioenergy / biofuels in general	( )	( )	( )	( )
with sustainability certification of biomass, biofuels or bioenergy	( )	( )	( )	( )

5) Which regions does your experience with the biomass, biofuel or bioenergy sector mainly stem from?

[ ] Worldwide
[ ] North America
[ ] Central America
[ ] South America
[ ] West Europe
[ ] South Europe
[ ] North Europe
[ ] Central and East Europe
[ ] Russia and former USSR
[ ] Middle East
[ ] South Asia
[ ] South-East Asia
[ ] East Asia
[ ] North Africa
[ ] Sub-Saharan Africa
[ ] Oceania
[ ] not relevant

6) The remainder of the survey contains the following parts. Please select the topics you would like to address. The number of questions per part are indicated between brackets. The unselected parts will not appear in the rest of the survey. As mentioned you are still free to skip questions you are uncomfortable answering, and you can still 'save and continue later'.

*Parts indicated with * are mainly relevant for actors in the biomass chain (biomass producers, traders, processors), but may also be relevant to certification bodies, auditors and certification scheme holders.*

*Parts indicated with ** are mainly relevant if you have on-the-ground experience with certification (actors in the biomass chain, certification scheme holders, certification bodies).*

[x] Governance of the sustainability of bioenergy systems (10)
[x] Non-certified land (3)
[x] Harmonization and compliance (8)

[x] Trade and markets * (7)

[x] Costs and adaptation * (8)

[x] Standards and scheme revision and development ** (8)

[x] On-the-ground effectiveness of sustainability certification ** (6)

[x] Verification and auditing challenges ** (6)

7) The last parts will ask your experience in relation to the scheme you are most familiar with (see also question 3). Please select.

In case you would like to share your experience for more than one scheme, you are welcome to repeat the survey (only the relevant parts) for the other schemes.

Drop-down list, see question 3

If you selected 'Other', or if you wish to be more specific (e.g. PEFC endorsed scheme of a certain country), please specify below.

_____

Governance of the sustainability of bioenergy systems (1/2)

8) There are a number of initiatives that have proposed criteria or requirements relevant for sustainable land management and sustainable bioenergy production and trade. Which of these initiatives do you believe are important for meeting sustainability objectives for bioenergy?

A. LEGISLATION

	not important	**moderate**	**important**	**very important**	**I don't know**
EU Renewable Energy Directive (EU RED)	( )	( )	( )	( )	( )
EU Timber Regulation Platform (EUTR)	( )	( )	( )	( )	( )
EU Common Agricultural Policy (EU CAP)	( )	( )	( )	( )	( )
EU Directives 92/43/EEC and 2009/147/EC forming the Natura 2000 network	( )	( )	( )	( )	( )
USA Renewable Fuel Standard (RFS2)	( )	( )	( )	( )	( )
California Low-Carbon Fuel Standard (LCFS)	( )	( )	( )	( )	( )
Brazil Agro-Ecological Zoning	( )	( )	( )	( )	( )

B. BIOENERGY STANDARDS AND SUSTAINABILITY INDICATORS

	not important	**moderate**	**important**	**very important**	**I don't know**
ISO TC248/ ISO 13065 Sustainability criteria for bioenergy	( )	( )	( )	( )	( )
CEN TC383 / EN 16214 Sustainably produced biomass for energy applications (biofuels and bioliquids)	( )	( )	( )	( )	( )
NTA8080 Dutch Technical Norm for sustainable biomass for energy	( )	( )	( )	( )	( )
Global Bioenergy Partnership (GBEP) sustainability indicators for bioenergy	( )	( )	( )	( )	( )

C. INTERNATIONAL CONVENTIONS

	not important	**moderate**	**important**	**very important**	**I don't know**
UN framework convention on Climate Change (UNFCCC)	( )	( )	( )	( )	( )
Kyoto Protocol	( )	( )	( )	( )	( )
Convention on Biological Diversity (CBD)	( )	( )	( )	( )	( )
European Landscape Convention (EU ELC)	( )	( )	( )	( )	( )
Ramsar Convention on Wetlands	( )	( )	( )	( )	( )
Convention to Combat Desertification	( )	( )	( )	( )	( )
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	( )	( )	( )	( )	( )
Cartagena Protocol of Bio-safety	( )	( )	( )	( )	( )
International Labour Organization (ILO) core conventions	( )	( )	( )	( )	( )

D. INTERNATIONAL SUSTAINABLE FORESTRY MANAGEMENT PROCESSES

	not important	**moderate**	**important**	**very important**	**I don't know**
The Montreal Process	( )	( )	( )	( )	( )
Ministerial Conferences on Protection of Forest in Europe (MCPFE), incl. Pan European Operational Level Guidelines (PEOLG)	( )	( )	( )	( )	( )
International Tropical Timber Organization (ITTO)	( )	( )	( )	( )	( )
Tarapoto Proposal	( )	( )	( )	( )	( )
African Dry Zone	( )	( )	( )	( )	( )
Near East Process	( )	( )	( )	( )	( )
African Timber Organization (ATO)	( )	( )	( )	( )	( )
Lepaterique Process of Central America	( )	( )	( )	( )	( )
Dry Forest Asia Initiative	( )	( )	( )	( )	( )

9) Do you think the above initiatives (together) are adequate to meet sustainability objectives of bioenergy? If no, please state what is lacking.

( ) yes

( ) no: _____

( ) I don't know

Governance of the sustainability of bioenergy systems (2/2)

10) Many nations, state and provincial jurisdictions have laws, regulations and policies that 'govern' natural resource management. In addition they may have laws or guidelines for sustainable land management and/or bioenergy feedstock harvesting. Please state which one(s), if any, most significantly influence your business or organization.

11) Do you believe that the existing rules and guidelines are sufficiently addressing the sustainability of bioenergy production?

( ) yes

( ) only partly: _____

( ) no: _____

( ) I don't know

12) Do you believe sustainability requirements should take the form of voluntary initiatives or regulatory requirements? Please state the reason for your answer.

[ ] Voluntary initiatives

[ ] Regulatory requirements

[ ] A mix of both

[ ] I don't know

13) Sub-contractors responsible for operations in the biomass supply chain are often certified by schemes that ensure that their operations satisfy sustainability criteria (e.g. Master Logger Certification, Smart Logging). Please state which one(s), if any, apply to your business.

14) If you identified any sub-contractor certification schemes in the previous question that apply to your business, indicate if you believe they contribute to meeting sustainability objectives of bioenergy. Please explain why.

( ) yes: _____

( ) no: _____

( ) I don't know / not relevant

15) Given all the existing 'governance' approaches (see Questions 8, 10 and 13), do you believe that voluntary certification schemes involving third-party audits are essential to ensure sustainability? Please explain why.

( ) yes: _____

( ) no: _____

( ) I don't know

16) Please identify those regions globally where you believe voluntary certification is especially important. ***(multiple boxes may be checked)***

[ ] Worldwide
[ ] North America
[ ] Central America
[ ] South America
[ ] West Europe
[ ] South Europe
[ ] North Europe
[ ] Central and East Europe
[ ] Russia and former USSR
[ ] Middle East
[ ] South Asia
[ ] South-East Asia
[ ] East Asia
[ ] North Africa
[ ] Sub-Saharan Africa
[ ] Oceania
[ ] not relevant
[ ] I don't know

17) What other approaches are you using, or are you aware of, that you believe contribute to achieving sustainable land management and bioenergy production and require less formality, cost or government regulation than the initiatives listed in the previous questions?

Non-certified land (1/1)

18) A large percentage of land is not certified under a forestry or agricultural land management scheme. Do you perceive this as a problem? Please explain why.

				explanation
	yes	**no**	**?**	
for forestry products	( )	( )	( )	___
for agricultural products	( )	( )	( )	___

19) Please rate the effectiveness of the following alternatives and support tools to certification in terms of achieving sustainability of bioenergy production systems and trade, including sustainable forest and agricultural management.

*Items indicated with * are further explained below.*

	effectiveness					**clarification**
	low	**moderate**	**high**	**not relevant**	**I don't know**	
Bilateral or multilateral agreements	( )	( )	( )	( )	( )	___
National verification methods	( )	( )	( )	( )	( )	___
Group or regional certification *	( )	( )	( )	( )	( )	___
Certification of entrepreneurs *	( )	( )	( )	( )	( )	___
Stepwise certification services *	( )	( )	( )	( )	( )	___
Fiber/biomass sourcing programmes *	( )	( )	( )	( )	( )	___
Introduction of international criteria in national legislation	( )	( )	( )	( )	( )	___
Multilateral initiatives such as the Global Bioenergy Partnership	( )	( )	( )	( )	( )	___
Non-certification systems *	( )	( )	( )	( )	( )	___
Other (specify)	( )	( )	( )	( )	( )	___

** Group certification: refers to options for gaining certification where several landowners or actors get certified under one certification managed by a certificate holder organisation. This is especially attractive for small land owners for whom individual certification is too expensive.*

** Certification of entrepreneurs: "entrepreneur" refers to any individual company along the supply chain that is involved in business that moves the biomass or bioenergy product from one stage to another. They could therefore be actors involved in logging, wood chipping, transport, storage, etc. (see definitions question 2)*

** Stepwise certification or verification services: option provided by some certification bodies or schemes that enable especially biomass feedstock producers to gain full certification over time, but in*

a stepwise or phased manner, as they get their management systems adequately developed to satisfy social, economic and environmental standards and able to pass auditor examination for full certification. Such stepwise approach helps the producer to gain market benefits before they are fully certified.

** Fiber/biomass sourcing programmes: the term "fiber sourcing programme" originates in traditional forestry certification schemes and generally is used where a forest products company is procuring its fibre (e.g. logs, chips, pulp, etc.) from multiple sources, and where that forest products company wants to "certify" that the fiber it has procured is from sustainably managed forests.*

** Non-certification systems: Labelling systems, good practice guidelines, producer manuals, environmental or social impact assessments, GIS systems providing e.g. information where certain crops can be produced, or which intensity of harvesting is advisable, monitoring and reporting systems, etc.*

Harmonization and compliance (1/2)

20) There are many sustainability certification schemes and initiatives related to biomass and bioenergy. Do you believe that there is a problem of redundancy, or do they all have added value? Please explain why.

( ) Yes, there is overlap/redundancy: _____

( ) No, they all have added value: _____

( ) I don't know

21) If yes in the previous question, please indicate how this may cause problems in the market? Please explain why.

	relevant problem ?			**explanation**
	yes	**no**	**?**	
Lack of transparency	( )	( )	( )	___
Lack of consistency	( )	( )	( )	___
Trade barriers	( )	( )	( )	___
Unwarranted discrimination in the use of raw materials	( )	( )	( )	___
Confusion about sustainability definitions	( )	( )	( )	___
Other (specify)	( )	( )	( )	___

22) Which solutions to the problems indicated in the previous question do you believe are best? Please explain why.

	relevance			**explanation**
	minor	**medium**	**high**	
Mutual recognition among voluntary certification schemes	( )	( )	( )	___
Introduce meta-standards that endorse existing voluntary systems	( )	( )	( )	___
Reduce the number of voluntary schemes and replace with a fewer number of systems, e.g. as agreed upon among governments	( )	( )	( )	___
Use future ISO or CEN standards (ISO TC248 / ISO 13065 and CEN TC383 / EN16214)	( )	( )	( )	___
Include international criteria in national legislation	( )	( )	( )	___
Other (specify)	( )	( )	( )	___

Harmonization and compliance (2/2)

23) Are there any clear advantages to keeping the diversity of biomass, biofuel and bioenergy sustainability schemes and initiatives that you know of? Please explain why.

				explanation
	yes	**no**	**?**	
.	( )	( )	( )	___

24) Do you see any conflicting values between sectors or groups of economic operators, which may hamper harmonization among biomass, biofuel and bioenergy sustainability certification schemes? Please explain why.

				explanation
	yes	**no**	**?**	
.	( )	( )	( )	___

25) Should certification schemes for biomass, biofuel and bioenergy sustainability, or sustainable forest management or good agricultural practices, comply with any of the following existing and future international processes and protocols? ***(Multiple boxes may be selected)***

[ ] EU Renewable Energy Directive (EU RED)

[ ] EU Timber Regulation Platform (EUTR)

[ ] EU Common Agricultural Policy (EU CAP)

[ ] EU Directives 92/43/EEC and 2009/147/EC forming the Natura 2000 network

[ ] USA Renewable Fuel Standard (RFS2)

[ ] California Low-Carbon Fuel Standard (LCFS)

[ ] Brazil Agro-Ecological Zoning

[ ] UN framework convention on Climate Change (UNFCCC)

[ ] Kyoto Protocol

[ ] Convention on Biological Diversity (CBD)

[ ] European Landscape Convention (EU ELC)

[ ] Ramsar Convention on Wetlands

[ ] Convention to Combat Desertification

[ ] Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

[ ] Cartagena Protocol of Bio-safety

[ ] International Labour Organization (ILO) core conventions

[ ] The Montreal Process

[ ] Ministerial conferences on Protection of Forest in Europe (MCPFE), incl. Pan European Operational Level Guidelines (PEFOLG)

[ ] International Tropical Timber Organization (ITTO)

[ ] Tarapoto Proposal

[ ] African Dry Zone

[ ] Near East Process

[ ] African Timber Organization (ATO)

[ ] Lepaterique Process of Central America

[ ] Dry Forest Asia Initiative

[ ] ISO TC 248/ ISO 13065

[ ] CEN TC383 / EN16214

[ ] NTA8080 Dutch Technical Norm for sustainable biomass for energy

[ ] Global Bioenergy Partnership (GBEP)

[ ] not relevant

[ ] I don't know

[ ] Other (specify)

26) Have you found any difficulties associated with the certification schemes you are applying in satisfying the requirements of the important international processes and protocols that you selected above? Please explain.

				explanation
	yes	**no**	**?**	
.	( )	( )	( )	___

27) Do you have any other comments regarding harmonization and compliance of sustainability standards and certification schemes?

Trade and markets (1/2)

Please answer the questions in this section if you are an actor in the biomass chain (biomass producer, processor, trader, distributor, ...), a certification scheme holder or a certifying body.

28) Have you observed in the period of 2008-2012 any major changes for your business (or the ones you audit) in production or trade flows as a result of the introduction of new sustainability governance for bioenergy production or trade?

e.g. changes in production system, type of crop grown, supply agreements, location of operations, feedstock origin, destination of products sold, chain of custody procedures, traded types of biomass/biofuels, trade routes, traded volumes

( ) yes (please clarify): _____

( ) no (specify): _____

( ) I don't know / not relevant

29) If you answered yes in response to the previous question, please indicate why it was necessary to change your production system or trade.

e.g. failure to comply with standards, poor GHG balance of products, no well-established certification scheme for my commodity, shift to other markets

30) If you made changes in your business as a result of the challenges and opportunities associated with any new governance, was the outcome positive or negative? Please clarify.

e.g. we gained market acces; we gained access to markets with less competition; we received higher prices and/or profits; we lowered our production costs; we lost market access; our profits dropped; we went bankrupt.

				clarification
	positive	**negative**	**neutral**	
outcome	( )	( )	( )	___

Trade and markets (2/2)

31) Please list up to the 3 major biomass based products that your company produces, trades or audits.

Examples:
- [Primary biomass]: roundwood, woody perennials, grassy perennials, sugar cane, palm oil, soybean, maize/corn, oil seeds, cereals, other crops
- [Residues]: agricultural residues (straw, stalks, manure), primary forestry residues, sawdust, sawmill by-products, other industrial wood residues
- [Processed biomass]: wood pellets, wood chips, vegetable oils from a specific crop, biodiesel from e.g. palm oil, bioethanol from ..., biogas from ..., others.

	description (including feedstock)
Product 1	___
Product 2	___
Product 3	___

32) What is the origin of the feedstock for the indicated products, where is the feedstock processed to a product, and what is their main destination?

	Origin	**Place of processing/refining**	**Destination**
Product 1	___	___	___
Product 2	___	___	___
Product 3	___	___	___

33) What was the total approximate amount of the indicated products your company dealt with in 2011*, which percentage was certified, and under which certification scheme?

** Please clearly indicate the units, e.g. tonnes (dry mass), m³ (liquids), GJ or MWh for energy products.*

	Approx. amount in 2011	**% certified**						**Certification scheme**
		<1%	**1-24%**	**25-49%**	**50-74%**	**75-99%**	**100%**	
Product 1	___	___	___	___	___	___	___	___
Product 2	___	___	___	___	___	___	___	___
Product 3	___	___	___	___	___	___	___	___

34) Do you have any further comments on the impacts of sustainability certification schemes on trade and markets?

Cost and adaptation (1/2)

Please answer the questions in this section if you are an actor in the biomass chain (biomass producer, processor, trader, distributor, ...).

35) If your products or feedstocks are not certified, please indicate the most important reasons.

	not relevant	minor importance	medium	very important
Administrative complexity	( )	( )	( )	( )
Too costly to become certified	( )	( )	( )	( )
No suitable certification schemes available	( )	( )	( )	( )
No significant market advantages	( )	( )	( )	( )
I don't know	( )	( )	( )	( )
not relevant	( )	( )	( )	( )
other	( )	( )	( )	( )

If you indicated 'other', please specify.

_____

36) Do regulatory requirements related to sustainability affect your decision to enter a market? Please explain why.

				explanation
	yes	**no**	**?**	
.	( )	( )	( )	___

37) Please indicate the main motivation(s) to seek certification to a voluntary biomass/bioenergy sustainability standard.

	not relevant	minor importance	medium	very important
Legislative requirements	( )	( )	( )	( )
Price premium for certified products	( )	( )	( )	( )
General market access	( )	( )	( )	( )
Access to niche markets	( )	( )	( )	( )
Maintain current market shares	( )	( )	( )	( )

Increased market shares	( )	( )	( )	( )
Improve management systems	( )	( )	( )	( )
Green business profile	( )	( )	( )	( )
Other	( )	( )	( )	( )

If you indicated 'other', please define.

_____

Cost and adaptation (2/2)

Please answer the questions in this section if you are a certified organization (biomass producer, processor, distributor, ...).

38) What are the approximate extra costs related to achieving certification per unit biomass or biofuel or energy produced?

Please clearly indicate the units, e.g. EURO or US$ per tonne (dry mass), per m³ (liquids), or per GJ or MWh for energy products.

39) Please rate in the accompanying list the most significant costs associated with certification?

	cost relevance				**specify**
	minor	**medium**	**important**	**not relevant**	
Fees to the certification scheme	( )	( )	( )	( )	___
Fees to the certification body	( )	( )	( )	( )	___
Services of the certifier and auditing company	( )	( )	( )	( )	___
Costs related to the extra administration	( )	( )	( )	( )	___
Costs related to changed management practises	( )	( )	( )	( )	___
Increased feedstock prices due to purchasing certified materials	( )	( )	( )	( )	___
Other (specify)	( )	( )	( )	( )	___

40) Do you consider the total cost related to certification to be significant compared to the value or profit margins of the biomass commodity or product? Please explain why.

( ) Yes: _____

( ) No: _____

( ) I don't know

41) If you answered yes above, please rank the following options for your organization in dealing with the costs imposed by certification? ***(most important on top)***

_____Increase commodity prices

_____Negotiate less expensive feedstock prices

_____Change to less expensive feedstock supplier

_____Seek efficiency improvements

_____Accept lower profits

42) Do you have any other comments on costs and adaptation?

Standards and scheme development and revision (1/2)

Please answer the questions in this section if you have concrete experience with certification schemes. This section will ask your feedback on the scheme you are most familiar with (in Question 7 you selected: ...).

43) Was this certification scheme revised within the last 5 years to increase its relevance to bioenergy production systems?

( ) Yes (specify how): _____

( ) No

( ) I don't know / not relevant

44) Do you believe there is a need that your certification scheme be revised for some of the following issues?

	revision needed ?				**specify how**
	Yes	**No, not needed**	**No, already included**	**I don't know**	
Periodic revisions should be conducted as part of the schemes regular revision (specify frequency)	___	___	___	___	___
Sustainability criteria for land management (biodiversity, soil, water, etc)	___	___	___	___	___
Sustainability criteria for the Chain of Custody	___	___	___	___	___
GHG (greenhouse gas) calculations should be included or methodology changed	___	___	___	___	___
Revisions to meet expected future legislative sustainability requirements	___	___	___	___	___
Revisions to meet expected future management systems requirements	___	___	___	___	___
Expanded supply chain scope	___	___	___	___	___
iLUC concerns (indirect land use change)	___	___	___	___	___
Handling of tradeoffs and conflicting sustainability criteria	___	___	___	___	___
Other (specify)	___	___	___	___	___

Standards and scheme development and revision (2/2)

45) Do you feel adequately involved in the process to further develop or revise the standards and the certification scheme? Please explain.

( ) Yes: _____

( ) No: _____

( ) I don't know

46) Is there a proper balance of power among the types of stakeholders involved in standards development and revisions for your scheme? Please explain why.

( ) Yes: _____

( ) No: _____

( ) I don't know

47) Do you think there is a need to engage with other types of certification schemes and/or legislators to coordinate, supplement, or possibly harmonize your efforts? Please explain.

( ) Yes: _____

( ) No: _____

( ) I don't know

48) What do you believe are the most important issues to be settled through these consultations? Please clarify if needed.

	importance			**clarification**
	minor	**medium**	**high**	
Jointly meeting sustainability criteria and goals along the supply chain	( )	( )	( )	___
More clarity in responsibilities for individual sustainability aspects along the supply chain	( )	( )	( )	___
Meeting external administrative requirements	( )	( )	( )	___
Ensure consistent verification and auditing	( )	( )	( )	___
Improve the Chain of Custody	( )	( )	( )	___
Improved consideration of external stakeholder views	( )	( )	( )	___
Other (specify)	( )	( )	( )	___

49) Do you have other comments concerning standards and scheme revision?

On-the-ground effectiveness of sustainability certification (1/1)

Please answer the questions in this section if you have concrete experience with certification schemes, in relation to the scheme you are most familiar with (in Question 7 you selected: ...).

50) Do you believe your certification scheme is effective in achieving the following sustainability criteria?

				clarification
	yes	**no**	**?**	
GHG emission reductions (life cycle based)	( )	( )	( )	___
Energy balance (life cycle based)	( )	( )	( )	___
Ecosystem carbon stocks	( )	( )	( )	___
Biodiversity	( )	( )	( )	___
Soil	( )	( )	( )	___
Water	( )	( )	( )	___
Air quality	( )	( )	( )	___
Social aspects	( )	( )	( )	___
Traceability /place of origin	( )	( )	( )	___
Competition with other raw material uses	( )	( )	( )	___
Other	( )	( )	( )	___

51) Do you believe that biomass, biofuel and bioenergy certification has caused any negative or positive unintended consequences?

( ) Yes (specify): _____

( ) No

( ) I don't know

52) Have you found any major weaknesses in the GHG balance calculations of your scheme with regard to ensuring and documenting GHG emission savings?

( ) Yes (specify): _____

( ) No

( ) I don't know

53) How accurate and precise do you believe that the mass balance calculation is in assessing the percentage of sustainability certified biomass?

( ) accurate within +/- 10%

( ) +/- 20%

( ) +/- 50%

( ) I don't know / not relevant

54) Have you encountered attempts to falsify sustainability claims in any way, including sustainability claims on biomass from illegal logging?

( ) Yes (specify): _____

( ) No

( ) I don't know

55) Do you have any further comments concerning on-the-ground effectiveness of sustainability certification?

Verification and auditing challenges (1/2)

Please answer the questions in this section if you are a certified organization (biomass producer, processor, ...) or a certifying body, in relation to the scheme you are most familiar with (in Question 7 you selected: ...).

56) How do you perceive the effectiveness of auditing related to your scheme?

	effectiveness				**clarification**
	low	**moderate**	**high**	**not relevant**	
Auditing frequency (specify frequency)	( )	( )	( )	( )	___
Audit sampling intensity	( )	( )	( )	( )	___
Auditor competence	( )	( )	( )	( )	___
Detecting and correcting non-compliances	( )	( )	( )	( )	___

57) Providing adequate information for verification of sustainability criteria may be difficult. Please rate the following criteria according to level of difficulty in conducting audits according to your experience.

	difficulty				**clarification**
	low	**moderate**	**high**	**not relevant**	
Supply chain control systems	( )	( )	( )	( )	___
GHG emission reductions	( )	( )	( )	( )	___
Energy balance	( )	( )	( )	( )	___
Ecosystem carbon stocks	( )	( )	( )	( )	___
Biodiversity	( )	( )	( )	( )	___
Soil and water	( )	( )	( )	( )	___
Air quality	( )	( )	( )	( )	___
Social aspects	( )	( )	( )	( )	___
Traceability/place of origin	( )	( )	( )	( )	___
Competition with other raw material uses	( )	( )	( )	( )	___
Internal management systems (documentation, training, etc.)	( )	( )	( )	( )	___
Other (specify)	( )	( )	( )	( )	___

Verification and auditing challenges (2/2)

58) Please indicate the largest cost items in relation to providing information for verification.

	low cost	medium	high cost	not relevant
Supply chain control systems	( )	( )	( )	( )
GHG emission reductions	( )	( )	( )	( )
Energy balance	( )	( )	( )	( )
Ecosystem carbon stocks	( )	( )	( )	( )
Biodiversity	( )	( )	( )	( )
Soil and water	( )	( )	( )	( )
Air quality	( )	( )	( )	( )
Social aspects	( )	( )	( )	( )
Traceability /place of origin	( )	( )	( )	( )
Competition with other raw material uses	( )	( )	( )	( )
Internal management systems (documentation, training, etc.)	( )	( )	( )	( )
Other	( )	( )	( )	( )

59) Do you feel there is a need to develop new or improve existing tools, models or guidelines for verification for the following?

				clarification
	yes	no	?	
Supply chain control systems	( )	( )	( )	___
GHG emission reductions	( )	( )	( )	___
Energy balance	( )	( )	( )	___
Ecosystem carbon stocks	( )	( )	( )	___
Biodiversity	( )	( )	( )	___
Soil and water	( )	( )	( )	___
Air quality	( )	( )	( )	___
Social aspects	( )	( )	( )	___
Traceability /place of origin	( )	( )	( )	___
Competition with other material uses	( )	( )	( )	___
Internal management systems (documentation, training, etc.)	( )	( )	( )	___
other	( )	( )	( )	___

60) Is there consistency among the data, tools, models or guidelines used for verification of compliance with certification standards along the whole supply chain? Please explain.

				explanation
	yes	**no**	**?**	
.	( )	( )	( )	___

61) Do you have any other comments concerning verification and auditing challenges – information needs, tools, models, guidelines, costs or other?

Follow up

Can we contact you at a later date for an interview to elaborate further on your views, or share your experiences?

[ ] Yes (please include your e-mail, if not specified in Question 1)

[ ] No

[ ] I don't know

Do you wish to receive the reports of the current study (including survey results)?

( ) Yes (e-mail, if not specified before): _____

( ) No

( ) I don't know

Any final comments or remarks are welcome below.

Thank You!

On behalf of IEA Bioenergy Tasks 40, 43 and 38 we would like to thank you for taking our survey. Your response is very important to us.

If you have questions about the survey or the procedures, you may contact

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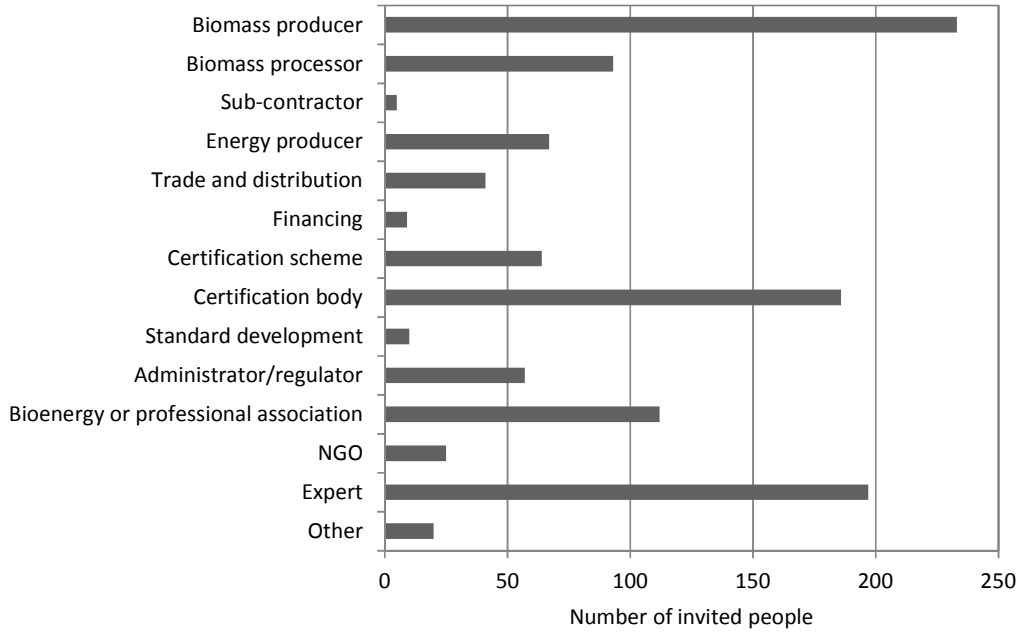
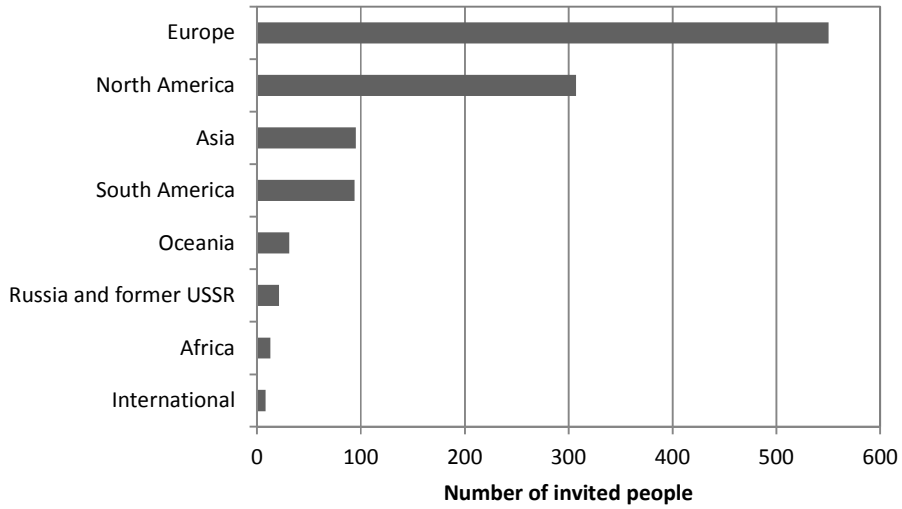
Appendix B: Categories of Respondents

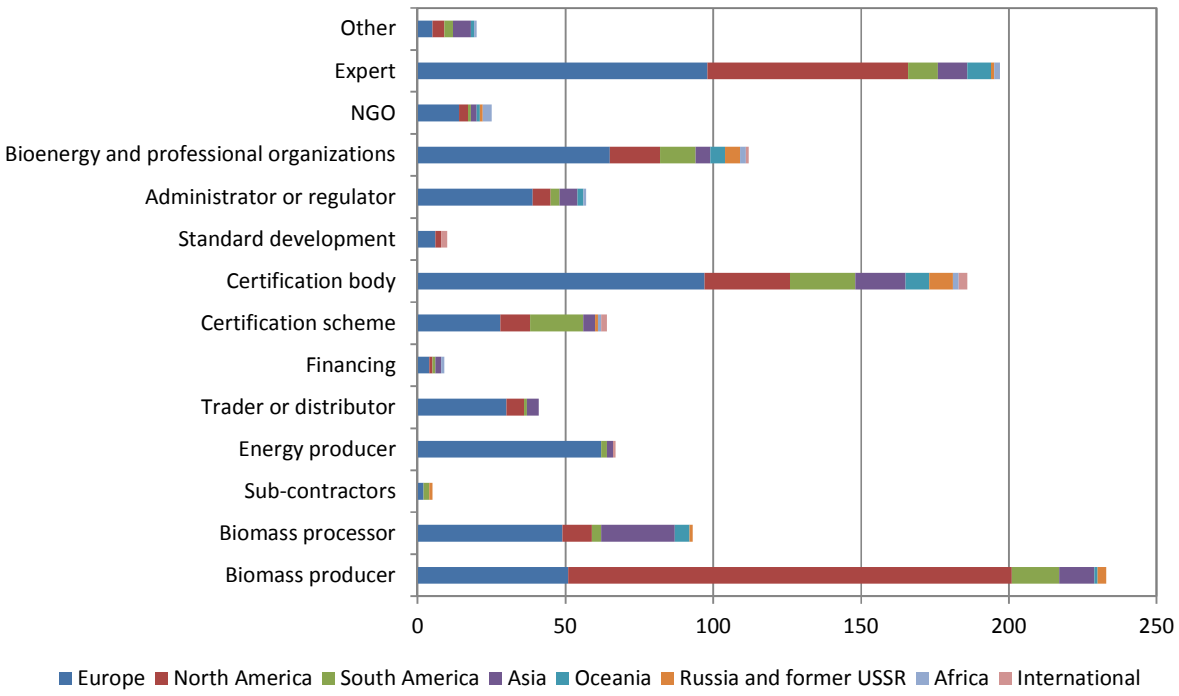
Biomass producer - agriculture	Defined as the land owner or manager of agricultural land. For example farmer, agricultural cooperative, owners and managers of energy crop farms, palm oil plantations and similar actors.
Biomass producer - forestry	Defined as the land owner or manager of forest land. For example forest owner or manager, forestry co-operative, owners and managers of forestry plantations and similar actors.
Sub-contractor	The entrepreneur contracted to perform for example planting, harvesting, chipping, pesticide application, transportation, etc. Includes both forestry and agricultural entrepreneurs, and transportation and storage, but for example not independent auditors hired by certifying companies.
Biomass processor/refiner - solid	The individual or organization transforming primary biomass into solid product: Producer of secondary solid biofuel products, for example wood chips, pellets, briquettes, charcoal etc.
Biomass processor/refiner - liquid	The individual or organization transforming primary biomass into liquid product: Producer of secondary liquid biofuel products, for example vegetable oils, ethanol, biodiesel, etc.
Trader/Distributor	The organization or person that buys and sells biomass or biomass products on a market. Such actors may also blend liquid biofuels.
Energy producer	Producer of electricity and/or heat from biomass.
Financing	The person or organization involved as third party financing for bioenergy projects.
Certification scheme holder	Existing or newly developing organizations or initiatives setting standards for sustainable biomass (including forest management and agriculture), biofuels or bioenergy.
Certification body	Certifying company that evaluates companies in the bioenergy supply chain that seek independent verification of compliance to a standard, and issues certificates. Often hires auditors, or might employ auditors in some cases.
Auditor	On-the-ground auditor of certification standards for sustainable bioenergy, including the chain of custody- initial and annual audits. May be an employee of a certification body or an independent consultant hired by a certification body.
Standardization and standards development support	Actors involved in national or international standardization (e**.g.** ISO and CEN), or association or partnership dealing with social and environmental standards. The latter may work with companies, non-profits and governments to support their referencing and use of voluntary standards, and may also define codes of good practice for setting social and environmental Standards (e**.g.** ISEAL alliance, GBEP, GIZ)**.**
Administrator	Institution that enforces laws and regulations (set by the regulators) and in different ways regulates actors involved in the biomass, biofuel, and bioenergy sector and administrates legislation and regulations related to sustainable bioenergy systems. For example county administrative board, municipality, etc.
Regulator	Jurisdictional institution at the regional, state, provincial, national, international, etc. level (e**.g.** the European Union, countries, Bundesländer in Germany, and states in the USA), which set laws and regulations relevant to sustainable bioenergy.
Bioenergy association	Non-governmental organization actively involved in developing bioenergy systems, with different types of members, including economic operators on the market, but also e**.g.** consultants, researchers, and other individuals.
Professional organization, society or association	Non-governmental professional organization with members being economic operators on the bioenergy markets.
NGO	Non-governmental environmental organization
Expert	Expert not listed above that provides advice on any aspect of sustainable bioenergy production systems, for example researcher, agricultural and forestry consultancy.

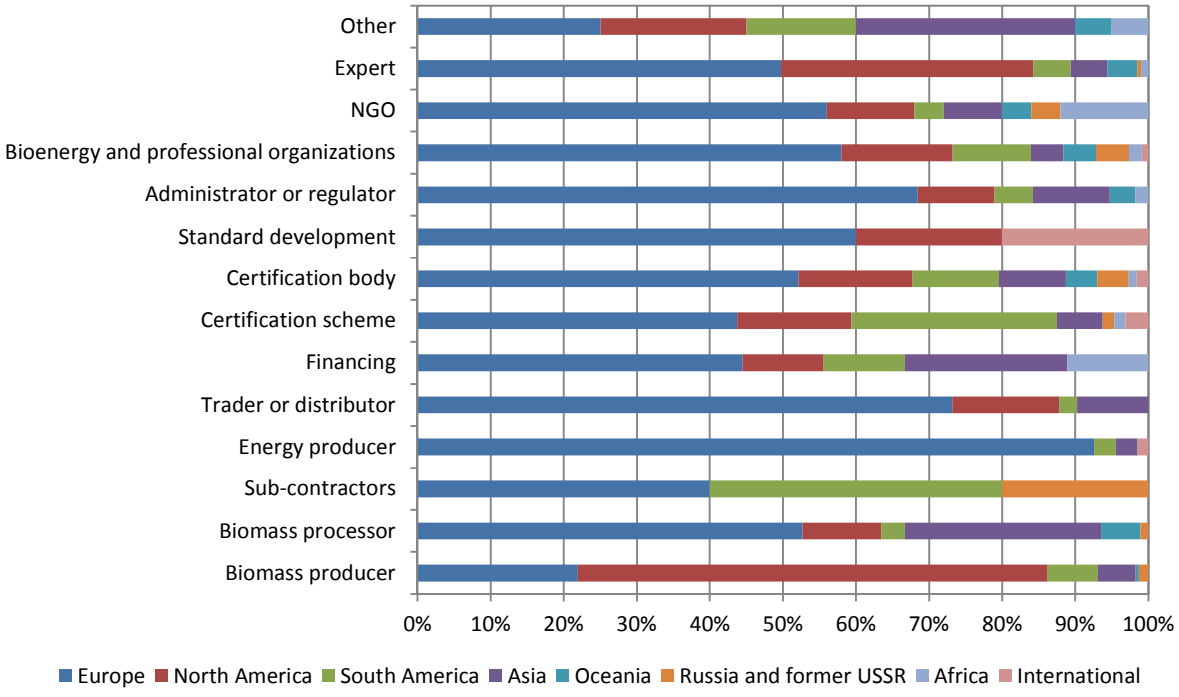
Appendix C: Capacity composition of potential respondents

1102 directly invited participants:






Other
Expert
NGO
Bioenergy and professional organizations
Administrator or regulator
Standard development
Certification body
Certification scheme
Financing
Trader or distributor
Energy producer
Sub-contractors
Biomass processor
Biomass producer
0
50
100
150
200
250
Europe
North America
South America
Asia
Oceania
Russia and former USSR
Africa
International


Other
Expert
NGO
Bioenergy and professional organizations
Administrator or regulator
Standard development
Certification body
Certification scheme
Financing
Trader or distributor
Energy producer
Sub-contractors
Biomass processor
Biomass producer
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Europe
North America
South America
Asia
Oceania
Russia and former USSR
Africa
International

Appendix D: List of Abbreviations

2BSvs, Biomass Biofuels voluntary scheme
BonSucro / Better Sugarcane Initiative
CSBP, Council on sustainable biomass production
GlobalGAP
Greenergy, ethanol from Brazil to UK
IDB, Inter-American Development Bank Biofuels Sustainability Scorecard
IFOAM, International Federation of Organic Agriculture Movements
ISCC, International Sustainability and Carbon Certification
NTA8080, Dutch Technical Norm for sustainable biomass for energy
RBSA, Abengoa RED Bioenergy Sustainability Assurance
REDcert
RSB, Roundtable on sustainable biofuels
RSPO, Roundtable on sustainable palm oil
RTRS, Roundtable on responsible soy
SAN/RA, Sustainable Agricultural Network / Rainforest Alliance
SBA, Sustainable Biodiesel Alliance USA
SEKAB, sustainable ethanol from Brazil to Sweden
IWPB, Initiative for Wood Pellet Buyers
Drax Power Limited
GGL, Green Gold Label (RWE-Essent)
LBE, Laborelec / Electrabel
FSC, Forest Stewardship Council
PEFC, Programme for the Endorsement of Forest Certification Schemes
AFS, Australian Forestry Standard
ATFS, American Tree Farm System
ATO/ITTO, African Timber Organisations - International Tropical Timber Organization
CerFlor, Brasil
CertFlor, Chile
CSA, Canadian Standards Association (PEFC endorsed)
FCR, Russian National Council of Forestry Certification
LEI, Lembaga Ekolabel Indonesia
MCPFE, SFM criteria from Ministerial Conferences on Protection of Forests in Europe
MTCC, Malaysian Timber Certification Council
PAFC, Pan African Forest Certification Scheme
RAC, Rainforest Alliance Certified
RA-HCVF, High Conservation Value Forest
RA-SLV, SmartLogging Verification
RA-SS, Sustainable Sourcing
RA-SSLAM, SmartSource Legality Assessment & Monitoring
RA-TLV, Timber Legality Verification

SFI, Sustainable Forestry Initiative (PEFC endorsed)
TREES, Community Forestry and Enterprise Development
EU Renewable Energy Directive (EU RED)
EU Timber Regulation Platform (EUTR)
EU Common Agricultural Policy (EU CAP)
EU Directives 92/43/EEC and 2009/147/EC forming the Natura 2000 network
USA Renewable Fuel Standard (RFS2)
California Low-Carbon Fuel Standard (LCFS)
Brazil Agro-Ecological Zoning
ISO TC248/ ISO 13065 Sustainability criteria for bioenergy
CEN TC383 / EN 16214 Sustainably produced biomass for energy applications (biofuels and bioliquids)
NTA8080 Dutch Technical Norm for sustainable biomass for energy
Global Bioenergy Partnership (GBEP) sustainability indicators for bioenergy
UN framework convention on Climate Change (UNFCCC)
Kyoto Protocol (KP)
Convention on Biological Diversity (CBD)
European Landscape Convention (EU ELC)
Ramsar Convention on Wetlands
Convention to Combat Desertification (CCD)
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
Cartagena Protocol of Bio-safety
International Labour Organization (ILO) core conventions
The Montreal Process
Ministerial Conferences on Protection of Forest in Europe (MCPFE), incl. Pan European Operational Level Guidelines (PEOLG)
International Tropical Timber Organization (ITTO)
Tarapoto Proposal
African Dry Zone
Near East Process
African Timber Organization (ATO)
Lepaterique Process of Central America
Dry Forest Asia Initiative