

Survey results on the future of IEA Bioenergy



IEA Bioenergy

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Introduction

IEA Bioenergy is a Technology Collaboration Programme (TCP) functioning within a framework created by the International Energy Agency (IEA). It comprises a world-wide network of experts in every aspect of the value chain of biomass for energy who are from the research community, government agencies and industry. <http://www.ieabioenergy.com/>

The work of IEA Bioenergy is structured in a number of Tasks, which have well defined objectives, budgets, and time frames. Work programmes are defined in three year periods (trienniums). Currently the programme for the next triennium (2019-2021) is being prepared. International evolutions and feedback of stakeholders and other international organizations are taken into account to prepare this programme. In July 2017 a public survey was sent out to provide input to this process. The survey was open until mid-September 2017. The survey was distributed to the full IEA Bioenergy contact database and through newsletters and social media. ExCo members distributed the survey to their national contacts. This report gives an concise overview of the survey results.

Survey results

RESPONDENTS

Overall, replies from **358 unique respondents** were received (doubles were excluded - 20 people answered twice). The following figure shows the distribution by country. There was very active participation from Australia (56). Most other IEA Bioenergy member countries counted between 10 and 25 replies.

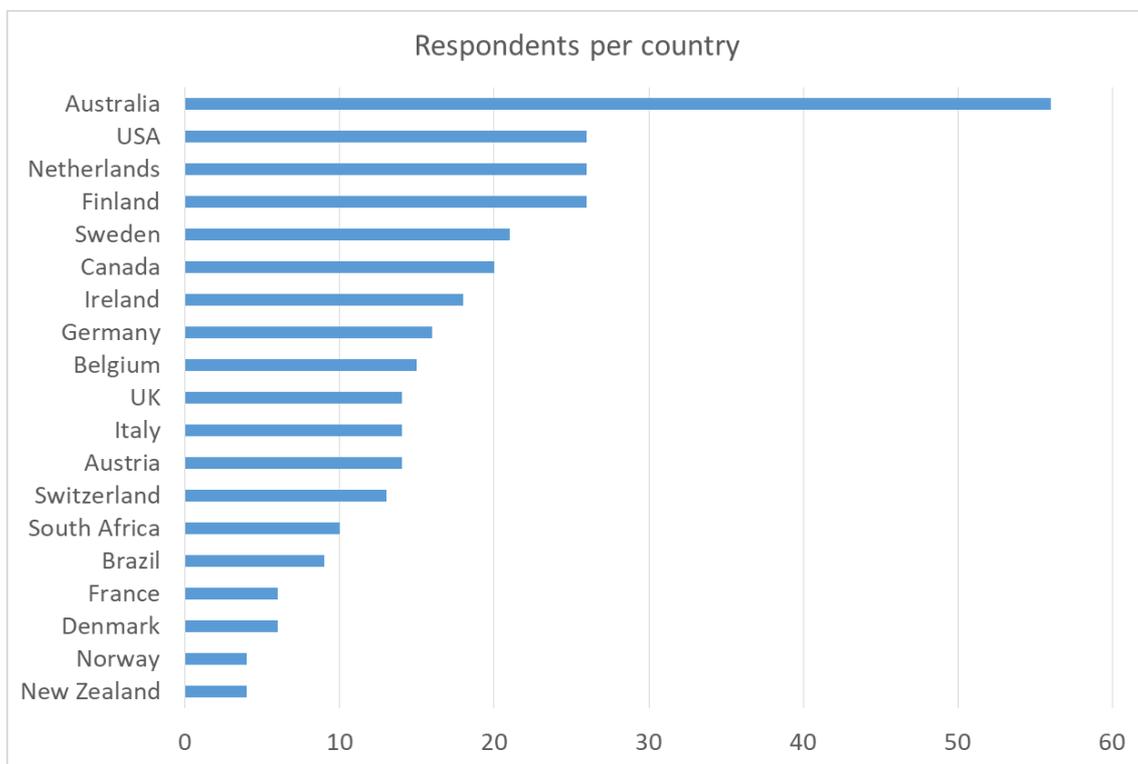


Figure 1: overview of respondents per country

Other countries include Spain (3), Croatia (2), Japan (2), China (2), Poland (2), Estonia, Argentina, Cook Islands, Indonesia, Iraq, Latvia, Lithuania, Malaysia, Mexico, Pakistan, Romania, Taiwan, Ukraine and Venezuela.

When looking at the background of the respondents, there is a high share of researchers (47%). Consultancy, industry and administrations also show a good representation (between 15 and 20% each). Input from NGOs is limited (3%). Mind that people could indicate multiple sectors.

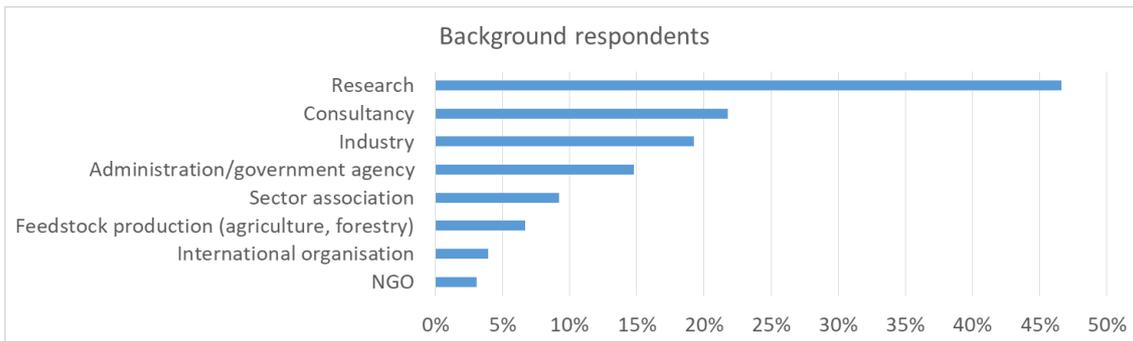


Figure 2: background of the respondents to the public survey

KNOWLEDGE OF IEA BIOENERGY

The majority of people who responded indicated they were familiar with IEA Bioenergy (80%), or at least slightly familiar (16%). This high number is no surprise, as the mailing was principally done to the IEA Bioenergy contact list and the survey was mainly completed by people willing to give feedback based on their experience with IEA Bioenergy.

People were also asked how they knew about IEA Bioenergy, which also indicates the effectiveness of several communication means. Newsletters and publications/reports turned out to be the most important, but also other means are relevant. A rather low number of people (8%) indicated social media like Twitter or LinkedIn. Around 100 people (28%) indicated that they participated in Task meetings. This implies that many participants of the network and the Tasks have taken this opportunity to give feedback on the operation of IEA Bioenergy.

The work of IEA Bioenergy is structured in a number of 'Tasks', which have well defined objectives, budgets, and time frames. The following table shows which Tasks people were familiar with. Most Tasks were familiar for 30 to 40% of respondents, with exception of a few smaller Tasks like Task 34 and Task 36 (around 15%).

To consider the response of people who are not involved in the Tasks themselves, in the right column we excluded the people who indicated they participated in Task meetings. In this case most Tasks were familiar for 20 to 40% of respondents. The smaller Tasks 34 and 36 score around 12%.

Table 1: Respondents familiar with Tasks

Task	Number		<i>Number (excluding task members)</i>	
		share		share
Task 32 - Biomass combustion and co-firing	120	34%	87	34%
Task 33 - Gasification of biomass and waste	128	36%	79	31%
Task 34 - Direct thermochemical liquefaction	61	17%	30	12%
Task 36 - Integrating energy recovery into solid waste management systems	49	14%	30	12%
Task 37 - Energy from biogas	142	40%	102	40%
Task 38 - Climate change effects of biomass and bioenergy systems	94	26%	58	22%
Task 39 - Commercializing conventional and advanced liquid biofuels	108	30%	55	21%
Task 40 - Sustainable biomass markets and inter-national trade to support the biobased economy	102	28%	61	24%
Task 42 - Biorefining in a future bioeconomy	118	33%	72	28%
Task 43 - Biomass feedstocks for energy markets	128	36%	86	33%
Other projects (e.g. bio-CCS; grid balancing, RES Hybrids, Roadmap, ...)	67	20%	39	15%

PRIORITIES FOR IEA BIOENERGY

A next question was about what should be the main priorities for IEA Bioenergy. People were given a list of 10 potential priorities of IEA Bioenergy, of which they could select the 3 most important. Mind that some people selected more than 3 as they felt that IEA Bioenergy has several parallel priorities.

The following options were given:

	Potential priorities
Cooperation & exchange	Act as a discussion platform between international experts, stakeholders and policy makers
	Move forward collaborative research between international experts to bring technologies and insights forward
	Provide the basis for harmonized R&D programmes in the participating countries and prevent duplication of efforts
	Discuss local issues and exchange experiences in an international context, leading to new perspectives and options on bioenergy deployment
Provide information	Provide science-based arguments and key figures to inform the public debate on sustainable bioenergy (towards policy makers, media and the public)
	Provide a central information source , with state-of-the-art information on bioenergy conversion technologies
	Provide key figures/general information, handbooks and best practises for entrepreneurs, industry, advisors, ...
Analysis	Analyse bioenergy markets and get insight in deployment opportunities
	Provide background on availability and mobilisation options of sustainable biomass resources; analyse impacts of bioenergy deployment in terms of sustainability, land use, ...
	Analyse policy frameworks/landscapes and produce policy advice to governments/policy makers

The following figure gives an overview of the prioritized options in the survey.

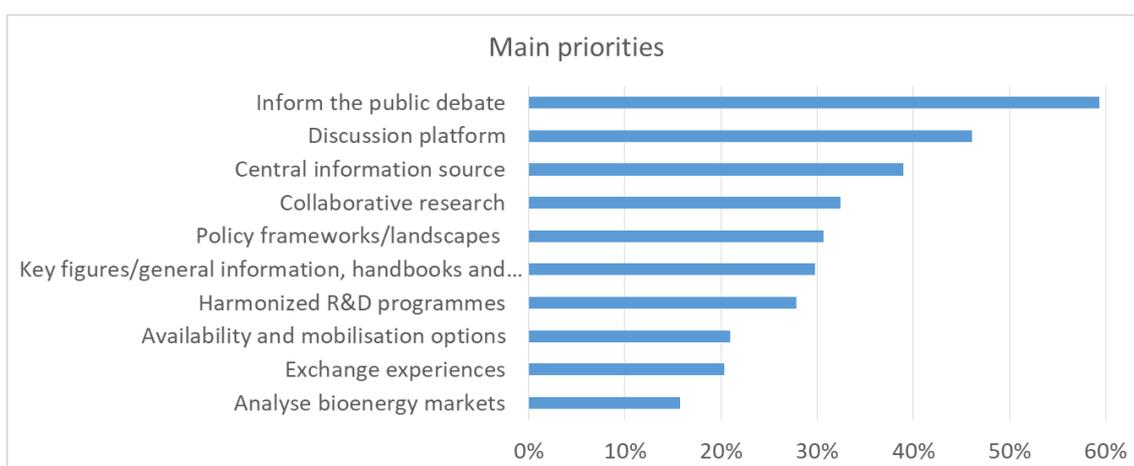


Figure 4: Main priorities for IEA Bioenergy

The highest priority is clearly given to informing the public debate, with 59% of people selecting this option.

Many people (46%) also considered it important that IEA Bioenergy acts as a **discussion platform** between international experts, stakeholders and policy makers’.

The third preferred (39%) was to provide a **central information source**.

Other options were selected by 20-30% of respondents, which means that they are also considered very relevant, sometimes varying by respondent groups. Analysing bioenergy markets came out least of the 10 options.

TOPICS FOR THE NEXT TRIENNIUM

Respondents could fill an open field on what topics they felt should be included in the next triennium programme. Suggestions are categorized in the following nine areas. In the below list they are ordered according to the number of people who suggested a topic in the specific area.

1. **Bioenergy in future energy systems / systems analysis** (41 suggestions)

Scenarios can be developed, analysing the specific role of bioenergy in the future energy system. This requires a system approach, considering what are the main assets of bioenergy in specific markets and how it can create synergies with other (variable) renewable energy forms. Also the role of bioenergy in the biobased economy, i.e. the link with other non-energy biobased applications, can be considered. This can evolve to region or country specific bioenergy roadmaps (starting from the overall IEA roadmap).

2. **Deployment** (35 suggestions)

Market deployment of bioenergy solutions needs to be supported. This can be done by showing case stories of successful bioenergy projects, promoting opportunities and developing skills (with education and training) and guidelines on how to develop finance options, what infrastructure is required, and guidance in terms of regulatory requirements. IEA Bioenergy should consider a horizontal topic that seeks to map public and private sector funding, and implementation programmes for bioenergy research, development and demonstration. We should also consider how the necessary policy and incentives can get in place for deployment of bioenergy and CCS and inform policy makers on these.

3. **Biomass conversion: business models and techno-economics** (30 suggestions)

New concepts of biomass conversion and business models will need to be developed and early experiences in the market need follow-up. This requires integrated systems and a combination of technologies, so updated techno-economic data of different advanced conversion options will be required, as well as process simulation. Some technologies can be in focus, e.g. gasification, liquefaction, and biochemical conversion options, as well as pretreatment options to broaden the feedstock base. Bioenergy can be an enabler for

industry innovation (e.g. towards liquid fuels, platform chemicals and building blocks). The processing of microalgae to a combination of energy and materials can be a research topic.

4. **Biomass mobilisation** (29 suggestions)

The topic here is how biomass feedstocks can be mobilized in a sustainable way, in relation to the biomass type. This includes biomass from agriculture, forestry and waste/residues, potentially also aquaculture. Sustainability governance in agriculture and forestry is key, e.g. in terms of carbon storage, biodiversity, water ... and this links directly to the topic of environmental impacts (see further). Land use for bioenergy should also be considered in the frame of demand for other applications (food, feed, materials). Further topics include improvement of economics, efficient logistics and supply chains, but also demonstrating good practices, including mobilisation policies, in different regions in the world.

5. **Circular economy** (28 suggestions)

A number of suggestions can be categorized in the topic of circular economy. Industries are moving more and more to the logic of circular economy and the role of biomass / bioenergy / biobased economy therein should be clarified. The use of waste and residues is central, as well as 'optimal use' of available biomass, potentially also 'cascading' approaches. Local economy solutions should be emphasized.

6. **Environmental impacts of bioenergy** (22 suggestions)

This includes methodological work (LCA, carbon accounting, iLUC ...), as well as a quantification of ecological impacts of concrete bioenergy/biobased projects and pathways, i.e. how do different pathways compare to each other and to the fossil reference. Decarbonisation (climate impact) is important, but other impacts should also be considered. 'Optimal use' of biomass (for energy, materials, and/or nature/biodiversity) can also be part of this.

7. **Social impacts, acceptance and dialogue** (15 suggestions)

There is a need for an explicit social science thread. Indicators of social impacts should be explored, showing how bioenergy can support sustainable development goals. A dialogue needs to be set up with stakeholders, also bringing back a positive attitude towards biomass, especially for local solutions.

8. **Transport biofuels** (14 suggestions)

The transport sector will need to undergo a major transition in the next decades for further decarbonisation. The future of biofuels (in combustion engines) will need to be placed next to developments of electric vehicles, which requires a clear vision (see also systems analysis).

Some sectors, in particular long haul transport (aviation, marine), will be in focus for future markets. The deployment of advanced biofuels requires major efforts. Fuels produced through CCU (from captured CO₂, combined with hydrogen from renewable electricity) are brought forward as an option for the transport sector. Prospects for these can be considered, as well as the potential role of biomethane in transport, or potentially also hydrogen fuel in future (could be produced from biomass).

9. **Biogas/biomethane** (13 suggestions)

Biogas is typically a local economy solution (see circular economy), often based on waste or agricultural residues. Economic opportunities to lower the cost should be considered in the frame of low fossil energy prices. But also other (non-energy) assets should be highlighted, like avoiding methane, producing fertiliser, improving soils... Opportunities in developing countries should be explored where there is often a lack of clear policy frameworks. Conversion of biogas to biomethane opens up many applications through the natural gas grid, or as vehicle fuel and this should be further explored. Links can also be made with synthetic natural gas (SNG) produced via biomass gasification.

OTHER SUGGESTIONS AND REMARKS

Finally, stakeholders had the opportunity to provide further suggestions and remarks.

Various respondents appreciate IEA Bioenergy as an important **international source of information**. Some state that this is important against lobbying or disinformation from other movements. The scientific focus is important to maintain for our credibility, also to stand out from other sector organisations. Nevertheless we should avoid too much focus on "ivory tower" academic issues.

Various people called for an **increased participation of national experts and stakeholders**. We have to watch out to be considered as an 'old boys club' which is difficult to enter as outsider (once task members are fixed), or that only proponents would be welcome. Involvement of non-task members should be encouraged. Outsiders could be invited to Task discussions and cooperation with associations can be improved. It would be good to have a higher involvement of civil society.

We should also aim to **get more countries to join IEA Bioenergy**, to increase our international coverage. Dedicated actions are needed to engage with emerging economies and support developing countries to enter the agreement (Asia, Africa, South America).

IEA Bioenergy should continue efforts to **engage with key international organizations and efforts**, such as Mission Innovation and the Biofutures Platform. The relationship with other TCPs should also be enhanced.

There should be increased **focus on communication and outreach**. Access to reports should be simplified, as they are difficult to find at the moment. More efforts are needed to reach national stakeholders (business, research, policy makers, associations...). For some countries it is a barrier that documents are only in English, so can we consider translation of

main messages in local languages? Announcements of workshops can be improved. There could be a shift to more policy relevant output and dissemination efforts targeting the government/policy level.

Synergies with non-energy benefits are important to highlight, e.g. in terms of environmental and social benefits, but also synergies with biobased economy.

Some provided specific suggestions on **how Tasks, Intertask projects and special projects operate**. It is important for IEA Bioenergy to continue and increase its focus on integration across disciplines and industry sectors. Transparency between Tasks is also key, and more cross-task meetings could be stimulated (e.g. connected to ExCo meetings). Task programmes should be more integrated, working together towards a comprehensive roadmap.

Acknowledgement

We would like to acknowledge everybody who contributed to the IEA Bioenergy survey. It has provided highly valuable input for the preparation of the work programme for the next triennium.

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Further Information

IEA Bioenergy Website
www.ieabioenergy.com

Contact us:
www.ieabioenergy.com/contact-us/