



Promoting stakeholder engagement and public awareness
for a participative governance of the European bioeconomy



Good practice guidelines for stakeholder and citizen participation in bioeconomy strategies

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EXECUTIVE SUMMARY

The BioSTEP project (bio-step.eu) aims to promote participative governance in Europe's emerging bioeconomy, by bringing together and making available existing information, exploring existing forms of participation in bioeconomy strategies, engaging with organisational stakeholders and with citizens, and experimenting with new forms of participative decision-making in relation to the bioeconomy.

This document has been developed as part of [Work Package 3](#), which has examined current participatory practices, involving both stakeholders and citizens, in bioeconomy strategies in six case studies, namely:

- Two case studies at national level (Finland and Germany);
- Four case studies at regional level (Bio-based Delta in the Netherlands, Saxony-Anhalt in Germany, Scotland in the United Kingdom, and the Veneto in Italy).
- Key documentary sources include international and national practice-based literature on stakeholder and public engagement, as well as other BioSTEP publications.

Two earlier reports ([Charles et al., 2016](#); [Davies et al., 2016](#)) provide a detailed overview of participation in these six case studies of national and regional bioeconomy strategies. Building on this work, as well as on a review of existing research on stakeholder and citizen engagement in the bioeconomy, this document sets out guidance and suggestions for designing and undertaking engagement with stakeholders and citizens in relation to national and regional bioeconomy strategies.

This guidance document begins by providing a definition of stakeholder and citizen engagement and differentiating between three main approaches, namely: (i) the provision of education and information, (ii) practices aimed at facilitating dialogue and consulting other organisations and individuals, and (iii) mechanisms focused on more intense forms of cooperation leading to the co-production of knowledge (Section 2).

Different rationales for engaging with stakeholder organisations and citizens are then explored, with a view to demonstrating the importance of participatory processes in relation to bioeconomy strategies (Section 3). These rationales include: (i) achieving pragmatic goals, notably to create new business or research opportunities, (ii) mobilising a range of viewpoints to inform and improve decision-making, and (iii) ensuring that all people affected have the democratic right and ability to voice their views and interests.

Although there are sound reasons for broader participation in bioeconomy strategies, the BioSTEP case studies have demonstrated that such practices face a range of challenges and obstacles, whether they are focused on stakeholders or on citizens (Section 4). It is often the case, for example, that participation is seen as potentially helpful in principle but that key stakeholders have a number of other, more pressing priorities, and are constrained by limited resources and time.

The guidance document then considers how participation should be designed and implemented, and introduces a series of principles underpinning good practice in stakeholder and citizen engagement, drawn from the six BioSTEP case studies and the wider literature (Section 5). These principles include: (i) design and prepare engagement activities carefully, (ii) ensure transparency, integrity and respect for all perspectives, (iii) ensure that engagement makes a difference, (iv) review and evaluate engagement to improve practice, (v) tailor engagement to the national/regional bioeconomy, (vi) engage people on what matters to them, and (vii) learn from other sectors and countries.

With a view to illustrating different methods for engaging with organisational stakeholders on bioeconomy strategies, the guidance document then sets out a series of examples of good practice engagement, drawn from the six case studies, which take the form either of dialogue/consultation or the co-production of knowledge (and not to education/information provision) (Section 6). These include: (i) bioeconomy councils and forums, (ii) consultations with stakeholders, (ii) hybrid organisations (such as clusters and innovation centres), (iv) business-led cooperation and engagement, and (v) policy funding for collaborative projects.

Further examples are provided of good practice engagement involving individual citizens (Section 7). The types of activities found in the six case studies related solely to education/information provision and to dialogue/consultation (with no examples found of co-production of knowledge with citizens). The

examples include: (i) public communication and information campaigns, (ii) support for education and training, (iii) measures targeting consumers, (iv) formal public consultation and dialogue, and (v) open-ended citizen participation.

The document concludes by suggesting how this guidance could be used by policy-makers and other stakeholders who are leading bioeconomy strategies.

Annex 1 provides information on further resources for designing and managing engagement activities in relation to the bioeconomy, while Annex 2 sets out further information on the six case studies, as well as an outline of the research methodology used.

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Abbreviations

AGHETERA	AGHETERA Environment and Development is a company specialising in analyses and solutions for territorial management (a BIOSTEP partner)
Assobiotec	Italy's business association of biotechnology companies
AVANS	The Netherlands' University of Applied Sciences
BbD	Bio-Based Delta in the Netherlands
BIO	Biotechnology Innovation Organisation
BIOCOM	A specialist information company for biotechnology and life sciences (a BioSTEP partner)
BBSRC	UK's Biotechnology and Biological Sciences Research Council
CSO	Civil Society Organisation
ELY-Centre	Finland's Centre for Economic Development, Transport and the Environment
EU	European Union
FINPRO	Export Finland, Visit Finland and Invest in Finland
FONA	Germany's Research for Sustainable Development programme
IBioIC	Scotland's Industrial Biotechnology Innovation Centre
INRO	Germany's Initiative for the Sustainable Supply of Raw Materials for the Industrial Use of Biomass
MOOC	Massive Open Online Course
NGO	Non-governmental Organisation
SAMS	Scottish Association for Marine Science
SIBE	Scottish Initiative for Biotechnology Education
SITRA	Finland's Innovation Fund
SME	Small and medium-sized enterprise
SPRING	Italy's National Technological Cluster of Green Chemistry
STEM	Science, technology, engineering and mathematics
TEKES	Finland's Funding Agency for Innovation
UK	United Kingdom
UCV	Veneto Region's Union of Chambers of Commerce (a BioSTEP partner)
WISO	Economic and Social Partners (e.g. business associations, trade unions, NGOs and CSOs)
WWF	World Wildlife Fund
ZEF	Germany's Centre for Development Research

1 Introduction

This document sets out guidance for good practice in stakeholder and public engagement in the bioeconomy. It aims to promote reflection on the principles that underpin engagement, as well as on typical benefits and challenges, and also to provide examples of good practice. In this way, this guidance document contributes to the broader goal of the BioSTEP project (<http://www.bio-step.eu/>), which aims to promote participative governance of the European bioeconomy by engaging key stakeholders and the general public.

The main sources for this guidance document are six case studies of engagement in national and regional bioeconomy strategies, as well as a review of existing research on stakeholder and public engagement in the bioeconomy.

- Two case studies were undertaken at national level (Finland and Germany) and four at regional level (Bio-based Delta in the Netherlands, Saxony-Anhalt in Germany, Scotland in the United Kingdom, and the Veneto in Italy).
- Key documentary sources include international and national practice-based literature on stakeholder and public engagement (including documents published by the European Commission, government bodies, national research councils, and community-based engagement-oriented bodies). Other inputs include BioSTEP publications, particularly conceptual papers (Ribeiro and Miller, 2015), the outputs of Work Package 2 aimed at 'Making existing information available' (de Bakker et al., 2016; Overbeek et al., 2016) and earlier outputs from Work Package 3, namely the review of national case studies (Davies et al., 2016) and regional case studies (Charles et al., 2016).

1.1 Structure of the report

The content of this guidance document is as follows:

- Section 2 defines stakeholder and citizen engagement;
- Section 3 sets out rationales for engaging with stakeholder organisations and the general public;
- Section 4 describes typical challenges and obstacles to engagement;
- Section 5 introduces a series of principles underpinning good practice in stakeholder and citizen engagement;
- Section 6 provides examples of good practice engagement with stakeholder organisations;
- Section 7 outlines examples of good practice engagement with individual citizens;
- Section 8 concludes and outlines next steps for the BioSTEP project.
- Annex 1 provides information on further resources for designing and managing engagement activities in relation to the bioeconomy;
- Annex 2 sets out an outline of the methodology used for the six case studies.

1.2 Accessibility

The Convention on the Rights of Persons with Disabilities (CRPD) was ratified by the United Nations General Assembly in 2006 and came into force in 2008. The European Union has signed the CRPD and recognizes that it is "essential that the Web is accessible in order to provide equal access and equal opportunity to persons with disabilities" (European Union 2014). To ensure web accessibility, the European Union adheres to the [Web Content Accessibility Guidelines 2.0](#). The following evaluation report (D3.3) of the BioSTEP project has been structured along these Accessibility Guidelines:

- All non-text content has a text alternative
- The document makes use of regular headings and subheadings, which provide structure and help to navigate through the document
- Unnecessary spaces have been deleted in the text for better audio use
- Hyperlinks have been added to help users find the content referred to in the text
- Cross links have been added to help users find the figure or table referred to in the text

The goal is to make the evaluation reports of Work Package 2 and 3 available in a structured and easily searchable way. The reports [2.2](#), [2.4](#) and [3.3](#) are referred to as “evaluation reports”, because they build on earlier BioSTEP reports and draw conclusions from prior findings. They were selected for an additional accessibility check as they contain especially valuable information for the general public, namely information on the potential impacts of the bioeconomy, the necessity for public involvement and good practice guidelines for this involvement. In general, however, it has been paid attention that all BioSTEP Deliverables are designed in a very structured and comprehensive manner.

2 What is stakeholder and public engagement?

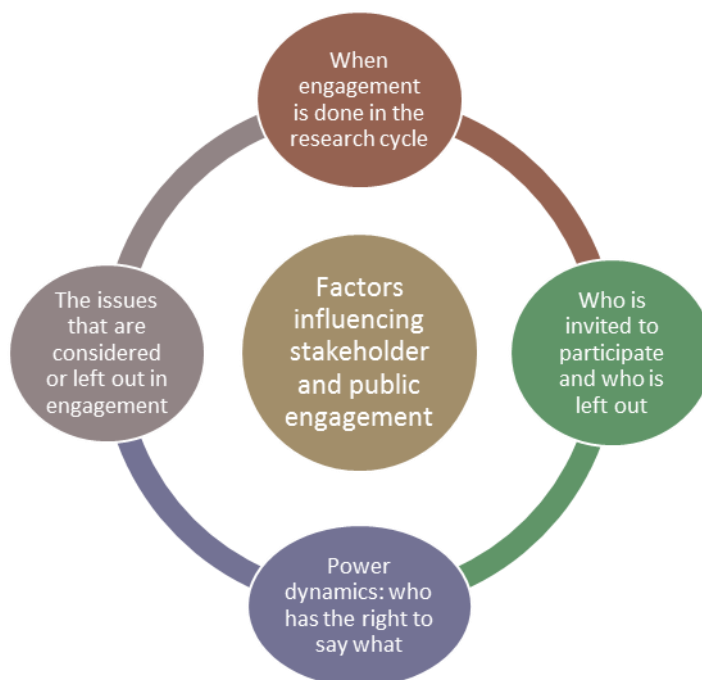
Motivations and objectives for planning and conducting engagement in national and regional bioeconomy strategies vary. Engagement with stakeholders (e.g. businesses, research and education organisations, policy-makers, and non-governmental organisations) typically seeks to develop networks and collaboration between organisations, in support of business and research activity, and to inform and influence policy-making. Engagement with civil society may aim to increase people's awareness of the bioeconomy, to gain public acceptance for a transition to a bio-based economy, or to gather the views and concerns of different groups to inform decision-making.

There are three broad approaches to stakeholder and public engagement (Ribeiro and Miller, 2015):¹

- **Education**, where experts provide other individuals and organisations with information on the bioeconomy;
- **Dialogue**, where some stakeholders consult and seek the views of other individuals and organisations;
- **Co-production of knowledge**, based on cooperation between a range of experts, citizens and interest groups

The impact of engagement activities on society or decision-making not only depends on the approach taken but also on other dimensions, including: who participates, when engagement takes place, what issues are considered or excluded, and power dynamics between participants (see Figure 1).

Figure 1: Factors shaping the impact of engagement



Source: BioSTEP project

¹ A review of the literature is available on the BioSTEP website, http://bio-step.eu/fileadmin/BioSTEP/Bio_documents/BioSTEP_Working_Paper_Ribeiro_and_Millar_2015.pdf

3 Why engage with stakeholders and citizens?

3.1 Rationales for engaging

Participants in the six BioSTEP case studies cited a range of reasons for engaging with other stakeholders or the wider public (Charles et al., 2016; Davies et al., 2016), and these can be divided into three main groups (Ribeiro and Miller, 2015; de Bakker et al., 2016), namely:

- To achieve pragmatic goals in terms of raising public awareness, reducing conflict and smoothing the way for new technologies or policies;
- To mobilise a wide range of viewpoints to inform decision-making and ensure that new developments are accepted in society;
- To ensure that people affected by decisions are able to voice their views and interests.

3.2 Achieving pragmatic goals

3.2.1 Cooperating with other stakeholders to create new opportunities

Engaging with other organisational stakeholders (particularly businesses, research bodies and policy organisations) can generate a number of specific benefits and improve opportunities for:

- Increasing information on and access to biomass and other materials and inputs;
- Reaching potential customers and suppliers;
- Finding new partners for R&D, innovation and knowledge exchange;
- Drawing on partner resources to undertake specific research studies;
- Ensuring that public policies, legislation/regulation and investment (e.g. in bioeconomy-oriented infrastructure or education and training) address the needs of stakeholders, e.g. businesses, researchers or non-governmental organisations;
- Improving flows of private and public investment to the bioeconomy.

3.2.2 Engaging with citizens to generate new opportunities

Engaging with individual citizens on the bioeconomy can bring additional benefits, including:

- Increasing awareness and acceptance of bio-based products, potentially leading to shifts in consumer behaviour;
- Addressing and resolving potential public concerns about bio-based activities and technologies at an earlier stage, which may reduce implementation costs;
- Generating new ideas for businesses and researchers;
- Improving labour supply, due to wider public awareness of the opportunities offered by the bioeconomy in terms of education, training and jobs.

3.3 Mobilising a range of viewpoints to inform decisions

The bioeconomy is often seen as a 'disruptive' sector in terms of systemic effects on supply chains, business activities, patterns of consumption, societal impacts and decision-making systems. Broad-based engagement with different stakeholders and citizens can improve information-sharing on the costs and benefits associated with shifts to a bio-based economy, so that negative impacts can be mitigated and opportunities exploited, and may also help to build new forms of consensus. In this sense, engagement can improve policy or business-led bioeconomy strategies by:

- Addressing blind spots and asking questions which would otherwise be neglected;
- Allowing the varying opinions, assessments, weightings, interests and needs of different individuals and organisations to be taken into account in relation to specific practical issues;
- Co-creating shared visions and goals in relation to bioeconomy strategies and activities;
- Facilitating discussion and resolving conflict on difficult questions e.g. on the sourcing of biomass, or on the introduction of new biotechnologies;
- Mobilising active support for sustainability targets, acceptance of new technologies, and a transition from an oil-based to a bio-based economy.

3.4 Ensuring that people can voice their views and interests

More fundamentally, enabling different people, organisations and interest groups to voice their views and interests can be seen as an important goal in its own right, without reference to a particular objectives (such as public awareness of bio-based products or increasing support for a transition to a bioeconomy). In this sense, engagement can be seen in terms of:

- Encouraging broad-based debate, with a view to facilitating the political, economic and societal transformation which may be needed for shift towards a bio-based economy (e.g. on the use of nature and natural resources, or on the redistributive effects of new technologies);
- Allowing a new consensus to emerge on fundamental objectives (e.g. the balance between economic growth and environmental sustainability) i.e. without prejudging the direction or content of this consensus.

4 Challenges and obstacles to engagement

The six BioSTEP case studies also illustrated a range of challenges and risks associated with the design and implementation of engagement activities, which may limit the types and scale of engagement undertaken (Charles et al., 2016; Davies et al., 2016).

4.1 Challenges for stakeholder engagement

First, engagement is not always high on stakeholders' lists of priorities e.g. because:

- Engagement is seen to bring risks (e.g. doubts over others' willingness to engage constructively; potential conflict between new/existing users of bio-material or between the goals of economic development and environmental sustainability);
- Some stakeholder organisations (e.g. NGOs) have very limited resources and may choose to target their resources on other issues than those related to the bioeconomy.

Second, engagement generates an additional administrative burden and practical difficulties e.g.:

- Slower and more complicated decision-making, and the need to take time to develop and co-create shared visions and goals;
- The possibilities that agreement/consensus may not be reached, which in turn could lead to difficulties in developing or implementing new ideas or projects.

Third, stakeholders may prefer to continue to focus engagement on existing partners, rather than building broader engagement e.g. because:

- There may already be strong strategic and engagement processes in specific sub-themes of the bioeconomy (e.g. relating to forestry, food or bioenergy), so that stakeholders do not see the need for engagement on the broader theme of the bioeconomy – especially in countries where the term 'bioeconomy' is not widely used or understood.

Fourth, stakeholders may be uncertain as to how to engage in a way that is useful/meaningful e.g.:

- They may be uncertain over who to involve, how to raise interest among different organisations/people, and how to convey complex material in a comprehensible way.

Fifth, there may be weaknesses in the approach taken to bioeconomy strategies:

- Bioeconomy strategies sometimes lack concrete objectives and measures, so that the need for engagement is unclear;
- Stakeholders may face 'engagement overload' i.e. there may be multiple engagement processes in (policy) fields related to the bioeconomy (e.g. on the circular economy and on sub-themes of the bioeconomy) which lead to a significant administrative burden.

Sixth, there are broader questions over the potential of the bioeconomy e.g. because:

- A shift towards bio-based inputs or products would often raise costs for business and also require shifts in supply chains.

4.2 Challenges for citizen engagement

First, citizen engagement is often hindered by a combination of limited public knowledge about the bioeconomy, together with the complexity of bioeconomy themes i.e.:

- In many countries and regions, there is a lack of public awareness of the need for a transition to a bioeconomy, or of the potential benefit of bioeconomy products;
- The technical/scientific nature of many bioeconomy themes;
- The complexity and wide range of potential impacts of the bioeconomy on society at local and global scales (e.g. debates on food or fuel);
- Difficulties in translating broad bioeconomy themes into local, concrete and citizen-relevant projects/products/events.

Second, strategy leaders, especially at a regional level and/or in the early stages of a strategy, often focus on business-oriented activities and engagement e.g. because:

- Stakeholders have limited resources and need to agree on priority activities;
- Regional policy-makers often target the bioeconomy from an economic development perspective, and so prioritise business-oriented interventions, such as business clusters or networks, and business-oriented research and education/training.
- Citizen-oriented engagement is seen to belong to a later stage, when businesses need to engage with consumers in order to grow markets for bio-based products;

Third, there is often no pressing need for stakeholders to engage with citizens, especially as consumer-oriented markets are small and slow to develop:

- In many cases, bio-based products and inputs do not currently bring a price premium from consumers and/or are more costly to produce, so that the benefits of consumer-oriented engagement are seen to be limited – whereas the need for information campaigns or citizen consultation would be clearer if bio-based markets were growing.

Fourth, there is often a lack of leadership on citizen engagement in the bioeconomy:

- In many cases, no organisation (or 'champion') is charged with stimulating and organising public engagement on the bioeconomy (whereas there is often an entity responsible for facilitating engagement between businesses, researchers and policy-makers);

Fifth, there is uncertainty as to how to engage with citizens in such a way that it is useful and meaningful, especially as:

- Strategy leaders may lack experience with citizen engagement;
- Stakeholders are aware of the need for a long-term, professional and targeted approach if engagement is to succeed in reaching a wide audience (rather than simply 'preaching to the converted') and in conveying complex material in a comprehensible way.

Sixth, national/regional institutions, democratic participatory traditions and the socio-cultural context all shape citizen engagement on the bioeconomy e.g.:

- Broader national/regional approaches to public consultation/participation in policy-making vary, particularly in relation to economic development policies;
- Scope for citizen engagement (beyond awareness-raising) at a regional level will depend on the country's governance structure and the responsibilities of regional governments (where these exist), and it may be more appropriate or efficient to organise citizen engagement activities at a national level instead (e.g. if focused on consumer awareness or education);
- Rather than aiming to engage citizens in relation to the bioeconomy, it may be more appropriate in some countries/regions to target engagement on broader societal objectives, which bio-based activities but also other technological and societal changes.

5 Principles of engagement

5.1 A first set of principles

A number of principles and criteria can help to frame engagement strategies. This section begins by setting out four principles drawn from existing studies on stakeholder and public engagement, particularly work aimed at influencing decision-making through an in-depth discussion of the perspectives and interests of a variety of people. These four principles relate to:

- The design and preparation of engagement activities;
- Transparency, integrity and trust;
- Impacts and outcomes;
- Evaluation.

Principle 1: Design and prepare engagement activities carefully

A key feature of successful engagement is effective design of engagement activities, which in turn implies the need to take time in the planning stage, and for careful consideration of:

- The timing of engagement;
- The contextual conditions needed;
- The representativeness of participants (in terms of their values and perspectives), in terms of both planned participants and who actually participates in practice.

Criteria for ensuring effective design of engagement include:

- Engagement is implemented as early as possible and also throughout the design, implementation, monitoring and evaluation of policies or projects;
- Organisers are aware of the needs of participants and of decision-makers;
- Participants agree on the objectives of engagement;
- Attention is paid to a range of voices, including different organisations and people of varying ages, genders, social class, ethnic groups, and geographical location, as well as organisations and people who are traditionally marginalised or seldom-heard;
- Care is taken over the choice of engagement methods and the number of participants.

Box 1 and Annex 1 provide information on guidance for designing and planning stakeholder and public engagement, developed by various supranational and national organisations.

Box 1: Resources for designing engagement

Community Planning Toolkit

This toolkit was developed by Community Places Scotland, an NGO which supports local communities to become more involved in and to take responsibility for communal spaces and places. Local community action in Scotland is sometimes linked to the purchase of land and the creation of community-owned businesses, including in the field of bioenergy (<http://www.communityenergyscotland.org.uk>).

The toolkit aims to support the planning and design of stakeholder engagement. It focuses on different forms of engagement (from consultation to active partnership) and how to overcome various barriers to effective engagement. In addition, the toolkit assesses the strengths and weaknesses of different methods and techniques for engaging with stakeholders. The 24-page document is available at: <http://www.communityplanningtoolkit.org/sites/default/files/Engagement.pdf>

Call for ideas by the German Federal Ministry of Education and Research

In November 2016, the German government launched a call for ideas for pilot projects that experiment with new methods and instruments for communication and participation in the bioeconomy, focused on a broad range of interest groups and the general public. These projects should be accompanied by research aimed at identifying success factors and obstacles to innovative forms of public engagement. Projects should involve a range of actors, including interdisciplinary groups of researchers (e.g. from both social and natural sciences) and also representatives of NGOs and civil society organisations, as well as specialising in communication (e.g. media, art/design, exhibitions). More information is available at: <https://www.bmbf.de/foerderungen/bekanntmachung-1249.html>

Principle 2: Ensure transparency, integrity and respect for all perspectives

Effective engagement also depends on transparency, where the organisers explain clearly what they are doing and are planning to do, in order to avoid information asymmetries. Thus, there is a need:

- To communicate clearly and openly about the design, implementation and results of engagement;
- To ensure that the results of engagement, and the views of all participants, are respected, even when these views differ from those of the facilitators;
- To continue to keep participants informed even after the engagement process has ended.

Criteria for ensuring that engagement is effective:

- Participants are provided with clear information before, during and after engagement, can contribute freely to reports, and are informed about the channels through which their views feed into decision-making;
- Transparency regarding the scope, potential and limitations of engagement (managing expectations);
- Transparency regarding the aims of engagement; the people who 'should' be involved and their needs and aspirations; and the broader context of the engagement process;
- Sincerity regarding the willingness of decision-makers to be open-minded and take participants' views into account (including how issues are framed);
- Organisers need to have 'duty of care' for the impact of engagement on participants;
- Participants' views are prioritised in the discussion, and participants are made to feel valued, comfortable and welcome.

Principle 3: Ensure that engagement makes a difference

Engagement must genuinely feed into decision-making processes and activities.

Criteria for ensuring that engagement is effective include:

- Decision-makers genuinely take account of participants' views;
- Participants engage in learning about the topic of discussion and also wider decision-making processes;
- Participants are engaged in a meaningful way and are encouraged to engage again in the future.

Principle 4: Review and evaluate engagement to improve practice

There is a need for ongoing reflection on the process and outcomes of stakeholder and public engagement in order to improve practice, as well as effective planning on how engagement will be reviewed and evaluated, and the evaluation tools to be used.

Criteria for ensuring that engagement is effective:

- Reflection on what has been achieved and how future practice can be improved (ex-ante and ex-post evaluation), focusing on: (i) who has been targeted and reached by engagement strategies; (ii) the methods used for engagement, their effectiveness, and possible changes or lessons for the future; (iii) the timing of engagement activities; and (iv) any outcomes or impacts of the engagement strategies.
- An evaluation plan which (i) clarifies the aims of engagement and its specific objectives; (ii) sets out clear evaluation questions; and (iii) explains the methodology to be used to answer those questions, including data collection, data analysis and reporting.

Box 2: Reviewing and evaluating engagement strategies

German research committee on citizen participation in the bioeconomy

The German federal government's Programme on Renewable Resources (*Förderprogramm Nachhaltende Rohstoffe*, www.fnr.de) is funding an expert committee of researchers to advise the Federal Ministry of Food and Agriculture on best-practice strategies on citizen participation. This has led to plans for two events aimed at dialogue: a) one focused on citizens (e.g. what the bioeconomy is, and issues relating to food security and climate change); and b) one targeting businesses (e.g. consumer expectations, and production processes and product labelling).

The programme funds applied research projects e.g. aimed at: increasing familiarity, acceptance and use of bio-based processes, products and energies; dialogue leading to changes in consumer behaviour; knowledge exchange leading to production and use of renewable industrial materials and intermediate/end products; development of educational material and innovative pilot education measures; identifying societal expectations and opportunities especially for rural areas; studies, dialogue processes and the publication of results on moves to a bioeconomy; pilot projects involving network building and citizen participation.

5.2 Additional principles drawn from the BioSTEP case studies

Three further principles have been drawn from the BioSTEP project, particularly the case studies on engagement in national and regional bioeconomy strategies, which are not necessarily emphasised in the literature, namely the need to:

- Tailor engagement to the national/regional bioeconomy;
- Engage people on what matters to them; and

- Learn from other sectors and countries.

Principle 5: Tailor engagement to the national/regional bioeconomy

The engagement approach must be adapted to suit the bioeconomy actors and activities in the country or region (Overbeek et al., 2016), as well as to ensure a coordinated approach across regions/localities and sub-themes.

Criteria for ensuring that engagement is effective include:

- Involving key actors in the national/regional bioeconomy, such as businesses, researchers, public bodies, hybrid organisations, non-governmental organisations and interest groups;
- Building on existing frameworks for engagement and existing debates e.g. if there are already strong structures for engagement between businesses, researchers and policy-makers, could these be broadened to include other organisations, interest groups or the wider public?
- Considering what forms of engagement are appropriate to the main bioeconomy sectors. Public acceptance tends to vary across different sectors of the bioeconomy, with greater approval of healthcare bio-based products rather than activities in agriculture and food.
- Taking account of the stage of bioeconomy activities e.g. early stage (characterised by planning, development and pilot projects) or well-established (with solid market growth and stabilisation), and assessing how engagement could support further development.

Principle 6: Listen and engage people on what matters to them

Engagement is most effective when the facilitators are not simply trying to communicate their own message to others but are genuinely endeavouring to meet people's interests and listen to their concerns over the longer term.

Criteria for ensuring that engagement is effective:

- Genuine long-term commitment to dialogue, aimed not only at informing but also at listening to and engaging with other people's concerns;
- Linking discussion of the bioeconomy to specific issues which are of interest and importance to stakeholders and citizens (e.g. nature, sustainability, local development).

Box 3: Finland's Open Government Action Plan 2015-17

The Government of Finland places a strong emphasis on openness and accountability through engagement. The central part of the rationale for its Open Government Action Plan (http://www.opengovpartnership.org/sites/default/files/OGP_Action_Plan_Finland-2015_2017.pdf) is the need to maintain and cultivate trust, as a foundation for effective policy-making. The Action Plan lays out 18 commitments to openness, each with measurable and verifiable milestones. This includes, for example, a commitment to target groups such as children, young people and the elderly.

Principle 7: Learn from other sectors, regions and countries

A final principle concerns the scope to learn from engagement practices undertaken outside the bioeconomy, or in other countries or regions. There are often useful experiences elsewhere that could provide lessons for engagement, although it is also important to orient the debate to local circumstances.

Criteria for ensuring that engagement is effective:

- Learning from engagement practices in other fields (e.g. public engagement in urban and local planning) within the same region (with the advantage of operating within the same institutional and cultural context);

- Drawing on engagement work in other regions or at national level within the same country (where, again, institutional and cultural frameworks are likely to be similar); and
- Engaging with stakeholders in other countries (e.g. by attending conferences and workshops), to see whether certain aspects of engagement could be usefully transferred.

Box 4: Learning from practices outside the bioeconomy

Participatory ethics in river management research

An engagement toolkit was developed in the context of a project based on collaboration between the Lune Rivers Trust, a UK charity that aims to protect and manage the River Lune and its tributaries in the counties of Cumbria, Yorkshire and North Lancashire and Durham University. Through a Participatory Action Research (PAR) approach, the organisers sought to empower local communities so that management decisions would be driven by their priorities. This in turn would inform legislation and policy that these communities would have to implement. The toolkit is available online at: <http://www.dur.ac.uk/resources/beacon/PARtoolkit.pdf>.

6 Examples of stakeholder engagement in the bioeconomy

Based on the six national and regional case studies undertaken for the BioSTEP project, this section provides examples of stakeholder engagement. Most examples involve only businesses, researchers and/or public sector organisations ('triple helix' forms of engagement), although some also involve civil society or non-governmental organisations. Section 7 then provides examples of engagement with citizens.

The examples are divided into groups, based on the typology of approaches to engagement outlined in Section 2 i.e. (i) education and information provision; (ii) dialogue and consultation; and (iii) co-production of knowledge. However, as we found no examples of activities based solely on education and information provision, this section focuses only on examples of dialogue and co-production of knowledge.

6.1 Dialogue

6.1.1 Bioeconomy Councils and Forums

Bioeconomy Councils, Panels, Forums or Working Groups play a key role in driving bioeconomy strategies and activities in some countries. These are typically made up of representatives from policy, business, research and education but may also include non-governmental or civil society organisations. It can be challenging to sustain these kinds of partnerships over the long-run, given the need for individual and organisational enthusiasm and commitment to these activities.

Box 5: Examples of bioeconomy councils and forums

Members of Finland's Bioeconomy Panel

The Panel is chaired by the Minister of Economic Affairs and the Minister of Agriculture and the Environment ([Davies et al., 2016](#)).

Public bodies: the Ministry for Foreign Affairs, the Ministry of Finance, the Ministry of Education and Culture, and the Ministry of Social Affairs and Health; FINPRO (Export Finland, Visit Finland and Invest in Finland), the Funding Agency for Innovation (TEKES), TAPIO consulting services, the Transport Safety Agency, the Natural Resources Institute, the Environment Institute, Metsähallitus (a State-owned enterprise that administers over 12 million hectares of land and water), the National

Business and employee organisations: the Confederation of Industries, the Food and Drink Industries' Federation, the Energy Industries, the Federation of Technology Industries, the Association for the Chemical Industry, the Forest Industries, the Sawmills Association, the Federation of Enterprises, the Central Union of Agricultural Producers and Forest Owners, the Confederation of Health Food, the Hospitality Association, the Central Organisation of Trade Unions, the Trade Union Confederation for highly educated people, and the Confederation of Professionals.

Research and education: the Technical Research Centre, SITRA, the Academy of Finland, the Finnish Universities, the Rectors' Conference of Universities of Applied Sciences, CLIC Innovation, and Motiva (a specialist in energy and material efficiency).

Non-governmental organisations: the World Wildlife Fund (WWF), and the Association of Nature Conservation.

WiSo Competence Center - the Competence Center to strengthen economic and social partners in Saxony-Anhalt

The Competence Centre of the Economic & Social Partners (WISO Partners) in Saxony-Anhalt deals with EU funds and its main aim is to ensure the optimal use of financial resources. In addition to administration, various civil society organizations - economic and social partners – are members of the Competence Centre. These are: economic partners, trade unions, social actors, women's organizations, environmental organizations, local authorities, partners in the agricultural sector and rural areas as well as universities, research institutions and educational institutions that contribute with their specific expertise. The WiSo Partners were involved in the development process of the Regional Innovation Strategy of Saxony-Anhalt and invited to different working group meetings.

6.1.2 Consultations with bioeconomy stakeholders

Policy-makers in many countries and regions consult businesses, researchers, NGOs and other stakeholders on the design of bioeconomy strategies, both via online/written interactions and also via roundtables and seminars on particular themes e.g. forests, agriculture, marine bioeconomy – sometimes bringing together stakeholders with conflicting interests. Similarly, membership-based bioeconomy industry bodies regularly conduct surveys of members e.g. to ensure accountability, to formulate policy responses, and to identify new market opportunities.

Box 6: Consulting stakeholders

Consultations led by industry umbrella bodies include:

- The European Biofuels Technology Platform - opened up a questionnaire to members of the public and stakeholders in early 2016, to inform its Research & Innovation Strategy.
- The Bio-based Industries Consortium (<http://biconsortium.eu/>) – conducts an annual survey of members e.g. of member activities such as investment in bioeconomy projects.
- Biotechnology Innovation Organisation (BIO, <https://www.bio.org/>) – an international trade association, BIO has established member-constituted committees to influence organisational policy development. Specialist areas include industrial biotechnology.

Consultations led by governments

In Saxony-Anhalt (Germany), the Land government consulted widely on its regional innovation strategy, which includes a focus on the bioeconomy, via: (i) interviews with universities, research institutes, businesses, technology transfer institutions, chambers of industry, and clusters; (ii) six roundtables with academic researchers; (iii) an open stakeholder consultation with 146 responses (34% industry, 37% science, 6% public authorities, 23% clusters and technology transfer institutions); (iv) six stakeholder workshops; (v) a meeting with non-governmental organisations; (v) five thematic working groups including businesses, business associations, and intermediaries between science, policy and business; and presentation of the strategy to a large event involving business and civil society organisations (Charles et al., 2016).

In the Veneto (Italy), the regional government consulted business associations, universities, research centres, and civil society, including consumer groups, on its 'smart specialisation strategy', which targets four themes, including two related directly to the bioeconomy (Smart Agrifood and Sustainable Living), while the other two (Smart Manufacturing and Creative Industries) also include bioeconomy elements (Charles et al., 2016). The engagement process included on-line consultations, thematic workshops, specific in-depth sessions, and public meetings, and aimed to ensure broad-based contributions to the identification of regional needs and the elements of the strategy. The regional government is continuing to work to strengthen bioeconomy activities e.g. by ensuring a favourable business environment and policy framework, and supporting the development of innovative technologies.

6.2 Co-production of knowledge

6.2.1 Hybrid organisations

A key development in the early stages of bioeconomy development in many regions is the creation of a hybrid organisation - e.g. an innovation centre or cluster body, involving businesses, research and policy-makers - to lead, encourage and organise cooperation and engagement.

Box 7: Organisations which promote engagement

The Bio-based Delta cluster in the Netherlands

Biobased Delta (BbD) is a cluster-based collaboration involving the provinces of Zeeland, Noord-Brabant and (since 2014) Zuid-Holland which aims to create the preconditions for the development of business, human resources and infrastructure (Charles et al., 2016). The cluster board supports businesses to create connections: between small companies, between small and large companies, between companies and knowledge institutions, and between public authorities and financiers. The cross-sectoral aspect of the regional agenda has resulted in small-scale bio refineries, new crops, new methods for pre-treating substances (proteins), and new inventions and areas of application.

Scotland's Industrial Biotechnology Innovation Centre (IBioIC)

In Scotland (UK), the Industrial Biotechnology Innovation Centre (IBioIC, www.ibioic.com) was set up in 2014 to bridge the gap between education and industry with the aim of accelerating development of commercially viable solutions for high-value manufacturing in chemistry-using and life science sectors (Charles et al., 2016). IBioIC is supported by more than 25 companies and 13 higher education institutions. Its Governing Board includes members from industry and universities, as well as observers from 2 regional enterprise agencies (Scottish Enterprise, and Highlands & Islands Enterprise). IBioIC supports researchers, businesses, policy-makers and NGOs to build links with others; organises events and meetings; provides advice on management, finance, marketing and business strategies; supports the growth of a skilled workforce via e.g. apprenticeships and PhDs; funds projects; and offers open access facilities in the form of two operational equipment centres.

Italy's National Technological Cluster of Green Chemistry (SPRING)

SPRING was established by three major companies (Biochemtex, Novamont, and ENI-Versalis), together with the National Federation for the Chemical Industry (Federchimica), and with the support of national government (Charles et al., 2016). The cluster has over 100 members, including individual enterprises, business associations, universities, public research centres, agricultural and environmental associations, universities, and regional enterprise agencies. It aims to encourage the development of a bio-industry by stimulating interaction between businesses, researchers and public bodies. SPRING provides funding to private and public stakeholders for pilot projects, technology transfer, organising and participating in international initiatives, and other activities for SMEs and start-ups. The cluster, in cooperation with the business association Assobiotec, the Veneto region and the Ministry of the Environment aim to develop and implement national and local bioeconomy strategies, also in collaboration with universities, research centres and consumer associations. The Region's overall aim is to reduce fragmentation and to maximise opportunities for stakeholders in relation to green chemistry.

6.2.2 Business-led cooperation and engagement

Business-oriented engagement in the bioeconomy can also be led by individual businesses or by sectoral/thematic business associations, industry groups or chambers.

Box 8: Business-led engagement

Bioeconomy Dates and events in Finland

In Finland, business associations have led the regional Bioeconomy Dates (*biotaloustreffit*), which aim to encourage business activity and innovation in the bioeconomy by stimulating discussion between businesses (e.g. on the types of partnership and expertise needed by businesses; on the efficient use of raw materials and resources; and on methods for accelerating innovation in the bioeconomy) (Davies et al., 2016). More information is available at: <http://www.biotalous.fi/biotalous-treffit-jatkuvat-maakuntakierros-alkaa-syyskuussa/>.

Other business-led events in Finland include the Slush Evening for Circular and Clean Solutions, which was organised by businesses and provided opportunities for large businesses to engage with start-up companies. See <http://www.kauppalehti.fi/uutiset/slushiin-uusia-bio--ja-kiertotalouden-kilpailuja/a7bduqTL>).

The Regional Association of Chambers of Commerce of Veneto (*Unioncamere del Veneto*, UCV)

Within the BioSTEP project, UCV and AGHETERA are engaging with businesses to develop a regional innovative bioeconomy network of enterprises aimed at strengthening the supply chains that are developing around various bioeconomy themes (<http://bur.regione.veneto.it/BurVServices/pubblica/DettaglioLegge.aspx?id=275529>); experimenting with new approaches; developing and sharing knowledge and skills; communicating with producers and (potential) users of bioeconomy products; and cooperating with other stakeholders, including business associations, researchers and the regional government.

6.2.3 Policy funding for collaborative projects in the bioeconomy

Public bodies in some countries provide funding for collaborative projects, typically between businesses and university researchers, but sometimes also other stakeholders, including non-governmental and civil society organisations, as is the case in Germany (Davies et al., 2016)

Box 9: German public funding for projects with wide stakeholder engagement

The **Initiative for the Sustainable Supply of Raw Materials for the Industrial Use of Biomass (INRO, inro-biomasse.de)** was funded by the Federal Ministry of Food and Agriculture and by the Agency for Sustainable Raw Materials (fnr.de) and involved e.g. environmental and development NGOs, business associations, certification bodies, researchers and policy-makers. INRO aimed to identify methods for ensuring that ecological and social aspects could be taken into account in the supply of biomass, focusing in particular on the certification of raw materials.

The **Research for Sustainable Development programme (FONA, fona.de)** project is funded by Federal Ministry of Education and Research and was revised in 2015, drawing on contributions from researchers, business, policy and civil society organisations. The new programme focuses on the Green Economy, the City of the Future, and Energy Change. Outcomes are channelled into government decision-making. Projects are based on applied work, involving cooperation between different stakeholders (e.g. businesses and local authorities, or a number of different CSO).

The **Centre for Development Research (ZEF, zef.de)** at the University of Bonn undertook a project, in cooperation with CSOs/NGOs, to develop a tool for certifying biomass imports from a food security viewpoint. It identified suitable criteria, operational indicators and verifiers for measuring the impact of biomass production on local food security, with a view to providing guidance for regional and national standard setting as well as for private certification systems.

7 Examples of citizen engagement in the bioeconomy

The six BioSTEP case studies also provide a number of examples of engagement with citizens and consumers, mainly in the form of the provision of information and education, but also more limited examples of dialogue/consultation. No examples were found of genuine co-production of knowledge involving citizens.

7.1 Public education

7.1.1 Public communication and information campaigns

A first set of activities involves information and communication campaigns which aim to educate citizens about the range, complexity and opportunities offered by the bioeconomy.

Box 10: Communicating with the general public

Citizen engagement on the Finnish National Bioeconomy Strategy

Citizen participation is embedded throughout Finnish policy-making (e.g. via the www.otakantaa.fi website) but is seen as particularly important for the bioeconomy where development depends on the choices of all citizens and consumers (Davies et al., 2016). Citizens were invited to contribute to consultations and workshops on Finland's Bioeconomy Strategy and specific tools were used to engage with citizens, including: (i) a website (www.biotalous.fi) with information, a blog and discussion forum; (ii) social media (notably a twitter account (@biotalous)); (iii) roadshows and fairs, including the national Forest Fair, e.g. presentations on bioeconomy innovations and practical applications, as well as sessions for school children; (iv) in newspapers and magazines; (v) television documentaries. In addition to government-led communications, individual businesses and NGOs have also aimed to engage the public on themes relating to the bioeconomy.

Creative activities in the Bio-based Delta (Netherlands)

The municipality of Bergen op Zoom sees itself as a creative city and aims to attract innovative entrepreneurs in the bio-based economy in order to become less dependent of the employment in multinational companies (Charles et al., 2016). It supports a range of activities, including a bio-based exhibition at regional events e.g. in the nature visitor centre, in the central square, and in annual events ('Brabantse Wal day' and 'Delta Innovation Days') so that citizens can learn about local bio-based products.

The Bio-based Delta cluster board has cooperated with artists and designers, who are interested in bio-based solutions and new products. The cluster board has shown their bio-based collection as part of Dutch design week, and involved artists who made artistic 'prototypes' of consumer products from bio-based material. In addition to enhancing the relationship between arts and innovation, the Dutch Design week also created public exposure as it has around 200,000 visitors.

A pop-up store has been set up in Bergen op Zoom from mid November 2016 until January 2017, with the aim of informing the public about the bio-based economy and raising public awareness of bio-based products, materials, applications and processes (http://www.bergenopzoom.nl/Inwoners/Nieuws/2016/november/Eerste_biobased_pop_up_Store_van_Nederland_opent_in_Bergen_op_Zoom).

BioSTEP exhibition

As part of the BioSTEP project, an exhibition of bio-based products, 'Bioeconomy in daily life' has been developed by BioSTEP partner BIOCUM, and will be shown in three locations (in Bulgaria, Italy and the United Kingdom), linked to other project activities. The exhibition is set up as a house, with a wide range of products, together with information on their bio-based dimensions. They include dresses made from milk or coffee, car tyres from dandelion, trainer soles from rice husks and armchairs that are tanned with extracts from olive leaves. A virtual version of the exhibition is available on the BioSTEP website; <http://www.bio-step.eu/results/virtual-exhibition.html>

7.1.2 Support for education

An important focus of bioeconomy activities in many countries and regions is education and training, including measures aimed at developing new educational curricula and courses; encouraging people to gain knowledge, skills and experience needed in the bioeconomy; increasing awareness of existing and emerging job opportunities in the bioeconomy; and enhancing the supply of skilled labour for bioeconomy-related activities.

Box 11: Education and training for the bioeconomy

Bio Base Europe Training Center

The Bio Base Europe Training Center enables students, scholars, businesses, public bodies and other organisations to learn about the bio-based economy, by providing training, education, network events, and expositions (www.bbetc.org). Furthermore, the Centre has developed bioeconomy modules for primary, secondary and tertiary education, and targets the education of young people in the bioeconomy, particularly via the University of Applied Sciences (AVANS) and Hogeschool Zeeland, as well as via massive open on-line courses (MOOC) which in three years have reached 1600 students from 13 countries ([Charles et al., 2016](#)).

The Scottish Initiative for Biotechnology Education (SIBE) and IBioIC

SIBE promotes engagement with biotechnology through interactions with the scientific community, school students, teachers and the general public ([Charles et al., 2016](#)). SIBE is comprised of science communicators at the University of Edinburgh who develop educational resources, run biotechnology workshops in schools, organise public science events, and train researchers to communicate their research to schools and the public. Partners and funders include, among others, Scottish Government and the Scottish Association for Marine Science (SAMS).

Separately, IBioIC has set up educational and training programmes covering life sciences, chemical sciences and engineering to address skills shortages in industrial biotechnology. Programmes include apprenticeships, undergraduate (Higher National Diploma in Industrial Biotechnology), the UK's first collaborative MSc in Industrial Biotechnology, and PhD studentships with Universities across Scotland and industrial partners across the UK. All 30 PhDs are qualified STEM coordinators and are required to visit schools to tell school pupils/students about industrial biotechnology.

7.1.3 Targeting consumers

Both governments and businesses target citizens-as-consumers, with the aim of informing and persuading people about the benefits of bio-based products, as well as developing standards, trademarks and certification of bio-based products and activities.

Box 12: Informing and supporting consumers

Standards and trademarks

In the context of EU efforts to develop and implement certification and standardisation of bio-based products (<http://www.biobasedeconomy.eu/standardisation/>), the Finnish and German governments are prioritizing support for standards and trademarks, with the aim of shaping consumer decisions, as well as business branding and marketing (Davies et al., 2016). Finland is committed to developing certification systems for bio-based products, while Germany is funding a three-year project to develop an internationally recognised and comparable methodology for comparing and evaluating sustainability standards.

Consumer-oriented information campaigns

Finland and Germany are also both prioritising consumer-oriented campaigns. The Finnish National Bioeconomy Strategy notes the need to influence consumer choices by highlighting the sustainability of bioeconomy products. Germany's National Policy Strategy on Bioeconomy links broader bioeconomy activities with efforts to provide consumers with more information on sustainable food consumption and production, as well as initiatives for reducing food waste, and so contributing to the circular economy.

7.2 Public dialogue

7.2.1 Public consultation and dialogue

Formal public consultation processes relating to specific bioeconomy themes are found, for example, in the field of local/urban planning or scientific research.

Box 13: Consulting the general public

Planning and public consultation in the Netherlands

The construction of biomass processing sites, bio-refineries and other bio-based industry facilities is governed by national planning law. Their legality and public acceptance require consultation with and consent from local communities and the public. In the Netherlands, for example, planning law specifies that public participation must form part of the process in developing municipality land use plans. Citizens have the legal right to object; this in turn triggers legally defined sets of procedures. Learning from this, municipalities have found it beneficial to involve the public at earlier stages of planning in order identify and resolve potential objections before they can lead to legal delays (http://www.vng-international.nl/wp-content/uploads/2015/06/Local_Government_in_the_Netherlands.pdf, pp. 31-32).

BBSRC's Bioenergy Public Dialogue in the UK

With co-funding from Sciencewise, the UK's Biotechnology and Biological Sciences Research Council (BBSRC) developed in 2012 the Bioenergy Public Dialogue to explore citizens' views, concerns and aspirations in relation to bioenergy (<http://www.bbsrc.ac.uk/engagement/dialogue/activities/bioenergy-dialogue/bioenergy-dialogue-project/>). One of the main objectives of the dialogue was to facilitate engagement between scientists and members of the public and use the outputs from the activities to inform BBSRC's strategy and policy development in bioenergy. See: <http://www.bbsrc.ac.uk/documents/bioenergy-dialogue-report-pdf/>.

7.2.2 Open-ended citizen participation

More open-ended forms of engagement aim to enable citizens to express their views, concerns and wishes on broad issues, rather than in response to specific policy or planning decisions.

Box 14: Open knowledge exchange

Citizen dialogue on the bioeconomy in Berlin

In September 2013, the German Bioeconomy Council organised an open forum for citizen dialogue on the bioeconomy in Berlin's Natural History Museum, which was attended by 80 people (Davies et al., 2016). It aimed for a non-technical discussion on the following issues: (i) What would tomorrow's and cities look like? (ii) How could we live without damaging the climate and environment? (iii) How could 10 billion people have enough food in the future? and (iv) How can industrial development become ecologically friendly? In order to attract a representative group of citizens, the organisers sent letters to over 150 organisations in Berlin, with a wide range of interests and age groups (e.g. gardening, nature protection, religious groups, car drivers, sports); distributed flyers in busy shopping streets and to local homes; and placed advertisements in local newspapers and magazines. More information is available at: <http://www.biooekonomierat.de/aktuelles/dialogveranstaltung-neue-perspektive-fuer-die-ratsarbeit/>

UK Citizens Jury on public perceptions of industrial biotechnology

In 2008, the UK government commissioned a Citizen Jury to explore public perceptions of industrial biotechnology in response to concerns that public opinion could hinder adoption. The Citizens' Jury took place in two stages and in two cities (London and Manchester) and aimed to stimulate in-depth discussion and explore concerns and interests. It included presentations, panel discussions, discussion groups and individual exercises, allowing time for discussion and reflection. The Jury was supported by a Project Advisory Group, made up of scientists, policy makers, industry and NGOs, which contributed to the development of materials for the Jury and responded to questions raised, ensuring that the Jury heard a variety of viewpoints. Further information is available at: <http://www.sciencewise-erc.org.uk/cms/public-perception-of-industrial-biotechnology/>

8 Conclusions

This guidance document has examined the benefits and challenges of stakeholder and public engagement in the bioeconomy, and has set out a series of principles that can support good practice. It has also provided practical examples of different types of stakeholder and citizen engagement across European countries and regions, notably in Finland, Germany, Italy, the Netherlands and the United Kingdom. The document should be seen as a resource for policy-makers and other stakeholders who are developing engagement strategies, or are looking for inspiration and new ideas for extending their current activities.

By setting out the core potential benefits of participatory approaches to bioeconomy strategies, the document aims to provide encouragement and support to policy-makers and other stakeholders who are new to engagement and are considering whether or not to take a more participatory approach to strategy design and implementation.

Conversely, the description of the challenges and difficulties associated with participatory approaches aims to ensure that stakeholders are better prepared for difficulties and limitations, and so are better able to manage their own and others' expectations and to forestall potential problems.

The key principles outlined in Section 5 address the question of 'how participation strategies should be designed and implemented' and aim to support good practice by setting out a series of dimensions that stakeholders should take into account in order to ensure that participatory activities in bioeconomy strategies are effective.

Finally, the range of examples drawn from the case studies aim to provide inspiration to strategy-leaders, and ideas which can be built on and adapted to fit particular national and regional contexts. The document differentiates between engagement activities (i) focused on stakeholders versus citizens, and (ii) which take the form of education/information, dialogue/consultation, or co-production of knowledge. These categories, together with the examples, should allow policy-makers and other stakeholders to clarify their options for further types of engagement activities, which build on those already undertaken. More detailed information on the examples can be found in other BioSTEP reports ([Charles et al, 2016](#); [Davies et al, 2016](#)) and via the websites cited in the Boxes.

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Annex 1: Resources

Box 15: Principles of Engagement

Deliberative Public Engagement – Nine Principles

Published in by Involve, a UK-based think tank that focuses on public engagement, this 18 page document presents nine principles for effective public engagement. It also offers an overview of engagement activities and a list of resources for further reading. <http://www.involve.org.uk/wp-content/uploads/2011/03/Deliberative-public-engagement-nine-principles.pdf>.

Community-based Participatory Research – A guide to ethical principles and practice

This is a joint publication by the Centre for Social Justice and Community Action of Durham University and the National Coordinating Centre for Public Engagement in the UK. This guide covers a series of ethical principles for participatory research. Although the focus is on the practices of researchers the principles included here are useful to other sectors to raise awareness of the ethical challenges when engaging with stakeholders and civil society. See: https://www.publicengagement.ac.uk/sites/default/files/publication/cbpr_ethics_guide_web_november_2012.pdf.

Core Principles for Public Engagement

This guide is the result of collaboration between the US-based National Coalition for Dialogue and Deliberation (NCDD) and the International Association for Public Participation (IAP2), among other leading practitioners' organisations specialising in public engagement internationally. It presents expanded descriptions of a list of seven core principles based on the experience of engagement practitioners. See: <http://ncdd.org/rc/wp-content/uploads/2010/08/PEPfinal-expanded.pdf>.

Assessing the Impacts of Public Participation: Concepts, Evidence and Policy Implications

Produced by the non-for-profit organization Canadian Policy Research Networks, this comprehensive review of 52 pages focuses on the evaluation of engagement activities. Recommended reading for those interested in more in-depth but still accessible literature on the topic. See: http://www.cprn.org/documents/42669_fr.pdf.

Box 16: Guidelines on engagement and consultation**The European Commission's Better Regulation Guidelines**

The guidelines (May 2015) address stakeholder consultation, laying out general principles and minimum standards which Directorate Generals (DGs) must adhere to. The Commission guidelines inform engagement strategies at the DG level. For example, the DG for Communication Networks, Content and Technology conducted a Stakeholder Engagement Strategy in 2013, to inform its approach to stakeholder participation in policy development. The resulting Digital Futures engagement strategy centres on the use of ICTs and is based on two pillars: 1) to host and facilitate a continuous dialogue between stakeholders and policy makers, and 2) to use an open platform to capture the content generated during the conversations (<https://ec.europa.eu/digital-single-market/en/stakeholder-engagement-strategy>). See: http://ec.europa.eu/smart-regulation/guidelines/ug_chap7_en.htm.

BBSRC's guidelines on consultation

Research councils, as publicly funded institutions, are mandated to act for the public good and are governed by guidelines on research ethics and SPE. In the UK for example, the Biotechnology and Biological Sciences Research Council (BBSRC) publishes its own guidance on the process of consultation. This emphasises the value of clarity and accessibility, whilst also adopting a more prescriptive approach to time limits for consultation; a minimum of 12 weeks. The BBSRC guidelines also inherently acknowledge the value of sufficiently informing respondents as to the implications of proposals – for example, by including Regulatory Impact Assessments in consultation packs. This ensures that stakeholders can provide informed feedback. See: <http://www.bbsrc.ac.uk/documents/consultation-guidance-pdf>.

Box 17: Support in designing and preparing engagement activities**Engage2020 Action Catalogue**

The Action Catalogue is an online decision-making support tool to assist those interested in promoting engagement activities choosing the method that best suits their needs. Some of the criteria explored by the tool include the objectives of method (e.g. policy formulation, research activity), the level of stakeholder and public involvement desired and the geographical scope of application (e.g. international, regional). It also helps evaluating the kinds of expertise and skills available and matches the methods against different types of participants (e.g. CSO's, policy makers, citizens, industry, users). The online tool was produced by the Engage2020 project, a European collaborative project that included partners from Germany, Denmark, the Netherlands, Bulgaria and the UK. It is available at: <http://actioncatalogue.eu/>. A description of the 57 methods for stakeholder and public engagement can be found here: <http://engage2020.eu/media/D3-2-Public-Engagement-Methods-and-Tools-3.pdf>.

National Coordinating Centre for Public Engagement

The NCCPE offers a comprehensive and user-friendly list of techniques and approaches for engaging with stakeholders and the public. Each item of the list includes a presentation on its objectives, characteristics and how to use the specific method. The page for techniques and approaches can be accessed here: <https://www.publicengagement.ac.uk/doi/techniquesapproaches>.

Annex 2: Case study methodology

In 2016, the BioSTEP team undertook two case studies at national level (Finland and Germany) and four at regional level (Bio-based Delta in the Netherlands, Saxony-Anhalt in Germany, Scotland in the United Kingdom, and the Veneto in Italy). For further information on the six case studies and more details of the research methodology, see Charles et al. (2016) and Davies et al. (2016).

The case study work involved:

- Desk research;
- Interviews with stakeholders in bioeconomy strategies;
- Workshops (only in the regional case studies); and
- Validation meetings on an early draft of this Good Practice Guidance document.

Table 1: Interviews with stakeholders in national and regional bioeconomy strategies

	Finland - National	Germany - National	Bio-based Delta (NL)	Saxony-Anhalt (DE)	Scotland (UK)	Veneto (IT)
National policy-makers	2	4				
Regional policy-makers & development agencies	2	1	4	1	6	3
Local policy-makers					1	
Business associations / individual firms	4	3	2	3	4	10
Research/education	2	3	2	2	2	
Hybrid entities			2	2		1
CSOs/NGOs	2	3	3	5		
Experts/consultants	3	1				1
Total	15	15	13	13	13	15

Note: Hybrid entities are bodies such as innovation centres, cluster organisations and bioeconomy forums which are based on engagement between public organisations, research/education bodies and businesses.

Source: Charles et al. (2016), Davies et al. (2016)

Table 2: Participants in regional workshops

	Saxony-Anhalt (DE)	Scotland (UK)	Veneto (IT)
National policy-makers			
Regional policy-makers & development agencies		2	
Local policy-makers		2	
Business associations / individual firms			
Research/education	2	3	
Hybrid bodies	1	1	
CSOs/NGOs	1		
Experts/consultants			
Total	4	8	25

Note: An additional workshop was originally planned in the case study of the Bio-based Delta in the Netherlands but, due to a change of directors at the cluster board, this could not be held within the required time scale. Instead, the case study leaders conducted a short survey of visitors to a public event organised by the Bio-based Delta, as part of the region's Delta Innovation Days. For more information on the survey, see Charles et al (2016)

Source: Charles et al (2016), Davies et al (2016)

Table 3: Participants in validation meetings on a first draft of this Good Practice Guidance

	Finland - National	Germany - National	Bio-based Delta (NL)	Saxony-Anhalt (DE)	Scotland (UK)	Veneto (IT)
No. of people invited	50	4	14	80	36	105
No. of participants	7	4	5	13	8	13
Policy	5	1	2		1	1
Business	2			1		7
Research/education			1	2	3	2
Hybrid entities		2	2		4	2
NGOs/CSOs		1		10		
Citizens						
Other						1

Note: The German national consultation was undertaken by email with key people involved in the federal bioeconomy strategies. It was originally intended to hold the validation meeting as part of the October 2016 meeting of the National Bioeconomy Council, but in the end there was no space on the agenda of this meeting of the Council and, due to the need to receive feedback in autumn 2016, it was decided instead to consult key members of the Council by email.