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## Communicating bioenergy: A growing challenge

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# Communicating bioenergy: A growing challenge

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**Abstract:** Bioenergy is rapidly growing in many parts of the world. But continued investments in bioenergy do not depend entirely on technological advances, feedstock availability, and economic conditions. The social acceptance of bioenergy by the general public appears to be essential to the political legitimacy of the bioenergy industry, and the willingness of policy-makers to introduce or maintain supportive policy schemes for bioenergy. In the context of Europe, this perspective argues that communication strategies will become increasingly important for the bioenergy industry as it continues to expand. In short, this perspective discusses 4 main questions, including: What is the current social acceptance of bioenergy among citizens in Europe? What are the key lessons from experiences with communication on bioenergy? What are the emerging “hot” topics for the bioenergy industry? What international efforts are underway to inform the general public about bioenergy? Overall, this perspective aims to provide insights into the linkages between the social acceptance and the political legitimacy of bioenergy, and the role of communication strategies.

**Keywords:** bioenergy, social acceptance, communication, political legitimacy

## 1 INTRODUCTION AND BACKGROUND

Bioenergy is growing around the world and sustained growth in the industry can be expected over the coming decades. Not least because there are an increasing number of countries putting in place supportive policy schemes for the expansion of the bioenergy industry. There are also several market leaders that are heavily promoting bioenergy and raising its profile internationally, such as Brazil, Sweden, Germany, the USA, and China. Large, multi-national companies are also making more significant investments and expanding activities around bioenergy.<sup>1</sup> Put simply, the prospects for the bioenergy industry appear to be very exciting.

Bioenergy in all its forms can produce multiple positive outcomes (see Box 1). In fact, bioenergy systems under the “right” conditions can contribute to climate mitigation and adaptation, improved energy security, maintenance of robust agricultural and forestry sectors, and industrial growth and greater exports.<sup>2</sup> However, poorly designed bioenergy systems can result in negative environmental and social impacts. Furthermore, reliance on permanent economic subsidies is also to be avoided. An imperative for the bioenergy industry is therefore to ensure bioenergy systems move in the sustainability direction – encompassing environmental, social and economic perspectives.<sup>3</sup> This demands attention on a group of inter-connected key issues, such as land use, greenhouse gas emissions, food security, international trade, and labour conditions, among many others.<sup>4,5</sup>

Turning to Europe, much of the success for bioenergy in the European Union (EU) is based on supportive EU directives and strategies that are stimulating national policies, local projects and innovation processes.<sup>6</sup> However, there are growing debates in the popular media and political spheres on bioenergy and sustainability. It is fair to assume that these debates will intensify as the bioenergy industry continues to expand. This perspective argues that without public acceptability of

expanding bioenergy in Europe, there will be weakened political legitimacy, and this is a serious problem for proponents of bioenergy.<sup>7</sup> The role of communication therefore takes on greater importance for the bioenergy industry. The purpose of this perspective is to critically discuss 4 main questions. These include:

- What is the current social acceptance of bioenergy among citizens in Europe?
- What are the key lessons from experiences with communication on bioenergy?
- What are the emerging “hot” topics for the bioenergy industry?
- What international efforts are underway to inform the general public about bioenergy?

### **Box 1. Terminology for bioenergy**

Humans exploit **biomass** (plant and animal matter) for many purposes. When it is utilized to produce heat, electricity or fuels for transport it is commonly called **bioenergy**. Biomass can be considered as “stored” solar energy because the process of photosynthesis “captures” energy from the sun in growing plants. Utilizing biomass for energy purposes is in fact tapping into the vast energy available from the sun. In a broader perspective, **bioenergy systems** comprise both the technical aspects of bioenergy, such as conversion technologies and biomass resources, and the overarching non-technical aspects of bioenergy, such as policies and actors.

The term **biofuels** is used in many different ways. Sometimes it refers to solid, liquid and gaseous fuels derived from biomass. In other cases it refers to liquid (and gaseous) biofuels for transport, which are commonly categorised as follows: first generation biofuels made from food crops, such as wheat, sugar beet and oil seeds; second generation biofuels from non-food biomass, such as ligno-cellulosic materials, including cereal straw and maize stalks; and third generation biofuels from algae. Only first generation biofuels can be produced on a large-scale at present. However, the commercialisation of second generation biofuels is expected over the coming decades. The third generation biofuels are in a research and development phase.

The **biorefinery concept** offers exciting potential to better manage and capture value from biomass. Similar to petroleum refineries, which produce multiple fuels and products from petroleum, biorefineries imply the integrated production of energy, fuels and chemical products from biomass. Biorefineries have been identified as one of the most promising routes towards a bio-based economy and away from a fossil-based economy. While partial biorefineries exist today, considerable research, development, demonstration and commercialisation is required to make advanced biorefineries a reality.

## **2 ANALYSIS AND DISCUSSION**

Investments in bioenergy do not depend entirely on technological advances, feedstock availability, and economic conditions. Social acceptance is cited in the literature as an increasingly important challenge for bioenergy development in Europe.<sup>8,9</sup> In fact, it has been argued by Silveira that “the leap towards broader utilisation of bioenergy is now more psychological than technological”.<sup>10</sup> There are at least two primary reasons why social acceptance is relevant for bioenergy. First, local communities can organise and prevent the implementation of bioenergy projects that are technically, economically and environmentally robust.<sup>6</sup> Second, the wider political legitimacy of bioenergy can be damaged by public concerns and the popular media. This in turn can reduce the willingness of policy-makers (at the local, national and European levels) to introduce or maintain supportive policy schemes for bioenergy.<sup>11</sup>

In response to concerns about the social acceptance of bioenergy, there have been some calls in the literature that communication is a vital area of research work (and action) that if left unaddressed could destabilise the bioenergy industry.<sup>12</sup> However, the bioenergy industry comprises a range of feedstocks, technologies, policies and systems, so basic attempts to communicate with the public and key stakeholders that address these abstract and complex terms are unlikely to be successful. Instead, it appears that much greater efforts must be made on interactive communication and stakeholder involvement, both at the local level for specific projects and also on the national and European levels.

In the context of the growing emphasis in the EU on the biorefinery concept, Peck et al. call for “improved communication of biorefinery contributions to sustainable development”.<sup>13</sup> While there appears to be positive views and expectations about biorefineries within the scientific community, these may not be shared by wider stakeholder groups. It is clear that if biorefineries are to play a significant role in the EU then supportive policy schemes will be vital. Peck et al. therefore recommend the development of strategies for communication between policy-makers and the scientific community that openly deal with challenging issues and trade-offs.<sup>13</sup> This perspective argues that such communication activities should be extended to encompass the general public.

In this perspective, the term bioenergy industry refers to a myriad of organisations and networks that are directly (and indirectly) involved in the implementation of bioenergy systems. The number and range of organisations and networks within the bioenergy industry is both a strength and weakness in terms of communication strategies. It is unlikely that the bioenergy industry can be a unified “voice”. However, there are some well-coordinated associations in several EU countries, and the recent creation of a World Bioenergy Association (see <http://www.worldbioenergy.org/>) can also enhance communication activities. Many research and innovation projects funded by the EU are also in a position to “experiment” with more creative communication processes to disseminate findings and engage stakeholders on bioenergy.

## **2.1 What is the current social acceptance of bioenergy among citizens in Europe?**

There is a significant research “gap” in our understanding of the social acceptance of bioenergy and what role it plays in the implementation of bioenergy projects. Only a few EU projects have explored bioenergy and social acceptance. These include the Bioenergy Promotion Project (see <http://www.bioprom.net/>), which focused on how to overcome non-technical constraints for bioenergy in densely populated urban areas, and the Create Acceptance Project (see <http://www.createacceptance.net/>), which explored the understanding of social processes affecting the acceptance of renewable energy. Additionally, the International Energy Agency runs a task group on socio-economic drivers in implementing bioenergy projects. Such work engages with both investigating and improving public acceptability of bioenergy.<sup>2</sup>

In a Eurobarometer survey (conducted in 2002) on energy issues, renewable energy received strong public support (and this is typical for such surveys).<sup>14</sup> However, when questions differentiate between the types of renewable energy there is often a contrasting result. Surveys of the general public from Ireland, the Netherlands, Germany and the UK all show that while renewable energy is viewed favourably by the general public, bioenergy has very low awareness and support in these countries.<sup>7,15</sup> Wind and solar are often rated much higher than bioenergy despite the higher contribution of bioenergy to the overall energy portfolio in the EU. In Sweden and Finland, there is greater support for bioenergy, which is linked to well-established bioenergy systems based on a strong forestry sector and positive experiences with bioenergy in these countries.<sup>16</sup>

Social acceptance of bioenergy differs from country to country and even region to region within Member States. A recent Eurobarometer survey (in 2007) reported that support for bioenergy differs significantly between Member States. While across the EU 55% of respondents support bioenergy, the range in favour of bioenergy varies from 21% to 75% in different Member States.<sup>17</sup> The reasons include cultural traditions, existing political, technical, social and regulatory structures, specific actor configurations, and previous experiences with renewable energy and bioenergy, among others. For comparison, in the Eurobarometer survey from 2007 solar received 80% support from across the EU with a range of 70% to 95% in Member States, and wind was similar with 71% for the EU and a range of 63% to 93%.<sup>17</sup>

A reason for apparent low support for bioenergy in many countries in the EU appears to be linked to confusion over the terminology.<sup>7</sup> Bioenergy refers to many different feedstocks, technologies, products and markets, and it is often used in a variety of ways. Additionally, there are a range of terms, including biomass, bioheat, bioelectricity, bioproducts and biofuels. While some forms of bioenergy may be seen as “clean” (such as pellets) others can be viewed as “dirty” (such as waste). Confusion around whether or not bioenergy is renewable energy has affected the current social acceptance of bioenergy in some parts of Europe.<sup>6</sup>

In relation to biofuels for transport, there has been increased criticism of first generation biofuels in the popular media and political circles as well as in the research community, particularly related to the use of food crops for biofuels. In contrast, the bioenergy industry envisages the possibility to use a much wider range of feedstocks other than food crops for the production of second generation biofuels. But there is still significant confusion and little understanding among the general public of the differences between biofuels for transport, namely first, second and third generation biofuels. This perspective suggests this may become a serious barrier, not just for biofuels used in transport, but for the entire bioenergy industry.

In a broader perspective, and shifting from the EU to the context of the USA, Sovacool argues that the barriers to increasing renewable electricity are socio-technical.<sup>18</sup> This term comprises the technological, social, political, regulatory and cultural aspects of electricity supply and use. Sovacool suggests that “a pernicious tangle of economic, political and behavioural obstacles” impedes the social acceptance of renewable electricity in the USA, and that improving public understanding of energy systems is a necessary foundation for change.<sup>18</sup> For Sovacool the social acceptance of renewable electricity is deeply complicated by the “invisible” nature of electricity supply and use as well as contradictory viewpoints and pervasive ignorance about energy systems by the general public.<sup>18</sup> This perspective argues that many of these insights from the USA are applicable to the EU.

## **2.2 What are the key lessons from experiences with communication on bioenergy?**

Based on the brief assessment of social acceptance of bioenergy in Europe, it is clear that a one-size-fits-all solution to communication does not exist. A further observation about bioenergy and communication in Europe is that bioenergy projects or technologies often encounter scepticism and concerns from the public, primarily because so little is known on the topic.<sup>6,7,8</sup> It is therefore important to design communication processes that avoid clashes between NIMBY (not in my backyard) and TINA (there is no alternative). TINA can sometimes be employed by developers and investors in bioenergy. While labelling all protests against bioenergy by the public as NIMBY fails to recognise the diverse reasons for opposition.<sup>19</sup>

The terms bioenergy, biomass and biofuels are rarely used in everyday language. Instead, people are often more specific, talking about wood stoves, sugarcane ethanol or biogas plants based on agricultural residues, for example. Bioenergy can therefore be difficult to communicate because it is too abstract and lacks clear “images”.<sup>20</sup> In contrast, the industries around wind and solar have developed strong “images” that jump to mind, such as wind turbines and solar photovoltaics. For the bioenergy industry, it appears necessary to repetitively use very specific and well-known language as well as develop “images” of bioenergy systems.

It is important to note that the social acceptance of small-scale bioenergy applications (such as pellet stoves in households) can be quite different to large-scale bioenergy projects (such as biomass-fired heat and power plants). In the case of small-scale technologies, communication strategies need to focus on “consumers” and how to market bioenergy. In contrast, large-scale technologies need communication processes that respond to the concerns of “citizens” and planning processes. Both scales are inter-connected and can positively or negatively impact on each other.<sup>21</sup>

A key process for bioenergy communication strategies is to identify target audiences, particularly opinion-formers that can influence the general public. These include (but are not limited to) journalists in the popular media, political and business leaders, and NGOs. End-users (whether they are individuals or organisations) who have invested in bioenergy technologies, both small-scale and large-scale, can also become powerful “informers” or “communicators”. This links to a key issue for bioenergy – it is not just about what is being communicated but who is performing the communication.

For bioenergy projects, one-way communication from developers and investors to the public is often not sufficient because of complicated issues and multiple stakeholders. Two-way communication that involves interaction with the general public and key stakeholders is needed to ensure feedback. Such feedback may result in a bioenergy project being altered in some way, but this may also result in it being implemented with less or no opposition. Unfortunately, bioenergy projects often do not recognise public concerns.<sup>6</sup> This perspective strongly argues that the general public and key stakeholders are likely to play an increasingly important role in the expansion of bioenergy in the EU and that interactive communication needs to become a higher priority.

The Create Acceptance Project on new energy technologies (including bioenergy) makes the observation that social acceptance is shaped by historical and accumulated experiences with individual projects.<sup>15</sup> Positive experiences gained at individual sites can expand to the regional or national level and influence policy development. At the same time, local controversies or negative impacts can expand to influence national conditions and result in the formation of advocacy organisations. These results show that one of the most important forms of communication for bioenergy is implementing “socially acceptable projects”. The Create Acceptance Project states that such projects are “locally embedded, provide local benefits, establish continuity with existing physical, social and cognitive structures, and apply good communication and participation procedures”.<sup>15</sup>

### **2.3 What are the emerging “hot” topics for the bioenergy industry?**

Currently, the subject of bioenergy, and particularly biofuels for transport, are at the crossroads of debates in the mass media in the EU (and further abroad). The inter-connected topics include: the contribution of first generation biofuels to reducing greenhouse gas emissions; impacts on land use, biodiversity and deforestation; the role of second generation biofuels in future transport systems; the food versus fuels debate; labour conditions linked with international trade; and the effects of

large-scale plantations of energy crops. Furthermore, an emerging “hot” topic for bioenergy is the use of Genetically Modified Organisms (GMOs) as biomass feedstocks.<sup>13</sup> Many experts and scientists agree that GMOs could increase biomass yields. However, a direct link between GMOs and biomass raw materials could become a distraction for the bioenergy industry if not handled carefully (taking into consideration the passionate discussions and confrontations on GMOs and food in the EU).

Interestingly, the bioethics community (which is concerned with ethical issues raised by new developments in biology and medicine) is becoming increasingly interested in bioenergy. In 2009, a seminar was organised in Finland by the Nordic Committee on Bioethics (see <http://www.ncbio.org/>) and the Association of Parliament Members and Scientists on the topic of bioethics and bioenergy. The starting point for the seminar was that the large-scale production and consumption of bioenergy raises a host of ethical issues.<sup>22</sup> Also in 2009, the Nuffield Council of Bioethics (see <http://www.nuffieldbioethics.org/>) in the UK launched a working party to investigate the ethical implications of new approaches to biofuels. The working party aims to identify and investigate the potential benefits and disadvantages as well as ethical, social, legal and economic issues raised by bioenergy, and to develop policy recommendations and an ethical framework to provide guidance on how to make decisions regarding bioenergy.<sup>23</sup> This is a very important consultation for the bioenergy industry not just in the UK but for the EU as a whole. Genetic modification, human rights and food security are all on the agenda for the consultation. Its findings will likely attract media attention and have ramifications for the bioenergy industry.

It is important to remember that social acceptance of bioenergy depends on more than communication strategies. It is also heavily affected by the actual impacts of bioenergy systems. Negative experiences with bioenergy are likely to remain in the public and political “consciousness” for some time. Furthermore, unsuccessful bioenergy systems with negative impacts can attract media attention. The weak understanding of bioenergy by the public and the media can also cause high susceptibility to oversimplified news. For example, the increased production of biofuels has been connected to food shortages on several occasions (in the food versus fuel debate). This connection is far from proven and very complex. However, it makes for “exciting” news that can shift the public and political “consciousness” on bioenergy. The bioenergy industry therefore needs to ensure that bioenergy systems do not directly (or indirectly) impact on food supply.

An underlying challenge for the bioenergy industry in some parts of the EU is that bioenergy is sometimes associated with developing countries. In other words, bioenergy is perceived as “a fuel of the past rather than a fuel of the present or future”.<sup>2</sup> A key area to persistently bring forward in the media is examples of the modern, efficient and advanced technologies and systems that are operating today in many parts of the EU. The bioenergy industry also needs to continually position itself as part of future energy systems, and at the same time highlight that it is growing and competitive today.

Klein et al. argue that NGOs are an important stakeholder for the social acceptance of the biorefinery concept in the EU.<sup>24</sup> Based on a survey of 7 NGOs in 6 countries in the EU, it appears that NGOs are actively monitoring developments in the field and they are already lobbying to influence future developments. At present, there is a diversity of positions held by NGOs on bioenergy. International trade of biofuels is a major issue on the agenda of NGOs (linked to labour conditions) as well as land use conflicts and impacts on food availability. Informing and engaging the general public is also raised as a critical issue by NGOs for the success of the biorefinery concept in the EU.<sup>24</sup>



## 2.4 What international efforts are underway to inform the general public about bioenergy?

Recently, a World Bioenergy Association (see <http://www.worldbioenergy.org/>) was formed, primarily because “the bioenergy business needs a voice on the international arena”.<sup>25</sup> This association recognises the intense debate about biofuels, and argues that bioenergy experts are not being heard in the media. Interestingly, the purpose of the association is “to create a body acting globally with a loud voice”.<sup>25</sup> This is a fairly explicit way of saying communication is a top priority. It appears that the “new” World Bioenergy Association will attempt to present stronger and more unified communication on bioenergy internationally. It is yet to be seen how the association will develop its communication processes and “influence” the media.

The World Bioenergy Association is in the process of establishing a web-based communication platform (called BioenergyConnect) to help business collaborate better, and to facilitate exchanges between researchers, authorities, organisations, buyers, sellers, investors and manufacturers. For example, the idea behind BioenergyConnect is that researchers in Australia working on biofuels for transport can find and communicate easily with authorities in Sweden, which have extensive practical experience with implementation issues. The use of a web-based portal to develop the connections between diverse stakeholders and create an online bioenergy “community” is a step towards improved communication “within” the bioenergy industry but also potentially “outwards”.

Launched in 2009, the Global Sustainable Bioenergy Project seeks to put aside what is the current reality and probability (in terms of development paths) and looks at what is physically possible for bioenergy (see <http://engineering.dartmouth.edu/gsbproject/>). So the point of reference is not the present but instead possible sustainable futures. The project has a broad group of stakeholders based on the idea that a wide cross-section of individuals and groups are interested in and affected by bioenergy development. The overall purpose of the project is to increase and broaden understanding about the physical potential of bioenergy around the world.<sup>26</sup> This project is focused on experts but will likely attract broader attention, including the media.

The Global Bioenergy Partnership (see <http://www.globalbioenergy.org/>) brings together public, private and civil society stakeholders in a joint commitment to promote bioenergy for sustainable development. It was established in 2005 by the G8+5 (Brazil, China, India, Mexico and South Africa). This partnership has developed a communication strategy to raise awareness and facilitate information exchange on bioenergy, in particular to show the importance of bioenergy as an opportunity for sustainable development.<sup>27</sup> With the backing of the G8+5, this partnership on bioenergy appears to be well-established and its communication efforts will grow.

Established in 2009, Bioenergy Promotion (see <http://www.bioenergypromotion.net/>) is an activity designed to promote the development of sustainable production and commercialization of bioenergy in the Baltic Sea Region in Europe. The Swedish Energy Agency coordinates the activity, which is a collaboration between 34 participating partners from 10 countries around the Baltic Sea Region. The activity highlights cross-sectoral and trans-national networking to facilitate information and knowledge exchange, as well as interaction and information dissemination through different communication channels to promote bioenergy.

Activities on the internet are also expanding, the International Energy Agency has developed an educational website on biomass and bioenergy (see <http://www.aboutbioenergy.info/>). Information on the website covers a broad range of topics from technologies to sustainability. There are also a few interactive features, such as “ask the experts” and a “biomass to energy calculator”. The Bioenergy Wiki (see <http://www.bioenergywiki.net/>) is another example. It serves as an open forum

to promote the utilization of bioenergy in a sustainable manner. It aims to advance understanding of relevant issues and facilitate sharing of information, views and experience. Bioenergy in Motion (see <http://www.bioenergy-in-motion.com/>) is an intriguing promotional effort – it aims to increase the uptake of new and innovative bioenergy heating and cooling technologies and systems in the EU in Bulgaria, the Czech Republic and Estonia in particular. To do so, it provides films on bioenergy to illustrate practical potentials and possibilities.

### 3 REFLECTIONS AND CONCLUSIONS

This perspective only begins to explore the linkages between the social acceptance and the political legitimacy of bioenergy, and the role of communication strategies. In an attempt to capture this complex area, this perspective introduces the concept of **bio-literacy**. Literacy means the ability to read, write, speak, and understand words. In this context, bio-literacy refers to the ability to understand the “language” of bioenergy systems, such as the benefits, trade-offs, technologies and resources. Of course, there are levels of literacy, ranging from no understanding to experts. In this case, the focus is on bio-literacy among the general public and opinion-formers (such as journalists in the popular media, political and business leaders, and NGOs).

The purpose of drawing attention to bio-literacy is to highlight the importance of knowledge, understanding and acceptance of bioenergy by the general public and opinion-formers.<sup>11</sup> Broadly speaking, in a democracy, government and industry depend on informed citizens and consumers to drive responsible, significant and sustainable solutions. But for bioenergy in the EU, most citizens are not well-informed.<sup>7,8</sup> Furthermore, as opinion-formers, journalists in the popular media, political and business leaders, and NGOs, are also in a position to greatly influence debates and perceptions about bioenergy. This perspective argues that the concept of bio-literacy therefore deserves further attention (see <http://bio-literacy.blogspot.com/>).

The starting point for this perspective was to explore and discuss the current social acceptance of bioenergy by the general public in the EU. Key points on the social acceptance of bioenergy in Europe include:

- There are very few EU projects that have explored and analysed the social acceptance of bioenergy and what role it plays in the implementation of bioenergy projects. This perspective strongly argues that this research “gap” will become increasingly problematic as the bioenergy industry grows across Europe.
- While renewable energy receives strong support in surveys of the general public in the EU, there is often a contrasting result for bioenergy. Wind and solar are often rated much higher than bioenergy despite the higher contribution of bioenergy to the energy portfolio in Europe.
- The social acceptance of bioenergy differs greatly from country to country in the EU. The reasons include cultural traditions, existing political, technical, social and regulatory structures, specific actor configurations, and previous experiences with renewable energy and bioenergy, among others.
- The bioenergy industry comprises a diverse range of feedstocks, technologies and stakeholders. The social acceptance of a certain technology or system does not imply the acceptance of another. A disaggregation of bioenergy options is a way of developing insights into the social acceptance of bioenergy.
- There is confusion and little understanding among the general public of the differences between biofuels for transport, namely first, second and third generation biofuels. This perspective suggests this may become a serious barrier, not just for biofuels utilised in transport, but for the entire bioenergy industry.

- Shifting from the EU to the context of the USA, Sovacool suggests that “a pernicious tangle of economic, political and behavioural obstacles” constrains the social acceptance of renewable electricity, and that improving public understanding of energy systems is a necessary foundation for change. This is an underlying challenge for all renewable energy.

In connection with the social acceptance of bioenergy, this perspective also highlights some of the key lessons from experiences with communication on bioenergy in the EU. Key points on communication strategies for bioenergy in Europe include:

- Based on the assessment of social acceptance of bioenergy in Europe, it is apparent that a one-size-fits-all solution to communication does not exist because of the diversity of feedstocks, technologies and stakeholders in the bioenergy industry as well as different contexts and situations.
- It appears necessary for proponents of bioenergy in Europe to repetitively use very specific and well-known language (for example, wood stoves, sugarcane ethanol or biogas plants based on agricultural residues) rather than abstract terms (such as bioenergy or biofuels) as well as develop “images” of bioenergy systems.
- In the case of small-scale technologies, communication strategies should focus on “consumers” and how to better market bioenergy systems. In contrast, large-scale technologies need communication processes that respond to the concerns of “citizens” and planning processes.
- End-users (whether they are individuals or organisations) who have invested in bioenergy technologies, and have had a positive experience, can become powerful “informers” or “communicators”. This links to a key issue for bioenergy that it is not just about what is being communicated but who is performing the communication.
- One-way communication from developers and investors to the public on bioenergy projects is often not sufficient because of complicated issues and multiple stakeholders. On the contrary, two-way communication that involves interaction with the general public and key stakeholders is needed to ensure feedback.
- One of the most vital forms of communication for the bioenergy industry is implementing “socially acceptable projects” that are “locally embedded, provide local benefits, establish continuity with existing physical, social and cognitive structures, and apply good communication and participation procedures”.<sup>15</sup>

While there is a growing recognition that public acceptability of bioenergy is important to the success of the bioenergy industry (particularly in terms of supportive policy schemes), there is a considerable research “gap” on how communication strategies can influence social acceptance. Broad surveys of the general public and more targeted surveys of key stakeholders as well as critical analysis and research both within countries and across the EU is required. Additionally, insights and knowledge from different fields, disciplines and contexts (such as the USA) can also help to improve understanding about this vital area for the on-going development of the bioenergy industry.<sup>28</sup>

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