



## **Case 10: Umbria local bioenergy projects**

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*Cultural Influences on Renewable Energy Acceptance and Tools for the development of communication strategies to promote ACCEPTANCE among key actor groups*

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## 1. Introduction

The case study is based on two reports: the first one considers three opportunity scenarios for the introduction of small-scale biomass gasification in Umbria, Italy: the 'Eco-city project in Umbertide', the 'use of waste of an industry (Aboca) in an industrial area', and 'a municipal district heating system'.

The second one aims to identify critical socio-economic factors, particularly regarding communication and stakeholder management, to facilitate bioenergy implementation in the Upper Tiber Valley of Umbria, in Italy. Bioenergy derived from biomass used in the production of energy. Biomass consists of biodegradable fractions of products, waste and residues from agriculture (including vegetal and animal substances), forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste. Biomass is a renewable energy source (RES), i.e. an energy source that does not rely on fuels of which there are only finite stocks.

## 2. Country overview

The energy situation in Italy is characterised by a high dependency on energy imports, including electricity imports. Domestic energy sources contribute to only 16.4% of total energy consumption. Electricity prices are the highest in the European Union, due to the low efficiency average value of Italian plant and for the massive use of hydrocarbon, which has relatively highest prices for thermal unit. More than 92% of total energy consumption in 2001 came from fossil sources, and prices for fossil fuels have been increasing. Fossil fuel prices are expected to continue increasing in the future, due to growing global demand and policy measures, such as carbon taxes.

In 2004, the needs of primary energy in Italy was strongly dependent from oil (45%), followed by gas (34%) and fuel (8.7%). The energy produced from renewable sources amounted to 7.2% of total energy consumption. At the same time, it was recorded a slight decrease of the oil consumption and an increase of coal consumption. The energy reliance from abroad is passed from 84.6% in 2003, to 84.7%, in 2004, along with a strong reduction in the domestic coal production for the same year (-35.6%). The growth of imports is 1.7% in 2003, even if the oil and electricity imports diminished in 2002 (-3.1 for oil imports, -10.5% for electricity).

The total costs of energy consumption in 2004 amounted to 2.2% of GDP; between 1980-1985 it was about 5% of GDP. In 2004 the energy consumption for industry was 28.9% of the total energy consumption. Particularly strong was the demand of electricity that amounted at 47% of total consumption for the sector. In the private sector the demand of energy has grown in the last years, recording a peak in 2003, with 6% of increase regarding 2002. In the 2004, the strongest component of the energy consumption for this sector, was electricity too.

To promote renewable energy production the Italian government in 1999 introduced 'The Green certificate system'. It means that all electricity generating or electricity importing companies have to assure a quota of 2% of new renewable energy on annual basis. If they can not cover this percentage with its own production, they have to cover it with the production of new green energy producers. The concept of new renewable has been defined in order to create incentives to incomers. Green certificates are given for each 100MWh produced within the first eight years of the plant.

The Law 1/06/2002 '*Ratifica ed esecuzione del Protocollo di Kyoto alla Convenzione Quadro delle Nazioni Unite sui cambiamenti climatici, fatto a Kyoto l'11 dicembre 1997*' asks for finding policy and measures finalized to reduction of emission by improvement of energy efficiency

of the domestic economic system and using renewable energy sources. According to Kyoto Protocol, in 2004 it was issued a law to regulate the greenhouses gas emission. The aims of diversification of energy resources, safety of energy provision and reduction of the energy costs are fundamental, especially for Italy that does not have many primary resources.

In 2005 the political debate in Italy focused on three areas: oil fuel and bio fuel, electricity production from renewable sources and energy saving. The decree n.128, according to 2003/30/CE directive on use of biofuel or other renewable fuels on the transport, aims to promote the use of such biofuel in substitution of gas in the transport. This decree is intended to achieve the aims of reducing the greenhouses emissions, of safety of energy provision and of promoting renewable resources of energy. It determined, by the end of 2005, the consumption of 1% of the biofuel in the transport and by the end of 2010 the percentage of 2.5. Moreover, it refers to the law 311 (30/12/2004), that provides incentives to the cultivation devoted to the production of biofuel.

### 3. Summary of the project

The Upper Tiber Valley is situated in the Province of Perugia, within the smallest region of Italy - Umbria. The major source of income for the region is agricultural activities, particularly tobacco cultivation. At the same time, in this region there is a surplus of agricultural land and forest left unmanaged and in general there is high rural unemployment. The economy of this small region will face difficulty in the next years due the gradual phase-out of EU subsidies for tobacco plantations. Also traditional crops like maize and wheat, with the new Community Agricultural Policy (CAP), will be no more remunerative. For both authorities and farmers it is therefore important to foresee the negative impact of these future changes upon the region. Hence, timely reconversion of some of the traditional activities, diversification of income sources and a shift towards other regional resources are expected to receive high priority in regional development plans.

The two research questions of our report, are “How could the conditions for bioenergy implementation in the Upper Tiber Valley of Umbria be described, such as drivers, barriers, opportunities or possible threats?” and “Who are the key stakeholders and how could they effectively be managed in a situation of bioenergy implementation, with specific attention paid to the general public’s acceptance?”

The case study is based on two reports: the first one looks at the socio-technical condition for the implementation of a bioenergy system with multiple benefits for local communities. The second one is focused on communication and stakeholder management. The study on bioenergy considers only the application of biomass for electricity and/or heat provision. The above reports combine primary data, such as observations and interviews collected during the fieldwork, with secondary sources, such as two previous reports, written by students from the IIIEE programme, and further relevant literature.

### 4. STEP ONE: Possible futures?

Several bio energy projects have been initiated in the region over the last decade; every time with a negative outcome due to various reasons. Often the general public’s strongly negative attitude toward the project has been the main obstacle and reason for interrupting the project. Another crucial element, as showed in Table 4.1, was a modification in national legislation: in 1995 a Biodiesel plant project was stopped, due to change in law. This failure provoked the impossibility to all investors to recovers all the financial resources.

Table 4.1 *Forms of participation in earlier project*

Year	Project	Failure
1995	Biodiesel plant Umbertide	Modification in national legislation.
1996	Biomass plant Umbertide - a 10 MW plant	Lack of financial support and political consortium.
1999	Private Biomass plant Terni - a co-incinerator Municipal Solid Waste.	Public opposition and spurting up public mistrust.
2001	Biomass plant Spoleto - a 10 MW plant.	Public protest that stopped the initiative after a few weeks.
2001-2003	Gasification plants Umbertide - a 2 MW small - scale gasification plant.	The municipality does not grant a license.
2004	Private biomass plant Nocera	Public protest.
2004-2005	Private biomass plant Aboca - use of herb residues as fuel for in-house heating	This plant could be used as 'show case' by authorities to spread trust among the public

The energy situation in Italy is characterised by a high dependency on energy imports, including electricity imports. Biomass is an important energy source from waste. This resource represents about 10.4% of primary energy globally consumed in the world. For Africa and Asia it represents a critical factor of survival because it covers respectively 38 and 45% of their energetic needs. For OCSE countries the use of this resources is not well developed and accounts for 3.5% of energetic needs.

Here below we analyze three different options for the implementation of a bioenergy system in Umbria. In doing so, a set of elements of analysis is identified that help to understand the potential opportunities and/or threats to the realization of the initiatives. The methodology used is the SWOT analysis. The first scenario is related to the Eco City Project that is part of a larger EU project. In the case of Umbertide one of the aims of the Eco city project is to turn the ex-industrial sites into a demo case for renewable energy technologies. It emerges from the analysis that stakeholders believe that linking the bioenergy project to the production of hydrogen could help to gain more public acceptance.

The second scenario is focused on Aboca, an industry that produces organic herbs. This company generates 630 tonnes of agro-residues per year and pay an external waste management company to process their agro-residues. The small-scale experiment conducted by Aboca is for the use of its agricultural waste as compost. The reason for this experiment is twofold: to avoid the cost of buying organic fertilizer and the cost of disposing of their agro-residues. Moreover, Aboca considered the utilization of its residues for several uses than simply energy, taking into account multiple options looking at long-term economic and environmental goals.

The last scenario is on Municipal District Heating System. The second report of reference aims to investigate on the factors that could facilitate the bioenergy implementation in the Upper Tiber Valley by reviewing all the past experiences and identifying critical socio-economic aspects. In doing so, it pinpoints all the elements that are relevant in terms of opportunities and to solve possible barriers.

## 5. STEP TWO: What were the various expectations of the case?

The two reports underline the possible consequences that derive from the initiatives related to the implementation of bioenergy system. There are several expectations from implementation of biomass system for the production of energy. First of all, this bioenergy meets the requirement

of environmental safety, related in particular to the carbon dioxide (CO<sub>2</sub>) neutral effect due to the CO<sub>2</sub> consumption by forests, neutralizing the gas emission released through the combustion flue gases. Moreover, bioenergy represents also a way to process agricultural and urban waste. On the other hand, there are some important consideration about costs of initial investment for conversion to a bioenergy system that is higher than that for fossil fuel based energy systems and some logistic challenges due to the high volumes needed for a profitable energy system.

Table 5.1 *Identification of stakeholder and their expectation in an implementation of bioenergy system*

Actor	Expectation/Fears	Speaking for ‘publics’
Consumers, i.e. communities	Mistrust toward bioenergy implementation	Social environmental and economic aspect of the bioenergy implementation
Fuel Suppliers, i.e. farmers, forest owners, saw mills	Option to diversify their business by including energy crops.	Energy crops as a new opportunity to complete outcome of tobacco plantation, not to replace; new form of economic development in the Umbrian region
Local Technology Supplier	Creation of new local supply chain	Support farmers that will decide in favour of energy crops
Public	Confusion between bioenergy with municipal solid waste, NIMBY (not in my backyard) Syndrome	Social environmental and economic aspect of the bioenergy implementation; job opportunity
Local authorities	New opportunities for business; creation of jobs; prestige for local communities.	Energy security; predictability of supply provision of energy; new form of economic development in the Umbrian region
Project developers	Expectations are the same of local authorities	New form of economic development in the Umbrian region
Media and NGO	Development and diffusion of information about initiatives	Energy security; new form of economic development in the Umbrian region

## 6. STEP THREE: Understanding ‘participatory’ decision-making: negotiating expectations

The reports on which the case study is based didn’t produces any data about the realization of the project they deal with. Due to the lack of any information about it, these reports focused on relevant aspects that have to be handled by the bioenergy project developers. Based on the past experience, the factors that emerge as the most relevant are related to communication strategy and participatory approaches to identify needs and to design and implement projects.

Any initiatives in the Umbrian region face the public’s high concerns over incineration. The experiences show that it is necessary for successful implementation to make any efforts to inform people that a biomass plant will not be a waste incinerator. Up to now, there was a positive initiatives that attempted to create a solid support to foster future development in this field: Table 6.1 points the main features of forms of involvement by relevant stakeholders in Umbria.

Table 6.1 'Attempts to improve participation'

Initiatives	Stakeholders	Forms of involvement
Ponti Engineering	Company that provides consultancy to other enterprises	Ponti Engineering could assist local project managers in new starting bioenergy projects. This will represent a great source of information.
Renewable Energy Showcase	City of Umbertide	Development of a renewable energy showcase that will represent a real life example of the potential for various renewable energy systems.
Agritourism	Aboca; Maridiana	The recent development of this form of tourism, could promote the bioenergy development. The biomass system could be seen to complement this activity.
Agenda 21	Administrations of: Città di castello, Umbertide, Gubbio, Gualdo Tadino	The aim of the Upper Umbria Forum is to create a network for environmental development in order to: pursue the scope of the Regional Agenda 21 for Upper Umbria within sustain development

As shown in the Table 6.1, there are several initiatives to promote the development of use of biomass as energy source. The main scope is to create acceptance to several degrees and to develop an integrated and coordinated approach. Due to this, it has been defined an agreed program between Municipalities and Mountain Community ('*Accordo di Programma tra i Comuni e la Comunità Montana*') that recognised the latter as a coordinator of this sector and the main responsible of a Plan for the development of renewable energies in the Upper Tiber Valley ('*Piano per lo sviluppo delle energie rinnovabili in Alto Tevere*'). It was created a technical board and, after important meetings and some preliminary documents, Mountain Community decided to redact a preliminary plan for the development of renewable energies in the Upper Tiber Valley ('*Piano Preliminare per lo sviluppo delle energie rinnovabili in Alto Tevere*'). This document plans a realisation of a 1.1 MWe power plant in Città di Castello, and 2-3 smaller plants in inland areas. It also foresees a Communication Plan, a Competence associated Centre and a Dissemination Centre.

For a successful bioenergy system implementation in Umbria, a selected group of stakeholders can be identified:

1. General Public
2. Suppliers
3. Local Authorities
4. Project Developers.

1. General public management is considered a critical factor for bioenergy implementation in Umbria. The role of project developer is to pay attention to handle the interests and the concerns, especially for local citizen. An information approach, i.e. an approach focused on the simple distribution of information, will not be an effective approach. A communication strategy must be established, involving a strategic coordinator that manages interaction between the selected parties, with the aim of building trust and allowing platforms for effective interactions. Also a facilitator must be selected in order to contribute to the trust building. The second report suggests the possibility of using two communication strategies: the first one is a low profile strategy: it is a data collection technique that aims to gain information about the general local citizens attitudes. The second strategy implies a participatory technique, where the local citizen themselves both identify and solve problems. This is a high profile strategy, where the scope is to identify problems and then develop potential solutions.

2. The other group of interest is composed by suppliers. This group is divided in:

- Bioenergy suppliers
- Technology suppliers.

These two subgroups have different expectations from the bioenergy project.

Suppliers are farmers, forest owners and local industries. The strategy for this group is the same as for the general public. The farmers can give their suggestions and solutions during ad hoc seminars, where they could find or explore benefits and opportunities of biomass supply chain. Technology suppliers are industries producing machine for tobacco cultivation. The linkage between those two subgroups, especially farmers and technology suppliers, is basic for the knowledge dissemination and for pushing initiatives among bioenergy suppliers. Moreover, technology suppliers have a different vision regarding to suppliers and are much sensitive to the changes and their benefits. Due to this sensitivity, a close cooperation between project developers and technology suppliers is strongly recommended in order to reach out a larger audience.

3. Local authorities are a central element of stakeholder framework, but their position is influenced by general public. The communication strategy to this group has to point to real advantages linked to bioenergy system implementation, that means a new local or regional economic development. The involvement of local authorities represents a useful support to project initiators, by gathering stakeholders at the same table for discussion, by informing the community about the initiative, or by engaging into Public-Private Partnership (PPP) initiatives. These actions turn into a decrease of the costs of bioenergy initiatives and at the same time it increases the trust and acceptance of the communities toward the projects.

4. Finally, the crucial element of the project is the project developer who identifies the key stakeholders and then manages all the stakeholder relationships. Particularly relevant is, as said above, the close cooperation that he takes with local authorities and technology suppliers.

## 7. STEP FOUR: From visions to actualities

The two reports do not focus on a specific form of implementation, but rather touch upon different options for implementation of bioenergy in Umbria. In particular, the second one considers potential forms of implementation: micro stove distribution and industrial establishment (as a demo case), combined heat and electricity (CHP); districting heating.

The relevant aspects concerning the realisation of a bioenergy system in Umbria occur in the following fields:

### *Establish good communication prior to the project's start*

Due to the presence of many stakeholders with different needs, it is very important building a good communication strategy for each group. The past experiences in the Umbrian Region proved that the opposition, especially of public, can be attributed to little information about benefits linked to the bioenergy projects. It is also necessary creating bottom-up initiatives, involving local communities. Building a show case could be a valuable demonstration of a bioenergy system and his potential benefits for all stakeholders.

### *Adopt participatory approach to identify needs and to design and implement projects*

The high concern over incineration is the main reason of the failure of the past initiatives in this region. Strong efforts must be made to ensure the public that a proposed biomass incinerator will not be a waste incinerator

### *Foster local authorities to assume leadership and responsibility for the project*

The role of local authority, as said above, is crucial in order to ensure the local population that initiative will not turn over time into a waste incinerator and that implementation will be transparent and based on broad public consultations. They can also contribute to a local sustainable development, allocating benefits to various stakeholders during the decision making process.

### *Start with supply chain creation*

This option is of strategic importance because it can transform local resources into capabilities, such as constructing a first biomass supply chain, by using the natural resources and mobilizing local human networks and know-how.

### *Treat the production and supply of biomass as an integral part of the project*

It is suggested to manage all the potential supply chain with a 'family approach', based on co-operation and strong communication. This means that every part of the chain is relevant and increased attention and communication efforts should be directed towards both ends of the supply chain: the consumers, general public and the biofuel suppliers.

### *Foster change of supporting legislation*

The harmonization of EU and Italian laws, policies and goals is crucial in order to developing biomass in Umbria. As noted above, it is necessary building an efficient system of incentives and financial mechanisms, explaining real differences between residues and waste and, finally, creating a cooperation among different levels of government.

## 8. Lesson learned

The main lessons drawn from these reports can be summed as follows:

### *1. Identify stakeholder*

- To help building trust and legitimacy.
- An internally designated or external facilitator can be used for strategic stakeholder management and facilitated implementation.
- Early involvement and liaison with local media, can help reaching out a larger audience with a positive message.

### *2. Build a show case*

- Different options for implementing bioenergy projects: from microstoves to a district heating network.
- Small initiative, implemented as a show case in one municipality that exhibits the least resistance.

### *3. Financing, risk sharing and trust could be created by public private partnership*

- Both reports we analyzed showed that strictly privately driven initiatives worry people due to the profit motive.
- This wrong message can cause a negative reaction that in the past led to a failure of such initiatives.
- A partnership with the local authorities can help project developers to overcome this mistrust.
- A Public-Private Partnership, along with a good planning project can be crucial condition for success.

The past experiences in Umbrian region, underline the need of a Coordinated Committee that could manage all the potential aspects/interests involved in the development of a renewable energy system. The involvement of all different stakeholders is essential to a successful implementation: this is the reason why the coordination is the only instrument to manage and monitor

every step of a biomass project. A coordinate Committee is also important to avoid wasting financial resources, needed to realise biomass plants, that could discourage, on the private side, the interest to be involved.

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