

The Bio4eco project in Abruzzo: prospects for renewable energy from biomass

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The Abruzzo Region's involvement

- The Abruzzo Region has joined the BIO4ECO project with great interest and a willingness to study and better understand the issue of renewable energies, especially those obtainable from biomass.
- Based on the indications provided by the Programme, an internal working group was set up, supported by external technical assistance, and the main stakeholders in the sector have been involved.
- The **stakeholder map** included in particular:
 - **The 4 Provinces** (L'Aquila, Chieti, Pescara and Teramo);
 - **Forestry consortia** (ForestAbruzzo, Colafor, Consorzio Forestale Alto Sangro, Consorzio Forestale Alto Gizio, Consorzio Forestale Maiella Ovest, Consorzio Forestale Colle Rotondo, Consorzio Forestale Subequano, Consorzio Forestale Le Valli dell'Orso, Consorzio Forestale Marsica Occidentale, Consorzio Forestale Gran Sasso Orientale, Consorzio Forestale Valle del Tirino)
 - **Poles of Innovation** (SMART - Polo Innovazione Energia Abruzzo)
 - **the National Organization for forest, environmental and agri-food protection "Carabinieri Forestali",**
 - **the National Agency for New Technologies, Energy and Sustainable Economic Development - ENEA,**
 - **the 4 Parks** (Parco Nazionale d'Abruzzo, Lazio e Molise; Parco Nazionale Gran Sasso e Monti della Laga; Parco Nazionale della Majella; Parco Naturale Regionale Sirente-Velino)
 - **Municipalities** (Sant'Eufemia a Majella; Collelongo; Popoli; Fontecchio);
 - **Regional departments directly affected by the project** (e.g. energy and forests, ERDF Managing Authority);
 - **Environmental Associations** (WWF, Legambiente)
- As foreseen in the application form, the Abruzzo Region actively participated in all the events that were organized in the Partner Countries with workshops, visits, seminars, etc.

The study visit in Abruzzo

- In March 2017 the Region organized a **STUDY VISIT in Abruzzo** during which partners and project stakeholders had a **first-hand experience on integral solutions for bioenergy policies and strategies**.
- This meeting began with a ***Good Practice Exchange Workshop*** to discuss issues related to the use of biomass that represents a problem in the local context.
- The debate held during this workshop led to the following conclusions:
 - the Abruzzo region has a good trend in the usage of **RES for energy generation**, overcoming the regional target at 2020;
 - **Electricity generation**: biomass gives very low contribution in Abruzzo Region;
 - **Thermal energy generation**: solid biomass is the principal renewable source mainly operating in small heating appliances (criticisms for air quality);
 - **District heating plants** could have a wider usage. One of the main barrier is the high entity of the investment costs.





The study

- Over the years the Region has had the opportunity to improve knowledge of this sector by:
 - a) following the overall functions and information within the regional structures;
 - b) acquiring other information from public and private subjects of civil society in Abruzzo. Therefore, it was possible to better understand the productive and socio-economic contexts involved in the production of energy.
- The results of these analysis have been included in the document **“Analysis of instruments finalized to the promotion of biomass energy production plants in the Abruzzo Region - State of the art on the use of woody agroforestry biomass for energy purposes in Abruzzo”** realized in 2017.



INTERREG EUROPE 2014-2020

BIO4ECO

Sustainable regional biomass policies – A game changer



ANALISI DEGLI STRUMENTI FINALIZZATI ALLA PROMOZIONE
DI IMPIANTI DI PRODUZIONE DI ENERGIA DA BIOMASSE
NELLA REGIONE ABRUZZO

*Stato dell'arte in merito all'utilizzo delle biomasse legnose agroforestali
per fini energetici in Abruzzo*

The impact of the exchange (i)

- We have increased knowledge in the meetings and exchanges with the partners of the Bio4eco project;
- We were able to verify the various developments in the production and use of energy obtained from biomass, greater in northern Europe and less in the south of our continent;
- In addition, different local forms of organization in each territory, following the existing regulations and specific territorial development conditions;
- We are aware of the positive implications on the socio-economic life of populations following the development of this specific production sector;
- The following good practices have been interesting for the Abruzzo Region;



The impact of the exchange (ii)



- The example of the **community of Vrasko in Slovenia**, a mountain area, with the project that aims at energy self-sufficiency from forest biomass, combined with photovoltaic systems. All this by improving air quality, creating new job opportunities, the necessary communication to citizens and therefore a real local sustainable development;
- The case of the **National Association of Forest Municipalities in France**, rational planning and involvement which are able to determine territorial development by also exploiting forestry as a lever for local development. Dialogue and correct communication represent fundamental tools for participation and acceptance by the many expressions of civil society.



The impact of the exchange (iii)

- The **Rambouillet forest** (FR) is an admirable example of the usability of the forest for citizens by the almost didactic demonstration of sustainable forest management methods and the overall benefits that can derive from it for the entire society;
- Of great relevance the example conducted by **Catalonia** in organizing the general planning of forest management with the optimization of wood products that are paid for on the basis of their quality and well as the correct classification between wood for use and for biomass. An overall planning that certainly creates new jobs and reduces carbon emissions. Participation of forest municipalities, creation of a virtuous circle and zero-kilometer bioenergy production;
- The examples of **Latvia** with studies on functional land use based on computerized analyses and maps and the involvement of many public and private stakeholders interested in and beneficiaries of bio-economy policy are very interesting, but impractical for us.
- As well as **Finland, eg. with the case of the Sirkkale Energy**. A Park in which take place the production and management of renewable energy from biomass and the creation of synergies also with tourism, with research, using ERDF fund.



What should be done in the Abruzzo Region

The potential availability in Abruzzo is considerable. In fact 40% of the territory is a wooded area and so far only less than 10% of the annual increase in wood mass growth of the woods is used for energy purposes and even less than the wood of agricultural tree crops. However, **in recent years the quantities of energy produced by biomass have not increased for several reasons:**

- the excessively **conservative management policy** of our woods, given the large territory that is included within the Natura 2000 Protected Areas;
- the **partial presence of detailed forest planning** (mostly public 57%), which made it difficult to plan a reliable and certain forest biomass supply over time by private and / or public entities interested in the development of the sector;
- the awareness that the development of a really short wood-energy supply chain is able to **bring benefits under multiple aspects**, not only economic but also environmental and social, such as the creation of direct and indirect jobs, the revitalization of companies and consortia forestry, the care and maintenance of the woods and greater prevention of forest fires. In addition, make the energy autonomy (heating) of the internal areas without having to build gas pipelines;
- the **opportunity for the public administration** to organize the wood-energy supply chains both in the forestry and in the agricultural sector;
- the **excessive distrust of the population** regarding possible environmental pollution and therefore the dangers to people's health due to wood combustion, unfortunately due to the limited correct information.

Significant elements

- The specific information acquired in the recent years have allowed us to verify that some plants have been built **without the use of the best technologies and / or with the use of improper, polluting and dangerous fuels;**
- Furthermore, **the specific knowledge of innovative technologies in equipment and plants is not widespread and still needs improvement;**
- More importantly, **the dissemination of knowledge and the function of the local media are limited** for this sector and often oriented against the use of biomass.



The potential of biomass use in the Abruzzo Region

- Few hundred of the municipalities of the Abruzzo region fall into climatic bands E (40.3%) and F (9.8%) and about fifty of them (falling into climate band E) are not yet served by a network of distribution of methane gas that covers all urban centres;
- Thus, **the potential and vocation of the inland areas of the Abruzzo region seem to be able to direct towards the construction of biomass district heating and / or cogeneration plants**, of adequate power to the territories that would host them, (for example 1MWt can heat from 150 to 200 housing units);
- Similar to the numerous experiences that have taken place in northern Italy, finding the right balance between the **best efficiency in terms of efficiency and emissions into the atmosphere of large plants with the size and relative biomass requirements suitable for a solid biomass supply model territorial scale** (very short supply chain).

The Good Practices in Abruzzo

Thanks to the exchange process within the BIO4ECO project, the Region identified two Good Practices

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1) Forest biomass plant for the production of thermal energy in the school building located in the Municipality of Collelongo (AQ).

This example demonstrates the convenience to develop production, especially for thermal energy, by supplying the chopped material from the woods next to the plant and by using modern technologies, together with public incentives.

An example of a virtuous supply chain cooperation created in a mountainous area, both sustainable and economically convenient. Power of 150 kW, transferable, realized by funding of the Measure 4.1.2 (POR FESR 2014/2020)



The Good Practices in Abruzzo

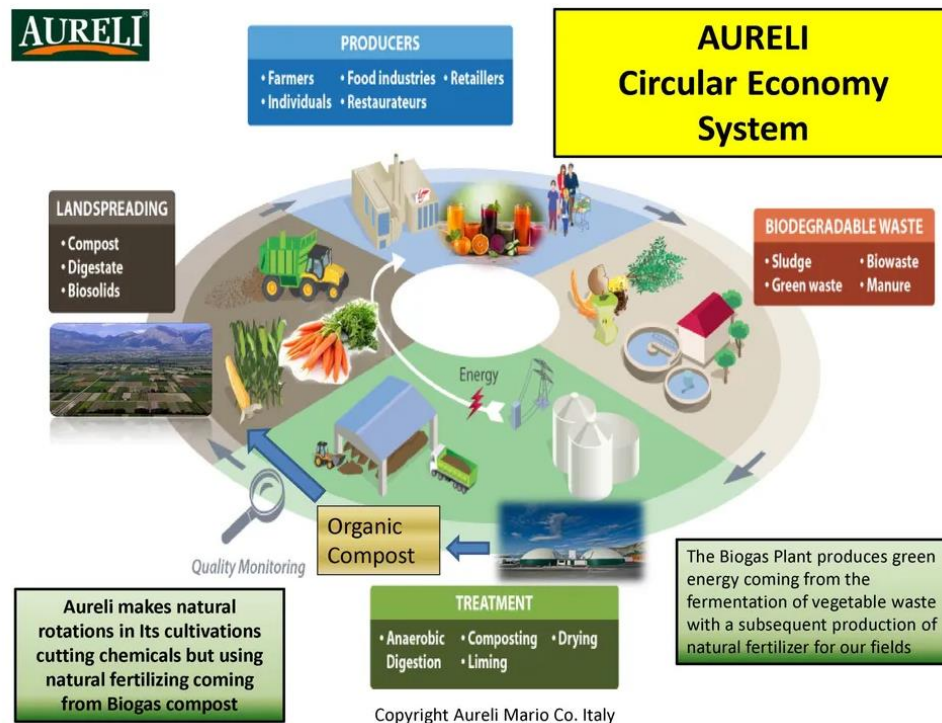
2) Agricultural biomass system for thermal, electric and biogas energy production - The Aureli Mario company

The Aureli Mario company, located in Ortucchio, for about 50 years has been cultivating carrot large surfaces in the Fucino area with its ever-expanding crop.

In 2010 the company adopted an impressive biomass energy plant from renewable sources, creating a plant for the production of electricity and thermal energy.

The plant is powered by the by-products of the company and is integrated with dedicated crops used for agronomic rotation.

The final digestate, being an excellent soil improver, reduces the consumption of farm fertilizers by 50%. The water used for the various processes, purified, is reused to irrigate the farm land and the organic material obtained from the treatment goes to the anaerobic digestion, also producing biogas. The water obtained from the evaporation of carrot juice or other vegetables is also re-used in steam boilers.



The plant now allows to have 100% of the electricity and 25% of the heating needed for the transformation processes of the company, allowing, in addition, to reduce the contribution of 50% purchased fertilizers

The Action Plan

- **ACTION 1** - FINANCIAL MEASURES IN SUPPORT OF BIOENERGY DEVELOPMENT IN ABRUZZO - ERDF AND PROGRAM AGREEMENT BETWEEN ABRUZZO REGION AND STATE;
- **ACTION 2** - INTERVENTIONS FOR PRODUCTION OF RENEWABLE ENERGY FROM AGROFORESTAL BIOMASS (2014-2020 ABRUZZO REGION RURAL DEVELOPMENT PLAN MEASURES);
- **ACTION 3** - ORGANIZATION OF THE WOOD ENERGY CHAIN IN THE FOREST SECTOR IN ABRUZZO AND IN THE MANAGEMENT OF THE URBAN GREEN AREAS;
- **ACTION 4** - ORGANIZATION OF THE WOOD ENERGY SECTOR IN THE AGRICULTURAL SECTOR;
- **ACTION 5** - INFORMATION CAMPAIGN TO INTERESTED CITIZENS AND PARTIES.



Action 1

FINANCIAL MEASURES IN SUPPORT OF THE BIOENERGY DEVELOPMENT IN ABRUZZO - ERDF FUND AND PROGRAM AGREEMENT BETWEEN ABRUZZO REGION AND THE STATE

Planned actions	Achievements
<p>Funding of plants with power over 35Kw (generally from 130 to 500 Kw) for the production of biomass chipped material from:</p> <ul style="list-style-type: none"> • Woody plant material deriving from forest-cultural interventions, forest maintenance and woody and shrub pruning; • Woody plant material deriving from dedicated crops; • Products deriving from agro-industrial processing activities; <p>With funds from the REBIOS project and the ERDF Regional Operational Programme (Axis IV Measure 4.1.1) Beneficiaries: Municipalities</p>	<p>About thirty plants were financed, mainly built by the municipalities for heating their premises</p>
<p>Financing with 2014-2020 ERDF ROP - Interventions to reduce and optimize energy consumption (Smart building) and polluting emissions.</p>	<p>More than 100 interventions funded. The financial endowment is about 7 million euros.</p>

Action 2

INTERVENTIONS FOR PRODUCTION OF RENEWABLE ENERGY FROM AGROFORESTAL BIOMASS (2014-2020 ABRUZZO REGION RURAL DEVELOPMENT PLAN MEASURES)

Planned actions	Achievements
<p>Monitoring the management of the 2014-2020 Rural Development Plan Measures in reference to Regulation 1305/2013 and in particular of:</p> <ul style="list-style-type: none"> ➤ M4.1 - intervention 4.1.1 "Support for investments in agricultural holdings aimed at improving profitability": construction of biomass thermal plants for production of renewable energy for corporate self-consumption. The expected sources of supply are agricultural and forestry by-products. ➤ M4.2 - Intervention 4.2.1 "Investments for the processing and marketing and development of agricultural products" : investments to improve energy efficiency, also through the production of renewable energy from biomass for self-consumption; the supply must be from agricultural, forestry and agri-food products or by-products without activating dedicated crops ➤ M7.4.1 - "Investments in the creation, improvement or expansion of basic services for the rural population" : investments related to the construction of public plants for the production of energy from renewable sources that use natural resources present in rural areas. Specifically, financing for structures, equipment, systems, furnishings, instruments. Specific interventions for wood chip or pellet-fired boiler stations, including, if necessary, district heating networks or simple heat distribution to buildings. 	<p>Calls still to be launched or under development</p>

Action 3

ORGANIZATION OF THE WOOD ENERGY CHAIN IN THE FOREST SECTOR IN ABRUZZO AND IN THE MANAGEMENT OF THE URBAN GREEN AREAS



Planned actions	Achievements
<p>Organization of meetings with the aim to promote collaboration between institutions, economic and social categories in order to launch the development of the supply chain and favoring the creation of local short supply chains:</p> <ul style="list-style-type: none"> ➤ Meetings with Municipalities and the “Separate Administrations of Assets for Civic Use” (ASBUC) ➤ Meetings with managing bodies of parks and protected natural areas ➤ Meetings with industry operators 	<p>Organization of two meetings:</p> <ul style="list-style-type: none"> • 1° June 2019, in Villavallelonga (AQ), where BIO4ECO Action plan as well as the knowledge and experience gained through workshops, study visits and exchanges between the partners have been illustrated; • 28° February 2020 at the seat of the Abruzzo region with the main BIO4ECO stakeholders to verify the implementation of the project Action Plan

Action 4

ORGANIZATION OF THE WOOD ENERGY SECTOR IN THE AGRICULTURAL SECTOR

Planned actions

Organization of meetings with the economic sectors:

➤ **Meetings with vine-sector**

In cellars the energy needs, both thermal and electrical, are important for the different rooms and for the management of the mechanical processing processes and that the costs are very significant. Then the Region planned to organize some local meetings to discuss opportunities, the new operational organization in the field and in the cellar, in the virtuous consideration that these paths would lead to autonomy from external energy dependencies, with a reduction in environmental pollution and also, probably, with some savings.

➤ **Meetings with olive tree sector**

In consideration of the need for energy, electricity and heat for oil mills for the transformation of olives into oil, it has been planned to organize some meetings in the area, especially where olive growing was more concentrated, to discuss with olive growers and oil millers about the considerations and advantages deriving from renewable energy sources and therefore the possible recovery and destination of pruning residues.

➤ **Meetings with urban greenery**

The availability of large quantities of various wood with the pruning of urban greenery makes its recovery and therefore its use for energy purposes quite easy. It was then proposed to carry out communication / information actions towards the municipal administrations to sensitize them to these problems and the new opportunities for the community.

Achievements

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16-17

Organization of one meeting:

- 29° November 2019 in Tortoreto with the Local Action Group "Terreverdi Teramane", where participants have been informed on the opportunities to switch to the production of energy from renewable sources, with the use of biomass.

Two additional seminars had been planned (with the LAG Terre Pescaresi and the LAG Majella) during in spring-summer 2020, but due to the Covid-19 restrictions they could not be held.

Action 5

INFORMATION CAMPAIGN TO INTERESTED CITIZENS AND PARTIES

Planned actions

Information campaign aimed at overcoming the widespread scepticism among the population of a possible construction of an energy production plant powered by biomass in their territory.

Publications on the use of biomass to produce thermal, electrical and biogas energy may concern:

- ✓ **regulatory aspects.** The most important aspects of the main European, national and regional standards concerning the use of renewable sources will be summarized and commented;
- ✓ **technological solutions.** Information will be provided relating to the high technological level achieved by the systems capable of reducing and / or eliminating environmental pollution;
- ✓ **short supply chain.** The possibility of creating a short chain in the agricultural and forestry sector will be illustrated in Abruzzo.
- ✓ **Interviews with biomass plant managers.** Interviews will be reported with managers of biomass plants already operating in the area who carry out the short supply chain.

Achievements

Communication and information activities on the Regional website

<http://www.regione.abruzzo.it/content/bio4eco-sustainable-regional-biomass-policies-game-changer>

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CONCLUSIONS

- The Abruzzo Region in 2019 incurred in a **radical change in the political government** which actually affected the achievement of the initially planned project outcomes. Due to this political change, the measures that can really change the previous policies are being defined, also with regard to the management of renewable energy. At today, a first program has been defined which envisages increasing the production and consumption of already existing renewable energies in Abruzzo (hydroelectric, wind and photovoltaic).
- The Abruzzo Region **exceeded the forecasts of energy consumption from renewable sources** established by the Ministerial Decree of 15 March 2012. Even more significant is the data relating to the share of gross final energy consumption covered by RES (%) which, for the Abruzzo Region reached a level of 26.4% in 2018 against a target set in the DM equal to 15.9% for 2018 and 19.1% for 2020. The Region also initiated actions for the preparation of the regional plan for adaptation to climate change and sustainable development.
- Finally, the Region still suffers for **problems of raising awareness on the use of agroforestry biomasses** which, despite the communication activities carried out in the project, have not yet been overcome, besides conservation policies for the natural forest, also to better guarantee the survival of flora and fauna. The Abruzzo region has about 40% of the territory in Protected Areas - Natura 2000.



EU Recovery and Resilience Facility

RECOVERY AND RESILIENCE FACILITY:
HELPING EU COUNTRIES TO COME OUT OF
THE CORONAVIRUS CRISIS STRONGER
#EUSolidarity #StrongerTogether

- Within the **National Recovery and Resilience Plan** of investments to make the Country more resilient, that shall be financed within the EU Recovery and Resilience Facility, the Abruzzo Region is going to propose, among the others, a project on the **sustainable management of forests and tree crops for the use of by-products (biomass) for energy purposes**.
- This project stems from the need to **increase the production and use of energy from renewable sources and to preserve the natural heritage** to mitigate environmental pollution by financing **interventions aimed at using any by-product of forest origin**, deriving from authorized cuts (logs, twigs, etc.) **and by-products from agricultural tree crops** (pruning of olive trees and vines), to be used as fuels from renewable sources, for the production of thermal and electrical energy in modern technological systems that minimize emissions into the atmosphere.
- **Planned actions:**
 - A) Timely verification / updating of the potential availability of wood of forest, agricultural and urban origin;
 - B) preparation and initiation of awareness raising towards institutions and citizens;
 - C) better organization of the wood-energy supply chain;
 - D) programming of EU ERDF and EAFRD funds for the appropriate measures to be implemented and therefore the resources that will be available.
 - E) Management of planned interventions (request and financing for the purchase and installation of systems and small heat distribution networks;
 - F) periodic verification of the implementation of the program.