



KOALA Projects



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BioRural - Castelfranco in Miscano

Circular economy and quality of life



Castelfranco in Miscano is a small village in the **province of Benevento** with just over 850 inhabitants...

The municipality is renowned for its unique production of **caciocavallo cheese**. This area is characterized by its rich pastoral traditions and high-quality dairy farming, which contribute to the distinct flavor of the cheese.

Caciocavallo from Castelfranco in Miscano is typically crafted from cow's milk, following **traditional methods** that have been passed down through generations; the cheese is noted for its smooth texture and slightly tangy taste, making it a celebrated product in Italian gastronomy.



BioRural - Castelfranco in Miscano

The **BioRural** project aims to establish a virtuous circular economy system that enhances the quality of life in Castelfranco in Miscano.

In fact the project is designed to integrate sustainable practices and modern technology to benefit the local community: by focusing on circular economy principles, it will **leverage local resources to create economic and environmental improvements.**

The planned Interventions are:

1. **Biogas Plant**, utilizing livestock waste to generate renewable energy
2. **Wellness Spa**, offering a wellness center for residents, enhancing local quality of life
3. **Renewable Energy Cooperative**, establishing a cooperative energy community involving local farmers to promote sustainable energy use.



BioRural - Castelfranco in Miscano

1. Biogas Plant

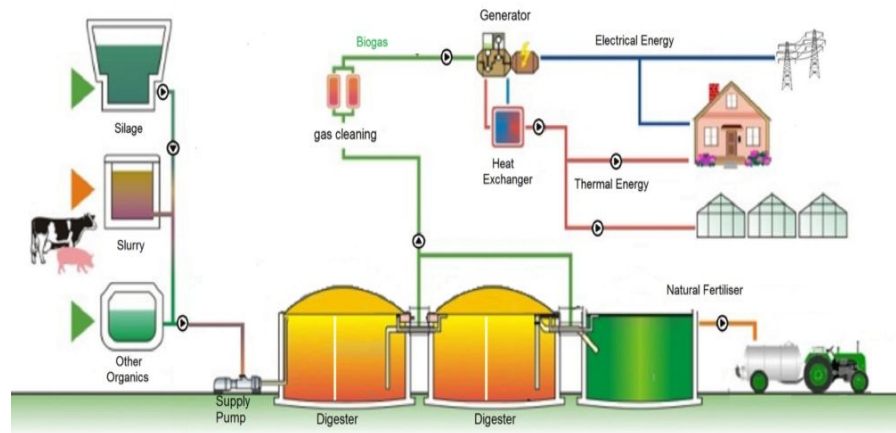
The project involves **converting livestock waste and dairy waste into biogas** through the use of an anaerobic digester.

The purified biogas will subsequently be used to power an internal combustion engine from which it will be possible to obtain **electricity** (approx. 100 kWh) and **thermal energy** (approx. 200 kWh).

The digester, on the other hand, offers the **digestate** as process "waste". This product can be used as a fertilizer for soil as it is rich in nitrogen, phosphorus and nitrates as well as offering the possibility of restoring some characteristics of the soil to better retain water.

The project involves the involvement of the **University of Sannio** as a technical support partner.

Biogas Plant Overview





2. Wellness Spa

The project involves the enhancement of **thermal energy** produced by a cogeneration plant, which will be partially used for self-consumption and partially to **power a small thermal center** located near the plant. The thermal energy, which is usually wasted, will be recovered and used to heat the pools and facilities of the thermal center, thus providing an additional service to the community.

This intervention not only improves the energy efficiency of the plant but also promotes personal well-being by creating a place of relaxation and care **accessible to local residents**.

Moreover, the establishment of this new commercial activity in the area will contribute to creating **new jobs** for local citizens and **increase the tourist flow** related to this activity, further **stimulating the local economy**.





3. Renewable Energy Cooperative

The **energy cooperative project** represents an innovative model of integrated management of energy resources and local activities. At the heart of this initiative is the creation of a local energy community, which uses a biomass power plant to produce sustainable energy. The cooperative not only manages the production and distribution of energy, but also handles the sale of digestate, a by-product of the biomass process that can be used as a natural fertilizer, thus contributing to the area's circular economy.

The legal form acts as a single regulator and coordinator, centralizing operations and facilitating collaboration among the various actors involved. This synergistic approach **optimizes resources, reduces operating costs and improves overall system efficiency**. The cooperative promotes the active participation of community members, enabling them to be an integral part of the decision-making process and directly benefit from the economic and environmental outcomes of the project.

In sum, the energy cooperative is not only a step toward energy sustainability, but is also a local economic development model that enhances the area's resources, creates jobs, and promotes community well-being. This integrated project demonstrates how collaboration and centralized management can lead to significant and lasting results.

02

Water based Energy and Wellness Community - Cassano Irpino

Nature and Biodiversity

Cassano Irpino is a small municipality of 975 inhabitants in the rural area of **province of Avellino**. This village is renowned for its abundant **water resources**, which are a defining feature of the town. It is home to several **natural springs**, including the significant **Peschiera Spring**, which supplies drinking water to much of the Campania region. The town's water is famed for its purity and quality, making it a **vital resource for both locals and the surrounding areas**.





Water based Energy and Wellness Community - Cassano Irpino

The **Water-Based Energy Community** project in Cassano Irpino is designed to **address pressing environmental challenges** while **fostering community involvement**.

The central objectives of this initiative are to **restore local ecosystems** and **halt the loss of biodiversity**.

At the same time, the project is committed to advancing sustainable energy solutions that benefit both the environment and the community.

To achieve these goals, the planned several key interventions are:

1. **Rigeneration of Center and creation of a "Water Path";**
2. **Wellness center and revitalization of the Historical Road "Cupa Romana";**
3. **Creation of a Biolake and construction of a Hydroelectric Plant.**



Water based Energy and Wellness Community - Cassano Irpino

1. Regeneration of Center and creation of a “Water Path”

Two projects for urban **redevelopment** aimed at addressing hydrogeological instability have been planned and funded. These projects will create public green areas with staircases linking the historic center to the natural swimming pond.



The natural swimming pond will be located near a **wellness center**, which is already funded and under construction. This center will allow people to enjoy services in complete **synergy with the ecosystem created in the biolake..**



Water based Energy and Wellness Community - Cassano Irpino

2. Wellness center and revitalization of the Historical Road “Cupa Romana”

The connection between the natural swimming pond and the hydroelectric plant is ensured by the redevelopment of an ancient Roman road called “**Cupa Romana**”, for which the design has already been completed.

The road will therefore be an active part of the **water path**.



Near the hydroelectric plant is a **public sports center**, which is also already funded for redevelopment. The facility will be linked to the rest of the water pathway.



Water based Energy and Wellness Community - Cassano Irpino

3. Creation of a Biolake and construction of a Hydroelectric Plant

The project involves creating a **natural swimming pond** that integrates seamlessly with the environment, offering an eco-friendly and sustainable bathing experience. With a variable surface area and a depth of **1.5-2.5 meters**, it will be divided into a bathing area and a regeneration zone.

The latter will feature aquatic plants for phytoremediation, maintaining water quality without chemicals. The system will include **biological and mechanical filtration with low-energy pumps**. Natural materials and biodiversity will enhance aesthetic and ecological integration. Minimal maintenance, including plant pruning and filter cleaning, will ensure clean, safe water, complementing facilities like the wellness center and hydroelectric plant.



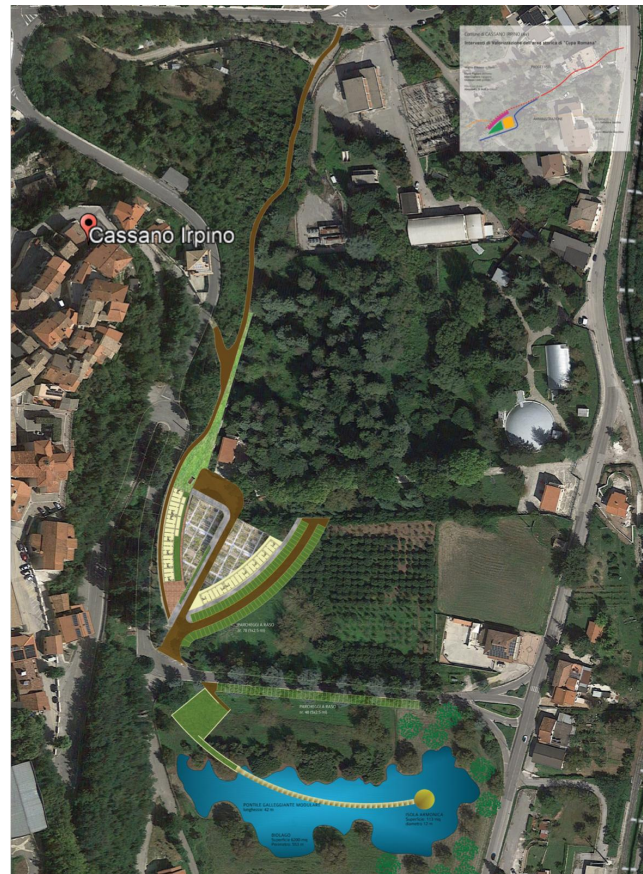


Water based Energy and Wellness Community - Cassano Irpino

A **100 kW** hydroelectric plant will be developed, utilizing natural flow from the Cassano spring to the Calore River. This plant will supply energy to the village renewable community, which already



benefits from two **geothermal plants at the municipal pool and a school**. The plant includes a turbine and generator system designed for high efficiency and low maintenance. Water will be diverted through a channel to the turbine, which will convert kinetic energy into electrical power. The plant will operate without large reservoirs, relying on the steady, natural flow of the river.





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