

Italy

Ostana is an Occitan village in the upper Po valley in the province of Cuneo in Piedmont. It is included in the list of the most beautiful villages of Italy, created by ANCI (the Association of Italian Municipalities Tourism). In 1921 the village declared 1187 inhabitants, today it counts 85 people, a number rising again since 2001 thanks to the Local Authority and community effort into revitalising the village. Ostana has been able to revert the population trend and start its return to a thriving community exploiting its rich cultural heritage (the Occitan language and culture, the favourable position facing the iconic Monviso mountain): initiatives linked to this heritage, attracting returning visitors and providing work opportunities include rural festivals but also the Premio Ostana, an international literary prize of protected and minority languages, a film school and festival, reliving of ancient traditions (bread cooking, hemp spinning), reopening of shops, collective care of the mountain environment, the hosting of university level courses (architecture, sustainability). In front of the town hall the Occitan flag is waving as a real sign of a linguistic tradition that is still alive. In the last years a careful planning and architectural renovation has changed Ostana into a small laboratory of new alpine architecture respectful of the traditions and environment, where modern buildings, constructed using local materials, are integrated in the traditional rural environment taking into account that the site where Ostana lies is a UNESCO candidate site.

Ostana ambition is to turn the Ambornetti hamlet, part of the Ostana municipality at 1620 m above sea level - now abandoned -, into an albergo diffuso with a prestigious restaurant, a wellness centre, co-working spaces and a small farm producing high quality local dairy products and high value produce. This structure will be 100% sustainable thanks to high tech solutions that will allow to generate thermal energy while locally treating residual solid waste and biomass arising from wood maintenance and agricultural activities and to obtain drinking water from rainwater thanks to plasma technology. Moreover, Ambornetti hamlet will be a completely autonomous, off-grid development through the installation of renewable energy solutions: photovoltaic panels and small scale wind turbine for production of electric energy, stored with innovative hydrogen based batteries, and solar thermal systems. Geothermal energy technology, hydroelectric stations and sewage sludge digesters will also be used.

Ostana is looking for a consortium of other entities involved in cultural-led regeneration as exemplar or follower depending on the level of development of the other partners.

Topics

SC5-21b-2017:

Cultural heritage as a driver for sustainable growth (b) Heritage-led rural regeneration (IA)

Info.

IRIS is connected to a network of research and industry partners each offering advanced water treatment technologies suited to treat industrial/domestic water with recalcitrant, difficult to treat pollutants and microbial contamination at a small scale. The treatment technologies available include:

- direct electric discharges in water and other advanced oxidation processes for water sterilisation,
- advanced photocatalysis to enhance the biodegradability of emerging and recalcitrant pollutants,
- nanofiltration to retain most of the common organic pollutants and to reduce the concentration of polyvalent ions in water,
- solar-photo-Fenton-AOP used to completely mineralize the organic pollutants,
- photocatalytic nanoporous adsorbent module e.g. for removal of mixtures of different dyes,
- microwaves for the removal of persistent organic pollutants.

Each technology is developed in modules that can be combined to best suit the type of pollution and the expected level of water purity requested as output, with recovery of valuable compounds where possible.

The ideal application of our suite of technologies is the use of alternative sources of water. Mains water is often of higher standards than required by the users (e.g. drinking water for washing of non-food plants), so it is over engineered. Often, other sources of water are available locally, be it collected rain water, wastewaters from nearby users (e.g. grey water from domestic use), small wells, water too expensive to treat in large volumes, like brackish waters. Furthermore, in a symbiotic approach, other water users are available and might be able to use any waste water that might not be recyclable within the plant, including agriculture. So there is an opportunity not only to seek out the closest water source to be treated exactly right for the needs but also the closest user of those water flows that cannot be used internally. In an integrated water management, wastewater can be treated to become the feed of a nearby factory or as irrigation water, while respecting the current regulations and standards.

The ideal test ground and demonstration pilot that we are searching for is a cluster of companies located in the same area, an industrial or commercial complex, or even a small city district where the water resources are used for different applications and where the water used for one application could be treated and re-used for a different purpose. For example, cooling water from a biomass power plant could be used by a nearby industrial laundry; organic compounds rich (or enriched through concentration processes) water would benefit local cultivations providing both nutrients and irrigation.

Topics

CIRC-02b-2017:

Water in the context of the circular economy (b) Towards the next generation of water systems and services; large scale demonstration projects (IA)

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