

Industrial Energy Cooperation Solutions in Italy: a case study

Italian legislation is aligned with the main EU requirements with respect to energy efficiency topics. Transposition of the latest Directives under the Clean Energy Package is ongoing. Italy has also recently submitted its National Energy and Climate Action Plan until 2030, which identifies citizens and businesses as key players and beneficiaries of the energy transition. Despite the efforts, the energy cooperation topic is not clearly defined in the regulatory framework and energy cooperation in industry represents a strategy that needs to be further implemented. S-PARCS aims at providing concrete solutions to overcome these barriers. We provide policy recommendations on the theme of energy cooperation, based on real experiences from our Italian Lighthouse industrial park.

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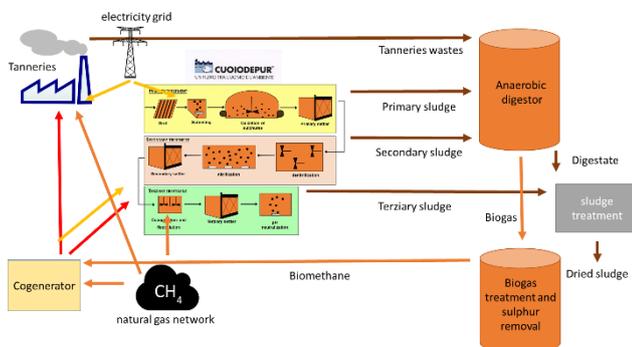
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Background

The energy cooperation solution analysed as real case-study in Italy is evaluated for Ponte a Egola, an industrial area mainly composed of several tanneries and a shared wastewater treatment plant, managed by Cuoio depur.

The solution foresees the development of a Combined Heat and Power (CHP) plant designed to use biogas (and further biomethane) yielded by the anaerobic co-digestion of vegetable tannery sludge to produce heat and electricity for the tanneries, for the wastewater treatment plant and for the grid if in surplus. The CHP plant is planned to be connected to already existing infrastructures – in terms of industrial area heating pipelines – to transport heat from Cuoio depur to tanneries. This infrastructure is already connected to another pre-existent CHP facility that is not running nowadays. Also including the potential installation of additional small CHP plants to balance the whole network and limit natural gas is under study.

Energy cooperation solution schematic



Depending on the actual configuration that will be implemented, it may be possible that an amount of energy surplus energy (electricity and/or heat), will be generated. Stakeholders involved may have the interest to sell the energy surplus in order to maximize the

profits for the investment and to establish a convenient trade.

The policy challenges

This solution has a significant degree of complexity, considering the number of actors involved and the high investment costs expected. The policy challenges met for the development of the solution affect different aspects of the solution.

First of all, the selling of self-produced energy is subject to regulatory and economic constraints. The selling of thermal energy to the district heating network already existing in Ponte a Egola – privately owned is legally feasible (cfr. D. lgs. 102/2014). The manager of the network is then entitled to sell the thermal energy to the tanneries or to other end-users connected to the grid. The existing bottleneck to trade thermal energy is the selection of proper tariffs, which guarantee profit for the district heating network manager on one side, and on the other side guarantee a decrease in water treatment costs borne by the tanneries due to a reduction of energy costs for the waste water treatment plant thanks to the increased efficiency of the CHP plant. Conversely, the selling of electricity surplus directly to the tanneries from the CHP plant is not allowed in the current regulatory framework, which foresees the self-consumption only on behalf of the owner of the energy plant. This situation is also being complicated by the fact that the CHP plants owned by Cuoio depur are – in turn – indirectly owned by the tanneries, which have shares of Cuoio depur and who would be the end-users of the electricity surplus.

As for using activated sludges from Cuoio depur and solid wastes (fleshing, etc.) from tanneries for biogas production, the **main barrier is related to the concept of “End of Waste”, regulated both at national and European level.** Indeed, wastes and sludges to be sent to treatment facilities (that remove waste and moreover produces energy) in theory need to follow the rules of waste management and tracing of wastes that could

hinder the adoption and operation of this energy cooperation solution.

Finally, the **uncertainty and gaps of the current legislative framework in the field of energy cooperation and the related bureaucratic obstacles** act as barriers for the realization of the project.

Solutions and Policy Recommendations

Multiple instruments to tackle the existing bottlenecks have been identified in the project.

In October 2019, the consortium of the tanneries of Ponte a Egola signed an agreement with the Tuscany Regional Authority to boost circular economy and to support its energy cooperation strategy. This direct agreement with local/regional entities is an important tool to tackle bureaucratic obstacles and fasten the adoption of energy cooperation actions, facilitating connections between the industrial area and regional government and/or local authorities. Finally, it reduces risks related to the uncertainty and fragmentation of legislation and Not-In-My-Backyard protests.

With reference to the possibility of selling the electricity produced by the CHP plant to the tanneries, an official request to the national authority in charge was made at the initial stages of the project and the possibility of involving an ESCO was taken into consideration, as this is a general instrument identified to overcome non-technical barriers in the project (cfr. D2.1, see below for further reading). Eventually, the issue is now solved and it is foreseen that the electricity surplus, which cannot be distributed among private actors according to current legislation for energy generation and self-consumption in Italy, is sold to the national grid according to the tariff schemes foreseen at national level for similar plants (in terms of type and size).

As for the barriers hampering the use of wastes and sludges for biogas production, mainly arising from end-of-waste legislation, the work to find a solution is still in progress in Ponte a Egola. However, it is acknowledged that the sludges, generated by the wastewater treatment plant, and exploited within the anaerobic digester, should not face any major obstacle related to waste legislation considering that they remain in the same installation and under the same owner. This situation allows to avoid the waste status and procedures related to waste management.

Conversely, for the case of solid wastes from the tanneries, which have to be transported to the anaerobic digester plant and which have to face a change of owner, agreements will have to be developed. According to the latest legislative developments on the matter on end-of-waste in Italy (cfr. L. 128, 2 November 2019), end-of-waste authorizations can be given at national level, under the authority of the Ministry of the Environment or at local level, by the local authorities. When

authorizations are given at regional level, they apply on a case-by-case basis and are thus specific for the entity posing the request for the authorization. Once more, the direct agreement with the Tuscany Region is likely to facilitate and accelerate the concession of end-of-waste for the flesh wastes generated by the tanneries. Also, the existence of previous studies on the specific subject may support the obtaining of the end-of-waste authorization.

Finally, the solution is associated with high investment costs that may prevent its realization. Despite this not being a legal obstacle, an increased availability of financing or incentives for energy efficiency solutions is identified along S-PARCS (cfr. D2.1) as a driver to energy cooperation.

Owing to the lessons learned in S-PARCS when analysing the implementation of a real energy cooperation solution in Italy, the following set of policy recommendations is proposed.

Policy Recommendations

- Introduce standardized professional training courses to generate specific competencies on industrial symbiosis and energy cooperation – particularly for industrial parks.
- Facilitate and promote formal agreements that support transition to circular economy and energy cooperation between multiple actors (e.g.: public authorities, industrial organizations, etc.), as they act as enabler and facilitator of concrete interventions.
- Develop and allow flexible business models to exploit energy produced by high efficiency systems.
- Adopt smooth and clear administrative processes to obtain end of waste authorizations.

Further reading

The analysis of instruments to tackle non-technical barriers and the complete list of policy recommendations based on the results of the legal, regulatory and standardization analysis was developed in Work Package 2 of the S-PARCS project. Detailed information is included in Deliverable 2.1, Deliverable 2.4 and Deliverable 5.4 and is available to download at: <https://www.sparcs-h2020.eu/results/deliverable/>

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Contact information

We are looking forward to hearing from you and are happy to discuss with you.

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