

Pilot SDH plant in Aosta

Subject:	Pilot SDH plant in Aosta
Description:	This document describes the measure implemented in WP3 regarding the development of a pilot SDH plant in the capital city of Aosta.
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Summary description of the instrument

Region: Valle d'Aosta

Partners involved: Ambiente Italia (SDHp2m partner), COA Finaosta – Valle d'Aosta Region, Telcha Srl, Politecnico di Milano University, Varese Risorse (A2A Group).

Short description of the measure.

The development of a pilot SDH plant in the capital city of Aosta will act as a real policy measure to foster the diffusion of SDH solutions as a viable alternative to district heating networks run on fossil fuels.

To reach such an objective, the barrier of mistrust and scepticism towards the visual impact of solar panels, especially in high-quality landscape mountain areas such as the Valle d'Aosta region, should be overcome by finding alternative low-impact solutions for the installation and through an awareness raising activity towards Regional and Local Administrations.



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Initial situation

As in many Italian regions, SDH is not a well-known solution for heat supply in Valle d'Aosta. Therefore, one of the best policies to foster its diffusion is to act through bottom-up measures as, for instance, the realisation of a pilot SDH plant which can be a real showroom for such a technological solution.

The DH network in Aosta is, at the moment, fed by natural gas and industrial waste heat, also through a large heat pump. The current network has an extension of 23 km and a heated volume of 1.2 Mm³, with 270 connected users and a heat demand of about 55 GWh. The final goal is to reach a network extension of 47 km and to cover a heat demand of 154 GWh. Such an extension could be partially supported by the contribution coming from the solar heat.

Objectives

The objective of this measure is to cooperate with the local utility managing the DH network in Aosta and with the Regional Administration to develop a pilot SDH plant which can be a 'living example' of the feasibility of the SDH solution also for other smaller towns and villages in the Region.

Through this measure, also secondary objectives can be reached:

- Awareness raising of final users aiming at demonstrating that district heating can be green and efficient.
- Showing the feasibility of 'higher level' applications of solar thermal beyond the domestic hot water production.
- Demonstrating the absence of relevant visual impact problems for medium-scale SDH plants, with active areas between 1,000 and 2,500 m².



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Measures and actions

From a technical point a view, a first feasibility assessment of the viability of a SDH integration into the Aosta network has been performed by Ambiente Italia, together with the local utility and the regional territorial agency Finaosta. This preliminary study has shown that solar thermal could give a fair contribution for covering the summer thermal losses of the network, with a limited investment needed, also thanks to the availability of a very favourable incentive scheme at national level, the 'Conto Termico'. A detailed computer simulation then followed such preliminary study (see below the paragraph on results).

Regarding visual impact and authorisation issues, a discussion has started involving the same actors reported above, which also includes the possibility of splitting the solar thermal plant into several sub-fields which could be installed on smaller roofs of industrial areas in the city or even on residential buildings. This would for sure increase the complexity and the cost of the plant development but it could be a good solution for overcoming visual impact concerns, which are mostly related to ground-mounted systems. A document describing the possible alternative solutions used in other EU countries for positioning solar thermal collectors has been prepared by Ambiente Italia and communicated to Finaosta.

Finally, since SDH is not a common technological solution in Italy, there is just one experience of authorisation procedure, coming from the SDH plant in Varese. The local utility, Varese Risorse, gave its availability to share its specific know-how about this topic with the regional stakeholders in Valle d'Aosta in a dedicated webinar held on November 20th, 2018.

Barriers and opportunities

As outlined above, the main barrier is to overcome the mistrust towards the installation of large areas of solar collectors. This is due above all to some bad experiences with photovoltaic plants in the recent past.

A relevant opportunity is the ongoing extension of the DH network, which calls for an additional heat supply, hopefully covered, at least partially, by a clean, local and renewable energy source as solar thermal. Furthermore, many users in Aosta are still burning LPG for heat production with a high cost and air pollution. Solar is also seen as an excellent complementary source to biomass, which always creates concerns because of the air quality issue.





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Results

The results of the preliminary evaluation of the SDH integration into the DH network of Aosta are quite encouraging, also given the financing opportunity provided by the incentive scheme of 'Conto Termico'. According to this first calculation, the incentive could give back, in a 5-year period, more than 50% of the initial investment. After this initial screening, a detailed site visit was carried out, also with the support of the Politecnico di Milano University which then carried out a detailed simulation of the pilot SDH plant to evaluate its yield and the economic parameters of the investment.

Regarding the authorisation and visual impact issues, a document in Italian summarising the main installation solutions realised all over Europe has been developed by Ambiente Italia and transferred to the regional stakeholders. Furthermore, a webinar was organised by Ambiente Italia on November 20th, 2018 where Varese Risorse (the utility mentioned above) gave details about the successful authorisation procedure used to develop their SDH plant.

Solar collectors could be placed on two buildings of the heating plant (400 m²) and on the ground (1,600 m²), with an expected output of around 1.6 GWh_{th} and an annual solar fraction slightly lower than 3%. Even though it could look like a minimal amount, one should consider that the size of the DH network is quite relevant. The area issue was therefore not so crucial allowing to find enough space to host a solar thermal plant whose size is close to the limit accepted within the Conto Termico 2.0 scheme.

Lessons learned

Solar thermal is considered as an interesting and appealing option for district heating to be 'greener' and to increase user acceptance towards this heat supply solution. However, the mistrust created by large-scale ground-mounted photovoltaic plants is still a major concern at local level, where the authorities should safeguard themselves from possible future complaints by the citizens.

A pilot example showing the low (or not existent) visual impact of medium-scale SDH plant, as the one in Aosta would be, would really act as a definite policy measure to unlock the market potential for using solar thermal in district heating networks.

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