

## PRESS RELEASE

### GEOOTHERMAL ENERGY FROM THE BASE TUNNEL TO POWER THE SUZA VALLEY CONSTRUCTION SITE

**The Polytechnic University and TELT examine the best options to promote this resource locally**

TURIN, 16 February 2021 - The hot water collected during excavation of the Chiomonte base tunnel will become a source of clean, sustainable energy for the construction site. This geothermal resource will then be made available to the community for use in the Susa Valley.

The opportunities offered by this geothermal energy have been explored in a study undertaken by TELT together with the Department of Environmental, Land and Infrastructure Engineering (DIATI) and the Department of Energy (DENERG) at the Polytechnic of Turin. This action accords with the principles and objectives of the Sustainable Development Goals (SDGs) to which the public promoter has been committed since it joined the UN Global Compact in 2015.

Geothermal energy is an alternative form of energy generated by the Earth's natural heat, offering a sustainable, renewable and cost-effective resource. The efficiency of this type of energy depends upon the distance between the point of production and the point of use. It is precisely for this reason that it is the nearby surrounding area that can most benefit from the positive spin-offs and use of this resource, both in Italy and France. It is also an opportunity to test innovative solutions and attract investments for a sustainable economy.

The research has lasted two and a half years and led to the definition of various aspects: on the basis of the experience gained during the construction of the Maddalena tunnel, where no impact was recorded on surface water resources, the project hypotheses were confirmed with respect to the flow rate of the water collected; furthermore, various hypotheses for the use of geothermal resources have been evaluated during both the construction and the operational phases.

According to the findings, the flow rate can be enhanced by a waterproofed lining in the tunnel to divert the water into a collection channel, generating an estimated 9.3 to 14.4 megawatts of thermal power.

Adopting these figures, the Polytechnic has developed the usage scenarios offering the greatest added value.

In particular, four hypotheses for use in Chiomonte during the years of the works have been examined: providing the energy for a visitors' area and construction site offices, district heating for 80 buildings, and energy for greenhouses for horticulture or hydroponic greenhouses. Three other hypotheses have also been analysed for use after 2030 in Susa, to which the hot water will be channelled after completion of the work: heating a municipal swimming pool, district heating for 2,000 homes or for the international railway station with its offices.

The results of the research have been summarised in a publication available online.

## FACT SHEET

### CHIOMONTE, 4 HYPOTHESES

**Construction site area** – Energy for the visitors' area and construction site offices during the construction period. Compared to a conventional heating system, this would result in an energy saving of approximately 264 MWh/year, with a reduction in CO<sub>2</sub> emissions of about 57 tonnes per year and an estimated annual saving of about 7,000 euros.

**District heating** – The potential catchment area has been found to include more than 300 buildings, but in order to maximise energetic and environmental benefits, it has been shown to be preferable to connect no more than 80 buildings with a total volume of about 120,000 cubic metres to the network. Although from an environmental point of view it would lead to a reduction of about 835 MWh/year of energy and 128 tons/year of CO<sub>2</sub>, this solution is not beneficial from an economic point of view as the costs are too high, principally because of the excessive distance between the final point where the resource is available (which at the end of construction will be in Susa) and the users (the buildings in Chiomonte).

**Greenhouses for horticulture** – Heating of greenhouses for agricultural activity within a radius of 1,200 metres from Chiomonte which could be connected via polyethylene pipes (with a saving of 50% compared to a heat pump). In this way, between 27,500 and 95,400 square metres of greenhouses could be supplied.

**Hydroponic greenhouses** - Fish farming: neither a heat pump nor special piping is required. Whether this solution proves to be advantageous depends very much on the type of farming. However, according to the study, the use of geothermal resources in this case is beneficial up to a range of 1,200 metres from the Chiomonte site.

### SUSA, 3 HYPOTHESES

**Swimming pool** - In providing for the needs of a municipal swimming pool there would be a 70% saving in energy per year with a reduction in CO<sub>2</sub> emissions of around 32.8 tonnes per year.

**District heating** - The available geothermal resource would make it possible to supply more than 2,000 homes with an integrated system between the heat pump and a series of boilers (to cover

peak demand during the coldest periods). This would result in energy savings of about 16.9 GWh/year and a reduction in CO<sub>2</sub> emissions of 2.63 tonnes per year.

**Railway property** - Hypothesising the provision of energy for the international station and offices in the Susa area, there would be energy savings of 70% per year and a reduction in CO<sub>2</sub> emissions of around 161 tonnes per year.

TEL-Tunnel Eralpin Lyon Turin, is the company responsible for the construction and management of the cross-border section of the railway link between Turin and Lyon. It is 50% owned by Italy and France through Ferrovie dello Stato Italiane (FS) and the French Ministry of Economy and Finance.

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