LEGISLATION AND REGULATION ANALYSIS COUNTRY BROCHURES

SWITZERLAND

Deliverable	D7.1
Acronym	Cheap-GSHPs
Website	www.cheap-gshp.eu
Grant Agreement number	657982
Due date of deliverable	31/03/2016 (M10)
Lead beneficiary	SLR
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The legislative and regulatory analysis presented below cover the virtual case study site of an Office building in Brogeda, Chiasso in the canton of Ticino.

GEOTHERMAL LEGISLATION

Geothermal Energy is defined through a Technical definition provided by the Swiss society of engineers and architect (SIA norm 384/6) with no legal definition in primary legislation. The exploitation of heat from underground (open and closed loop) is governed by the Water Protection Act (WPA) and Water Protection Ordinance (WPO) at federal state level.

LOCAL LEGISLATION

Local Cantonal authorities enact the federal laws relating the WPA and WPO. The application of these differs between Cantons. There is no local legislation yet in Cantone Ticino to apply WPA and WPO.

LICENSING & PERMITTING PROCEDURES

LICENSING AND PLANNING APPLICATION

A licensing system that does not differentiate between different system types (open vs closed loop ground heat exchangers) is applicable. The licensing process in Cantone Ticino is included as part of the 'Legge dell'edilizia' and 'regolamento della legge edilizia' concerning all aspects of building licenses not only GSHP. The license for GSHP installations is issued by the municipality with Cantonal Administration expressing a binding opinion on the conditions included in the license. A two month application process is typical. For closed loop ground heat exchangers a permit cost of 300 CHF as administrative fee plus 100 CHF for each borehole. Fees are variable for other Cantons.

DRILLING PERMITS

A drilling permit for completing exploratory boreholes that may be needed for geotechnical or for dimensioning purposes like in the case of a test probe to perform a TRT is required. The permit is issued as part of the building licensing process mentioned above free of charge in the case of Canton Ticino, with the borehole permit issued within 2 weeks. Once the authorisation for installing the GSHE system is obtained (refer to 8.2.1), no further permits are required.

EIA REQUIREMENTS

EIA and EIS requirements are limited to large scale open loop systems, with no requirements currently applicable for closed loop system and coaxial heat exchangers. In the case of open loop systems, the building license requires a hydrogeological report containing pumping test, infiltration test, that demonstrate that the well is sustainable, that the proposed extraction does not harm the aquifer balance or groundwater quality as well as the abstraction by other nearby permitted users.

MONITORING REQUIREMENTS

Monitoring requirements are not mandatory for GSHP system, with pumping rate or temperature change monitoring required in Cantone Ticino where the intake yield $\triangle$T°C > 3 °C and /or pumping rate > 500 litres per minute. An initial submission of data after the first year of monitoring to the Ufficio Protezione Acque e Approvvigionamento Idrico, UPAAI for the Cantone Ticino is required. This decides if further monitoring is required.

REGULATIONS

GSHP SYSTEM REGULATIONS

The regulations covering the exploitation of heat from underground (open and closed loop) are governed by the Water Protection Act (WPA) and Water Protection Ordinance (WPO). A minimum temperature limitation for heat extraction not below -1.5°C average forward and return temperature is applicable.

ENVIRONMENTAL

Regulations prohibit the establishment permanent interconnection of different aquifers as part of any borehole completion applicable to open and closed systems. The number of boreholes needed to provide heating/cooling, must not constitute barrier blocking more than 10% of the groundwater flow considering the boundary of the site as a base for the calculation. The latter restriction is more likely to occur in closed loop systems that require a larger number of probes.

In the case of small scale systems up to 4 probes, heat injection to the ground is restricted and cannot be considered as part of the dimensioning of the system in accordance with SIA norm 384/6.

Restrictions specific to particular areas are also applied in the case of presence of underground structures like tunnels, where a limit to borehole depths may be applied or the use GSHP systems prohibited.

BUILDINGS

The implementation of the EPBD is transposed through the Minergie standards, the SIA Norms, MUKEN and the Regulations on the Use of Energy. A target of minimum 20% of energy for heating and cooling from renewable energy for new build, retrofit, public sector and commercial buildings is applicable. No specific targets for GSHPs are available. Historical buildings are considered exemptions and do not need to respect energy requirements mentioned above.

HEATING & COOLING PLANTS

The main regulations covering heating and cooling plants are given by the SIA norm 384/2 and 38/4 on the the heating and cooling needs of buildings.

POLICY CONTEXT

The use of ground source heat pumps and borehole heat exchangers contributes to 2,621 GWh of heat production in Switzerland, with 2,600 km of total length of borehole heat exchangers drilled. The density of systems installed equated to about 3 standard 12 kW units per km^2 of land mass (Link, 2015). Targets for the energy market towards 2035 and 2050 have been set at national level but no specific targets are set for GSHP systems.

STANDARDS & GUIDELINES

Standards and guidelines are implemented by the Heat Pumps Professional Association (FWS) that provide certification for drillers. A requirement as part of the installations is for the driller to use certificated materials consequently ensuring the certification and standard of the BHE. Non mandatory heat pump certification is achieved through the Buchs centre.

Guidelines on the installation of GSHE are outlined in SIA 384/6 and Federal Office for Environment (FOEN) guidelines covering vertical probes and heat baskets.

TRAINING & CERTIFICATION

Training and certification schemes are provided through the FWS for drillers with programmes promoted through associations and professional schools. No specific certification for designers is applicable.

OTHER INFORMATION

Information on geothermal resources and on the promotion of GSHP technology is available from the Swiss Society for Geothermics, through geological maps and from FWS. A database of GSHP installations is available in every Canton. The GESPOS database available for Public Administration and operators through a WEB GIS Portal for the Ticino Canton.