GEOTeCH - Geothermal Technology for Economic Cooling and Heating

The Drilling technology that is currently used for installation of vertical borehole heat exchangers requires capital-intensive equipment that is expensive to mobilize, leads to deteriorated working conditions and requires experienced teams of specialist operatives. Drilling operations also often require significant quantities of drinking quality water and dispose of dirty water and mud. GEOTeCH will employ a different drilling concept that is based on dry auger methods that requires less capital-intensive equipment, enhances safety and avoids the environmental risks, complexity and costs of dealing with water supplies and contaminated waste.

Another key concept of GEOTeCH will be a better integration between heat exchange elements during installation by developing an innovative heat exchanger allowing to achieve high levels of thermal performance with low pressure loss. This device employs a co-axial configuration and spiral fluid flow pathways to achieve low thermal resistance compared to conventional U-tube devices.

Furthermore, GEOTeCH aims to implement cost-effective geothermal systems by alleviating the costs associated with drilling boreholes in large size buildings. The GEOTeCH's approach seeks the maximum use of the foundation structures that are otherwise required, exclusively, for structural and geotechnical purposes in tertiary buildings. Foundation structures such as piles, screen walls and basement slabs will become effective geothermal heat exchangers in GEOTeCH.

GEOTeCH will develop optimized hybrid solutions that will integrate the different geothermal systems in small and large buildings market. The optimization of geothermal system operation will be achieved with the Energy Management System and the development of a dual source heat pump capable of making optimal use of ground and/or air environmental heat sources. The GEOTeCH's geothermal heating and cooling standard will be more attractive to design professionals and construction companies.

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