

University of Macau

Abstract

AN INVESTIGATION OF POTENTIAL APPLICATION OF
GROUND SOURCE HEAT PUMP FOR ENERGY SAVING
IN MACAU

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In recent years, ground source heat pump system installations have grown continuously on a global basis (estimates range from 10 to 30% annually). They have broadened in application, have enjoyed the benefits of international collaboration, and are becoming recognized as a cost effective standard for energy conservation. The acceptance by the users of the ground source technology is attributable to the infrastructure, and the response of heat pump and component manufacturers. Recent research has concentrated on reducing the first costs of ground heat exchangers, determining soil thermal properties and further development of design methodologies.

The main usage of ground source heat pump is used in space heating and air conditioning. Macau is located at Zhuhai Delta of South China. The climate is wet and hot. Therefore, the demand of air conditioning in summer is very large and common in all commercial and domestic buildings. Although different manufacturers also developed different systems to achieve that goal such as Daikin VRV and HRV system, Johnson and Johnson BMS (Building Management System), the main energy used is still electric power.

Ground source heat pump system applies Geothermal energy in air conditioning or HVAC system to achieve the goal of energy saving. Since there have not been any studies and investigation of ground source heat pump system in Macau, it is interesting to evaluate the potential of this system in technical and economical viewpoints with consideration of local parameters and environment in Macau.