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Hybrid cooling using green energy as heat sources and storage system for a building at Innovation Park Muscat

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Cooling for a building is a critical issue for hot climate countries such as Sultanate of Oman. Electricity driven chillers commonly used for this purpose. However, they consume remarkable electrical energy compared with thermal driven chillers. This project aims to develop a worldwide unique concept for a continuously operating hybrid cooling system with a thermally driven chiller based on renewable energy resources. The energy for a sustainable cold supply can be developed from heat energy sources. For hot country like Oman solar heat supply is definitely the best option with an expected fluctuating. To overcome this challenge and using the wonderful geological resources of Oman a geothermal heat system is generated by studying the potential of the energy. Therefore, a combination of both, called hybrid cooling, might provide an excellent solution of this challenge. For the stabilization of the system it is advisable to foresee storage systems which can be realized in the underground. The challenge is to investigate, to develop, and to establish a combined system of geothermal and solar heat and an underground storage system together with specific technical solutions of absorption chillers adapted to the different sources. A demonstrator of such an innovative system will be realized at the end of the project and installed at one of the building of the Innovation Park Muscat (IPM) in Oman. The realization will present a great progress of an environmentally friendly and sustainable energy option especially for hot climate countries.

Biography

Sausan Al Riyami has completed her degree in Physics with Minor in Geology in 2007 from SQU, Master's degree of Science & Engineering with honor (IGSES Awards) and her Doctorate of Science in Applied Science for Electronics & Materials in 2013 from Kyushu University. She was a Guest Researcher at Institute for Materials Research, Belgium. She was at GUTech before she joined The Research Council in Oman as Renewable Energy Researcher in 2015. Her recent focuses are both Nanotechnology and Renewable Energy. She received outstanding awards and research fund grants and has published more than 20 papers and serves as Scientific Reviewer in reputed journals.

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