



IND

2013

CLIMATE SOLVER 2012 AWARDEE

GHG Reduction - Air to Air Heat Exchanger for Cooling

Developed by: Toro Cooling Systems Pvt. Ltd.

Innovation

Compressor-based air conditioning systems and the ubiquitous air coolers are the two known alternatives for human comfort cooling that are used in the commercial, industrial and domestic segments. However, AC systems consume considerable power and thus have a big carbon footprint.



Air-to-air heat exchanger for cooling developed by Toro Cooling Systems Pvt Ltd , is an innovation, that saves 50-80 per cent energy compared to AC systems. It offers sustainable and energy-efficient air conditioning alternatives and uses water as a counter-current for direct and indirect heat exchange to cool the air. It is particularly suitable for tropical countries like India.

Perfectly conditioned air requires an optimum level of humidity and temperature. Toro Cooling Systems Pvt Ltd is based on sound thermodynamic principles that use both indirect and direct evaporative cooling technology, to maintain a comfortable range of temperature and humidity. This reduces the energy consumption of air conditioners and eliminates the use of chemical refrigerants. This system can also be used in combination with a conventional air conditioner to provide required cooling in extreme weather conditions.

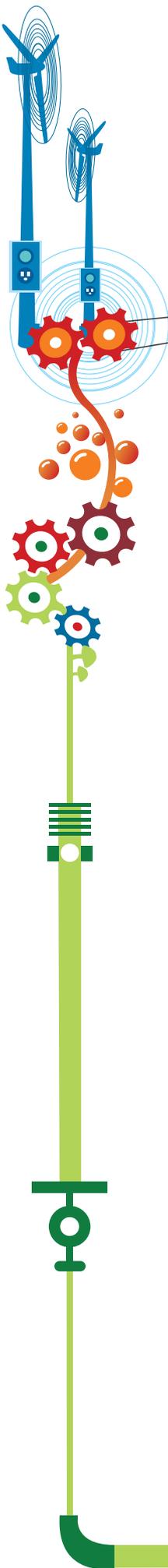
The technology is designed in a manner that it is capable of providing comfort cooling in a wide range of situations, like office premises and some industrial applications such as food processing units, hatcheries, and pharmaceuticals.

Climate Benefits

If this innovative solution could have wider application in the tropical regions, it has the potential to annually reduce GHG emissions by 21 million tonnes by 2022.

About the Company

Toro Cooling Systems Pvt Ltd is in the business of designing, manufacturing and marketing low energy air conditioning systems suitable for commercial, industrial and domestic applications.



CLIMATE SOLVER 2012 AWARDEE

GHG Reduction -Geothermal Building Cooling Systems

Developed by: Green India Building Systems and Services Pvt. Ltd. (GIBSS)

Innovation

Comfort cooling load is increasing the demand of electricity in tropical countries. As the living standards rise in these areas, so will the demand for electricity. In India, roughly 30 per cent of the demand for power comes from buildings sector. Additionally, water resources are also getting stressed. Thus there is a need from the users and owners of buildings to reduce the energy required for air-conditioning as well as water consumption.

Geothermal Cooling System by Green India Building Systems and Services Pvt. Ltd. (GIBSS) is an innovative technology that replaces the rejection of heat to ambient air in the conventional systems by the rejection of heat to ground. In conventional air-conditioning systems, the cooling efficiency depends on atmospheric temperature. If the atmospheric temperatures are higher, efficiency of the air-conditioning system is lower and vice versa. The key innovation behind Geothermal Cooling System is the designing of a heat exchanger system that uses the earth temperature, which is much lower than atmospheric temperature to reject the heat. Lower temperatures significantly improve the efficiencies of the air-conditioning systems.

Apart from saving energy, Geothermal Cooling System through its close loop piping system also prevents the loss of water and does not require chemical cleaning. This piping system helps channelize the building heat into the earth. The innovation also uses harvested rainwater, which is distributed evenly throughout the geofield. The rainwater helps in enhancing the heat transfer efficiency of the geofield. GIBSS uses 13 different strategies to address various conditions of the ground and optimizes the use of energy accordingly.

Climate Benefits

Residential, commercial and public buildings in India account for 89 million metric tonnes of CO₂ emissions. GIBSS through its energy-efficient innovation for cooling buildings has the potential to help businesses reduce costs and increase productivity. If the implementation of these systems in both greenfield project and in retrofitting buildings could be accelerated, there is a potential to reduce GHG emissions by about 20 million tonnes by 2022.

About the Company

GIBSS is a net zero energy building systems company that develops geothermal cooling systems, hot water co-generation systems and lighting systems to reduce operating costs and the carbon footprint in buildings.



The upper visible part of Geothermal Cooling System in the foreground. In the background are the cooling towers it has replaced.

