Procuring sustainable cooling equipment in Sri Lanka

Quick facts

- Type of procurement: **cooling equipment**
- Year of inception: **2017**
- Type of business: **Hotel**
- Organisation name: **Jetwing Blue**
- Number of staff: **308**
- Country/region: **Sri Lanka**
- Procurement value: **220,995 USD** for the vapour absorption chiller and boiler

Background information

Jetwing Blue hotel is located in Negombo, less than 40km away from Colombo. Considering the tropical climate in the region, air conditioning can represent up to 60% of Jetwing Blue's electricity bill. The result is high costs, as power and energy contribute to 10 to 15% of its total operational costs. According to the figures of the Green Cooling Initiative, it is estimated that the refrigeration and air conditioning sector accounted in 2014 for 15% of Sri Lanka's greenhouse gas emissions.

The challenge

The hotel aimed to reduce the carbon emissions of conventional air conditioning equipment while also cutting its operational costs.

The strategy

Air conditioning at Jetwing Blue was initially provided via a conventional electrical chiller. A diesel-fired boiler was also run to produce steam for the laundry and generate hot water. In 2017, and in collaboration with the Green Cooling Initiative[1], it was decided to introduce a vapour absorption chiller (VAC) and a biomass boiler to replace both the electrical chiller and boiler.

A vapour absorption chiller is a gas cooling system which runs sustainably via steam generated from a biomass boiler; it therefore helps to drastically reduce the usage of grid electricity. The refrigerant used for the vapour absorption chiller is distilled water, which, at very low pressure (60 mmHg), absorbs heat from the water that is circulating through the fan coil units during evaporation and releases heat during condensation. Thanks to its environmentally friendly characteristics and the fact that it does not produce emissions during repairs or leakage, using water as a refrigerant is considered a sustainable option.

Most of the energy for these vapour absorption chillers derives from renewable sources, as the main energy source is steam generated through a biomass-driven boiler. Sustainably harvested cinnamon wood is used as a fuel for the biomass boiler as it is one of the four most sustainable fuel woods of Sri Lanka due to its fast cropping cycle of just six months. It also offers various technical advantages such as high calorific value, high density, and less smoke generation than other wood-based fuels.

	Refrigerant	Lifespan (Years)	COP	Running hours (hours/a)	Electricity consumed (kwh/a)	Elec. cost per year (US-Dollars)	Biomass consumed (kg/year)	Biomass cost (US-Dollars)	GHG Emissions (tCO_2/year)
Vapour absorption	Distilled Water	20	1.40	7,950	125,280	13,781	1,387,000	41,610	379

1 The Green Cooling Initiative (GCI) is funded by the International Climate Initiative by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and implemented by GIZ Proklima. More details are available at http://www.green-cooling-initiative.org/

Impacts

- **Average electricity consumption reduced: 113,345 kWh/month**
- **Average cost reduction resulting from reduced grid electricity use: 10%**
- **Average CO_2 emissions avoided: 770 MT/year**
- Vapour absorption chillers contribute to the **mitigation of greenhouse gas emissions** in the environment, as de-ionized water is used in the absorption cycle as a refrigerant instead of the major climate damaging refrigerants like CFCs, HCFCs and HFCs.
- The biomass boiler uses cinnamon wood as its fuel source, which is essentially a waste product of Cinnamon spice farming. The purchase of this waste product furthermore provides an additional income for the farmers and local supply chain, resulting in an important community benefit as well.

Today, Jetwing Hotels has four vapour absorption chillers of varying capacities (not only in Jetwing Blue, but also Jetwing Lagoon, Jetwing Yala and Jetwing Lake), catering to each hotel's entire air conditioning requirement.

"We hope that through this initiative and similar others, the hospitality industry of Sri Lanka recognizes the importance of climate-friendly RAC solutions and the benefits for the industry as a whole."

- Sashika Kaluwahewa, Assistant Manager Sustainability, Jetwing Hotels Ltd.

Lessons learned

- As this type of technology is quite new to the local market, the **availability of local expertise and due diligence on technology options** were the two critical factors in the procurement decision.
- Despite the higher upfront costs for the purchase and installation of vapour absorption chillers, they offer an interesting alternative to the electrical chillers due to the reduction in energy consumption and GHG emissions along with the typical financial returns (payback period of less than 4 years for Jetwing Blue). Moreover, financial incentive programmes such as the Green Cooling Initiative help to overcome the potential financial barrier of the acquisition costs.

© Jetwing Blue Ltd.

The vapour absorption chiller at Jetwing Blue

For further information

https://www.giz.de/expertise/downloads/giz2017-en-gci-green-cooling-hotel-roadmap.pdf

Contact person: Mr Jude Kasturi Arachchi,
Director of Jetwing Hotels Ltd

jude@jetwinghotels.com

UN environment
United Nations Environment Programme

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE
MINISTÈRE DE LA TRANSITION ÉCOLOGIQUE ET SOLIDAIRE

Supported by:
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
based on a decision of the German Bundestag