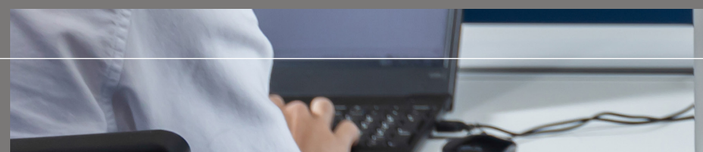
REVOLUTIONARY APPROACH TO ENERGY EFFICIENCY

A decade ago, optimising energy efficiency for buildings was a process that involved long-term payback and high audit fees. Many companies found it hard to justify putting in large upfront investments where savings and returns were not guaranteed. But things changed when energy performance contracting firms such as BBP came into the market, offering asset owners energy savings with minimal to zero investment costs.

Since then, companies like LumiLeds, Hewlett Packard, Resorts World Sentosa have achieved up to 40 percent of cost and energy usage savings – made possible with patented HVAC optimisation technologies, proprietary software algorithms, Internet of Things (IoT) and machine learning.

BBP's unique business model allows customers to optimise their existing chiller plant without changing out their equipment, revolutionising the energy efficiency industry across Asia. This model also allows customers to pay via actual achieved savings that are independently verified by 3rd party energy auditor on an annual basis.



SUCCESS AMONG LOCAL COMPANIES

Lumileds Singapore

Revolutionary Approach to Energy Efficiency

When Lumileds set out to improve the overall operational efficiency of the plant in 2014, its facilities that operate round the clock across gross floor area of 41,716 m2 is cooled by a 14-year-old chiller plant. One possible approach was to replace the existing chiller plant at significant expense to achieve better chiller plant efficiency. However, that will incur significant expense for Lumileds.

At that juncture, Lumileds was offered an alternative to deliver the desired level of optimisation without upfront investment or equipment replacement. The solution includes installation of a comprehensive suite of intelligence and controllers as well as a dedicated data acquisition interface to deliver best in class optimisation. The data obtained from installed sensors and controllers are then connected to a cloud-based central system, which enables Lumileds Singapore as well as the BBP command centre to access remote monitoring, auto reporting and other features to improve day-to-day operations.

As a result of all these efforts, Lumileds Singapore achieved a 27 percent improvement in the chiller plant's efficiency, without any disruption to operations at the plant. With sustained savings of 30 percent of initial energy consumption, Lumileds Singapore was able to realise a reduction of 2.9 GWh in annual energy usage.

Lumileds Singapore became the first and only manufacturing plant in Singapore to receive BCA (Building Construction Authority)'s Green Mark Platinum Award for existing buildings in 2015, achieving NEA (National Environment Agency)'s mandatory Minimum Energy Efficiency Standard (MEES) even before it was introduced locally. Seven years on, Lumileds continue to enjoy improved savings with BBP's support.

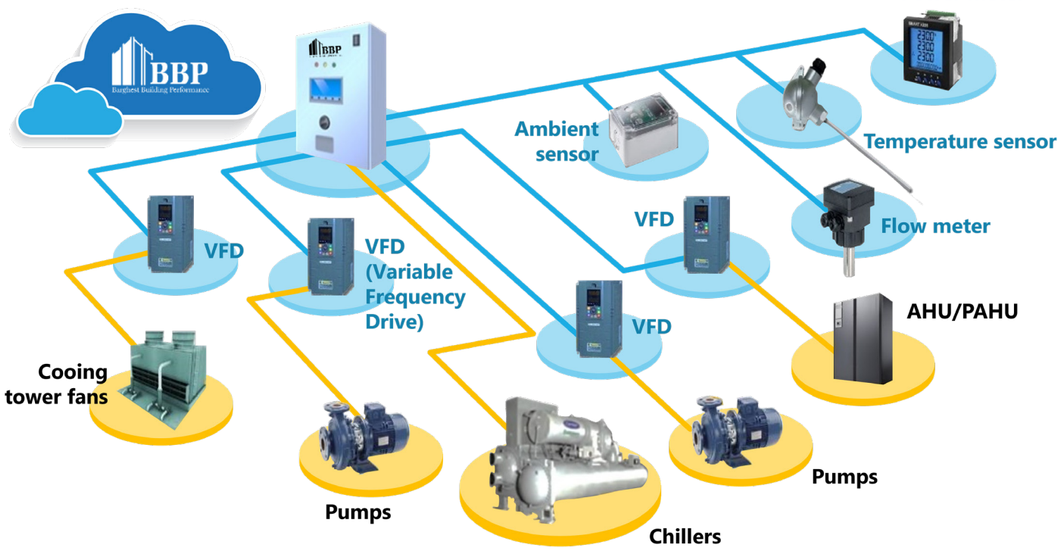


Figure 1. BBP's holistic solution with sensors, controls, programming, software, and asset management

Resorts World Sentosa District Cooling Plant

The District Cooling Plant (DCP) managed by Resorts World Sentosa (RWS) supplies chilled water to the entire RWS property including the casino, hotels and Universal Studios Singapore for cooling purposes. Despite having undergone equipment upgrading as well as performance improvement, RWS engaged BBP in 2015 to explore and evaluate further energy efficiency improvement opportunities for its DCP.

RWS and BBP worked closely to customise and install a chiller optimisation solution, keeping in mind the critical operation of a district cooling plant. The installed system optimised the energy use of chillers, pumps and cooling tower fans using an algorithm-based dynamic control to achieve and maintain improved plant efficiency across varying load profiles without affecting the comfort of occupants and visitors. It also allows for continuous improvement through remote monitoring, daily performance reports and data analytics that led to immediate corrective actions whenever necessary.

The successful implementation of this optimisation project resulted in a 10 percent improvement in plant efficiency, or 5.5 GWh of annual energy savings without disruption to the operations of the plant. The DCP and BBP were jointly recognised in the Best Practices (Honourable Mention) category in the 2017 NEEC ceremony organised by NEA (National Environment Agency).

For both Lumileds and RWS, BBP's solutions helped create a strong pipeline of usage and equipment data independent of their existing building management system. The harvested data provided valuable insights for data analytics, predictive maintenance, and further energy optimisation. These solutions do not discriminate type and age of chiller plant and aims to provide building owners an accessible option in the market to reduce their carbon footprint.

SMARTER AND GREENER BUILDINGS FOR SUSTAINABLE FUTURE

Global energy usage in buildings makes up over one-third of global final energy consumption and nearly 40 percent of total direct and indirect carbon dioxide emissions. Cooling specifically, which accounts up to 40 percent of energy usage in buildings, will be an area of opportunity which businesses can tap on to address their sustainability goals.

BBP's holistic offerings is intended to set customers up for guaranteed long term success in today's world where energy usage in buildings continues to rise. Since its founding, BBP placed strong emphasis on developing its analytics and machine learning capabilities to help building owners address their operational challenges. At present BBP offers fault detection and diagnosis through its advanced analytics platform, BBP Analyse+, which helps buildings to reduce false alarms, operational anomalies and extends equipment life cycle. All these on top of existing chiller plant energy efficiency optimisation.

As smart buildings evolve, overall building management demands will shift from reaction problem solving to predictive maintenance. In recent years, experts have pointed out that the concept of achieving a fixed gold standard efficiency is fading away as buildings look for solutions and platforms to anticipate real time impact and risks. In that future, it is a world of endless possibilities where energy efficiency will be delivered in ways we have not seen or experienced. And till then – companies can look to kickstart their decarbonisation journey with BBP.

Contributed by:
BBP

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