

## CASE STUDY

# McQuay Templifier™ Units Save \$5 Million A Year In Energy Costs At LG Philips LCD Factory In Korea

LG Philips LCD (LPL), a leader in the LCD market, chose a leader in the air conditioning market – McQuay - to help them save \$5 million USD in energy savings at their expanding manufacturing facilities in KooMi, Korea. Originally formed in 1999, LPL today produces four million small and medium panels and four million large LCD panels, including the world's largest LCD panel sized at 42 inches (1950 by 2250 mm). With the LCD market expanding rapidly in the PC, TV, and HDTV markets, LPL has expanded its manufacturing capacity in Korea and China to meet the worldwide demand for LCD panels.

To stay competitive in the market, LPL knew that it needed to contain its energy usage in its expanding factory in KooMi, Korea. Working with SACI, the McQuay Air Conditioning representative in Korea, LPL



Factory Sites of LG Philips LCD in KooMi, Korea

asked for various energy saving alternatives. After a thorough analysis of the energy consumption and specific operating demands, SACI worked with the McQuay chiller application experts in Staunton Virginia, USA, to propose six McQuay Templifier units for LPL production lines in the KooMi facility.

The McQuay Templifier unit is a unique heat recovery machine which can recover large amounts of heat that would otherwise be rejected from the building and then use it for either building heat or domestic hot water heating.

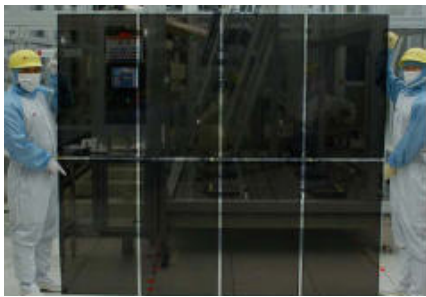
This unit heats water more economically than fossil fuel fired boilers or electric resistance heaters.

In the case of the KooMi factory, the centrifugal compressor Templifier units would supply hot de-ionization water for the LCD production lines, simultaneously supplying 13° C water and 50° C (or higher) hot water, replacing the existing steam hot water heaters. Through recovering water heat from existent chillers, the six Templifier units have 17,866,993 kcal/h heating capacity and 4,821 tons of cooling capacity with 4,730 gpm.



After a thorough review of all heat recovery chillers, LPL concluded that the McQuay Templifier unit was the best choice for the KooMi facility. An important factor in McQuay's favor was the R-143a refrigerant used by the Templifier unit. R-134a is an HFC-based refrigerant with no ozone depletion potential and no phase-out schedule under the Montreal Protocol. Because LPL is an ISO-14000 green listed factory, the "green" aspect of the non-ozone-depleting refrigerant was consistent with LPL's corporate environmental position.

The total energy savings estimated by SACI and LPL for the KooMi factory is approximately \$500,000



*World's Largest "Generation 7" LCD Panel from LG Philips*

USD a month or \$5 million USD a year. Those savings translate to a one-year return on investment (ROI).

With these considerable savings, the Templifier system qualified for funding by the Korean government's "Energy Saving Fund". Typically this funding is provided to building owners who utilize energy efficient or energy saving equipment.

In recognition of the dramatic energy savings, LG Philips received the Korea President's Award in November 2006 at a ceremony attended by the Korean Prime Minister, Minister of Industry and Energy and 350 people in energy-related industries. The award was presented for recovering useful heat from waste heat resources in their manufacturing processes, saving 65% energy cost compared to the previous system. LG Philips was the first company to apply the McQuay centrifugal water-to-water heat pump system in Korea.



*Examples of LG-Philips LCD Panels*

The proper products, combined with state-of-the-art engineering by SACI and support from the McQuay Chiller Applications Group and its International Business Development team, provided the most efficient and effective solution for LG Philips LCD. The key facility engineers of the LPL brought their expertise to the implementation of the system design. Working together, the entire team found an innovative method to provide energy cost savings and environmentally sound solutions. This project is truly an exemplary case, not only for the LCD industry, but for all of Asia as well.