

# Case Study



## HEWH-500-WS - High Efficiency Water Heater



*Scripps Research Institute, Jupiter, Florida*, a world renowned research facility, is dedicated to basic biomedical research and drug discovery.

Particularly significant is the institute's study of the basic structure and design of biological molecules.

The 350,000-square-foot campus supports more than 600 full-time faculty, scientific, technical, and administrative staff members in their efforts to find new therapeutic agents for a variety of devastating human diseases, including HIV/AIDS, cancer, diabetes, Parkinson's disease, and Alzheimer's disease to name a few.

*By simultaneously heating and cooling with a natural gas engine driven heat pump water heater we can offset significant natural gas and electricity use, lowering our operating costs and benefiting the environment at the same time.*

The Institute must meet the strict climatic conditions of a research environment with large outdoor air requirements and a

significant number of air changes per hour. This means both the heating systems (boilers) and cooling systems (chillers) are working overtime. The

traditional method to treat the air to the proper psychrometric conditions involves first cooling it with electric chillers and then reheating it with a traditional heating device such as a boiler. This traditional method of treating air can be inherently energy inefficient because, in fact, the boiler and chiller are working against one another

## Heat Differently.™

constantly. The chiller is removing heat from the facility, while the boiler is constantly adding it back. Implementing a dedicated heat recovery chiller that will simultaneously heat and cool the facility dramatically reduces the amount of gas consumed by the boiler, decreasing operating costs and working towards the common goal of improving the sustainability of the campus.

When choosing a dedicated heat recovery chiller the facilities department wanted to use the most efficient and cost effective device on the market today. This led them to the Ilios HEWH-500-WS which uses the principles of combined heat and power, commonly referred to as "CHP" to efficiently and cost effectively produce simultaneous heating and cooling with low-cost natural gas. Selecting a product that leverages CHP technology allows the facility to save money on the energy input needed by the dedicated heat recovery chiller. Because Ilios units recover heat from the prime mover, the natural gas engine used to drive the process, they have a generation efficiency in the low 80% range. A traditional electric power plant has efficiency closer to 30% when generation efficiency as well as transmission and distribution losses are considered. In addition to substantial operating cost savings, the Ilios unit also offers significant greenhouse gas savings, a big advantage over an electric-driven dedicated heat recovery chiller. The Ilios installation at Scripps will save over 2,000 tons of CO<sub>2</sub> each year. Due to offset cooling tower usage it will also save over 2,000,000 gallons of water each year.

Using the Ilios HEWH-500-WS as a dedicated heat recovery chiller, the Scripps Research Institute is not only able to significantly reduce the amount of

natural gas consumed in their boiler, but they were also able to offset electricity used in their central chilling plant. Because the Ilios units operate using low-cost natural gas, the Institute can avoid costly electric demand charges during peak demand hours.



Seven (7) Ilios HEWH-500-WS units provide simultaneous heating and cooling to keep the Institute at the proper climatic conditions for their research needs.

"The HEWH-500-WS is very unique in that it leverages mechanical CHP to reap the benefits of the heat pump cycle, while using low-cost natural gas to ensure both operating savings and reduced greenhouse gas emissions" remarked Stephen Lafaille, Product Manager for Ilios.

The new installation was part of a deep efficiency retrofit which involved removing steam

boilers and replacing them with right-sized steam generators for lab sterilization needs. The high efficiency hot water generation plant combines seven (7) Ilios HEWH-500-WS as the base load, backed up for full redundancy by an efficient hydronic boiler system. The project was implemented by cutting edge design-build contractor Debonair Mechanical. The overall project will provide over 30% savings in natural gas consumption. Free cooling, a by-product of the Ilios units, will offset electricity and demand charges of the central chilling plant.

**For more information please visit [www.iliosdynamics.com](http://www.iliosdynamics.com)**

or contact us at...

781-466-6500 • [products@iliosdynamics.com](mailto:products@iliosdynamics.com)  
45 First Avenue, Waltham, MA 02451

brought to you by **Tecogen**  [www.tecogen.com](http://www.tecogen.com)  
Advanced Modular CHP Systems