CASE STUDY: ALASKA SEALIFE CENTER

"Heat exchanger" usually brings to mind images of a dusty, loud industrial environment, or the illegible scribbles of a seasoned engineer on a crinkled technical draft. In the case of the Alaska SeaLife Center, however, it meant inexpensively utilizing the latent solar heat in Alaska's otherwise frigid waters. ASLC's innovative, environmentally-friendly approach saved them from years of massive energy bills, and gave them a sustainable model in the face of fluctuating oil prices.

A cold day in Alaska. Image credit: Holly Chaffin (Public Domain)

A SMALL TOWN CALLED SEWARD

The modest Alaskan town of Seward is situated on the southern coast, a two-hour drive south of Anchorage. Seward, a traditional port town, claims a population of around 3,000, but sees nearly 160,000 annual visitors to its public aquarium, the Alaska SeaLife Center (ASLC). Despite the traffic, prohibitively expensive heat and electric bills were making their oil-boiler-based heating financially infeasible. When oil heating costs rose to $5 per gallon, ASLC was looking down the barrel of a $730,000 annual heating bill.

Image Credit: Wikimedia Commons

AN INNOVATIVE IDEA

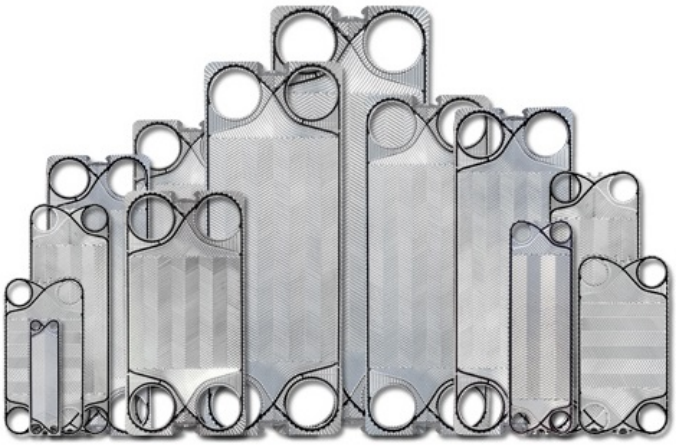
ASLC looked to an independent clean energy consultant, who drew inspiration from Japanese seawater heat pumps. After finding a promising ROI, they secured grants to begin installation. Two seawater pumps were installed and supplied a majority of ASLC's heat needs. The pumps work in tandem with an impressive titanium plate heat exchanger, using seawater to warm glycol and water to feed the pumps. Since the heating system no longer relies on air temperature, the seasonal fluctuations of the high-latitude town don't affect ASLC's solution at all.

AN IMPRESSIVE RESULT

The Center nearly eliminated all of its usage of fossil fuels for heating

After a two stage rollout, the ASLC immediately started seeing the benefits of its ground breaking heat pump system. The Center nearly eliminated all of its usage of fossil fuels for heating its 120,000 square foot facility. Now 98% of the ASLC's heating comes from the ocean. This has lowered their heating costs by an estimated $15,000 per month and reduced their annual carbon emissions by 1.24 million pounds.

A CLOSER LOOK AT THE TECHNOLOGY



Titanium plate heat exchangers are growing more common, as engineers around the globe envision new ideas for energy transfer with corrosive materials. ASLC's seawater application is just one example of using the ocean to solve industrial problems, not to mention all the uses involving corrosive synthetic chemicals, like hydrogen chloride. While expensive, titanium is the only material that will reliably resist corrosion when the chloride content of a fluid exceeds trace amounts. The market for plate heat exchangers continues to grow every year thanks to innovative applications such as we saw in Seward. Thanks, ASLC!

"ASLC Shifting 98% of the Center's Heating Needs from Fossil Fuel to Ocean Water as Source Heat - Alaska Sealife Center." Alaska Sealife Center. http://www.alaskasealife.org/news_item/34.