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ENGINEERING

Details for Follow-up Activities: Gas Water Heaters Recommendation

Implementation Schedule

Gas water heater installation can consume approximately 6-8 hours (or a full workday). This estimation does **not** include the time required to meet permit requirements. It should be noted that this installation process may disrupt the normal workflow of the company, as machine downtime is likely.

Maintenance Cost

Industrial gas water heaters typically do not require any maintenance for a period of 10 years. However, after this 10-year period there may be some repairs required. The severity of the repair will determine the cost of repair, as some water heater issues will cost more than others. The following repairs and their estimated cost that may be necessary are listed below:

Common Water Heater Repair Issues	
Dip Tube	\$10 - \$150
Pressure Relief Valve	\$20 - \$200
Anode Rod	\$20 - \$50
Electric Thermostat	\$150 - \$200
Thermocouple	\$20 - \$150
Gas Control Valve	\$300 - \$500

It should be noted that manufacturers recommend a basic maintenance check-up/ part replacement after this 10-year period. This can cost approximately \$300- \$450.

Energy Saving Cost

An electric water heater running at 98% efficiency for 2- 3 hours per day will cost approximately \$40 to \$60 a day, depending on location. A tank-less natural gas water heater supplying 12 gpm with 98% efficiency running 2-3 hours a day will cost approximately \$28/day.

Department of Energy Recommendations [1]

When selecting the water heater that best meets the needs of the user's facility, the following should be considered:

- Fuel type, availability and cost
 - The fuel type or energy source that is used for water heating will not only affect the water heater's annual operation costs but also its size and energy efficiency. Click [here](#) and navigate to the heading "Exploring Water Heater Options by Fuel Type" for more information on selecting fuel types.
- Size
 - To provide facility with enough hot water and to maximize efficiency, a properly sized water heater is required. Click [here](#) and visit the section "Types of Water Heaters" for more information on sizing
- Energy efficiency
 - how energy efficient a water heater is before purchasing.
- Cost
 - Before purchasing a water heater, it is recommended to estimate the annual operating costs and compare those costs with other less or more energy-efficient models.

Success Stories

While conducting an operational cost analysis on gas versus electric water heaters, Michael Bluejay concluded that gas is almost always cheaper than electric water heaters. Mr. Bluejay's research focuses on electricity saving, and he claims gas water heaters typically cost about \$30 a month to run, while electric water heaters cost closer to \$42 a month, depending on utility rates, of course [2]. This, however, does not consider the possibility of integrating solar panels to power the water heaters.

Suppliers

The Centre of Sustainable Energy and Environmental Engineering has no affiliation with the following vendors. The following suggestions are simply a recommendation

Manufacturer	Price	Website
AO- Smith	\$2,244.00	Here
AO- Smith	\$2,901.95	Here
Commercial	\$2,441.00	Here
Rheem	\$4,410.67	Here

Technicians

Technician Name	Location	Website	Phone
Elite Mechanical Heating and Air	Ayden, NC	Here	252-746-6200
Keen Plumbing Company	Goldsboro, NC	Here	919-429-7280
Gunns Electric	Greenville, NC	Here	(252) 258-1628

Plumbers may charge \$45-\$65 per hour and can install a water heater in approximately one business day (6-8 hours). This will cost a total labour cost of \$270-\$520. Since, this is application involves an industrial water heater and a gas connection, installation may consume an addition 2-3 hours (\$90-\$195) to install. Therefore, the installation may cost between \$270 - \$715.

References

- [1] "Selecting a New Water Heater," *U.S. Department of Energy*. [Online]. Available: <https://www.energy.gov/energysaver/water-heating/selecting-new-water-heater>.
- [2] M. Bluejay, "Water Heater energy use...and how to save on it," 2016. [Online]. Available: <https://michaelbluejay.com/electricity/waterheaters.html>.