Energy Demand Reduction for FSU's Central Utility Plant

FAMU-FSU College of Engineering

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TRANE

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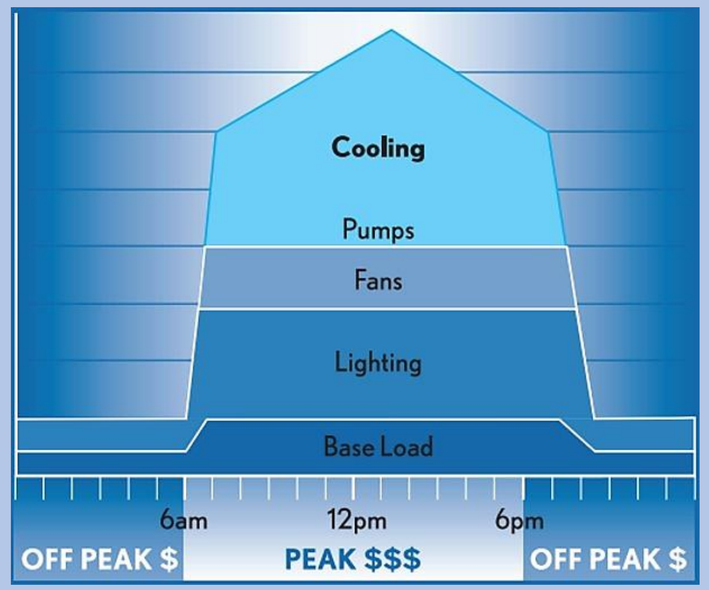
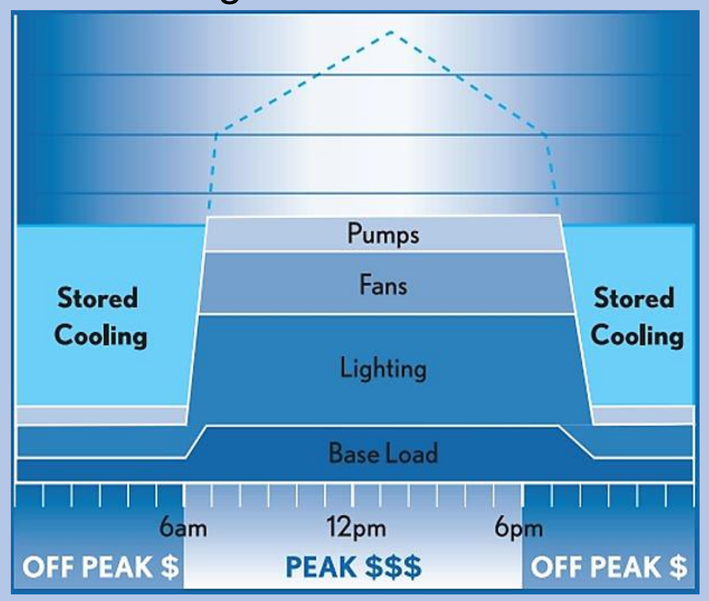
Our team will save Florida State University $400,000 Dollars each year



Average Demand Profile



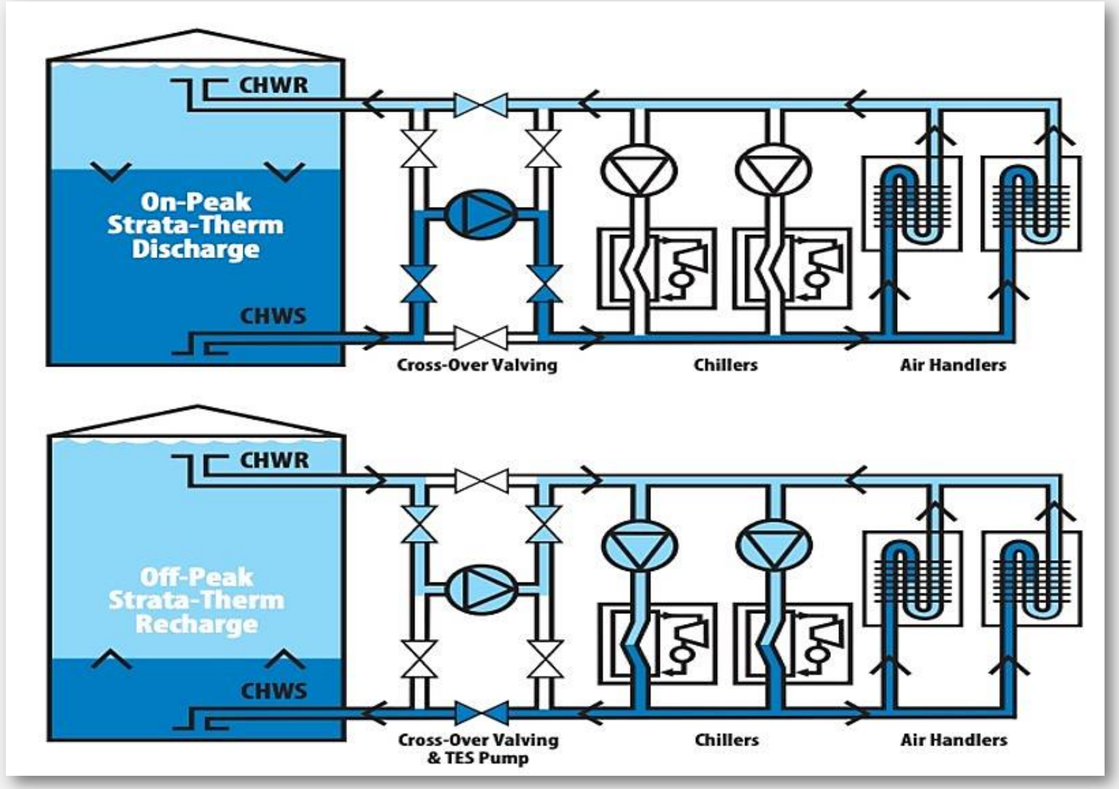
Demand Profile with TES

Objective

Research, study, evaluate, and propose a project that reduces Florida State University's Central Utility Plant electric utility bill by reducing peak demand and/or the overall electric consumption to generate a financial payback to Florida State.

Storage Tanks Comparison to Other Technologies

Energy Storage Technology	Efficiency (%)	Useful Life (Years)	Capital Costs ($/kWh)
Pumped Hydro	80	>25	165
Na-S Batteries	75	14	907
Lead-acid Batteries	72	3	649
Li-ion Batteries	86	10	469
Flywheels	86	>20	11520
Compressed Air	52	25	105
Large CHW TES	93 - 100	>50	125-300



Thermal Energy Storage Tank Loading and Off-Loading Process

Results

- Project Cost: **6,470,000 [$]**
- Tank Size: **3.5M [gal]**
- Cooling Capacity: **30,800 [ton-hours]**
- Chilled Water Flow Rate: **7,366 [gpm]**
- Peak Load Reduction: **3.215 [kW]**
- Demand Rate: **11.32 [$/kW]**
- Consumption Savings: **50,000 [$]**
- Demand Charge Savings: **350,000 [$]**
- Total Savings: **400,000 [$]**