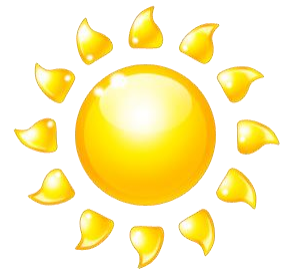




Solar Thermal for Building Applications



By: Christopher Castello

EGRS 352 Energy Technology and the Modern World

Applications

Economics

Residential

- ☀ Solar Water Heater (50-60% of hot water needs)
 - ☀ Main Use
- ☀ Solar Space Heating (30-40% heat demands)



Commercial

- ☀ Pre-heat water heating systems
- ☀ Pools, Spas, etc.
- ☀ Industrial Process Heating



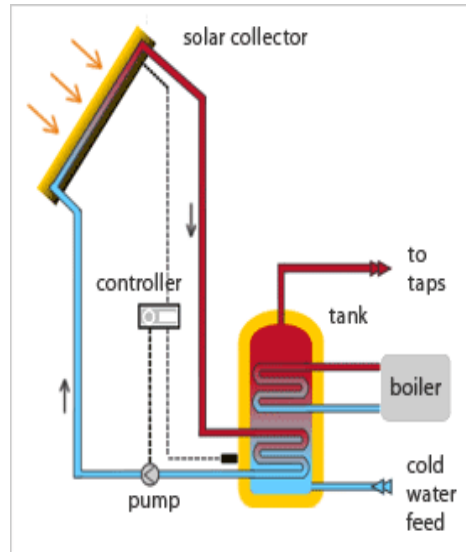
Key Terms

Collectors: collectors utilize a glycol solution flowing through copper tubes attached to fins to collect heat energy from the sun.

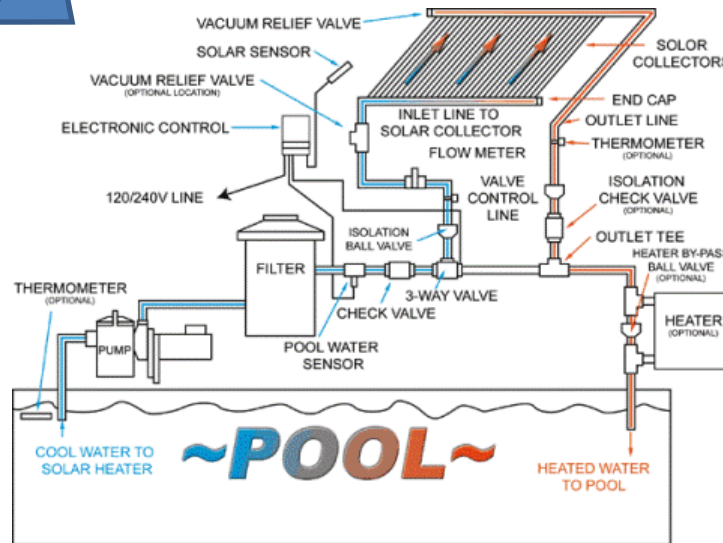
Storage tank: after the energy is collected, it is stored until needed.

Pumps: one to circulate glycol solution through the collectors, one circulate hot water from the storage tank(s) to the end-use in the building

Controls: a digital controller with sensors determines when the pumps run.

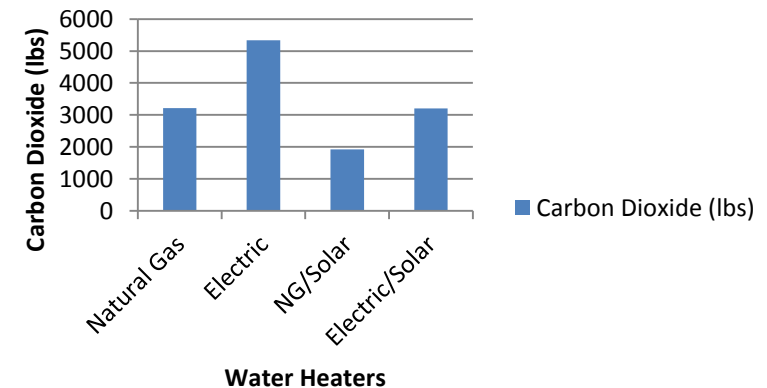


Water Heating	Initial Investment	Annual Cost	Annual Savings	Payback Period (years)
Natural Gas Unit	\$ 500	\$ 307	\$ -	N/a
Electric Unit	\$ 450	\$ 503	\$ -	N/a
NG w/ Solar	\$ 1,895	\$ 184	\$ 123	15.4
Electric w/Solar	\$ 1,845	\$ 302	\$ 201	9.2



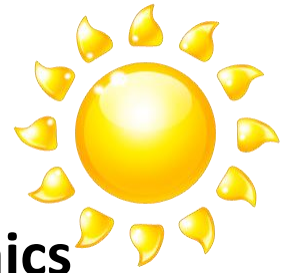
Environment

Annual Carbon Dioxide Emissions from Water Heater





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