SOLAR THERMAL SYSTEM CASE STUDY

Barrington Brewery & Restaurant, Great Barrington, Massachusetts

STIEBEL ELTRON
Simply the Best

The Barrington Brewery & Restaurant is the first brewery on the east coast to install a solar panel system that supplies hot water for brewing and the restaurant.

The system was initially installed with 15 SOL 25 plus collectors. Eventually, the owner decided to double the system size to 30 collectors to produce even more solar energy for the restaurant and brewing process.

A high-efficiency gas condensing boiler backs up the solar system, and also provide radiant heat to the floors of the apartments.

A 1500 gallon atmospheric tank serves as the store for the solar energy. As domestic hot water (DHW) is drawn, cold water is pre-heated through the solar tank, and piped into the backup heating system

If the water is up to temperature, the boiler doesn't fire. This setup ensures the building always has hot water, even when the sun isn't shining.

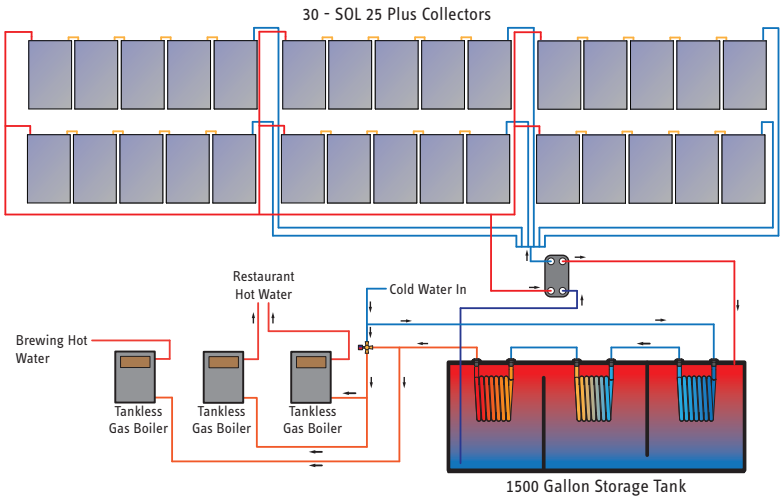
The brewery will brew 1100 barrels (34,100 gallons) of beer this year, averaging 3 completed batches per week. The brewers work 5 days per week preparing and brewing the 220 gallon batches. On average, 620 gallons of water go into each batch.

The DHW system is plumbed to recirculate once the temperature in the loop drops below a usable temperature. A 4-way valve regulates the recirculated water returning back into the DHW loop. A larger 3-way valve regulates water coming from the solar tank and the backup heater.

The ratio of gallons of storage to number of collectors is 50:1, which is typical for commercial solar thermal systems. The large volume ensures that the tank temperatures stays consistently low, and the collectors operate in their most efficient state.

The mechanical room houses the solar thermal components except for the thermal mass storage tank, which is on the other side of the pictured wall.

The controller and datalogger control the operation and monitor critical components of the system.



Project Partners:

Barrington Brewery & Restaurant
Property & system owner
Precision Decisions LLC
Professional engineering services
SolarWave Energy, Inc.
Datalogging design and consultation

By the numbers (data tracked since 4/15/14)

Data tracked since: 4/15/14
Total area of collectors: 840 ft²
Installation cost: $85,000
Estimated incetives available (if installed today)**:** $50,000
Estimated payback time: 16 years

Solar production per month: 9.0 MMBTU
Yearly CO_2 emissions saved: 15,350 lbs

Natural gas saved per year: 1,310 therms
Yearly savings: $2,100 (at $1.60/therm)

Calculated yearly savings vs. #2 oil: $4,268 (at $3.70/gal)

Calculated yearly savings vs. propane: $5,733 (at $3.30/gal)

Calculated yearly savings vs. electricity: $5,750 (at $0.17/kWh)

Equipment:

30 Stiebel Eltron SOL 25 Plus collectors
1500 gallon thermal mass storage tank
Stiebel Eltron SOM 10 differential controller
1 Bosch tankless natural gas backup
2 Rinnai tankless natural gas backups
SolarWave DL2 datalogging system

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