ECOGREEN HOTEL

Supporting Hospitality Sustainability

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EcoGreenHotel-President

Hospitality professional with over twenty years experience with major hotel chains, such as Intercontinental, Starwood, Hilton and Choice Hotels. General Manager of the United States first L.E.E.D. certified and "Environmentally Friendly" Hotel; the Sheraton Rittenhouse.

EcoGreenHotel is a hospitality solutions company dedicated to “Supporting Hospitality Sustainability” We do this through training, education, energy and sustainability solutions and an online purchasing channel.

www.EcoGreenHotel.com
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What We Do?

EcoGreenHotel:

- - Supports hotels to identify sustainable and energy efficient strategies that reduce a property's usage, costs, and overall environmental impact.

- - Our vendor neutral approach delivers the best quality and value for all our clients.

- - We specialize in identifying and taking advantage of incentives, grants, rebates and loan programs.

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Hot Water Heating and Distribution

More than many other facility types, water heating is a major load for hotels. It can account for over 30% of a hotel facility's energy consumption

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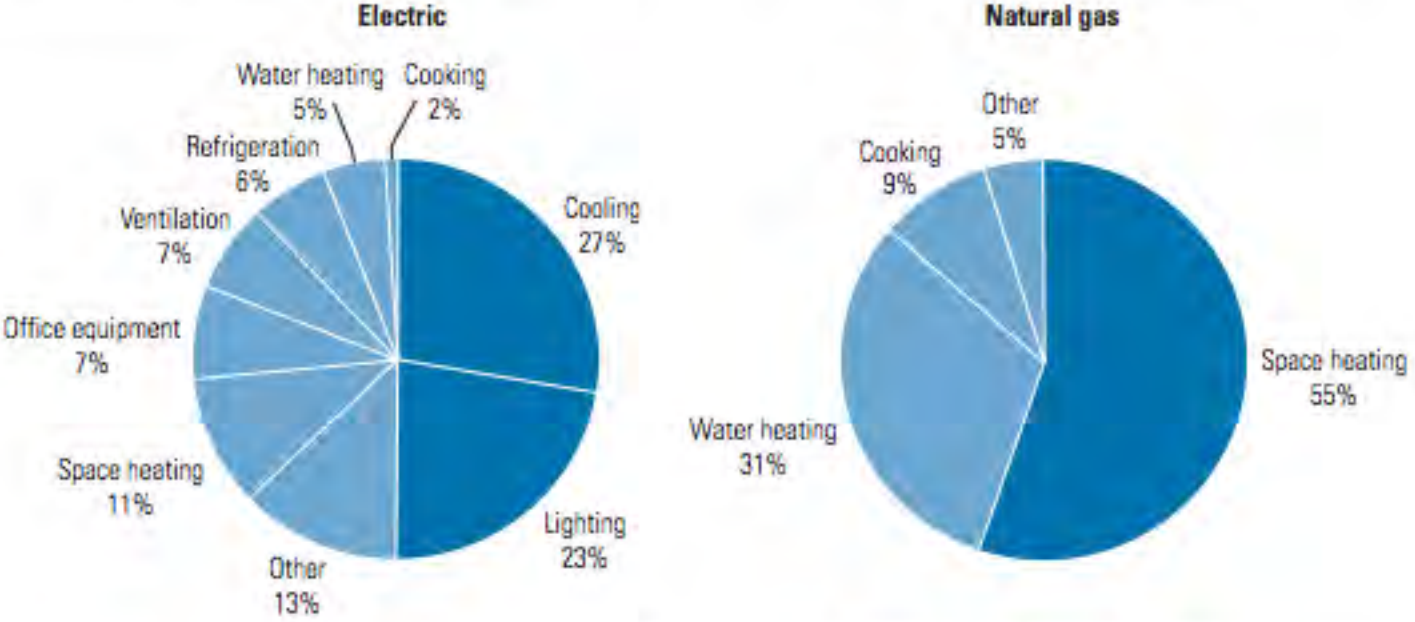
Most of the electricity consumed by hotels and motels is used for space cooling and lighting. Typically, space heating represents the largest use of natural gas in hotels and motels. However, each facility's energy profile is different, so these charts are not representative of all lodging facilities. Hotel and motel energy use will also vary depending on the types of amenities available.



Courtesy: E SOURCE; from Commercial Building Energy Consumption Survey, 1999 data

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Occupancy Based EMS

Hotel studies have shown that sold rooms are unoccupied for 12 or more hours per day.

Hotel operators can link their energy management system (EMS), reservation system, and automated check-out system together to keep an unsold room ventilated but with minimal heating or cooling.

A sold room can then be heated or cooled to a comfortable temperature an hour before a guest's scheduled arrival.

An EMS can enhance guest comfort while reducing associated energy costs

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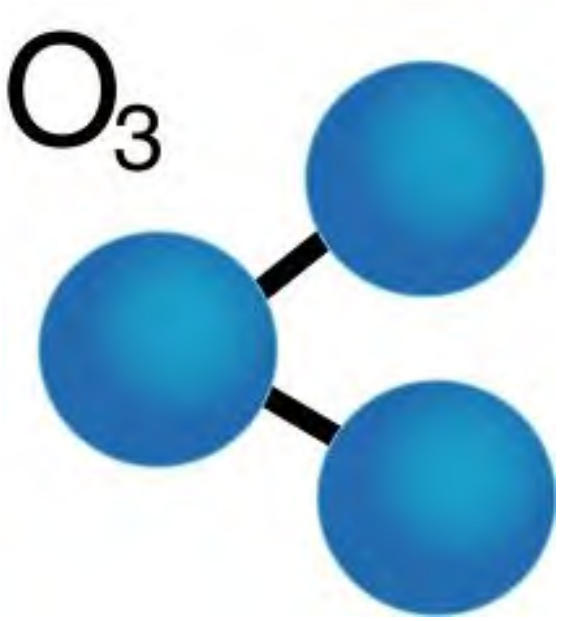
Ozone Laundry

- Ozone laundering systems offer big savings by using cooler water and much less of it; they also use less energy and detergent. Jurys Doyle Hotel Group spent $45,000 on an ozone system at its ENERGY STAR–labeled Boston facility
- The system allows the use of cooler water, uses shorter washing cycles, and has cut detergent use by 30 percent, leading to a payback period of just 16 months



Data provided by: Energy Star

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Hostelling International NYC (662 Beds Largest Hostel in USA)
Ozone Laundry October 2011
Occupancy Based EMS November 2011

	Natural Gas Usage (CCF)				Usage POB				Cost ($)			
	2009	2010	2011	2012	2009	2010	2011	2012	2009	2010	2011	2012
Jan	6,688	6,429	6,743	5,395	0.5145	0.5386	0.4521	0.4015	$ 9,818	9,271	$ 9,220	$ 7,601
Feb	7,632	5,374	5,419	5,243	0.6500	0.3676	0.3587	0.3329	$ 11,603	7,971	$ 7,970	$ 7,157
Mar	3,365	3,687	4,576	3,278	0.2589	0.2199	0.2327	0.1614	$ 5,113	5,779	$ 5,947	$ 4,978
Apr	2,350	2,634	3,651	3,036	0.1610	0.1465	0.1912	0.1532	$ 3,015	4,045	$ 5,074	$ 4,026
May	2,146	3,338	3,180		0.1423	0.1699	0.1575		$ 2,717	4,726	$ 4,586	
Jun	2,526	3,037	2,595		0.1445	0.1537	0.1307		$ 3,217	4,197	$ 3,615	
Jul	3,952	2,833	2,143		0.2351	0.1399	0.1043		$ 5,010	1,877	$ 2,985	
Aug	2,934	2,521	2,365		0.1673	0.1235	0.1143		$ 3,683	3,686	$ 3,293	
Sep	3,809	2,816	2,173		0.2032	0.1420	0.1081		$ 4,750	4,137	$ 2,978	
Oct	3,326	3,142	2,743		0.1926	0.1571	0.1327		$ 4,199	2,280	$ 3,888	
Nov	2,995	6,240	3,752		0.2629	0.4025	0.2019		$ 4,428	8,482	$ 5,700	
Dec	8,686	6,647	5,266		0.5650	0.3663	0.2650		$ 12,085	8,515	$ 7,418	
	50,409	48,698	44,606	16,952	0.2914	0.2440	0.2041	0.2623	$ 69,637	$ 64,966	$ 62,674	$ 23,761

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ECM: Recirculation Loop Management

Systems such as Hot2O Savr and Enovative D'Mand Circ automate the operation of the recirculation loop. The solution is to turn off the pump when there is no demand for hot water. In order to implement this solution the following is required:

* Heat and flow sensing devices to determine when hot water is needed
* A high speed pump
* Hot water available in a storage tank
* A controller to turn the pump on and off

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Hot2O Savr by US Energy Solutions

- "The Hot2O Savr presents an effectively simple solution for properties with hot water recirculation loops that only utilize hot water specific times in a given day. The Hot2O Savr turns off the recirc-line during times of no usage. For hotels, this value becomes quite apparent – given the 'normal' morning and evening rushes while mid-day & mid-night times remain minimally used.

- The Hot2O Savr works by employing a flow sensor to determine when no hot water is being called for by any user. Once a user opens the hot water, the recirc-line immediately begins to "drain"; this draw causes the flow sensor to be tripped and allows the recirc-pump to begin sending hot water from the boiler or storage tank. The system comes standard with an override timer switch to allow for staff to manually lock-out the loop shut off from the flow sensor."

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Energy wasting!

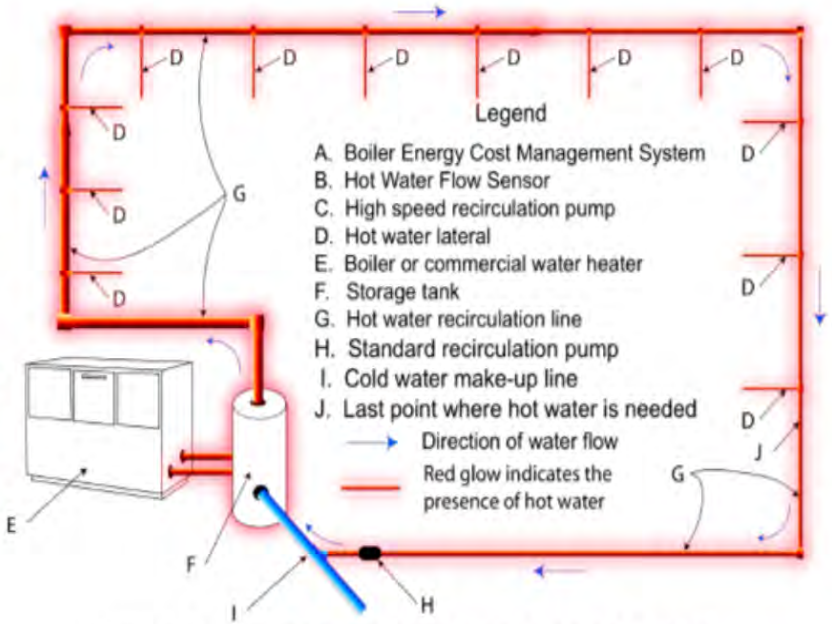

Figure 1A: Hot water recirculation line running full time.

Uses 25% less energy!

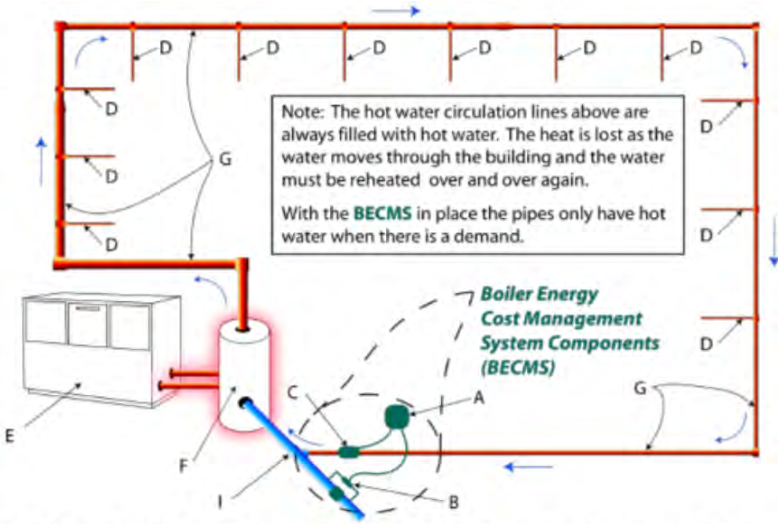

Figure 1B: Hot water recirculation line running in energy conservation mode.

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Hampton Inn Lenoir City TN – 77 Rooms
Ozone Laundry December 2010
Hot Water Circulation Control November 2011

	Natural Gas Usage (CCF)				Usage POR				Cost ($)				% Change Y to Y		
	2009	2010	2011	2012	2009	2010	2011	2012	2009	2010	2011	2012	2009-10	2010-11	2011-12
Jan	472	621	458	142	0.2827	0.4129	0.3161	0.0939	$ 647	$ 788	$ 479	$ 150	46.06%	-23.44%	-70.28%
Feb	589	593	366	163	0.4169	0.3714	0.2521	0.0991	$ 958	$ 714	$ 384	$ 167	-10.90%	-32.11%	-60.69%
Mar	405	643	251	180	0.2216	0.3513	0.1351	0.0905	$ 541	$ 732	$ 251	$ 184	58.55%	-61.54%	-33.00%
Apr	344	360	275	233	0.1916	0.1733	0.1455	0.1220	$ 412	$ 422	$ 261	$ 272	-9.55%	-16.05%	-16.14%
May	226	214	201	170	0.1238	0.1090	0.0992	0.0927	$ 278	$ 258	$ 226	$ 182	-11.97%	-8.98%	-6.50%
Jun	186	196	192		0.0924	0.0930	0.0951		$ 229	$ 224	$ 229		0.64%	2.20%	
Jul	181	189	177		0.0917	0.0918	0.0908		$ 223	$ 216	$ 230		0.09%	-1.04%	
Aug	161	192	162		0.0825	0.1026	0.0877		$ 198	$ 220	$ 215		24.38%	-14.59%	
Sep	156	172	182		0.0830	0.0974	0.1065		$ 192	$ 197	$ 241		17.23%	9.43%	
Oct	166	176	204		0.0818	0.0914	0.0944		$ 204	$ 224	$ 269		11.69%	3.25%	
Nov	255	302	295		0.1484	0.1691	0.1688		$ 294	$ 389	$ 331		13.92%	-0.14%	
Dec	409	340	183		0.3039	0.2697	0.1418		$ 468	$ 361	$ 194		-11.24%	-47.43%	
	3,550	**3,998**	**2,946**	**888**	**0.1767**	**0.1944**	**0.1444**	**0.0997**	**4,646**	**4,745**	**3,311**	**955**	**10.74%**	**-15.87%**	**-37.32%**

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ECM: Boiler Computerized Control System

The Computerized Hot Water Control System consists of a single digital electronic device that uses a microprocessor to calculate fuel savings by adjusting the burner run pattern to match the system's "heat load." The controller accomplishes this by monitoring both the boiler out-flow water temperature, as well as, the rate at which that temperature is changing.

The Computerized Hot Water Heating Control System:

- Consists of a sensing device to optimize boiler heating operation
- Extends boiler "off-times" = results in longer, more efficient burn cycles and reduced burner wear & tear
- It functions like how digital fuel injection works in automobiles – Computer control calculates the most optimal fuel utilization pattern
- Comes with a 15 year warranty. Designed with fail safe operation meaning your HVAC will continue to work should the unit ever fail

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ECM: Liquid Pool Cover

Heatsavr™ is an effective liquid pool cover that greatly reduces heat loss and evaporation from your exposed pool surface. Heatsavr™ is made of simple biodegradable ingredients that form the best barrier currently available to slow the heat and water loss

HeatSavr Liquid Pool Cover:

- Fully automated
- Energy savings
- Chemical Savings
- Water conservation
- Slows evaporation substantially.

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Hampton Inn Knoxville TN – 92 Rooms
Ozone Laundry - July 2010
Hot Water Circulation Control - February 2011
HeatSavr Liquid Pool Blanket – February 2011
Intelledyne Boiler Economizers - May 2011

	Natural Gas Usage (Therms)			Usage POR			Cost ($)			% Change Y to Y	
	2009	2010	2011	2009	2010	2011	2009	2010	2011	2009-10	2010-11
Jan	1,202	1,377	1,397	1.2181	1.2964	1.0888	$ 1,994	$ 1,678	$ 1,549	6.43%	-16.02%
Feb	1,133	1,471	1,018	1.1980	1.4445	0.8359	$ 1,796	$ 1,860	$ 1,138	20.58%	-42.14%
Mar	1,069	1,436	620	0.7643	0.8798	0.3730	$ 1,657	$ 1,781	$ 690	15.11%	-57.61%
Apr	1,091	1,154	1,039	0.7446	0.7174	0.6279	$ 1,577	$ 1,402	$ 1,133	-3.65%	-12.48%
May	1,226	1,081	689	0.7775	0.5922	0.3443	$ 1,554	$ 1,243	$ 755	-23.83%	-41.86%
Jun	992	1,007	745	0.6290	0.4887	0.3640	$ 1,197	$ 1,146	$ 816	-22.31%	-25.52%
Jul	1,461	1,093	630	0.8126	0.4815	0.2872	$ 1,710	$ 1,228	$ 708	-40.75%	-40.35%
Aug	1,089	940	610	0.6961	0.4565	0.2964	$ 1,278	$ 1,065	$ 715	-34.42%	-35.07%
Sep	1,304	937	567	0.7537	0.4646	0.3131	$ 1,377	$ 1,075	$ 673	-38.36%	-32.60%
Oct	1,386	1,179	633	0.6740	0.5596	0.3165	$ 1,318	$ 1,276	$ 738	-16.96%	-43.44%
Nov	1,636	1,414	965	1.0983	0.7470	0.5634	$ 1,754	$ 1,515	$ 1,113	-31.99%	-24.58%
Dec	1,330	1,296	647	1.2404	1.1100	0.4923	$ 1,594	$ 1,397	$ 721	-10.52%	-55.65%
	14,919	**14,385**	**9,559**	**0.8839**	**0.7698**	**0.4919**	**18,807**	**16,666**	**10,750**	**-15.06%**	**-35.61%**

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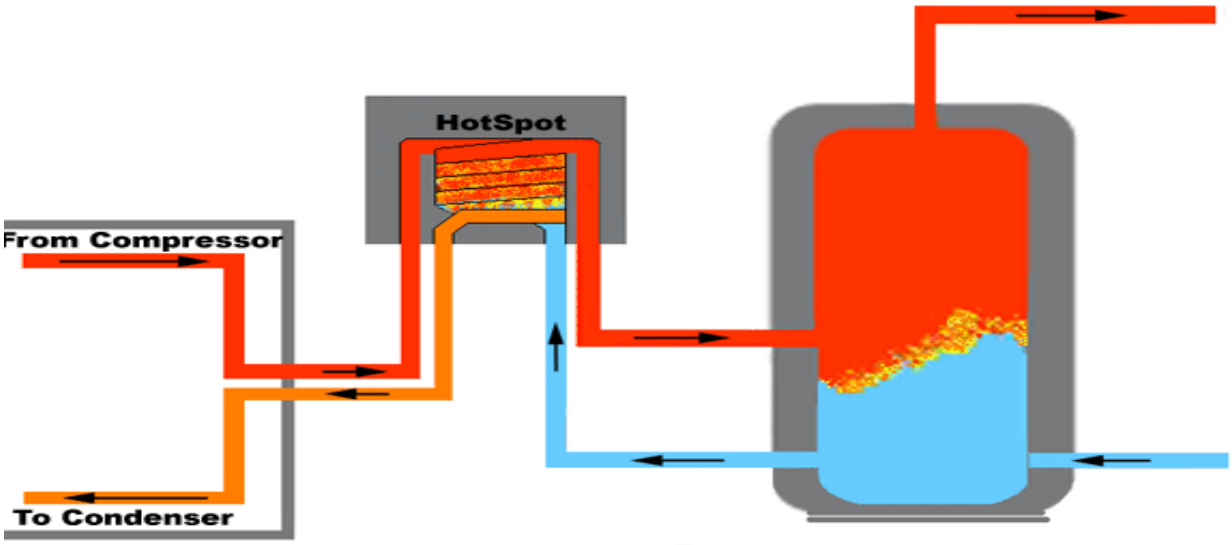
Heat Recovery

Hotels can obtain “free” hot water from their cooling and refrigeration equipment by using double-bundled heat exchangers in the chillers or a plate heat exchanger in the condenser-cooling loop



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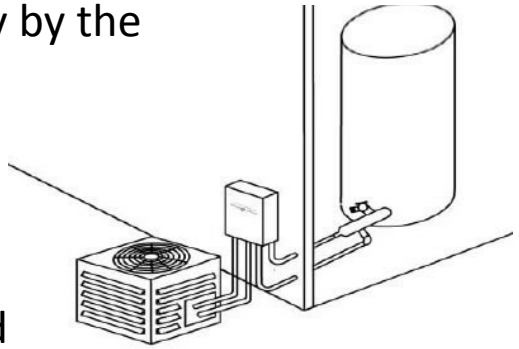
Heat Recovery

Hot refrigerant gas from the compressor enters and flows in the opposite direction as the water flow. The water picks up the heat from the refrigerant gas, cooling the gas and heating the water. The excess heat that previously would have been thrown away by the condenser is recycled.



HotSpot connects to the compressor through standard refrigeration lines, and connects to the hot water tank through standard insulated plumbing pipe, PEX etc. The pump circulates water from the tank, through the heat exchanger, and then back to the tank. The heat exchanger efficiently transfers the compressors high temperature waste heat to the water circuit of the unit.

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HEAT RECOVERY POOL HEATING SYSTEM
FREE POOL HEATING FROM AIR CONDITIONER WASTE HEAT

HotSpot FPH Free Pool Heating

The FPH provides free pool heating by recycling the waste heat that your air conditioner throws away.

In the process, the FPH increases the efficiency of your air conditioner, saving up to 40% on your electricity costs for indoor cooling.

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Tankless Hot Water Heaters

- ENERGY STAR® Qualified
- Energy Factor of .95 for Natural Gas and Propane
- Built-in Rinnai Circ-LogicTM recirculation program cycles an external pump at pre-set intervals and temperatures to maximize efficiency and comfort (see brochure for more details)
- Enhanced scale detection lessens possibility of serious, long-term damage to unit
- Temperature lock function prevents accidental or unauthorized changes to water temperature

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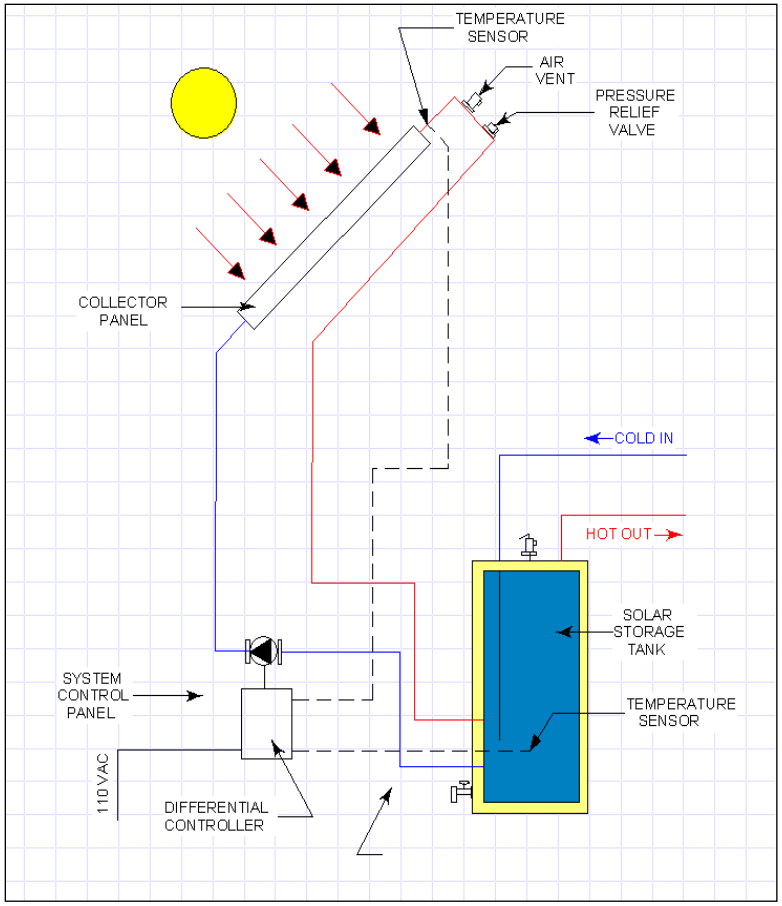
Solar Thermal Energy

Solar collector panels containing a heat transfer fluid are installed on the roof at a favorable angle to the sun. Pipes lead from the panels to the hot water tank, where the heat is transferred to provide tremendous amounts of hot water. Even in winter, hot water temperatures can reach 180º. Solar hot water systems are usually designed to provide 80% of the processes overall hot water needs over the course of a year.

Hybrid Panels



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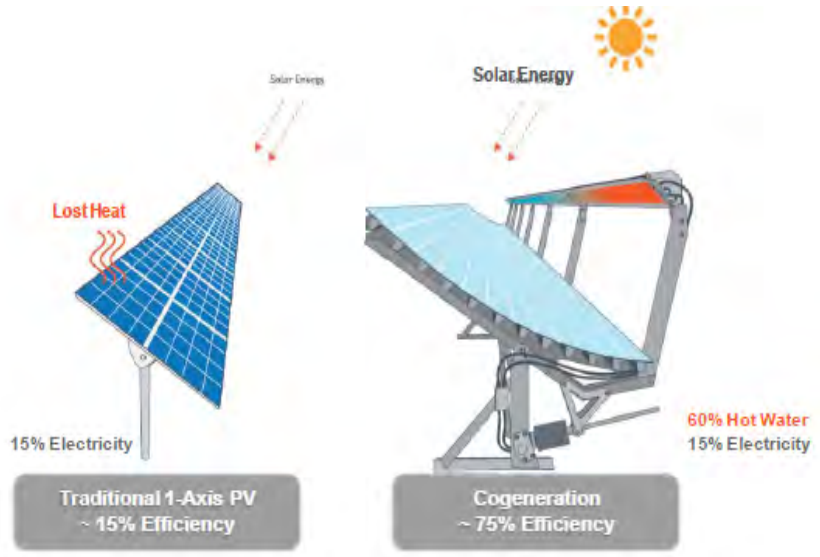
Solar Cogeneration

Solar cogeneration combines the best of both photovoltaic and thermal technologies. Solar cogeneration transforms the need for PV cooling from a liability (waste heat that must be ejected) into an asset (valuable heat that can be captured and utilized). Solar cogeneration can be thought of as a concentrating solar thermal design in which silicon (PV) cells replace the usual black absorption coating. Silicon cells absorb solar radiation nearly as effectively as a black coating. The difference is that silicon cells capture some of the energy as electricity and all the remainder as heat.



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NSTAR (Gas) - Commercial Energy Efficiency Programs

Program Overview:	
State:	Massachusetts
Incentive Type:	Utility Rebate Program
Eligible Efficiency Technologies:	Dehumidifiers, Water Heaters, Chillers , Furnaces , Boilers, Heat recovery, Steam-system upgrades, Programmable Thermostats, Custom/Others pending approval, Food Service Equipment, Infrared Gas Heating Systems, Fryers
Applicable Sectors:	Commercial, Industrial
Amount:	Forced Hot Water Boilers: $500-$15,000 Boiler Reset Controls: $225 Condensing Unit or Water Heater: $500 On-Demand Unit Heater: $1000 or $1600 Warm Air Furnaces: $400-$800 Indirect Water Heater/Boiler: $400 Tankless Water Heater: $500 or $800 Storage Water Heaters: $50 or $100 Low Intensity Infrared Heating Units: $500 High Efficiency Cooking Equipment: up to $1,000 Steam Traps: $25 Programmable Thermostats: $25 Custom Projects: 50% of cost

Questions?

THANK YOU FOR YOUR TIME

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