Example name: GLE balustrade solar water heater

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For installations

BISTS *Location: Florida, 30N, 84W*
Climate Type: *Cfa*
Building Use: *residential*

Level of BISTS integration
Rush level 3 / Reijenga level 3

- ~~O~~ New Build
- ~~O~~ Refurbishment
- O Other: ……

Type of BISTS:

~~Active~~/Passive/~~Hybrid~~

Function(s):
- O Air heating
- ~~O~~ Water heating
- O Combi-system
- O Cooling/ventilation/shading
- O PV/T
- O linked to another system (e.g., heat pump)
- O Other: ……

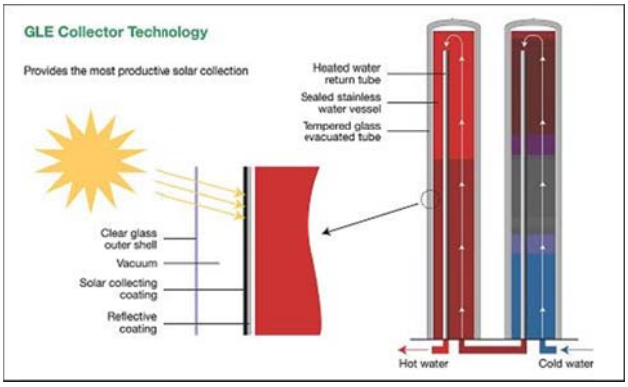
COLLECTOR SPECIFICATIONS		
Gross Area:	1.737 m²	18.70 ft²
Net Aperture Area:	0.861 m²	9.27 ft²
Absorber Area:	0.855 m²	9.20 ft²

Collector and Storage Vessel Specifications		
Dry Weight	77 kg	170 lb
Fluid Capacity:	64.0 liter	16.9 gal
Test Pressure:	1103 kPa	160 psi

Building element:

- O Facade
- O Roof
- ~~O~~ Other: Balustrade

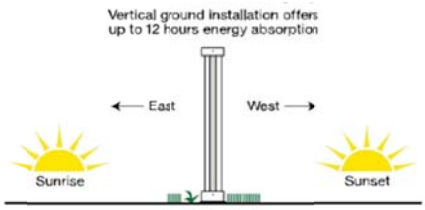
BISTS characteristics:
GLE SHP310 ICS Glazed solar water heater is an in-line Evacuated Tube Batch Collectors (ETBC). The tubes are 650mm long and 125mm in diameter. The glass is 4mm thick borosilicate glass and the absorber tube is made from stainless steel, coated with graded Al-N/Al (absorption: >92%/emittance: <1% (80°C). The stagnation temperature is 330°C and the rated heat loss is <0.1 W/(m^2°C)



Stage of Development:		**Responsible:**
O	Idea/Patent	……..
O	Prototype	……..
O	Demonstration	……..
O	Integral building element	……..
~~O~~	Commercially available	Great Lakes Electric-Solar Energy

BISTS description and context
The GLE solar evacuated tubes are much larger than traditional evacuated tube collectors and therefore create a much larger unit. The framing for the tubes is designed to integrate into existing fence, handrail and balustrade features, providing an aesthetically integrated appearance. The units are directly connected to the existing domestic water supply (creating minimal disruption and no roof penetration.

For optimal results, the unit should be mounted North-South, with the widest surfaces of the panel facing East and West. In other words, if the unit is positioned on the south side of the building, the unit will achieve the best results when oriented perpendicular to the building.



System viability

COLLECTOR THERMAL PERFORMANCE RATING							
Kilowatt-hours (thermal) Per Panel Per Day				Thousands of Btu Per Panel Per Day			
Climate -> Category (Ti-Ta)	High Radiation (6.3 kWh/m².day)	Medium Radiation (4.7 kWh/m².day)	Low Radiation (3.1 kWh/m².day)	Climate -> Category (Ti-Ta)	High Radiation (2000 Btu/ft².day)	Medium Radiation (1500 Btu/ft².day)	Low Radiation (1000 Btu/ft².day)
A (-5 °C)	5.0	3.9	2.9	A (-9 °F)	17.0	13.5	9.7
B (5 °C)	4.6	3.5	2.4	B (9 °F)	15.6	12.0	8.3
C (20 °C)	0.9	2.9	1.8	C (36 °F)	3.1	9.8	6.1
D (50 °C)	2.6	1.6	0.5	D (90 °F)	9.0	5.4	1.7
E (80 °C)	1.3	0.3	0.0	E (144 °F)	4.6	1.0	0.0
A- Pool Heating (Warm Climate) B- Pool Heating (Cool Climate) C- Water Heating (Warm Climate) D- Space & Water Heating (Cool Climate) E- Commercial Hot Water & Cooling							

The GLE solar evacuated tube collector costs US$2,000 (unit only) and is supplied with a 10-Year manufacturer warranty.

Modelling and simulation tools developed/used

Not available

BISTS Performance data

Based on:
O Estimation
O Detailed simulation
Θ Measurement/testing
O Long-term monitoring

Performance parameters

For integrated systems:
key performance indicators -

For separate collectors:
performance rating coefficients -

SRCC
η= 0.424 - 1.163(P/G)

Other:

TECHNICAL INFORMATION	Tested in accordance with: ISO 9806
ISO Efficiency Equation [NOTE: Based on gross area and (P)=Ti-Ta]	
SI UNITS:	η= 0.424 - 1.163(P/G)
IP UNITS:	η= 0.424 - 0.205(P/G)

The unit was evaluated by the Solar Rating & Certification Corporation (SRCC) in accordance with SRCC OG-100.

Additional information:

Sources and references:

http://www.glesolar.com