



Solar Dynamics'
Contribution to Climate
Change.

James Husbands
Solar Dynamics Ltd

History of Development of Barbados'

Solar Hot

Water Industry: 1960's

Professor Tom Lawand



- ❖ Professor Tom Lawand of the Brace Research Institute of McGill University visited Barbados in the 1960's.
- ❖ Tom utilized the materials available to construct one of the earliest “low cost solar water heaters”.
- ❖ Professor Lawand had competition for recognition of the earliest solar water heater from Arthur Coppin, a Barbadian chemist and Sir Frank Hutson, who we are told built one in 1935.

History of Development of Barbados' Solar Hot Water Industry:

- ❖ The first energy shock with oil cost going through the roof saw Fr. Andrew Hatch construct one of Lawand's units.
- ❖ So satisfied was he, that he took a proposal to CADEC for funding the technology of making solar water heaters.

History of Solar Dynamics

Solar Dynamics Ltd was established in Barbados in 1973/74, and in St. Lucia in 1993: in conjunction with Minvielle & Chastanet Ltd.

On October 1, 2013, Solar Dynamics (EC) Ltd became a fully owned division of Solar Dynamics Ltd.

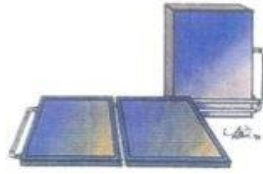
Its purpose is to manufacture, install and service Solar Dynamics Hot Water Systems in Saint Lucia and the Eastern Caribbean and elsewhere.



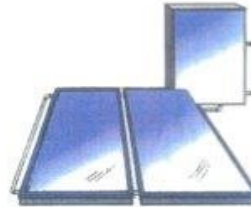
Solar Dynamics started operations with a loan of \$2,495.00 from CACDC. The Grant Research Institute's design was used to produce the first units. Mr. David Louis-Smith, Carlton Moore, G. James, and Mr. John MacLennan, Maresfield Street, St. John's, were the first clients.



First improvement! Plywood replaced the pitch pine enclosures.



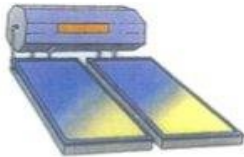
Metal enclosures replaced the wooden. Introduction of headers and risers made of galvanized pipe. The collector's heat transfer plate being aluminium. Enclosures of galvanized steel were introduced.



The introduction of copper collectors. Headers and risers made of copper pipe were introduced. The transfer plate of aluminium was later changed to copper.



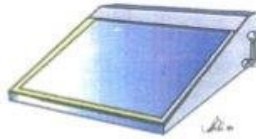
The first horizontal tank, installed with full copper collectors, now enclosed in more durable aluminium casework.



The shape of things to come... the Sunbird. The new octagonal casework for the tank with its graceful lines provide an aesthetic improvement over its predecessors.



Sure! The flagship of the new generation in the early 1980's. Graceful line. Safe tempered glass. The state-of-the-art "D" tubes. Oh so hot!



The new shape of the 90's the Solar Dynamics "Integ", introduced at the Agricultural Exhibition at Craze Hall.



Integ! Modified to permit more solar radiation.



The highest performance and sleekest designed product for your money. It's hot in design and performance.

Development through the years



Solar Hot Water Systems

saving.

- ❖ The average family use a 65 gallon Solar Hot Water System, saving 3145 kWh per year.
- ❖ Equivalent to 1.85 barrels of oil annually. (each barrel of oil will produce 1700 kWh of energy)
- ❖ St. Lucia has an estimated 12,000 Solar Hot Water Systems installed .

Savings:

37,740,000 kWh energy per year.

Equiv to 22,200 barrels of oil

At US \$60.00 per barrel is US \$ 13.320.000.00 per year saving.

E.C \$37.029.600.00 per year .



Bay Gardens Hotel



Savings in Hotels:

Each room use 40 gallons of hot water per day.

Energy displaced daily: 5.3 kWh

Monthly: 161 kWh

Yearly: 1935 kWh

Bay Gardens Reported Satisfaction 95% to 100% (UNEP)

Age of system: 20 Years

Bay Gardens Hotel

At EC \$0.88 per kWh for electric water heating, St Lucian Hotels would save 95 % to 100% of their hot water bill. Same is true for liquefied petroleum gas (LPG).

Bay Gardens is one of many hotels which benefit from such savings.

Bay Gardens estimates that the Solar Dynamics Hot Water Systems installed, cut their operating expenses by 40%. (UNEP)

BAY GARDENS HOTEL & INN, SAINT LUCIA: SAVING ENERGY COSTS WITH SWH

Business Information

Co. name	<i>Bay Gardens Hotel & Inn</i>	Type of establishment	<i>Large Hotel</i>
Building size	<i>Hotel: 78 rooms & suites Inn: 33 rooms Capacity: 150 - 325 guests</i>	Annual hot water demand	<i>Not measured</i>

Fuel source	<i>Electricity</i>	System type	<i>Electric boilers</i>	System capacity	<i>Not measured</i>
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Solar water heating at Bay Gardens Hotel, Saint Lucia

System Type	<i>Flat Plate</i>	System Capacity (in gallons)	<i>Per room: 40 Total: 4440</i>	% of demand offset by SWH	<i>100%</i>
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Savings	Estimated payback
<i>40% monthly on property's electricity costs</i>	<i>1.5 years</i>

Return on Investment on a Solar Dynamics Hot Water System based on electricity cost of \$0.88 per kWh (St Lucia Sept 2018)

Comparison of Electric Water Heater 40 gallon to the
Solar Dynamics Hot Water System 65 Gallon capacity
with Guaranteed Temperature 135F.

Solar Hot Water savings based on electricity @\$0.88 per kWh (St Lucia Sept 2018) Cont'd

❖ Year 1

Capital cost \$1.800.00
Installation Cost \$400.00
Total Cost \$2.200.00
\$5.900.00
Electrical Energy 3145 kWh
@ \$0.88= 2.767.60
Total Cost Year 1
\$ 4.967.60
Return on Investment
50.32%

❖ Year 2

Electrical Energy 3145
kWh@ 0.88 2.767.60
Cumulative cost Yr 2
\$7.73520

Year 3 Electrical Energy 3145
kWh@ 0.88 2.767.60
Cumulative cost Year 3
\$10.502.80

Solar Hot Water savings based on electricity cost of \$0.88 per kWh (St Lucia Sept 2018) Cont'd

❖ Year 4

Electrical Energy 3145 kWh

5% Increase @ 0.92

2.893.40

Cumulative Cost Year 4

\$13.396.20

❖ Year 5

Electrical energy 3145 kWh

@0.92

\$2.893.40

Cumulative Cost Year 5

\$16.289.60

❖ Year 6

Electrical Energy

2.893.40

Cumulative cost Year 6

\$19.183.00

❖ Year 7

Increase 5%

3.038.07

Maintenance 1.000.00

Cumulative cost

\$22.22.10

Solar Hot Water savings based on electricity cost of \$0.88 per kWh (St Lucia Sept 2018) Cont'd

❖ Year 8

Electrical Energy

3.038.07

Cumulative cost

\$25.259.14

❖ Year 9

Electrical Energy

3.038.07

Cumulative cost

\$28.297.21

❖ Year 10

Electrical Energy

3.189.97

Cumulative cost Year 10

\$31.487.18

❖ Year 11

Electrical Energy

3.189.97

Cumulative cost Year 11

\$34.677.15

Solar Hot Water savings based on electricity cost of \$0.88 per kWh (St Lucia Sept 2018) Cont'd

❖ Year 12

Electrical Energy

3.189.97

Cumulative Cost

\$37.867.12

❖ Year 13

Electrical Energy

3.349.46

Year 13 Cumulative

\$41.216.58

❖ Year 14

Electrical Energy

3.349.46

Cumulative Cost

\$44.566.04

❖ Year 15

Electrical Energy

3.349.46

Year 15 Cumulative Energy

\$ 47.915.50

Solar Hot Water savings based on electricity cost of \$0.88 per kWh (St Lucia Sept 2018) Cont'd

❖ Year 16

Electrical Energy

3.516.93

Cumulative

\$51.432.43

Total Solar Dynamics \$8.100.00

❖ Note: A Replacement of electrical heater likely at 10 Years(likely \$2.700.00).

❖ Allow for change of Element every 4 years.(\$150.00 each)

❖ Likely total cost EC\$54.742.43

Conclusion

- ❖ The return on investment on the use of a solar hot water system in households and the hospitality industry makes sense and money for everyone.
- ❖ It saves carbon emission, and therefore enhances the environment.
- ❖ Financing Solar Hot Water Systems makes the systems accessible to more members of the population.
- ❖ Hot Water is important to national productivity, as children and adults take their shower effortlessly when hot water is readily available.
- ❖ Few items have the social, environmental and foreign exchange benefits as solar hot water systems.
- ❖ Through the partnership with the St. Lucia Development Bank, the industry can grow at a faster rate; making a fuller contribution to other national, regional and international efforts to mitigate the effects of climate change.

Thank You.

Solar Dynamics