



Bride sunshine for tourism and solar thermal technology: 64 collectors on the parking place supply the hot water for the Almond Resort All-Inclusive in Barbados.

Photo: Solar Dynamics

The Barbados model: A success story in 3 acts

270,000 inhabitants already benefit from the 45,000 solar water heating systems for private, public and commercial buildings on Barbados. Two out of five households on the island use solar energy to heat their water. This is a remarkable success for a solar market.

Solarthermalworld.org spoke with William Hinds, senior technical officer from the Energy Division of the Ministry of Finance, Economic Affairs and Energy of the island state, as well as James Husbands, founder and managing director of the collector manufacturer Solar Dynamics. “The challenge is to combine the necessary measures in the public and the commercial sector at the right time”, says Hinds. When looking back, he makes out three different phases the Barbados market has gone through.

Phase 1: Public and commercial sector working together to get the market started

Phase 2: Maintaining market growth to become a self-sufficient market

Phase 3: carrying the market success abroad



**Solar water heaters on the roof of the Oistins Police Station – installed in 2008
Photo: Solar Dynamics**

Phase 1: Public and commercial sector working together to get the market started

The establishment of a solar water heating sector on Barbados can be traced back to the year 1973, during the first oil crisis. Two very important factors worked together in this early stage:

- A small industry with a strong commitment to solar thermal technology emerged in the early 1970s. James Husbands of Solar Dynamics pioneered the industry's development, equipped solely with a small loan of US \$4,200, granted by the Caribbean Conference of Churches in 1973. Peter Hoyos of Sunpower followed in 1978. A third company, called Aqua Sol, also entered the market. Barbados' solar water heating sector benefited from the competition among these companies. Back then, system manufacturers went from door to door to inform the people about the cost-effectiveness of solar water heating technology.
- At the same time, the government put policies in place which persisted even as energy prices went down again. It implemented the first fiscal incentives during the government of late Prime Minister Tom Adams (1976 to 1985). "Adams was impressed with the reduction in his household's consumption of bottled gas after installing a solar water heater," remembers Husbands. "Adam's family typically consumed a 100 lb cylinder for cooking and water heating every three weeks. After installing the Solar Dynamics hot water system, the 100 lb cylinder lasted eleven weeks."

Prime Minister Adams gave a tax concession to households who installed solar water heaters and increased the duties on gas and electric water heaters. The tax deductions were in place until the early 1990's and were halted when Barbados went through structural adjustments. In 1994, when Prime Minister Owen Arthur came to power, the tax deduction for homeowners was reinstated. Arthur also gave the country's third highest honour, "The Gold Crown of Merit", to the industry's pioneer James Husbands, making Husbands the first person in this business sector to receive such an award.



Standard 66 gallon solar hot water heater from Solar Dynamics with a guaranteed temperature of 135 °F ± 5°. If the water falls below this temperature and it is proven that it is due to the performance of the system, Solar Dynamics will investigate and do the necessary to ensure that the guaranteed temperature is reached. Photo: Solar Dynamics

Phase 2: Maintaining market growth to become a self sufficient market

Bringing down the price of solar water heaters, providing a sustainable business for the industry and improving the confidence of consumers in the product were the three crucial factors during the second stage.

1. The government committed itself to using solar water heaters in its housing programme. In 1974, the housing development at Oxonards St. James Barbados was the first to let Solar Dynamics install 84 solar water heating units. It proved not to be the last project to incorporate solar water heaters. The National Housing Corporation, a division of the Ministry of Housing, completed other building sites that included solar water systems, such as the Husbands in St. James (1980), the St. George and Orange Hill (1990) and London Bourne Towers (2000).
2. Another important factor at that stage was communication. “A big effort by the government as well as the industry was necessary to inform the population about the cost-effectiveness of solar water heaters,” says Hinds. The return-on-investment for families using solar water heaters is very appealing. The net return of the investment is reached after less than two years – in contrast to the, on average, 4,000kWh/year a family would have to pay for, if it purchased an electric water heater. The following table shows the calculated figures in Barbados Dollars (BBD). The minimum savings over the 15-year life-cycle of a solar water heater are BBD 36,000.

Investment costs of an electric water heater including installation	1,000	BBD
Electricity bill (4,000 kWh/year) over two years	4,800	BBD
Total costs in the first two years	5,800	BBD
Investment costs of a solar water heater (80 gallon) including installation	4,900	BBD
Tax deduction	-1,125	BBD
Net investment costs	3,775	BBD

Solar water heaters were able to penetrate the domestic market as deeply as they have, because distributors and credit unions as well as commercial banks provide credits to end consumers over a two-year period.

3. Improving consumer's confidence in solar water heaters played another important part in maintaining market growth. First, Solar Dynamics improved the efficiency of solar hot water systems, which led to a reduction of the collector area required to heat the water to a specified temperature. A 42 ft² of collector area was no longer necessary. 33 ft² became sufficient - a reduction of 21 %, which lowered the price. Second: The solar water heater manufacturer established and maintained a policy of installing only right-sized systems suitable for their respective use. Third: "A major confidence builder was the voluntary testing of a 66 gallon unit at the Florida Solar Energy Center", says Husbands. "The unit delivered 863.5 Btu/ft², which has remained unmatched in the Barbados market".

Phase 3: Carrying the market success abroad

"A mature market like Barbados is able to export its technology and its experiences globally", says William Hinds. The industry made successful steps beyond the island's borders. Aqua Sol entered the market in Trinidad with a franchise manufacturing plant. Solar Dynamics started producing in St Lucia through a joint venture in 1993. The Solar Dynamics EC Ltd. exports to the islands of the Eastern Caribbean and has had great success with it. In 2006, it won the Export Award of the St. Lucia Chamber Of Commerce, Industry and Agriculture. The company has been assisted through the wisdom of St. Lucia's electricity provider LUCILEC, which advises its consumers on their bills to use solar water heating, in order to reduce their electrical consumption. In the meantime, 80 % of the solar water heaters in the English-speaking Caribbean originate from Barbados-owned factories.

Conclusions by the two interview partners

James Husbands finally stated that the Barbados model has therefore been built on key consumer benefits, including protection through a unique temperature guarantee by Solar Dynamics, tested high-performance and right-sized products, consumer credits, consumer education, a tax incentive by the government and the use of solar hot water systems in the government's housing estates.

William Hinds indicated that the success of the Barbados model has been based not just on the innovative leadership of Barbadian manufacturers in combination with government support, but equally on the strategic timing of each combined effort of the government and business sector, beginning with the start of the first water heater company Solar Dynamics during the very same year as the start of the first energy hikes in 1973.

More information:

Solar Dynamics: www.solardynamicsltd.com

Energy Division of the Ministry of Finance, Economic Affairs and Energy

[http://www.energy.gov.bb/\(S\(jan4zra1qppk5q55uleunqnc\)\)/default.aspx](http://www.energy.gov.bb/(S(jan4zra1qppk5q55uleunqnc))/default.aspx)

This article is written by Bärbel Epp in close cooperation with James Husbands and William Hinds.