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Organization of Caribbean Utility Regulators 14th Annual Conference
Montego Bay, 26-28 October 2017

The Regulatory Framework for the Development of the Solar Water Heater Industry in the Caribbean

Adapted from
Solar Water Heating: Business Models, Financing Models and Lessons, STEPs Project

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Since 1900s…

Since the 1970s….

SWH costs for a "standard" HH of 4 members
- as low as 600 USD/1,500 USD [ODA countries]
- to 3,500/7,500 USD [OECD country]

Source: *http://www.energymatters.com.au/solar-hot-water/flat-vs-evacuated/*

Types of Solar Water Heating Installations

Solar Water Heating Technology

- Mature technology
  - Dominant flat-plate solar collector design, sometimes using evacuated tube collector, is commonly used across many country contexts
  - Relatively low key technology which can last +30 years
  - Nevertheless requires some maintenance, in terms of cleaning and removing residues once a year (lime scaling) + change parts (valves,…)

- Manufacturing
  - Can be imported ➔then more expensive,
  - But design can be adapted to local material availability, or local manufacturing capacity for evacuated-tube collectors can be created
  - Implementation of local workshops and not just distribution/installation network

The Market Opportunity for SWHs in Caribbean Countries

Identifying the Market

- There are a number of opportunities in Caribbean country markets to develop a solar water heating sector, thanks to:
  - High levels of insolation,
  - Level of urbanisation increasing – growing middle class

- Rural areas?
  - Rural communities can be targeted with solar heating, particularly health centres and schools + lodges for tourists.
  - Communities that predominantly use electricity for meeting their water heating energy demand stand to make considerable savings over time from switching

Case Studies for Solar Water Heating: Tunisia (I)

Phase 1 (end 1980s - 2004)

- Replace natural gas and LPG as the fuel for heating water
- Exemption from VAT & import duties reduced to 10%
- Label to ensure quality & certification process for SWH installers
- Systems were able to be purchased at a subsidised rate of USD75/m2 of heater (20% system cost)

➔ Not much happened

Phase 2 PROSOL (2005 – 2010)

- Repayment through electricity bill (on top of subsidies)
- Allow consumers to buy SWHs cheaply, and pay back over long periods

➔ SWH market took off

Case Studies for Solar Water Heating: Tunisia (II)

Costumer

- Pay only 10% up-front (or less)
- Loan mechanisms over a 5-year term
- Repayment of the loan via the utility bill
- Monthly repayment correspond to energy savings

Simplified procedure

- Costumer contact the SWH supplier and fill a form with ID and last utility bill
- Installation immediate

Source: from M. Touhami; G. Hannane, UNEP.

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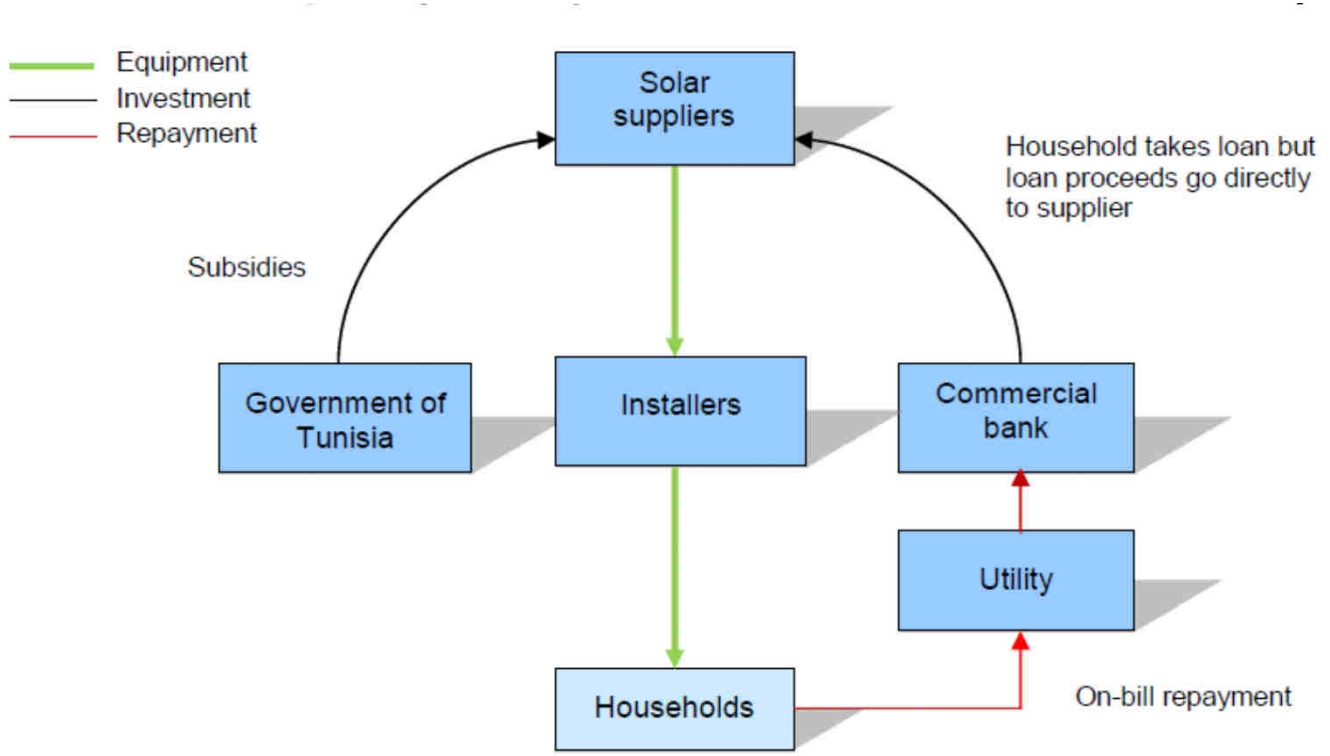

Source: Econoler, STEPs project, 2014.

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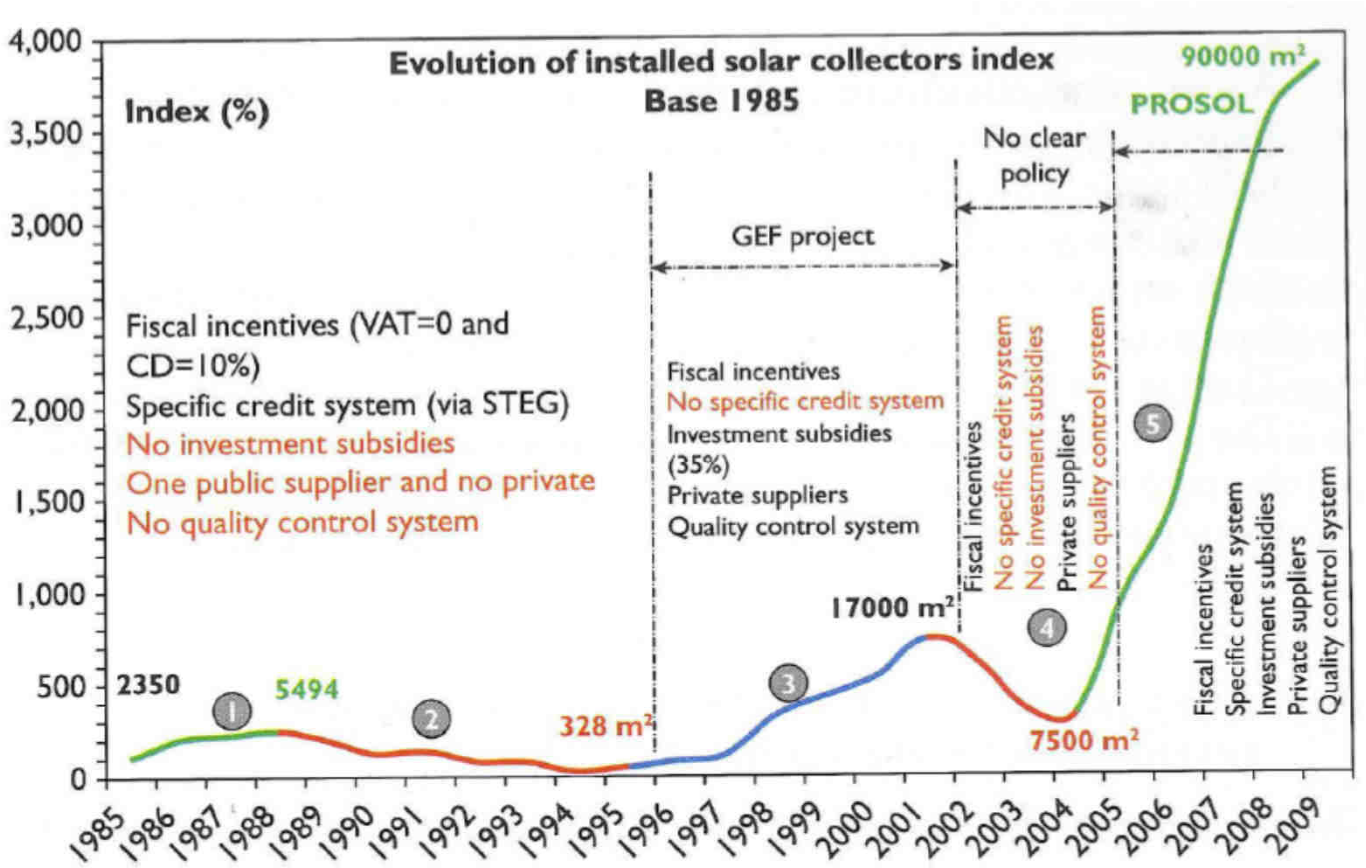
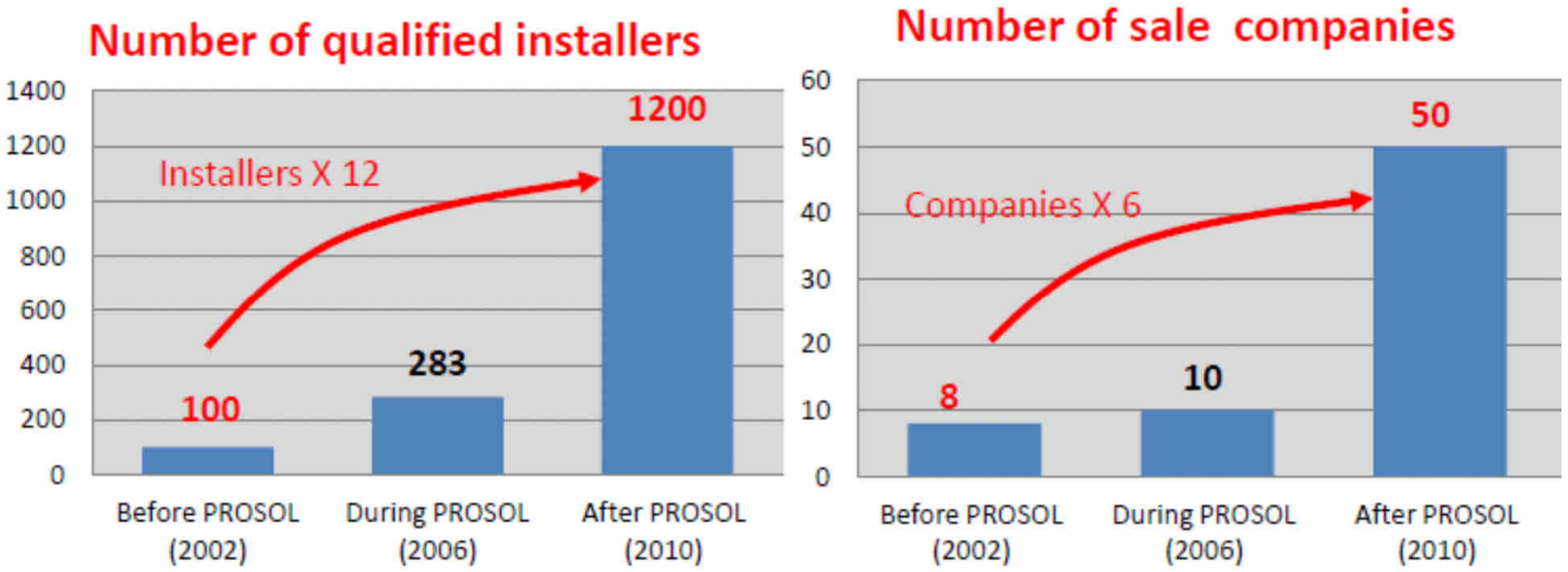


Source: IEA-RETD, 2013, "Business Models for Renewable Energy in the Built Environment"

Case Studies for Solar Water Heating: Tunisia (V)



Source: M. Touhami; G. Hannane, UNEP.

Case Studies for Solar Water Heating: Tunisia (VI)

PROSOL - Tunisia

- One of the most prominent success cases for solar water heating dissemination in the Global South
  - From 2004 to 2010, over 363,000 square metres/ 136, 466 systems of solar water heating capacity were installed , financed through USD73 million of local bank loans, facilitated through funding from UNEP and the Italian government

- **Utility-led** means consumers repay their SWHs on their electricity bill
  - No risk for the consumer – reliable installation
  - No risk for the utility – consumer will repay (or electricity cut)
  - No risk for the bank – interest rate reduced from 12-13% to 5-6%

Case Studies for Solar Water Heating – South Africa (I)

- One million Solar water heater program by 2014!

- Initially promulgated by the government in 2009, with the national utility ESKOM as the main implementing agency
  - Initial target: savings of 578 GWh equivalent of building a power plant of 2,000 MW as
  - Reduction peak demand
  - Domestic water heating 40% of electricity bill

- Issues linked to the "stop and go" nature of this policy
  - Fly-by-night companies selling cheap imported Chinese products
  - Accumulation of counter-references ➔ negative reputation for SWHs
  - Market stabilised from 2011 with established solar companies

Case Studies for Solar Water Heating – South Africa (II)

- 1 million SWH? As of Jan 2014, approximately **400,000 solar water heaters** had been installed nationally under the program

- The program was restructured in 2014, with the Department of Energy now taking full responsibility for the program, contracting with ESKOM as an installer, but also with local producers on a much greater scale & greater involvement of municipalities

- Contradiction: Electricity consumption reduction was a major target but majority of installations were in least-consuming areas of country (low income SWH programme till 2012) limiting impact

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Low-income SWH programme South African case sometimes struggled due to lack of consumer buy-in from lack of sense of ownership of system, and a lack of operations and maintenance service provision leading to non-functional systems

Solar water heaters on homes in Kuyasa, South Africa, installed as part of the CDM project for the township. Source: https://energygeographies.wordpress.com/south-africa/

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Case Studies for Solar Water Heating - Barbados

- Government support and clear, **long-term policy** and regulatory support in turn have been major contributors to the development of the market
  - Homeowner Tax Benefit from 1980-1992 and from 1997 allows maximum of US$1,750 to be deductible for the cost of the installation of SWH equipment
  - Mandatory government purchasing of SWH for state housing has been in place since 1977
  - Private sector has benefited from providing credit facilities for consumers, alleviating the up-front cost burden of the technology
  - Robust regulations for quality control of solar water heating equipment

- As of 2009, there were approximately 45,000 units installed in the country, or two-fifths of households, and by 2012 this could have grown to 50,000 installations (other estimate: around 38,000 ?), covering one-quarter of the islands 200,000 inhabitants

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Case Studies for Solar Water Heating - Turkey

- Turkey has a developed solar thermal/solar water heating market, notable in that the market has succeeded with only minimal interventions financially from the government

- Access to consumer finance is high among companies in the country, in part driven by a reasonable climate of access to business finance
  - Allows consumers to pay on flexible terms, alleviating cost barriers
  - Stable, long-term commitment to technology from the government has supported the sector

- Estimated 90 large factories, and 700-800 retailers for solar water heating equipment in Turkey

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Encouraging Growth in SWH Markets and Entrepreneurship

Policy Support for SWH

- There are a number of avenues that can be utilised to support solar water heating market and business development with policy
  - Supply-side mechanisms such as **accreditation** for products and **licensing** for companies increase consumer confidence in technologies
  - **Tax incentives** can be used, either to incentivise indigenous production or improve access to imported SWH equipment, allowing the technology to compete in the market more effectively
  - **Mandatory purchasing** regulations from governments can significantly stimulate markets

➔ Important to target regulation to stage of market development: early-stage markets benefit from public support in terms of product innovation and capacity-building, later-stage markets from wider market-based measures

Encouraging Growth in SWHs Markets in the Caribbean

Can the experience of Barbados be replicated?

- Barbados high level of income <> situation other SSA countries

- Nevertheless what makes a real difference
  - Simplification of administrative process for consumers
  - Nurture market at different stages of development

Obvious positive impact of large dissemination of SWHs

- Reduction of electricity demand – avoided cost of generation
- Reduction of climate impact (compared to generation with fossil fuels)
- Creation of local jobs (higher than conventional sources)

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Further information

STEPs project look at public-private partnerships to deliver thermal energy services
LPG, SWH, cook stoves, biogas

STEPs website: http://stepsproject.net/
STEPs blog: https://stepsproject.wordpress.com/
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"This document is an output from a project co-funded by UK aid from the UK Department for International Development (DFID), the Engineering & Physical Science Research Council (EPSRC) and the Department for Energy & Climate Change (DECC), for the benefit of developing countries. The views expressed are not necessarily those of DFID, EPSRC or DECC, or any institution partner of the project."

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