Federal Ministry for the
Environment, Nature Conservation,
Building and Nuclear Safety

Dissemination of Solar Water Heating in Brazil and Mexico

The use of fossil fuels for cooking and water heating represents a major source of greenhouse gas (GHG) emissions in Latin America. One of the most technically viable and economically attractive ways of reducing fossil fuel consumption in home systems is solar water heating (SWH). As part of the International Climate Initiative (IKI), the German Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) commissioned the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) to carry out projects aiming to foster the use of SWH systems on rooftops as a sustainable alternative to conventional water heating technologies, providing total funding of up to EUR 4.7 million.

1,000 Roofs Programme in Brazil

In Brazil, it is common to heat water using electricity or natural gas. The widespread use of electricity for showers, in particular, leads to demand peaks in the power system.

From 2009 to 2013, the "1,000 Roofs Programme" promoted the use of SWH systems in different sectors and in various regions of the country.

The programme supported the introduction of national quality standards and training for technicians in the planning, installation and maintenance of solar heaters. It also provided assistance to the Brazilian National Environmental Ministry (Ministério do Meio Ambiente) in the process of creating and coordinating a working group on SWH systems, which was tasked with drafting and implementing a national strategic plan for the deployment of SWH systems.

A major goal of the project was to promote the introduction of SWH systems in the context of ongoing Brazilian initiatives in the social housing sector. One result was that the district of Mangueira in Rio de Janeiro became the first social housing complex in the country to be equipped with SWH systems. It has since served as a reference in the Brazilian social housing sector. Due to the positive results achieved by the project, the Brazilian Government decided to make SWH mandatory for all social housing units constructed within the programme "Minha Casa Minha Vida" (My House My Life). Coordinated by the National Ministry of Cities and implemented by Caixa Economica Federal (CAIXA), "Minha Casa Minha Vida" is now one of the largest social housing programmes in the world, aiming to construct over six million housing units by 2018. To date, more than 230,000 units have been equipped with SWH, contributing to a reduction of around 7,000t of CO_2 per year. Based on a subsidy of BRL 1,600 per SWH unit (approximately USD 410), Minha Casa Minha Vida has invested over USD 94 million in the deployment of SWH systems.

25,000 Solar Roofs for Mexico

Mexico ranks among the world's top ten emitters of greenhouse gases. The use of renewable energy technologies in the residential sector represents a significant opportunity for reducing emissions. Although Mexico has one of the highest average rates of solar irradiation in the world,

its potential remains largely untapped. The IKI project "25,000 Solar Roofs for Mexico" was implemented from 2009 to 2015. It aimed to increase the use of SWH systems in the Mexican residential sector, removing barriers that inhibit their use and thereby reducing GHG emissions.

The project was based on the Market Incentive Programme that had already been running for several years in Germany. The concept was adapted to the Mexican context by developing a mortgage facility, the "Hipoteca Verde" managed by the National Workers Housing Fund Institute (INFONAVIT) with a combined grant from foreign funds. Thanks to the introduction of this innovative model, Mexico was able to position itself as a pioneer in the field.

The project enabled Mexico to take more advantage of its huge potential for solar energy and to boost the market for SWH. In particular, the project helped to:

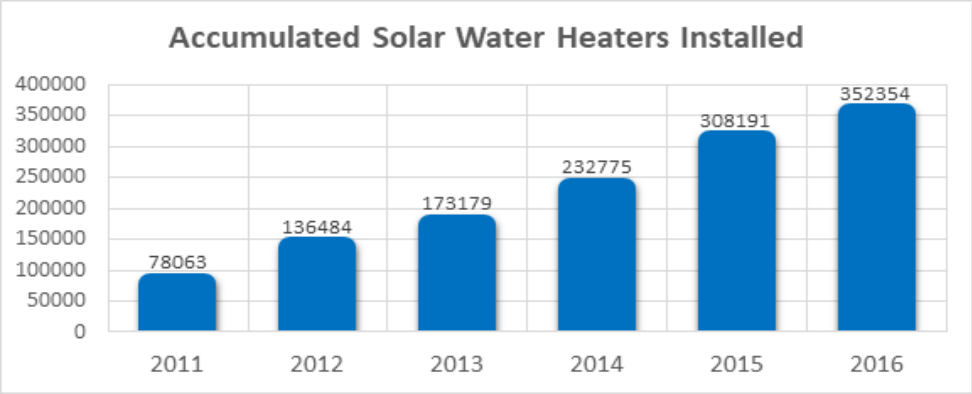
- generate savings for end users (reduced gas consumption) and the government (reduced subsidies);
- provide access to a proven, clean and highly profitable technology for the low-income population;
- strengthen Mexican production capacity and services;
- support the implementation of the Special Climate Change Programme (PECC) of the Mexican Government.

Between 2010 and 2012, around 19,000 SWH units were subsidised. The installed equipment allows emissions reductions of at least 146,711 tCO_2e to be achieved over its technical lifetime of 15 years as well as reductions in the consumption of liquefied petroleum gas (LPG) in households. Each SWH mitigates an average of 0.57 tCO_2e per year.

Total investment during the project execution phase amounted to EUR 3.1 million (EUR 1.9 million in direct subsidies and EUR 1.2 million through technical assistance). During the lifetime of the equipment, the installed SWH units are expected to produce total savings of EUR 24 million for end users and save the Mexican Government EUR 700,000 in subsidies. Each user is expected to save approximately USD 100 per year due to the reduction in gas bills.

The project helped integrate more than 65% of the Solar Water Heaters installed in Mexico's housing sector. After the project came to an end, Hipoteca Verde continued financing SWH units (without German subsidies). By the third quarter of 2016, more than 350,000 units had been financed in both new and existing households. This shows the enormous potential the project set out to seize, serving as a platform for the development and implementation of new and better technologies.

Thanks to the success of the 25,000 Solar Roofs for Mexico programme and other institutional actions, the Mexican SWH market now has strong foundations on both the supply and the demand side. This makes the country a model for other Latin American countries on how to design and implement policies for promoting renewable energy technologies.



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