SOLAR HEATING & COOLING PROGRAMME
INTERNATIONAL ENERGY AGENCY

2017 HIGHLIGHTS

Task 54 – Price Reduction of Solar Thermal Systems

THE ISSUE

One of the greatest challenges of the 21st century is to secure a sustainable energy supply and to considerably reduce CO_2 emissions and the serious consequence of climate change. The challenging goals with regard to the contributions of renewable energy cannot be reached without considerable growth of solar thermal markets worldwide. Therefore, cost-competitive, efficient and reliable solar thermal systems are required. Cost-competitiveness is particularly hard to achieve as the price of solar thermal systems is still not equaled by the price end-users have to pay for conventional heat supply. A great number of complex, costly and oftentimes non-transparent steps are needed to bring solar thermal from the factory to the actual users. SHC Task 54 is looking for ways to optimize each of these steps as well as looking into the social-political context in which solar thermal installations are embedded. The ultimate goal is to strengthen the solar thermal industry by finding solutions for more cost-efficient production and installation of solar thermal systems and for marketing them at an even more competitive price.

OUR WORK

SHC Task 54 aims to reduce the purchase price for end-users of installed solar thermal systems by evaluating and developing sustainable means to reduce the production and/or installation costs of materials, sub-components and system components.

Special emphasis is being placed on the identification and reduction of post-production cost drivers (e.g., channels of distribution). An extensive market research, the definition of reference systems, cost analyses, and the study of socio-political boundary conditions for solar thermal prices in selected regions will provide the basis for the evaluation of cost structures and cost reduction potential. Additionally, ways to make solar thermal more attractive by improving marketing and consumer-oriented designs are being explored.

Participating Countries

Australia
Austria
China
Denmark
France
Germany
Italy
Netherlands
Norway
Switzerland

Task Period 2015 - 2018
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TASK 54

KEY RESULTS IN 2016

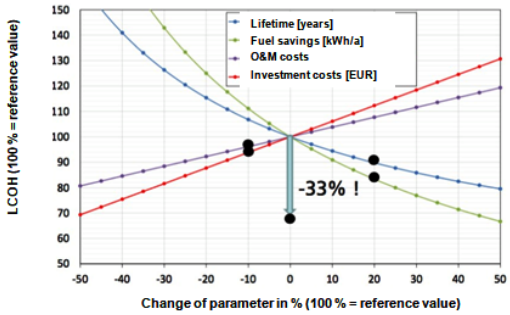
Levelized Cost of Heat (LCoH) for Reference Systems in Austria, Germany, Switzerland and Denmark

To assess the impact of different measures on the costs of the heat produced by solar thermal systems over their lifetime a method was needed. The levelized cost of heat (LCoH), a measure based on the concept of levelized cost of energy this is widely used in the power sector, was chosen (for more details on the calculation method see Info Sheet A01).

In 2017, LCoH for reference systems in different European countries such as Austria, Germany, Switzerland and Denmark were calculated for different system types and configurations, for example, conventional heating systems for single (SH) and multi-family (MF) houses, solar domestic hot water systems for single and multi-family houses or combisystems for single family houses. Dependent on the chosen technology and application, the results range from 0,056 €/kWh for a solar domestic hot water system (MF) in Austria to 0,206 € / kWh for a solar combisystem (SH) in Germany. The costs calculated for these reference systems form the benchmarks for the cost reductions tackled in Task 54's final year 2018. Info Sheets on all reference systems including costs are ready for download at http://task54.iea-shc.org/info-sheets.

The Key to 33% Cost Reduction

With the help of the LCoH calculation method, a sensitivity analysis was conducted. It highlights the factors that are most influential on current solar thermal system prices and gives an idea of the immense reduction potential that results from a combination of each. The study reveals that there are at least four decisive factors for reducing solar thermal system costs: investment, O&M, lifetime and fuel savings.



For example, lowering the investment costs by 10% in combination with 10% lower O&M costs, 20% higher fuel replacement and a life time increase of 20% can lower the complete system price by 33% - one third of the initial benchmark. Developing a technology able to boast with all of these aspects is part of Subtask B's work; the results are expected in 2018. The sensitivity analysis was conducted by the University of Stuttgart's ITW in the framework of the German project KoST.

How Sexy is Solar Thermal – Key Results of the 2017 Dissemination Workshop

In October 2017, major results of Task 54 research were presented at a public dissemination workshop and associated Industry Round Table in Linz, Austria. Hosted by the Johannes Kepler University in Linz, the workshop was mainly dedicated to key results of novelties on polymeric pumped and non-pumped systems. The closing session was on the integration of these findings into Task 54's LCoH calculation. Around 50 people from the Austrian private sector (energy planners, SMEs, industry) and research participated.

The Industry Round Table on the following day was directed at a small expert circle from the solar thermal industry. Short presentations by selected experts, and a guest lecture by Roger Hackstock, Austrian Solar, were followed by a discussion on the viability of the Task's findings. Generally, the experts from SolarIER, Gasokol, Austria Solar, GreenOneTec, Ernst Schweizer and SolarFocus agreed with the Task's approaches, but also see potential in new system approaches, for example, district heating and technology mix or investment models. The experts further strengthened Task 54's assumption that solar thermal not only lacks competitive prices, but also a competitive image amongst the renewables. PR measures and awareness raising activities could contribute to polishing the image of solar thermal.