

Solar space heating in Ladakh (SolLad)



Highlights

- Implementation of a solar air heating systems for high altitude region Ladakh, Himalaya region
- Simple and economic technology with opportunities for local manufacturing
- Low maintenance, frost-proof operation, as heat transfer medium is air
- First demonstration systems implemented and under monitoring
- Transfer of a very well proven solution & long term know how from Altiplano project (Andes, Argentina)
- Commissioned by BMUB (IKI), project in cooperation with Solar Institute, Jülich and SWT, University Stuttgart
- After implementation of demonstration systems up scaling through policy and financing schemes

Context

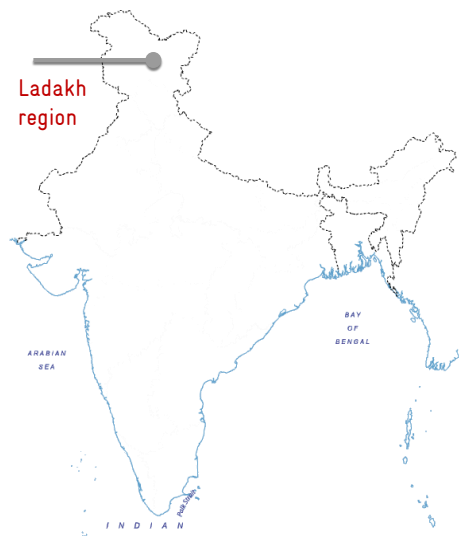
Population of Ladakh is exposed to sub-zero temperatures for more than seven months per year. Conventional heating is not only very expensive but also traditional heating (e.g. Bukharis) has an adverse impact on health and environment.

To address similar challenge of high altitude, cold desert climatic condition a system was designed 15 years ago in Altiplano region of Argentina. With the “Altiplano Solar Air heating system” a environmental friendly, very economic and proven technological option for high altitude regions exists and can be replicated in Ladakh.

Main objective of the project is to focus on the adaptation of the “Altiplano” solar air heating concept for high altitude region Ladakh. The measures to improve the thermal energy efficiency of the local buildings (insulation measures) will also be covered along with the solar air-heating system.

After successful demonstration dissemination of the solution e.g. large scale up-scaling, facilitation through policy and capacity development measures will be conducted.

There exists strong possibility to replicate and upscale the solar-air heating system with insulation measures in other Himalayan regions, states like Himachal Pradesh and Uttaranchal as well as in neighboring countries (e.g. Nepal).



Ladakh region in Himalayan mountain range with adverse living conditions

GIZ's work

GIZ through the project Solar air heating solutions in Ladakh region „SolLad“ is supporting to develop the technology locally and with locally available materials to the widest extend possible. The local people will be trained on the various aspects viz. selection of material, fabrication, development of skills, monitoring, optimization during the project period.

International experts have been contracted to design, develop, install and monitor demonstration system as well as – in parallel - build local capacities to overtake these tasks. The installed systems are monitored for a typical period. Based on the simulated and monitored data the design of the system is optimized. This optimized design will be further demonstrated and tested. Insulation also plays a major role in maintaining the temperatures inside the building and is being demonstrated. The fabrication of solar air heating system (incl. Collectors) for demonstration systems help in capacity development of local people. A concept for roll-out and facilitation of the solution – consisting of support policy and financing schemes - will be proposed.

Activity Details

First demonstration systems with different configuration have been placed for monitoring and optimization of future systems. The typical size of a system for a residential home is ca. 3 kW with storage capacity of ca. 30 kWh. The systems are designed to maintain a temperature between 15 °C – 18 °C as per the user requirement.

After system optimization further demonstration systems will be installed and monitored in order to test final efficiency and configurations before larger up scaling of the solution.



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Main Stakeholders

The project is funded by the German Ministry of the Environment und it's "International Climate Initiative" and is being implemented by GIZ together with Ministry of New and Renewable Energy and it's local agencies in Ladakh. Following local and international project partners initiated the project and support the implementation: Ladakh Ecological Development Group (LEDEG), Solar-Institut Jülich - University of Applied Sciences Aachen, Steinbeis Transfer Center for Solar and Thermal Technology (SWT), Stuttgart and associated experts.

Up-scaling

Extensive capacity building and awareness raising measures are foreseen to be conducted in the region. Furthermore it is planned to – jointly with the responsible Indian Ministry (MNRE) and it's local entities, but as well local financing institutions – develop a policy and financing framework for up scaling the environment friendly heating solution in the project region.

Impacts

- The demonstration of technology in remote Ladakh region will help in promoting the technology and build strong background for capacity building
- The project shall directly help in reducing green house gas emissions and shall act as a light-house project for future replications
- Negative health and environment impacts of traditional heating systems will be mitigated
- Access to economic favorable (no payment for fuels) space heating solution for the people of the region

