CAMP Central Asian Mountain Partnership AGOCA consulting kuhiston alatoo

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PROMOTING ENERGY EFFICIENCY

VILLAGE ENERGY STRATEGIES AND INSULATION OF HOUSES

Living conditions and the energy situation in Central Asia

Living conditions have worsened in Central Asian mountain areas since independence. A major reason of this decline is that households have insufficient heating to cope with temperatures that can drop to as low as minus 40°C. This also affects people's health, in particular women, children and the elderly who stay at home in winter.

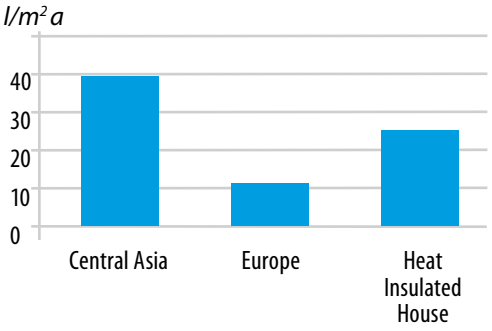
At the same time people still expect to consume energy without paying for it since in Soviet times energy was provided free of charge. Now however, households must pay for their energy needs, but an insufficient supply and a lack of purchasing power make this an ongoing struggle.

In Tajikistan, Kyrgyzstan and Kazakhstan the process of privatising the energy sector is ongoing but taking place under different conditions and following different strategies. In many mountain villages, the supply of electricity, coal, gas or fuel is often no longer provided. Therefore villagers mostly turn to cheap and accessible energy sources such as dung and wood instead. On average a household uses up to three tons per year creating further problems:

- The use of dung as a fuel instead of as fertilizer leads to soil degradation and smaller yields.
- The uncontrolled use of wood and bushes is leading to erosion which reduces the productivity of the pastures privatisation of the energy sector will most probably not benefit the local people as the energy is produced for urban centers and for export. Moreover electricity prices are likely to further increase.

Low energy efficiency

Almost all private and public buildings are poorly insulated. In colder areas, private households spend between 30 and 50 percent of their income on energy - a figure that continues to rise. 80 percent of household energy use is spent on heating and cooking. Better insulation could potentially cut energy consum-ption by about 30 to 60 percent.

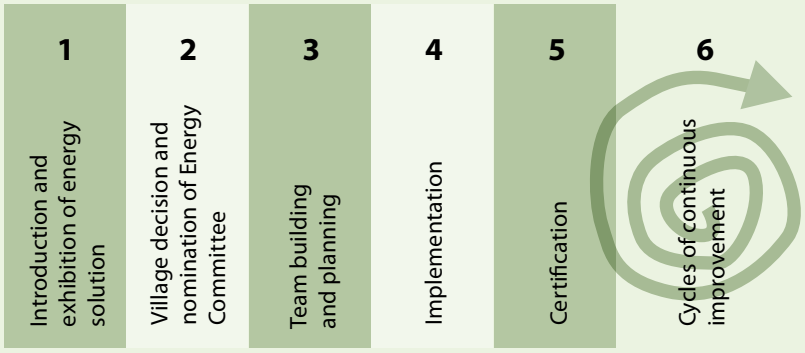


Fuel consumption in 2001 in liters of oil per square meter and year

Identifying needs and setting priorities

The results of research into the current energy situation in three mountain villages in Kyrgyzstan were discussed during exhibitions and roundtables within the 'Dom Gor' project (see separate Activity Sheet). Three main fields of priority intervention to improve the energy situation were identified:

- The insulation of rural houses using local materials
- The technical improvement of stove systems



Six stages of the CAMP Energy Efficiency Program (EEP)

- The rehabilitation of forests at a village level as a future fuel source

'The CAMP Program' then started projects regarding the first two fields of potential intervention.

Goal

Our main efforts are to promote the more efficient use of energy resources through house-insulation, thereby improving people's living conditions and preserving the natural resources of mountain communities.

Rationale and objectives

Since it was established, the CAMP Program has initiated natural resource management (NRM) activities in Kyrgyzstan, Tajikistan and Kazakhstan directed towards developing appropriate technologies for a more effective and sustainable use of renewable energy resources. The insulation of houses reduces heating costs and improves comfort.

Heat insulation technology, based on the use of locally accessible materials is simple, easily implemented by villagers and doesn't require special skills, tools or assistance.

The objectives are:

- To develop and promote the use of insulation materials produced from locally available and accessible raw material such as clay, hay, reed, sawdust, and wool
- To train local people how to install simple yet effective insulation into their homes, cheaply, and with their own hands.

Development of insulation technologies and training

In spring 2002, insulation technologies for floors, walls and roofs using local materials such as straw, sawdust, loam, and cement were developed with the support of the 'Fachhochschule Beider Basel' (FHBB) and the 'Energy Fund of Basel' (Switzerland). Subsequently three seminars on the theory and practice of insulation were carried out in all three countries and co-organized by the FHBB, the CAMP Program and a local partner. This work also involved the Kyrgyz University of Statics, Transport and Architecture, the Tajik Technical University, and the Kazakh Energy Saving Department. The main purpose was to inform and train students and engineers.

Later on, local specialists were trained during pilot insulation projects carried out in villages. For this, external backstopping was provided by Oekofacta, a Swiss company.

From the beginning, activities in the field of energy efficiency were supported by several donors such as the Government of Liechtenstein, the GTZ-CCD/Batken, the SDC, and the Canton of Basel. The installation of insulation was usually followed by an awareness-raising seminar (L4S) on energy efficiency.

Optimal energy saving can be reached through a combination of insulation, an effective stove, and the use of solar energy. Further, small changes to everyday life, which do not require big investments, can contribute to energy saving.

without Insulation **with** Insulation

***Insulation** principle for classical floors*

***Walls** can be insulated from the outside. The insulating materials are fixed to the existing wall with a wooden structure and plastered with loam or a mixture of wood and loam, or filled into the gap between the wall and a thin wooden or reed wall. Possible material: straw and reed, saw dust, compact straw and loam, prefabricated straw and loam plates.*

***Floors** can be insulated from the top, from the bottom or both. The layer of insulating material is put over or under the existing floor and fixed with wood. Possible material: rolls from straw and loam, sawdust and cotton fiber, sawdust with a hermetical covering of tar paper, prefabricated straw and loam plates, pore concrete.*

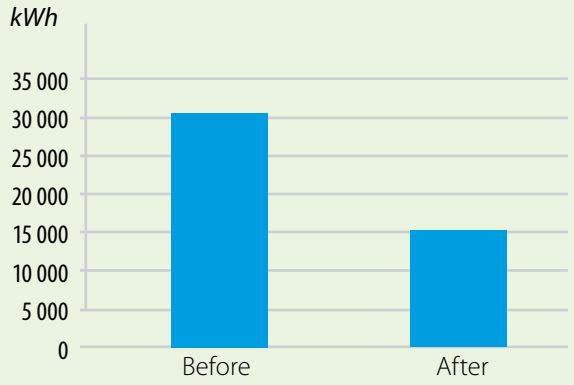
***Ceilings** are insulated with a layer of material on the garret floor which is then covered with loam. Possible material: straw, sawdust, sawdust and reed, prefabricated straw and loam plates.*

Satisfaction

The results of the insulation were satisfying: in the insulated houses less wood, electricity or dung is needed for heating and more rooms can be heated with the same amount of fuel. People feel warmer, especially when sitting on the floor. The results of electricity and fuel saving as well as improvement of heat comfort evaluated on the basis of monitoring and calculations made in insulated houses during the heating season before and after the heat insulation, show energy savings of 40 to 60 percent.

Further dissemination

Due to villagers' poor awareness of effective energy resources they continue to use cheap energy resources.
For the application and dissemination of more sustainable technologies the CAMP Program has developed tools within the Energy Efficiency Program (EEP). They support the development of sustainable energy supply and energy saving strategies at a village level. They involve various partner organizations including representatives of local self governance bodies and state structures.



Annual heat consumption of private houses before and after the heat insulation in Jardysuu village (Kyrgyzstan)

The proposed approach is directed at developing potential and providing support. This will allow villagers to develop measures, taking into account local factors, and implement them as part of a more sustainable energy saving system in villages.

Energy Efficiency Program

The EEP is aimed at reinforcing the idea of energy efficiency and the use of renewable energy sources at a village level. To achieve this, a six-stage process has been devised. The stages fall into two catagories: stages one, three and five are externally driven; stages two, four and six are internally driven by the energy committees and the village representatives.

Obstacles

- The dissemination of heat insulation methods among villagers is poor due to the absence of concrete examples to convince the local people

Country	Insulations	L4S workshops
Kyrgyzstan	19	31
Tajikistan	15	9
Kazakhstan	15	6

Number of insulation measures and L4S workshops implemented by the CAMP agencies until 2007

- The lack of a clear pricing system and a transparent cost benefit analysis often puts households off installing insulation
- Villagers are often unaware of the advantages of heat insulation

Institutional frame
The local offices of the CAMP Program were transformed into local NGOs: the 'CAMP Alatoo Public Foundation' in Kyrgyzstan, 'CAMP Consulting' in Kazakhstan, and the 'CAMP Kuhiston Public Association' in Tajikistan. In 2005 the Centre for Energy Efficiency Building in Central Asia (CEEBA) was founded to implement insulation works. Specialist work is done in cooperation with various foreign and local partners.

Recommendations

- Carry out awareness raising activities in villages on the advantages and opportunities of heat insulation technologies
- Inform villagers and local management bodies about house insulation on a regular basis and in an accessible form
- Be guided by experience, the ability of local masters and the results of local trials because the insulation technology varies from region to region depending on the quality, structure and composition of local materials, the climate, and other conditions of production
- Practical training on heat insulation should preferably target middle income and rich households first as they are more likely to be able to take action
- Create financial institutions at a village level for supporting heat insulation works based on small credits

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CAMP Kuhiston
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