Promotion of energy efficient stoves and straw briquettes at national level in Armenia: main strategic directions

- Enforcement of the standards for heating devices and solid biomass fuel.
- Building institutional capacities for quality testing and certification of heating devices and biomass fuel.
- Improving the sectoral policies on energy, forest and agriculture to address better the issues of energy efficiency and alternative biomass fuels.
- Intersectoral cooperation in the fields of rural development, energy, forests and agriculture as well as engagement of all relevant stakeholders.
- Capacity building for local producers of heating devices and alternative biomass fuel.
- Financial and market mechanisms, affordable financing and incentives for rural households.
- Awareness raising on the advantages of energy efficiency and alternative energy for rural households.

The combination of different energy efficiency and alternative energy measures can ensure the highest fuelwood savings and forest conservation, as well as improve the living standard and energy security in rural areas.

ECOserve energy component in Georgia: promotion of energy efficient stoves and dry fuelwood in rural communities – Akhmeta municipality (Kakheti region)

Main highlights and achievements supported by ECOserve

- The concept for the EE pilot in Akhmeta Municipality was developed in line with Georgia's National Forest Program (NFP);
- A cost-effective methodology for measuring EE and thermal capacity of wood-burning stoves was developed by Georgian Technical University (GTU) based on the standards ISO/DIS 13336 and CEN/prEN 13240;
- Three types of EE stoves were selected and tested in real life (EE 70-85%, suitable for cooking, affordable price; design improved based on women's recommendations);
- A mechanism for dry fuelwood provision was developed, and awareness raising campaign was launched to get households involved;
- 41 households participated in the pilot: purchasing of EE stoves with 50% co-financing, use of dry fuelwood, improved insulation, and data recording;
- 11 control households using old stoves, recorded data (reward: 50% subsidized EE stoves for the next winter);
- Recommendations based on a rapid energy audit for minimizing energy loss and decrease of fuelwood consumption were provided by GTU to households.

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MINISTRY OF TERRITORIAL ADMINISTRATION AND INFRASTRUCTURE OF RA

REPUBLIC OF ARMENIA MINISTRY OF ENVIRONMENT

MINISTRY OF ECONOMY OF RA

Գերմանական համագործակցություն DEUTSCHE ZUSAMMENARBEIT

Implemented by giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

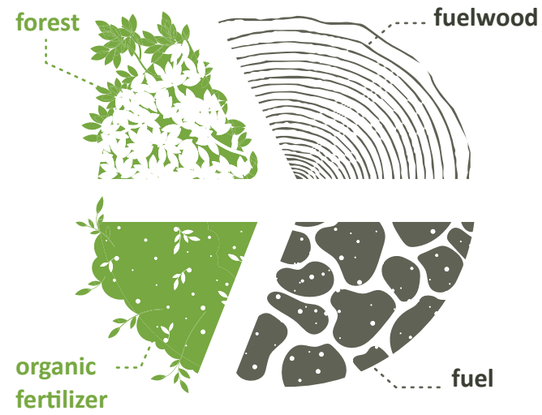
Sustainable household energy protects forests of Armenia: practical experience at community level

Heating in rural areas of Armenia: main problems, possible solutions

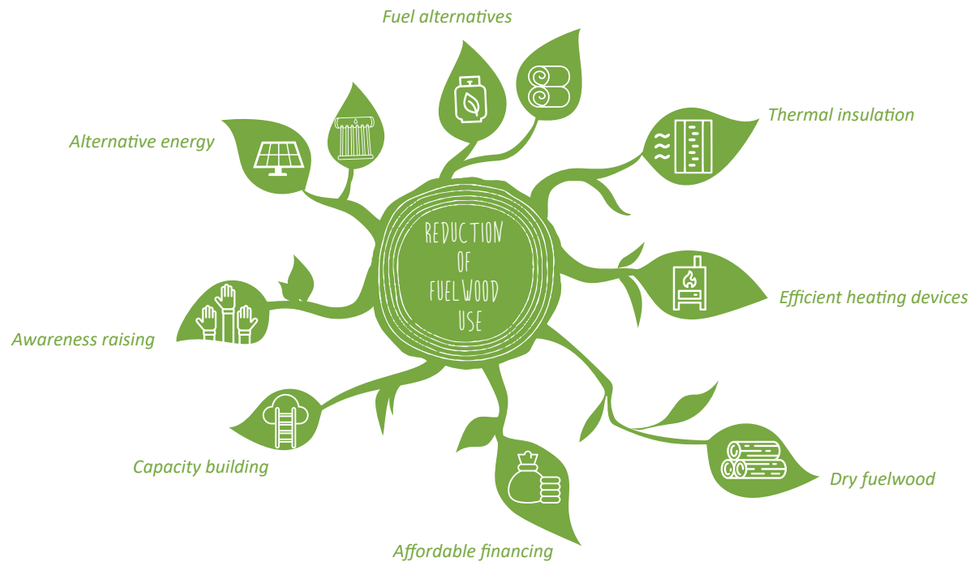
In Armenia about 70% of rural households use fuelwood as one of their heating fuel sources, often as the primary one.

The demand for fuelwood significantly exceeds the reported supply and the renewal capacity of forests in Armenia which leads to continuous forest degradation and deforestation.

Dung has been widely used as fuel by rural households, thus reducing its availability as valuable organic fertilizer.



There are significant heat losses due to the low energy efficiency of the current heating practices and housing conditions in rural areas. The main energy efficiency (EE) and alternative energy solutions to reduce the use of fuelwood (and dung) at household level include thermal insulation of houses, use of efficient heating devices and dry fuelwood, use of alternative biofuels (straw briquettes, biogas) and energy (solar), etc. Awareness raising and capacity building should address the issues of the impact on household costs and on nature, the available options to save energy and others. Financial mechanisms can include governmental incentive programs, micro-finance opportunities and others.



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40%

Thermal insulation of the houses can reduce the heating demand by at least 40%.

40-50% EE

The conventional radiating wood stoves have a low energy efficiency in the range of 40-50%.

75-80% EE

More advanced stove models can have 75-80% and more energy efficiency.

20%

Dry wood with humidity of about 20% provides more energy and therefore heats better than semi-dry or wet wood.

The current heating practices cause inconveniences to rural families and in particular to women who spend more time at home. The families spend additional time and resources to organize the heating with solid biomass fuel.

The socio-economic survey in the frames of ECOserve targeted 380 fuelwood users in the project pilot communities and identified household heating practices, preferences and perspectives. Main highlights:

1. In average 62-81% of the HH space is heated in winter.

2. Both women and men are engaged in fuelwood and dung preparation and heating maintenance, both spend almost equal time to prepare and store dung for heating.

3. The current heating practices with indoor pollution cause negative health impacts such as eye and skin irritation, respiratory problems, and others.

4. Wherever forests are closer and wood is easy to get, it will be the preferred source over dung.

5. The choice of fuelwood as fuel is mainly conditioned by affordability, easy use, lack of alternative and accessibility. The choice of dung for heating is conditioned by the same features except for the easiness of use.

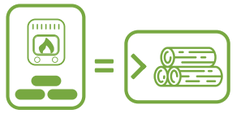
6. The use of straw briquette is not common. Briquettes could be used more widely if they are available at competitive price and consistent quality, and suitable heating devices are available.

7. Rural HHs often face difficulties in making an initial investment to increase energy efficiency or changing the heating system or fuel.

Promotion of energy efficient stoves and straw briquettes in Armenia

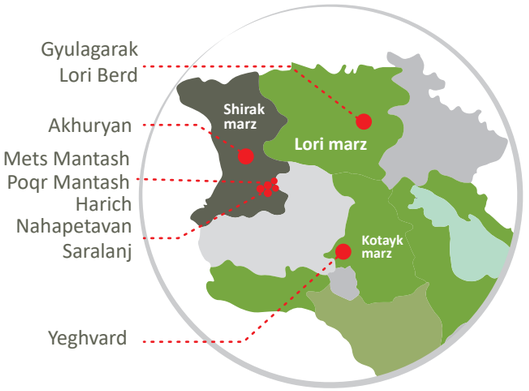
Main highlights and achievements of ECOserve pilot

- Introduction of an approach to assess the EE of stoves as a step towards energy audit and enforcement of standards for heating devices working on solid biomass fuel. Assessment of the EE of 10 stoves with potentially high EE.
- Selection of 3 stove models with high EE of 70-80% for the pilot promotion:
  - affordable price
  - tailored to the user needs
  - suitable for fuelwood and briquettes



- Manufacturing of the selected stove models by local craftsmen in the communities.
- 70 beneficiary families obtained stoves with 50% cost sharing for a stove and additional 25% cost sharing by the project if the beneficiary uses also straw briquettes as fuel.
- Sharing and exchange with local partners and players on the benefits of EE and promotion of EE stoves and alternative fuel.

ECOserve pilot communities



Local Partner:
"Environmental Sustainability Assistance Center" (ESAC) NGO

Pilot beneficiaries say...

"With the new stove we will not use all the fuelwood we prepared for this winter. We heat more space and have more comfort at home."
-Marine Mkrtchyan (Gyulagarak, Lori region)

"Formerly, it was lots of work to prepare and store dung. The new EE stove and use of straw briquettes save lots of time for me."
-Hamest Babayan (Zoravan, Kotayk region)

"The stove is very good also for briquettes. This year I will saw additional 2 ha of wheat on my previously non-used land and barter the produced straw for briquette as fuel."
-Hasmik Harutyunyan (Zoravan, Kotayk region)

"I have spread information on my new good stove in the community. More than 10 other families obtained the same model produced by our local craftsmen. It has a potential to spread further during the coming seasons."
-Armine Galstyan (Vardablur, Lori region).

Replication

- Mets Parni Revolving Fund jointly with a GEF/SGP project on EE in rural areas (implemented by ESAC NGO) has used the stove EE measurement approach developed within ECOserve. Another stove model was assessed and showed high EE.
- About 45 EE stoves of different models were produced locally and disseminated in Lori, Aragatson and Shirak marzes in the frames of the GEF/SGP project on a cost-sharing basis.
- More than 60 EE stoves were produced locally and provided to socially vulnerable families in Lori marz by Diaconia Charitable Fund donor support program.