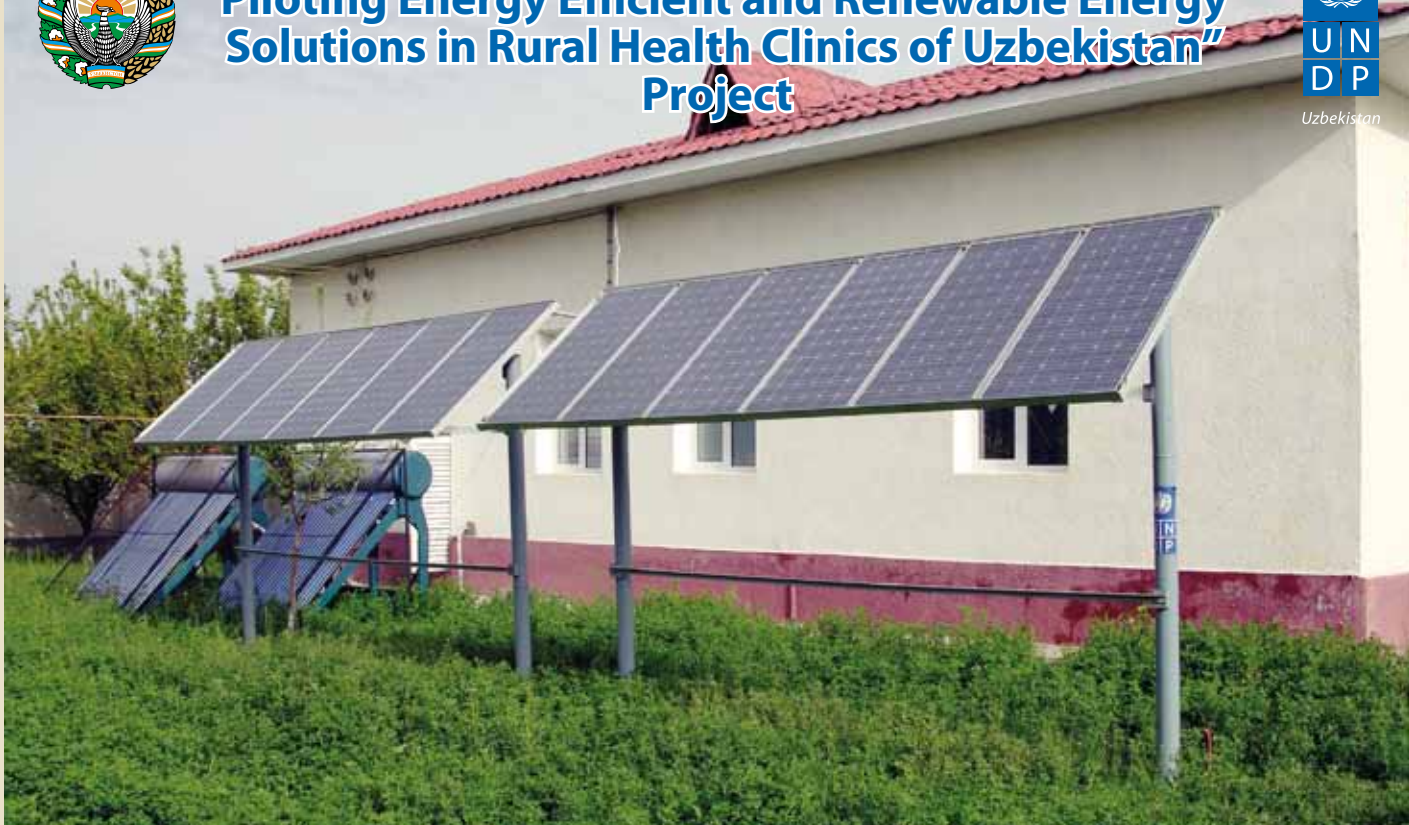




“Piloting Energy Efficient and Renewable Energy Solutions in Rural Health Clinics of Uzbekistan” Project





The Demonstration Project of the United Nations Development Programme in Uzbekistan (UNDP) and the Ministry of Health of the Republic of Uzbekistan “Piloting Energy Efficient and Renewable Energy Solutions in Rural Health Clinics of Uzbekistan” began its activity in February, 2008. The Project will pilot various energy efficient technical solutions in four rural health clinics in order to prove that the use of different technical equipment adjusted to the needs and peculiarities of each clinic can resolve the problem of energy supply in remote rural areas.

These technical solutions include the use of energy efficient and energy saving equipment, which would be coherent with the budgets of small rural clinics. Subsequently, the use of this equipment could be recommended for replication on a large scale throughout the country.

As a result of the study, the project will make recommendations on optimal technical solutions applicable for rural health clinics in different provinces of the country.

In an effort to ensure uninterrupted and reliable energy supply during technical power cuts and drops in gas pressure, as well to gain practical experience and obtain reliable data needed to replicate this experience in other rural clinics and hospitals, the Project installed various types of energy efficient and renewable energy equipment and devices in four pilot rural health clinics in Uzbekistan.

The current solar photovoltaic system with a power capacity of 1 kWt (photo 1) together with the backup power supply system may guarantee that the functioning of a clinic's essential medical equipment and lighting will remain uninterrupted during cuts in power from the regular grid.

The power capacity of this system will be enough to supply energy for approximately two days, assuming average levels of energy consumption by essential, priority medical equipment.



Photo 1. Solar photovoltaic system panels, installed at the “Juzim-Bog” rural health clinic, Kegeli District, Republic of Karakalpakstan.



By means of this system:

(a) medical personnel will be able to continue to deliver medical care for patients, including emergency cases, since the power supply for the equipment and devices needed to provide such care, including electrocardiograms (ECG), laboratory equipment and refrigerators for storing blood and vaccines will be assured;

(b) spoilage of medical reagents and analyses, such as, general blood tests will be prevented, which will avoid cases of misdiagnosis and as a result– the incorrect treatment of patients. It is generally known, that medicines and analyses should always be stored at a certain temperature and in proper conditions, which cannot be provided during power cuts.

(c) the stable and uninterrupted work of sterilizing equipment will be ensured thus preventing

Photo 2. A representative of the supplier company conducting a training course for medical staff on the use of a backup power supply system, installed in the “Bay-mukhamedov” rural health clinic, Tashkent region.

the infection of medical instruments and materials which could occur if the equipment stops functioning during outages of power from the regular grid;

(d) proper storage of expensive medical products and vaccines as well as maintenance of their quality and effectiveness will be ensured. The lack of a backup power supply system might reduce the quality of these products and make them worthless as well as waste the funds spent on their procurement. Thus, the availability of such a backup power supply system is extremely important for rural health clinics, taking into account possible temporary interruptions in energy supply, especially in rural and remote areas.

Photo 3. A staff nurse at the “Baymukhamedov” rural health clinic carrying out analysis using laboratory equipment during an outage of power from the regular grid. Lighting and electric energy is supplied from a solar photovoltaic system.





Even during power outages doctors and staff nurses in health clinics continue providing emergency medical care to patients, because essential, priority medical equipment, including physiotherapy devices, are operated from a solar photovoltaic system.

Photo 4. A doctor carrying out a physiotherapy session.

Photo 5. A doctor carries out an electrocardiogram of a patient's heart.





Irregularities in the supply of natural gas, especially during the winter period, lead to interruptions in heating and hot water supply to rural health clinics. This has a negative effect on the quality of medical services offered to patients and the operation of medical equipment, as well as on the possibility of providing emergency care when needed.

With the aim of resolving this problem, the Project installed solar water heating systems capable of providing rural health clinics with year-round heat and hot water, especially during the winter, when the pressure in the regular gas distribution network may temporarily drop. Thus, the quality of medical services and efficiency of emergency care rendered to patients is increased.

Photo 6. A solar water heating system, installed at the “Baymukhamedov” rural health clinic .

In order to use natural gas more rationally and economically, the project installed energy efficient gas boilers and replaced the gas burners on existing boilers in the pilot rural health clinics with new ones which can automatically regulate the gas supply. This ensured that actual thermal energy consumption was reduced, and rural health clinics now spend less on their electricity and natural gas.



Photo 7. An energy efficient water heating gas boiler with automatic regulation of gas supply, installed at the "Baymukhamedov" rural health clinic.



In order to ensure uninterrupted electricity and heating for rural health clinics located in remote mountainous areas where the supply of electricity and gas is limited, the project installed and tested energy efficient coal boilers for heating the clinics and diesel powered generators for providing electricity.

Photo 8. An energy efficient coal boiler, installed at the “Djahonobod” rural health clinic, Bostanlik province, Tashkent region.

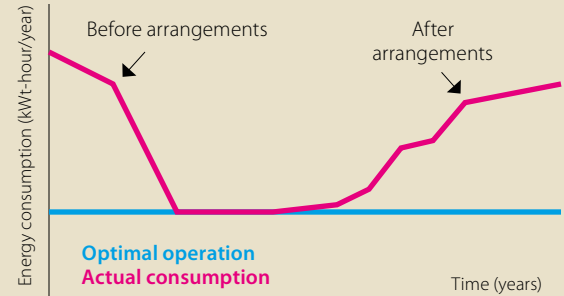
As a result of installing this equipment, the quality of medical services provided to the patients in “Djahonobod” rural clinic was increased and the costs of purchasing coal were reduced.

Photo 9. A diesel powered generator of electric energy, installed at the “Djahonobod” rural health clinic, Bostanlik province, Tashkent region.





Photo 10. Arrangement of a tambour (lobby), installed to reduce heat loss in the “Baymukhamedov” rural health clinic, Tashkent region.



Currently, energy consumption in many buildings in Uzbekistan, including rural health clinics, exceeds the level necessary to maintain a comfortable temperature by 20–40%. Energy consumption in such buildings may be considerably reduced by means of energy saving arrangements and measures, including installation of thermostatic taps on radiators, replacement/compaction of windows and doors, and insulation of floors, ceilings and walls. As a result of such efforts, energy consumption is generally reduced to the designed or optimal level and remains there for several years, as shown in the diagram.

Based on the results of an analysis of heat loss conducted in the pilot “Baymukhamedov” rural

health clinic, the Project specialists carried out a number of activities and arrangements to improve the thermal insulation of the clinic building. All existing wooden windows and doors were replaced with new plastic ones with double-glazing (double-pane) units, a tambour/lobby was erected (Photo 10) and the ceiling was also insulated. In addition, the clinic staff was trained in energy monitoring skills, which involves regular energy monitoring and its maintaining at a proper level, based on readings of the meters installed

With the aim of conducting monitoring, which including the collection of data on the frequency and duration of outages in the supply of electricity and natural gas, as well as on the actual consumption of electricity, gas and water and the operational parameters of installed equipment, various types of meters and devices were installed as part of the Project.

In the course of the monitoring process, which will last for one year and include both heating and non-heating seasons, the Project plans to collect reliable data and information which could serve as the basis for developing recommendations on replicating this experience in other rural health clinics and hospitals.



Photo 11. Some of the meters installed at the “A. Umarov” rural health clinic, Tashkent region.



It is expected that as a result of the activity of the demonstration project:

- the quality of medical services offered in rural provinces will be raised due to the provision of uninterrupted and reliable energy supply to rural health clinics;
- the use of solar and renewable energy for practical purposes will be stimulated;
- a reduction in the use of fossil fuels for national energy needs as well as a decrease in greenhouse gas emissions will be achieved;
- and finally, budget expenditure operating costs of rural health clinics on electric and thermal energy will be reduced through the use of modern energy efficient technologies and equipment.

Photo 12. A staff nurse reads the data from meters installed in the “Baymukhamedov” rural health clinic.

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