



UNDP Energy Access Small and Medium Enterprise (SMEs) Development Project financed by OFID and implemented by CREEED



REPORT



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Energy Access Small and Medium Enterprise (SMEs) Development project

has been formally launched in January 2018, building upon previous experiences from the United Nations Development Programme (UNDP) Green Villages Initiative implemented in Tajikistan and Kyrgyz Republic. The project is funded by Organization for Petroleum Export Countries (OPEC) Fund for International Development (OFID).

The project goal was to offer a comprehensive strategy to scale-up private sector engagement in energy access by improving the risk-return profile of private investment in energy access products and services. The key objective of the project is to expand energy access and provide reliable, affordable and sustainable energy products and services for the rural population of Kyrgyzstan through promoting scalable, private sector-led business models and de-risking their investment. The project activities have focused on introducing new technologies and energy services through the following three interlinked components:



Component 1:

Enabled policy framework and capacity development for green energy. This component was aimed to address policy and technology risks that energy access enterprises/Small and Medium Enterprises (SMEs) face by supporting an enabling policy framework and improving the skills and capacities for SMEs and final project beneficiaries to provide and use green energy products and services.

Kyrgyzstan achieved impressive results, with 9 вафке regulations, facilitated by multi-party stakeholder dialogue, high-level policy advocacy and formalization through a Working Group on the elaboration of the secondary legislation. After the Regulation «On the conditions and procedure for the implementation of activities for the generation and supply of electricity using renewable energy sources» was approved by the Government on 30th October 2020, 17 companies have registered as RE subjects, intending to build renewable energy plants and produce electricity by the end of 2020, reflecting that Regulation has met the need for structured process for investors. Awareness was raised through various events, targeting a wide typology of stakeholders. As an integral part of the capacity development activities, the project provided technical and consultative support to 2 SMEs in Kyrgyzstan (biogas plant and solar drier) through project implementing partner Center for Renewable Energy and Energy Efficiency Development (CREEED).



Component 2:

Enabled access to finance and business models for green energy SMEs and energy service users. In partnership with various local and international partners, the project was able to facilitate access to affordable finance by establishing a virtual Energy Access Funding Platform.

The project has supported the creation of energy access platform www.greenenergy.kg in Kyrgyzstan with a perspective to develop the market for sustainable energy solutions and stimulate investments in green energy projects. As part of enabling access to finance, project cooperated with 3 micro-financial institutions and banks. The project introduced and tested 2 new business models for green SMEs - initial steps of establishing more complex models in order to increase and improve access to modern, affordable and sustainable energy services in the near future. The project has also developed several new renewable energy-using solutions for small businesses, using or selling renewable energy. Connections were established between suppliers, manufacturers and financial institutions that allow creation of new financial products for end-users and improving access to finance for green solutions.



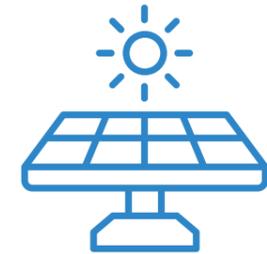
Component 3:

Access to sustainable energy services in remote rural areas. Complementing the first two components, the project brought energy access in rural areas at household level, public buildings level and village level.

The project promoted access to sustainable energy services in remote rural areas through installing 9 new solar PV, water heating and energy efficient solutions in Kyrgyzstan, that will provide benefits to over 10000 people. Additionally, the project has supported already existing solutions by providing repair and rehabilitation services to 3 PV and solar water heating systems, thus, supporting the emerging market for maintenance and repair services. The activities implemented under this component provided basis for similar interventions and sustainable scale up in the country.



Modern technologies to help the elderly and the disabled



For most residents of our country green technologies are just a dream for the future; however, they are the existing reality for residents of the Nizhnaya Serafimovka institutional facility for the elderly and people with disabilities. Alternative energy is used here every day, particularly in the evening, providing people with light and comfort.

«It was used as a pasture. We planted apple, pear, apricot and cherry trees here. The harvest as yet is rather modest, but fruits are served to the tables of our residents. It will take time for the trees to finally get stronger to yield more fruit, so we might sell the harvest to cover the costs of the care home,» he says.

Nizhnaya Serafimovka residential care home for the elderly and people with disabilities is only an hour's drive from Bishkek, the capital of the Kyrgyz Republic. The institution is located in a rural area of Kyrgyzstan among vast fields in front of majestic mountains.

The director specifies that now the institution is a home for 313 people between the ages of 18 and 95. The bulk of financing for the care home is provided by the state. He explains: «The budget resources are quite enough to nourish the residents and provide them with basic medical services, including dental ones.

There is a checkpoint with a gate at the entrance to the residential care home area. The four-storey building constructed in the 1970s is ensconced behind a veil of trees in the depth of the land plot. The cobblestone path leads directly to the building through a young orchard.

However, the maintenance is an issue here. Truly speaking, from time to time our permanent patrons help us, for example, make repairs and replace broken-down plumbing. There are enough good people in the world. We also work with international donor organizations. We try to take part in different projects to have additional income for the care home. For instance, the orchards you've seen earlier. In addition, there is a pond fish farm on our territory arranged within one of the projects,» Dzhunushev points out.

According to Baktybek Dzhunushev, a director of the institution, 1500 fruit tree saplings were planted here in 2017 under the aegis of the UN Food and Agriculture Organization (FAO).

This land plot adjacent to the residential care home had been empty for a long time.





We are approaching the main building. The impressive structure includes residential premises similar to the Soviet-style recreation center, a medical station, a reading hall and administrative offices. From the outside the building might look decrepit, but new insulated windows prove that there are some repairs made.

There are spot lights around the building with new lanterns along the internal paths. Does it all really work?

«Yes, that is quite a sight at night — it's almost as bright as day. And most importantly, the lighting within the area of the care home, including the orchard, doesn't cost us a coin,» Baktybek Dzhunushev says.

The care home management is especially proud of the lighting system.

«We are probably the only ones in the district who use solar energy for this purpose. Follow me, I'll show you everything,» says the director striding to the eastern side of the area.

Here is an old orchard that will be refreshed in the future. There is a small clearing among dwindling trees with a solar array installed behind a chain-link fence. The dark panels have been turned so as to collect maximum energy from the Sun. Then the absorbed solar energy is converted into electricity and accumulated in batteries.

The battery room is located on the ground floor, in the infirmary within the main building. We meet one of the residents in the corridor on the way there.

Sergey Kasyanov moves around the building in a wheelchair because his leg was amputated. Having found out that he was talking to journalists, the man told about how he had ended up living in the Nizhnaya Serafimovka care home.

«My leg was amputated after my wife had died. It was probably a nervous condition that caused a narrowing of blood vessels and later gangrene. That's how I got here. But it's alright — the place

is good, we are always well-nourished and looked after. We have fun here when the actors come to us to conduct concerts. However, now due to the lockdown, we have to do without entertainments,» he complains.

Here's the battery room. A rack with energy storage devices is installed in a small, clean whitewashed room. Power switchboards with relays and levers are mounted on the wall.

«Quite a convenient system. Here, see for yourself — everything is arranged so that the light automatically turns on in the evening and turns off at daybreak,» explains the director of the care home with smiling eyes.

As the COVID-19 pandemic rages on, half of his face is hidden behind a protective mask — a sign of the times.

Baktybek Dzhunushev enthusiastically tells us how solar panels and batteries first appeared in the Nizhnaya Serafimovka residential care home for the elderly and people with disabilities.

«As part of the UNDP project, in 2013 it was decided to install an off-grid solar power system for the village first-aid station that existed in our institution. This equipment was used during on-grid power blackouts, so that various medical devices could work,» says Mr. Dzhunushev.

The batteries had been running for several years and finally reached their lifetime limit. Afterwards, they were idle for some time.

«We contacted the UNDP again. The village first-aid station had already ceased to exist by that moment, but the institution had its own needs which could be satisfied by a system of solar panels and batteries. As a result, this equipment was brought to life under the UNDP/OFID Energy Access SMEs Development Project in 2018. The existing solar photovoltaic system has been completely restored through upgrading the electrical wiring and battery capacity,» the director of the care home says.



It should be noted that this project builds upon experiences from the UNDP Green Villages initiative implemented in Kyrgyzstan and Tajikistan during the last five years. The key objective of the project is to expand energy access and provide reliable, affordable and sustainable energy products and services for the rural population of the Kyrgyz Republic who are facing energy poverty.

Through this project, the alternative energy sources have ensured comfort and safety for all residents of the care home.

It is obvious that some residents are not capable to enjoy a walk since they are completely paralyzed or too weak due to their age. But there are also residents who think that a stroll around the building after dinner is a pleasant and useful way to spend time.

Thus, Alexander Prikhodko, who has recovered from brain hemorrhage, never misses a chance to take a wheelchair ride around the care home. He is convinced that movement helps him restore health, so he must always «have a walk» after meals.

«It's nice now. When you go out, it's as bright as day. My spirit soars. The air is already cool, of course, but my cat Katya and I still try not to miss a single day. You must keep yourself in shape,» says the man, caressing his faithful companion.

Well, it turns out that the Nizhnaya Serafimovka care home has become a perfect beneficiary of the Energy Access SMEs Development Project. Although the poorhouse receives stable funding from the state and occasional support from donors and patrons, we have to admit that these funds cover only the basic needs of the care home residents. If the management had to pay the bills for lighting around the building, most likely, these costs would have to be reduced as much as possible. This means that the life of at least one of the care home residents would become much darker.



Better than in the capital city: a rural school in the Issyk-Kul oblast takes advantage of a helioplant



Solar collectors provide one of the most modern and eco-friendly technologies to collect energy that can be used for heating water and buildings. Now this device is successfully used in a school of the village of Eshperovo in the Ton district of the Issyk-Kul oblast.

Eshperovo is a small village located in the eastern part of Ton district of the Issyk-Kul oblast. Approximately 450 families live here. The village has a community center and a secondary school named after Mukanbet Dogdurov.

The academic year is in full swing now, but the school courtyard is unusually deserted and quiet. The absence of schoolchildren can be explained by the measures of the state authorities imposed in relation to the COVID-19 pandemic: offline classes are conducted for first-graders and graduate students only.

Talantbek Abyshov has been working as a school principal for a little more than four years though he has been a teacher at the school for 29 years. He is currently in his office on the second floor of the building, taking part in an online meeting with the heads of other district schools.

The Zoom conference is ending in a few minutes, and Mr. Abyshov is really glad to show us around the school entrusted to him. He says that now there are only 470 children in the school, which is enough to fill all classes.

«We have great students and an excellent team. The school has 30 teachers and 15 technical workers. All these people strive to make our school better in all respects,» he says.

The team of the Eshperovo village secondary school is successfully achieving the aim pursued. The entire school area is fenced, the building is whitewashed and painted, and the interior is in order. Undoubtedly, it takes a lot of efforts to maintain the school in such a good condition using just subsidies and incentives from the state budget alone.

«We have made it a rule to look for any opportunities to modernize the school. We regularly monitor grant programmes, submit applications and try to participate in all development projects,» the principal says.

Two such major programmes are being implemented at the school right now. Within the incentive grant





and sponsorship from Kumtor Gold Company, major overhaul of the heating system has started in the school's premises that are not used for the classes.

We are building a large greenhouse on the western side, behind the main building. This project uses the support of the UNDP and the Good Neighbors International in Kyrgyz Republic NGO. Vegetables from the greenhouse will be served in the school canteen. We use all opportunities to improve the school equipment for the students and teachers to feel comfortable,» emphasizes Talantbek Abyshov.

Moreover, in early autumn the school obtained an innovative technology for solar energy collection and conversion. Long story short, now the school has a solar collector that is used to heat 500 liters of water.

«This is our first experience related to the use of renewable energy sources. In March, we decided to participate in the UNDP-OFID Energy Access SMEs Development Project. We submitted an application to take part in the first round. Later I received a letter inviting us to participate in the second round. We submitted the application again and won. When I found out about it, I was happy like a child,» recalls the Director.

The project mentioned by Talantbek Abyshov builds upon experiences from the UNDP Green Villages initiative implemented in Kyrgyzstan and Tajikistan during the last five years. The project aims to offer a comprehensive strategy to scale-up private sector engagement in providing products and services that improve access to energy through the risk-return profile of investments.

The key objective of the project is to expand energy access and provide reliable, affordable and sustainable energy products and services for the rural population of the Kyrgyz Republic who are facing energy poverty, through promoting scalable, private sector-led business models and through the search of investments to implement them.

«The project implementation had had a slight delay due to the lockdown. However, we managed to

complete everything before the start of the new academic year. The project specialists arrived in late August and installed the collector, equipment and water reservoir. The entire process took about a week,» says Mr. Abyshov.

Collectors of the modern helioplant are mounted on the roof of the Eshperovo school. The device includes three vacuum collectors, each of which consists of 20 vacuum tubes. Inside each tube, there is a so-called heat pipe made of a heat-conducting material with a highly volatile liquid inside. The heat from solar radiation evaporates the liquid in the lower part of the tube, thus ensuring thermal absorption. The vapors rise to the upper part of the tube, where they condense, and transfer heat through a copper absorber to the propylene glycol-based heat carrier. The condensate of the highly volatile liquid flows down, and the process repeats. The heat carrier circulates through the pipes and transfers heat through the heat exchanger to the water in the storage tank.

The helioplant performance depends on the amount of energy transferred to the heat carrier.

The Issyk-Kul oblast in fact has more than enough of this energy. Anyway, the helioplant installed in the secondary school of the village of Eshperovo ensures excellent thermal efficiency.

«At first, when everything had just been installed, the water temperature in the collector rose up to 120 degrees Celsius. As there were few students, and we didn't use much hot water, we had to do something that would help slightly reduce the heat,» says the school principal.

They came up with a simple solution – to cover a part of the surface of vacuum collectors with a simple cloth – old tulle curtains.

«At first, we covered two of the three collectors. The water temperature became lower, but not enough – about 100 degrees Celsius. As a result, we decided to cover the whole surface of the collector unit,» Mr. Abyshov summarizes.





And it worked — now the maximum water temperature is 60 degrees even on dull days when the entire sky is overcast uniformly with grey clouds. When the school is fully operational again, the collectors will be uncovered to heat more water.

The hot water storage tank and all the equipment controlling the helioplant are installed in the school canteen. Some of the hot water goes to the taps installed in the hallway near the canteen. The rest of the water heated by the Sun is used for daily needs of the canteen.

«Like any other catering business, we are supposed to comply with health and safety requirements. We always try to maintain the appropriate sanitation standards. However, now it is much easier,» says Gulniza Bayrashkayeva, polishing already sterile chrome surface of the kitchen table.

The woman has been working as a cook at the Eshperovo village school for several years. She is one of those responsible for ensuring that children get delicious and healthy meals for lunch.

«The canteen is open even now when only two groups attend classes. They do not have hot meals, but they are served with fresh pastry and a hot drink — compote or jelly. The classes also start for grades 5 and 9 from the next week. Then we will serve full-fledged hot meals,» Gulniza says.

A bell is ringing in the school hallway, notifying of the end of another lesson. The first to appear in the entrance hall of the canteen are the first-graders heading to the sinks and taps in a lined-up column. The children are washing their hands thoroughly, then drying them under the hand dryer. After all these hygienic procedures are done, they may open the doors of the canteen and go to the already served tables.

Elmira Shekeyeva, a vice-principal, is pleased to see that students maintain good hygiene. She concludes: «Hot water is especially important during the COVID-19 pandemic. We do our best to teach the kids about hygiene, and now we have a chance to do that with maximum comfort.»

Later, the graduate students are appearing in the hallway. Like first-graders, they are painstakingly washing and drying their hands before coming to the canteen.

«Of course, everyone is very happy to have hot water. This is so great! We attend a rural school, and the conditions are the same as in the capital city,» says Aigerim Sultanova, a graduate student.

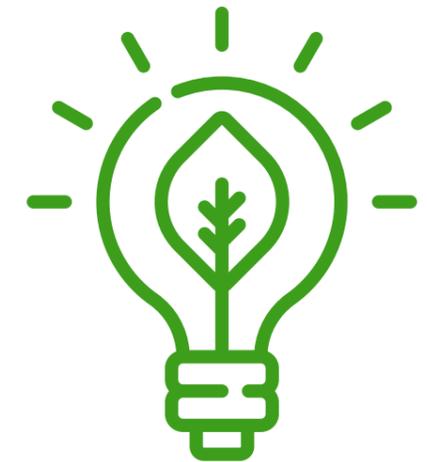
She also believes that green technologies will be useful in general for all residents of the village of Eshperovo.

«I think this is one of the best ways to develop the rural community and make it more modern and progressive. It's great there are such projects helping to introduce innovations everywhere,» says the schoolgirl.





The Sun in allies: how residents of the private sector can save on electricity bills



Bishkek is actively being built up. Construction companies commission new high-rise buildings almost every day. The private sector is also growing: more and more modern mansions appear on the outskirts of the city. At the same time, electricity consumption is growing too. New houses are connected to the existing power grids but it is simply not designed for so many facilities. Domestic power engineers warn of a possible crisis.

Recently, the National Power network of Kyrgyzstan stated that the republic has reached the peak of electricity consumption during the entire existence of the energy system. Regular equipment overloads could lead to rolling blackouts becoming a new reality for residents of the capital in the near future. To avoid negative consequences, it is recommended to save the energy.

But what about the owners of private houses, in which not only lighting depends on electricity, but also the supply of heat and the availability of hot water in the tap? The answer is simple: you need to switch to alternative, environmentally friendly energy sources, as the married couple Strizhenkovs did.

The young family moved into their new house in the

metropolitan area known as Kyrgyzia-1 last fall after the finishing work was done. The modern, spacious mansion became the embodiment of their dream of a cozy habitation.

- We've been carrying out construction for two years. And, as you can see, there's still a lot of work to be done,» Nina Strizhenkova says.

Despite the impressive size of the house, it is very warm. The owner of the house is dressed in light clothing. In addition, she allows her little son to play on the floor without any worry. Whereas, it's a snowy winter in Bishkek with freezing temperatures - according to the app on her smartphone, the temperature outside has dropped to -11 degrees.

Her husband Nikolai is responsible for the solar plant, and Nina talks about her intention to arrange their household in accordance with the rules of ecology and energy saving. For instance, she is now installing a household waste sorting system.

- So far I am only been able to sort out the paper, but eventually, I hope, I'd be able to sort all household waste, - she says.



She confesses that she is looking forward to spring to set up a compost pit on her plot and also to try out other «green» technologies.

When Nikolai arrives, he shows us what is probably the most important room in the house - the boiler room. We go down into the bright, modernly equipped room which provides heat for the entire house.

- When we made a project for the house and went to "Severelektro", we were told that they could only allocate 15 kW. But we needed at least 25 kW to cover all our needs - for water heating, house heating, electrical appliances. Because of the power shortage, we had to think what we could do to save on electricity consumption, - said the man.

Finding a solution was helped by chance: Nikolay saw an advertisement for solar collectors from the company 220.kg and became interested. He searched for information about solar installations on the Internet, asked his colleagues and friends. He found out that some of his acquaintances had already installed the panels in their homes and were happy with them.

Hereupon, the man was determined to use this technology for his own needs.

- He turned to the experts. The company 220.kg made all the calculations and suggested installing a combined boiler house. As a result, the house can be heated with electricity, gas, coal and solar energy,» says Nikolay.

As a result, a heat pump, coal and gas boilers were installed in the cottage. Four solar collectors were installed on the south side of the roof to provide the house with hot water. In the boiler room itself there is a water tank connected to the solar plant, as well as a control panel.

- All this allows us to keep within the allocated 15 kW and even some power remains. If we used classic heating and hot water systems, we wouldn't have enough energy,» says the owner.

It is widely accepted that alternative energy sources for a private houses are expensive, because even in social institutions in our country such installations appear mostly due to the support of donors.

For example, in the Nizhne-Serafimovskiy social care facility for the elderly people and people with disabilities or in the school in the village of Eshperovo, Issyk-Kul region, solar collectors were installed under the UNDP project «Development of Small and Medium Enterprises for Access to Energy», implemented by the Center for RES and Energy Efficiency (CREEED), based on the experience of the UNDP «Green Village» initiative, implemented in the Kyrgyz Republic and Tajikistan for the past two years. The project is funded by the OFID (Opec Fund for International Development).

Meanwhile, the Small and Medium Enterprise Development for Energy Access project doesn't just work as a donor program. One of its components aims to develop the domestic market for sustainable energy solutions by providing access to finance and business models for clean energy providers and users of energy services. In partnership with various local and international partners, the program created a virtual platform for financing access to energy www.greenenergy.kg, on which 220.kg, that installed



solar collectors in the Strizhenkov's family house, is among the proven providers of green technology.

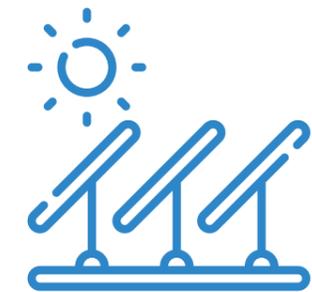
Therefore, thanks to the work of the project, more and more high-quality and affordable business proposals related to renewable energy sources are appearing in Kyrgyzstan. And as the market grows, the prices for energy-efficient house equipment go down.

- Yes, this is not a small one-time investment, but it quickly pays off for itself. We have Chinese equipment installed: it runs smoothly and it costs several times less than its European alternative. I think that in two years the solar collectors will fully justify itself, given the fact that for a half of the year we use hot water for free with the whole family. From my own experience, I can say that the volume of heated water is enough for two families. When my sister's house was renovated last summer, she with her husband and children came to bath at our place. In the end, hot water was quietly enough for everyone, - recalls Nikolai Strizhenkov.

Nina and Nikolai point out that heating of a private house is really difficult and important issue. But it can be solved even in conditions of energy shortage, as renewable energy sources are becoming more and more accessible. After all, it is bizzare not to use solar energy in a country where the sun is active more than 300 days a year.



Solar energy to save money



Myrzaiym Child Educational Center (CEC) located in the town of Isfana has become a paragon for successful application of energy-saving solutions in the Batken Oblast with the first photovoltaic power plant installed here. The up-to-date equipment has significantly improved working conditions at this CEC specially created for

migrant children. In addition to child care services, the CEC provides training courses for teenagers.

The spectacular two-story building of the CEC with the walls painted in soft strawberry tones resembles a fairy-tale house. The solar collectors mounted on the roof seem rather enigmatic for the residents and guests of Isfana. The dwellers have learned to correctly use solar energy in everyday life. This energy now supports heating not only of the premises but also the souls of children and adults.

The Myrzaiym CEC, operating for the past two years, can accommodate up to 100 children. Now there are 70 young citizens studying here. The journalists came around to see one of the groups of children aged 5–6 years who had a math lesson.



"Children, what kind of figure is it?"

"Circle!"

"How many circles are here?"

"Two!"

"What sign is it?"

"Minus!"

"What will we have if we take away one circle?"

"One!"

Nargiza Tuichieva, a teacher, conducts a class for the children of local residents in Russian. She has been working in this CEC for a year and is quite satisfied with the conditions:

"There are 30 children in my group: 18 boys and 12 girls. They are here from 8:00 a.m. to 6:00 p.m. for five days. On Saturday, they stay here until lunch. The children learn, play, eat three times a day and have naptime after a delicious lunch like in a typical kindergarten. Most important, it almost feels like home in our facility. It is very cozy, warm, and children wear lightweight clothing even in the cold season. I really like the relationships between employees. The managers are very loyal and

calm, it's different from what I have previously seen."

The Myrzaïym CEC, indeed, provides child care services similar in quality to the child care centers in Bishkek. The building has a WC facility, playground, and kitchen. All rooms, corridors, and stairs are covered with carpets.

Gulnara Derbisheva, one of the founders of the child care facility, comments on the history of how the CEC has adopted such a system in times when energy is the most relevant topic:

"We often have blackouts here. The classes were cancelled on such days. The cooking was done outside in a cauldron, so the dishes quickly cooled down. Heating was our main problem. As soon as electricity went out, the pumps that circulate hot water through radiators automatically turned off as well. It was getting cold in the building in no time. With the pumps turned off, we could not use WC facilities or draw water from the well. Eventually, our center had to suspend its activities until the electricity was restored."



Recently, the CEC has had a photovoltaic power plant installed within the "UNDPOFID" Energy Access SMEs Development" Project. Since then, even during blackouts, children have meals in due time, and hot water is always available."

The power plant includes 2-kW solar panels, 12 batteries, and an inverter. The inverter serves to convert 12-volt DC to 220-volt AC used in the standard power grid.

"The best part is that the system is automated. It automatically starts with a power outage. If the electric power is insufficient, we can use solar energy just by pressing a button. Previously, when the electricity had gone out, it was getting cold in the building, so the children often got sick. Their parents were outraged. To prevent children from getting sick, we decided to install floor heating systems."

Myrzaïym child care facility has three groups for children: nursery, intermediate, and preparatory groups. In the intermediate group, we got acquainted with children who were enthusiastically drawing pictures. One of them, a four-year-old boy Mezgil, is proudly showing an album sheet with the result of his efforts.

"What have you drawn?"

"Carrot!"

"Well done!"

Mezgil's father and mother are working in Russia. The child is being brought up by his maternal grandmother.

We have asked how often the classes are conducted in Russian for those pre-school children whose parents left their homeland in search of a better



life. Eventually, there was a reason for creating an educational institution of this type here. Gulnara Derbisheva, head of the center, tells us about topical problems to be solved:

"As our center has been established specifically for migrant children, we conduct lessons in Russian as requested by their parents. They are all planning to take their children to Russia in the future. I tell them 'That's not the goal you should set for yourself! Don't even think about it. We do not raise future migrants. We provide education. We encourage them to learn other languages.' Therefore, we also provide in-depth English lessons. In my opinion, it would be nice if children learn Turkish and Chinese along with English. We will definitely have more opportunities in the future. It's a well-known fact that the Batken Oblast takes first place by the number of migrants who went to work in Russia. In almost every third family with children, one of the parents – sometimes both of them – work abroad. In most cases, they leave their kids with grandparents, sometimes with other relatives, so that children do not distract them from earning money. This mainly

affects preschool children. Citizens who care about the future of such boys and girls offered us to open a kindergarten. They had been concerned that the waiting list for admission to state preschool institutions was too large, therefore, children had to stay at home all day through. Following this proposal, with the support of our compatriots living in Russia, we built the second floor for the resource center and re-opened the building in 2017."

It is worth noting that the Myrzaiym CEC conducts classes on topics related to achieving the objectives of the migration policy of the Kyrgyz Republic.

"The population of Isfana is multinational. Young representatives of 8 nations aged between 1 and 14 years attend our center. We offer kindergarten program for the little ones. Special two-hour lessons are conducted for another category of students from 7-year-olds to teenagers. Along with language courses, they learn public speaking and leadership, as well as the basics of volunteer work. Since we are a social center, the fees are not high. Adult relatives pay a nominal

monthly fee of 2,000 Kyrgyzstani soms. These funds are enough to cover the salary of teachers, catering for children, and utility bills.

The main purpose of such lessons is not to prepare children for migration, but to open new opportunities for them. We read interesting books for the younger generation. We encourage adults to read books for children at home. Unfortunately, not all adults support our aspirations... But we diligently remind them about the importance of education and the desire to broaden the horizons," says Gulnara Derbisheva, the head of the Myrzaiym CEC.

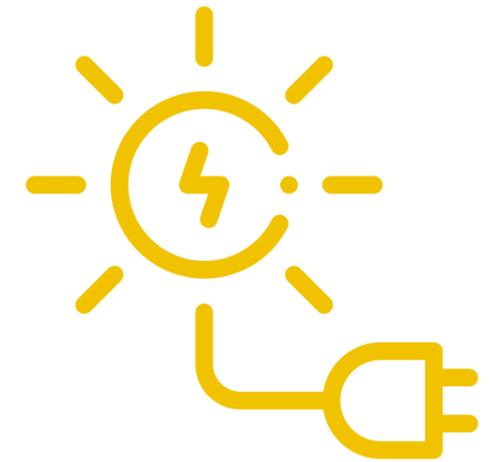
She also adds that they are planning to open a library and a co-working space for teenagers, where they can gain leadership, debating, and critical thinking skills, as well as learn how to navigate the world of information technologies.

The installation of the photovoltaic power station demonstrates that simple solutions can be innovative for the population, significantly improve the quality of life for children, set a positive example, and open up opportunities for development.





Sanitary Epidemiological Service in Sulukta switched to an eco-friendly heating systems



The air heat pumps installed in the Sulukta Town Center for Disease Prevention and State Sanitary and Epidemiological Supervision ensure conditions for the most accurate test results.

I met Musratilla Iskanov, director of the institution, when I arrived in the Sulukta Town Center for Disease Prevention and State Sanitary and Epidemiological Supervision. An inscription in huge Orkhon-Yenisei letters caught my eye. Mr. Iskanov immediately responded that this is the manifestation of patriotism:

"I believe that this is the ancient Kyrgyz runic writing system. So do some foreign scholars. I have done some research on these runes. So, the center's name is written in the Orkhon-Yenisei language as well"

The medical center's two-story building was constructed 31 years ago. In recent years, we have revamped the roof, windows and doors, and also done thorough overhaul.

"The building was raised in Soviet times – in 1989. The building has been reconditioned to the European standards. We have changed the roof, windows, and doors. Although the condition of the building is satisfactory, some equipment has known better days. To name a few, the bacteriological laboratory," said Mr. Iskanov taking me to the room at the very end of the building.



There we met Zebinsa Eshmurzayeva, head of the bacteriological laboratory, and a laboratory assistant.

"Just the two of you? How do you keep up?"

"Yes, there are only two of us. Another lab assistant worked here, now she is on maternity leave. So, we need one more employee."

Previously, in the winter, the institution faced various problems. This year, thanks to the support of international organizations that installed several heating devices in the building, most of these problems are solved.

Zebinsa Eshmurzayeva: *"People who brought material for testing or came for some other reason had to wait in the cold hall. We used a typical potbelly stove for heating. Of course, there was smoke in the rooms. We used electric appliances to heat the laboratory. Nevertheless, the rooms were cold. Thanks to these heat pumps, we have resolved many concerns."*

Musratilla Iskanov, the head epidemiologist of Sulukta, commented on the words of Zebinsa Eshmurzayeva, the head of bacteriological laboratory:

"Indeed, some rooms of the building were heated with the potbelly stove fueled by coal. It feels so much better and comfortable after the installation of air heat pumps within the UNDP-CREEED Energy Access SMEs Development Project and with the support of the OFID Fund. Such a heating system consumes a small amount of electricity, and it can provide the required indoor temperature in a short time. These conditions have a positive impact on our specialists' health. Earlier we couldn't keep 18–22 degrees centigrade required for normal operation of the laboratory, but today the problem is solved. This contributes to more accurate results of tests, studies, and reactions, and ensures normal operation of the equipment."

Air-to-air inverter heat pumps Mr. Iskanov talks about can keep warm air in the rooms in winter and cool air in hot summer. According to him, such conditions contribute to the most accurate test results in the Sulukta town laboratory.

"Accuracy of test results depends on three factors: proper operation of equipment; knowledge and literacy of specialists; microclimate in the laboratory, especially in the equipment room. Only the stable temperature range indicated above can minimize errors in the test results."

Musratilla Iskanov, the head of the Sulukta Town Center for Disease Prevention and State Sanitary and Epidemiological Supervision, notes that now he is contacting relevant authorities to upgrade the outdated equipment.

The center holds 16 employees and conducts about 8,000 tests annually. It is mostly miners and teachers who use these professional services.

Musratilla Iskanov: *"Parasitological, sanitary-hygienic and bacteriological laboratories all together conduct about 8,000 tests per year. Miners, employees of schools and kindergartens come to us for testing. In addition, we conduct infectious disease testing for the patients of the Sulukta Town Hospital."*

In recent years, people who went abroad or to other cities due to difficult life in the 90s, have begun to gradually return to the town of Sulukta located far in the south-east of Kyrgyzstan. According to the information provided by the Sulukta Mayor's Office, the town's population has grown by more than three thousand people just for one year and is currently 23,889 people.

The life of the town with 152-year history is closely related to coal mines. About 40 private coal pits are operating there to date.





Heat pumps on guard of villagers' health



What are the rural residents doing when the situation with COVID-19 has worsened again and the infection rates have increased? The residents of the village of Zhin-Zhigen in the Batken Oblast are fighting the disease on their own. There is only a small paramedical and midwifery station with two nurses who take care of the villagers.

This station is located in the center of Zhin-Zhigen. Upon arrival of the journalists, **Kanzada Atazova**, a paramedic, was examining rural women:

"Yesterday blood pressure was 100/60, today it is lower – 90/60. Are you taking the prescribed medications?"

"Yes. Toxicosis has become a little easier to bear. It is no longer a big trouble," says 28-year-old **Zhumagul Zhorobekova**, a mother of four children.

Kanzada comes to the paramedical and midwifery station almost every day since the new facility has been opened.

"Earlier, the medical station was based in a dilapidated building on the edge of the village. There were no appropriate facilities for the work. The paramedic used to do house-to-house surveying. But now the patients are admitted in warm, clean, and bright rooms," proudly says **Zhumagul Zhorobekova**.

Then we noticed that young mothers walk barefoot inside the station. Last winter, the building was warmed up by several heaters only. They hope that this winter won't bring troubles with heating.

"This year, we have air-to-air heat pumps provided within the UNDP-OFID Energy Access SMEs Development Project. Energy-saving heat pumps ensure the appropriate temperature in the rooms in a short time," explains paramedic **Kanzada Atazova** during a tour around the paramedical and midwifery station.

These heating devices are more efficient compared to simple electric heaters. The energy efficiency class of GREE U-CROWN split-systems is A+. In the cooling mode, the energy efficiency factor is 7.5; in the heating mode, it is 5.1. It means that heat generation is 5.1 times more than power consumption. Noiseless models of this series can heat rooms in extreme temperatures of -30°C. For comparison, conventional air-conditioners, designed for operation in winter can be used at outdoor air temperature up to -15...-20°C.

The new building of the station has four rooms and a flower garden in the courtyard. One of the rooms has been specially equipped for patients with COVID-19 or pneumonia in the worst-case scenario. The villagers made an oxygen tank for the artificial lung ventilation machine.





of patients often have to buy medicines beyond our village.”

Another resident of the village of Zhin-Zhigen, 60-year-old Kantaiym Imarova, lives with her husband. As the village has no appropriate infrastructure, the children had to leave for Bishkek and Russia.

“Our most pressing problem is the absence of a kindergarten. Recently, I had to send my grandson back to Bishkek because there is no kindergarten, parks, or playgrounds in the village. Me and my husband were upset. Is there any way out? We need to build a kindergarten and a gym for young people here,” says **Kantaiym**, a village resident.

The village of Zhin-Zhigen with a population of 1200 people is located in the foothills, near idle coal mines, 7 km far from from the town of Kyzyl-Kiya. As to the social facilities in the village, there is only one junior secondary school and a paramedical and midwifery station.

Kanzada Atazova says, *“People are really helpful. Our compatriots who are working in Russia made this large oxygen tank and installed it. This is a stationary version. Graduates of the Turkish Lyceum bought a portable oxygen concentrator for us. We use it in outpatient settings.”*

Ikram Zhumabayev, the village head, who says that the local population is mainly engaged in agriculture and trade, helps nurses propagate anti-COVID-19 measures.

According to him, the only way to prevent the spread of the disease is to visit crowded places and explain safety rules.

“As a result of outreach activities, people became aware of the danger. They don’t go to restricted areas and don’t do forbidden things. Now, when the school re-opened its doors for children, all of them follow safety rules. The pandemic has shown that the village needs an in-patient facility,” says **Mr. Zhumabayev**.

Local residents have to take people with severe diseases to the district hospital. They waste precious time on the transportation and accommodation procedures in medical institutions.

Mr. Zhumabayev says, *“Next year, we are planning to open an in-patient facility with 6–8 beds in the building of the paramedical and midwifery station. Previously, we used to waste a lot of time to transport seriously ill people to the district hospitals. The village needs an in-patient facility.”*

According to **Kanzada Atazova**, the only paramedic of the village, now she is working to obtain a permit to store and sell medicines in the medical center. She is also trying to provide clean drinking water for the facility.

She says, *“We are not allowed to sell medicines in the paramedical and midwifery station. I am currently working to resolve this issue. We are facing serious problems due to the lack of medications. The relatives*



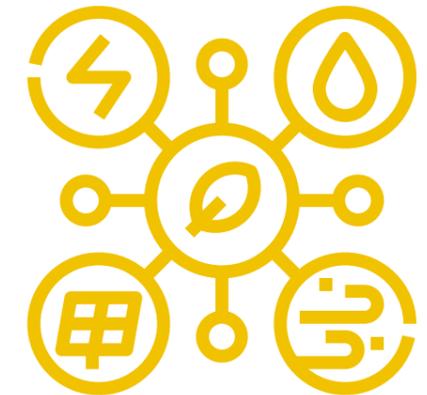


Ainagul Rysmendeeva, leader of zhamaat "Ak-Suu Organic", organized as part of Bio-KG Federation organic aimak development several years ago, is getting ready to use solar drier for producing dried fruit, vegetables and herbs. Photo: Tatiana Vedeneva



A solar system with 300W solar PV panel. Photo: Sam Barataliev

Renewables in Kyrgyzstan: mission impossible?



What can renewable energy offer to entrepreneurs in a country with 100% of grid coverage and one of the cheapest electricity tariffs in the world?

Kyrgyzstan is a relatively small country, with over 90% of the territory covered by mountains, which offers a lot of opportunity to produce organic foods. Out of over 6,3 million of total population, 66% live in the rural areas. Agricultural production employs 20% of labor force and accounts for 12% percent of country's GDP.

Electricity generating capacity of the country equals 3945 MW with an annual output of 12-15 billion kWh. Although 92% of electricity is produced by hydropower plants, and can be considered "green", the share of renewable energy (small hydropower plants) in 2018 was only 1.38%. Household consumption accounts for 57% of the total distributed electricity and 85% of total distributed heat across the country. At the same time, the level of physical deterioration of assets of the electric power industry is up to 50-70%[1], which creates high risks for the stable functioning of the industry, contributes to the growth of accidents and failures of power equipment during peak seasonal overloads.

Raising the interest in renewables

In 2013, the country consumed all electricity generated, and next year the country moved from the category of export-oriented countries to the category of import-oriented ones.

An increase in electricity consumption over the last 8 years equals 83% with an increase in population by only 17%, and a further disproportionately large increase in electricity consumption can be predicted from population growth only. There is no stock of generating capacities in the country to ensure the growth of electricity consumption.

Electricity tariff for households is heavily subsidized and equals to 0.01 USD, for businesses – 0.03 USD per kWh while the cost of production equals to 0.026 USD. Lack of management transparency has resulted in a loss of trust - household surveys indicate that over 65% of respondents said that electricity tariffs are too high and should be reduced.

High dependence on the tariff policy in the energy sector leads to the accumulation of losses of the energy sector, resulting in need of renovation and investment, ever-increasing debt financing, and lack of support for renewables. As a result, very few experts, products and firms are available in the renewable energy market, and almost all are based



Gulshat Danapiyeva, owner of a road-side café on Barskoon road, is using solar drier to prepare kurut - a hard cheese, traditionally produced by Kyrgyz nomads to preserve the nutritional value of horse and cow milk. It is made from condensed sour milk, called suzmo, which is then formed into small balls or other shapes and is normally dried in a shaded area for seven to ten days. Kurut is increasingly used as a tourist product and can be sold with 10 cents profit per ball. Solar drier allows preparing kurut much faster – in 2-3 days and has increased profits of Gulshat's business. Photo: Tatiana Vedeneva

in Bishkek, making it difficult for consumers to get consultations.

Limited market leads to limited resources for informing the potential consumers about the benefits of renewable technologies, limited demonstration possibilities, higher prices and the low quality of service and after-sales support from suppliers. So, how do we interest consumers in renewable energy?

Solutions: tailoring to specific consumers

The cost of a 1kW PV system with 9.6 kW battery backup starts at 4000 USD, with a simple payback of 60 years, and 135-liter integrated solar water heating system costing around 1500 USD with a simple payback of 17 years at business tariffs.

To promote renewable energy in such conditions, we tailored to specific consumers and businesses in Kyrgyzstan with adapting or creating market and technology solutions, which would be cheap and reliable enough in conditions of cold winters and unstable electricity supply.

Specific consumers, first, all entrepreneurs involved off-grid activities: cattle grazing, beekeeping, eco-tourism, as well as businesses involved in the production of eco-foods and herbs. Three of the most promising solutions, promoted as part of Energy Access SME Development Project, supported by OFID, include solar driers, solar chargers as well as pre-packaged solar PV systems.

For example, a forced convection solar drier, adapted and upgraded to be mobile and to have a back-up electric drying, can dry up to 10 kg of fresh product

and is being marketed at 300 USD. Adapting a more efficient solar drier design has allowed decreasing the cost of drier per kilo of fresh produce from 55 to 33 USD and increase the volume of dried product 10-fold per square meter of drier's tray area.

Over 25 such small solar driers have already been sold through local micro-financial institutions, and a larger solar drier, able to dry up to 100 kg of fresh product in one batch has been developed and is now ready to be used by small cooperatives.

Solar charger – is another product, developed specifically for remote tourist camps, which otherwise would use a diesel generator for producing electricity for several light bulbs, supporting a small fridge and charging electronic devices of guests. The 50W and 300W versions are available for different sized camps, at the equivalent of 347 USD and 835 USD.

For example, the large solar charger was successfully used during Kol Fest - eco-art and music fest in June 2019, organized on the southern coast of Issyk-Kul, bringing together people from different countries. Solar charger provided energy for smartphones and power banks of over 100 festival participants, who otherwise would have been left without power. The festival participants said that they would pay for charging – at 25 US cents per charge; it would allow a small business to pay back the full cost of the solution within 1 summer season.

A solar system with 300W solar PV panel, 225Ah battery power, controller of 25A and 0,5kW inverter, needed to receive "regular" 220V electricity from 12V, stored in batteries is offered for equivalent of 970 USD. The energy, provided by the system should be enough to support the basic needs of a family, who can use it to watch TV, separate milk, keep a small refrigerator going and ensure that their off-grid home is well-lit with LED lights.

The solar solutions, adapted for the Kyrgyzstan market seem to be modest – almost too simple, but we tried to find the right balance between comfort and financial considerations and see them as seeds for the green energy revolution.



Solar charger – is another product, developed specifically for remote tourist camps. Photo: Sam Barataliev



The large solar charger which was successfully used during Kol Fest in Issyk Kul. Photo: Tatiana Vedeneva

Source: <https://www.kg.undp.org/content/kyrgyzstan/en/home/presscenter/articles/2020/03/renewables-in-kyrgyzstan-mission-impossible.html>, Posted on April 2, 2020



Akbarali Zhoroiev, the entrepreneur who founded the Texas brand, has just built the first biogas plant in the Batken province of Kyrgyzstan.
Photo: Public Fund Fluid



Biogas plant operator is trained before the biogas plant is handed over into his care. Photo: PF Fluid.

Biogas plants: a promising area for shifting towards renewables in rural Kyrgyzstan



Biogas plants have the fastest payback time of all renewable sources in the Kyrgyz Republic. However, as with all renewables, large upfront investments are needed for the construction of a biogas plant. When does it make sense to invest in a biogas plant?

Let's look at an example of the newest biogas plant in the Kyrgyz Republic - the first one built in the Batken province. Akbarali Zhoroiev, the owner of the famous Texas cafe, says: "I started my business with building a toilet - a clean, modern toilet on the Osh-Isfana highway. I specially bought quality plumbing, did everything with care, even installed mosquito nets on windows to ensure there were no insects inside. Then we began to build cafe, expanded, built a hotel. We try to provide quality services for our customers, and we see their response. For example, we sell our own kefir. We serve in large reusable glass jars. Customers love our delicious kefir so much that many people order several servings first thing at the doorstep." The Texas cafe continues to expand its business towards renewable applications, such as biogas power plants.

The main customers of Texas cafe are local residents and those who drive along the Osh-Isfana highway. In addition to the cafe, Akbarali owns retail space for food and livestock, where he constantly keeps several cattle. A 2-hectare cherry and apricot orchard for 500 trees is the most recent addition to his establishment.



A cherry garden on 2 hectares - about 500 trees - requires care and attention, like any part of the business. Photo: PF Fluid.

When deciding on the construction of the biogas plant, Akbarali received advice within the framework of the UNDP-OPEC Fund for International Development (OFID) project "Development of small and medium-sized businesses for access to energy" on the possibilities of using biogas technology products in business, but he himself has already made the main economic calculations.

"I have known about biogas plants for a long time - I have graduated as an agronomist. I have long wanted to build my own circular non-waste production, and now, finally, I have such an opportunity", Akbarali says. One of the key goals that Akbarali wants to reach through the construction of a biogas plant is to increase the productivity of the cherry garden with the help of biofertilizers. He also aims to reduce heat and cooking bills – which cover a large part of his expenditure, by shifting towards environmentally friendly renewable technologies and using produced biogas.

Kyrgyzstan has its own manufacturer of biogas plants, operating for over 20 years. With the support of various UNDP projects, PF Fluid contributed to the development of biogas technologies not only in Kyrgyzstan and Central Asia, but also in the distant North Korea.

The appropriate size of a biogas plant, measured in cubic meters of the digester, can be calculated based on the number of cattle heads - 1 cubic meter per head. The best biogas production results, however, are obtained by using a mixture of various types of wastes - manure, green and food waste.

According to National Statistical Committee of the Kyrgyz Republic, as of 2019, there were 1,680,750 head of cattle in Kyrgyzstan. Processing of all collected livestock waste (40%) in Kyrgyzstan will make it possible to obtain up to 16 million tons of liquid fertilizers which could fully satisfy the country's agricultural needs for fertilizers.

As calculated in the 2017 edition of the Manual on Biogas Technologies, first developed with UNDP support in 2006, along with the production of liquid fertilizers, as a result of anaerobic processing of animal waste, 268 million cubic meters of biogas per year, or 745 thousand m³ of biogas per day, can be produced and used to provide for energy and motor fuel needs of the rural population.

This volume of biogas, after deducting the biogas used for heating the biogas plants themselves, will be enough to heat 2.6 million square meters of residential and industrial areas, that is, 52 thousand medium-sized (with an area of 50 m²) rural houses - about 6% of the rural population. If produced biogas would be used for cooking, it could satisfy the needs of 15% of rural households with additional benefit from conserving forests, reducing greenhouse gas emissions and alleviation of female labor.

The biogas plant for Akbarali Zhoroiev is designed to process waste from 50 cattle heads and costs about 23.5 thousand US dollars. To reduce the cost of biogas plant, PF Fluid makes it possible to use materials and vessels already owned by the customer - if desired, he can make purchases according to the specifications provided. Of great help to Akbarali was the assistance received from the EBRD's business development program, which supported 75% of the costs of consulting services for the construction of the biogas plant.

At the end of March 2020, the biogas unit was commissioned into operation and can already process more than 3 tons of raw materials (with 89-92% moisture content) per day. The unit can produce more than 3 tons of biofertilizers per day - sufficient for fertilizing 0.5 hectares daily, as well as 90 m³ of biogas, sufficient for heating around 300 m² of premises. The biogas produced will be used by Akbarali for cooking and heating the interior of the cafe. Due to internal production of biogas and biofertilizer, energy costs of Akbarali's business can be reduced by more than 50%, and cherry yield growth, can increase by 15% – 200%.

Akbarali plans to sell the surplus of biofertilizer on the local market, and will share it for free in the first year of plant operation, so that farmers can test the results of applying biological fertilizers on their own farms.



The main part of the raw materials for processing in a biogas plant is dairy cattle. Photo: PF Fluid.



How does the system work?

The main part of the biogas plant - the digester - is a hermetically sealed container where at a temperature of 37 °C anaerobic digestion of the organic mass of waste occurs with the formation of biogas. Waste - most often manure, vegetable and food waste - is collected daily, ground up and diluted with water until the desired moisture content is reached. After that, the finished raw material is heated to 20 °C and introduced into the digester, where it is processed by methane bacteria.

The resulting biogas, consisting of 65 - 70% methane, after purification, is collected and stored until use in a gasholder. From the gasholder biogas is carried out through gas pipes to the place of use in gas appliances. In addition to internal use, biogas can be sold to other farms or businesses aligned with the national standards developed by the UNDP-OFID Energy Access SME Development Project, namely "General technical conditions" and "Gas distribution systems for biogas", technical regulation "On the safety of biogas distribution networks" and the methodology "Determining costs for the calculation of tariffs for biogas".

How efficient is the system?

Calorific value of one cubic meter of biogas is, depending on the methane content, 20-25 MJ / m³, which is equivalent to the combustion of 0.6 - 0.8 liters of gasoline; 1.3 - 1.7 kg of firewood or the use of 5 - 7 kW of electricity. The raw materials processed in the digester of the biogas plant, converted into biofertilizers, are unloaded daily and applied into the soil or used as a feed additive for animals.

Biofertilizer – liquid methane effluent, contains organic substances that increase soil permeability and hygroscopicity, prevent erosion and improve general soil conditions. Organic matter is also the basis for the development of microorganisms, which convert nutrients into a form easily absorbed by plants. Practice shows that applying 5-7 tons of biogertiliser per ha the yields of plants increase from 15% to 200%, and most weed seeds are destroyed.

On average, the payback time of a biogas plant is 1-2 years. Let's make a calculation for a specific biogas unit of Akbarali Zhoroiev: the equipment cost is 23,500 USD, plus construction - the total cost of the unit will be about 30,000 US dollars. With the price of natural gas in March 2020 equal to 17.6 - 21.3 soms (0.22 - 0.27 USD) per cubic meter, biogas, with an efficiency equal to 65% of natural gas, will cost 0.14 - 0.17 USD per cubic meter. The installation of Akbarali will produce 59,400 m³ of biogas per year - or the equivalent of 10,000 US dollars, as well as 1,200 tons of biofertilizers, which, at a cost of 6 USD per ton, will save 7200 US dollars.

Increasing the yield of the cherry garden even by a minimum of 15% - from 20 tons per hectare to 23 tons per hectare - will bring 112500 soms or 1.5 thousand US dollars per hectare - or 3000 USD

per year for the farm of Akbarali Zhoroiev. That is, the total annual benefit from the installation will be about 20,000 US dollars, and the payback period is 1.5 years.

At the same time, it should be understood that a biogas plant is more a living organism than a machine, since methane bacteria, which are sensitive to both temperature and regular feeding, do the main work on processing the wastes. About 2 hours should be spent on the maintenance of the biogas plant per day by trained operators.

Like any living organism, a biogas plant is quite demanding - it needs regular nutrition, water, favorable temperature, but in return it produces energy and nourishes the soil, helping to increase the quality and quantity of the obtained crops. But anything is possible if you have the right incentives and support mechanisms in place for SMEs.

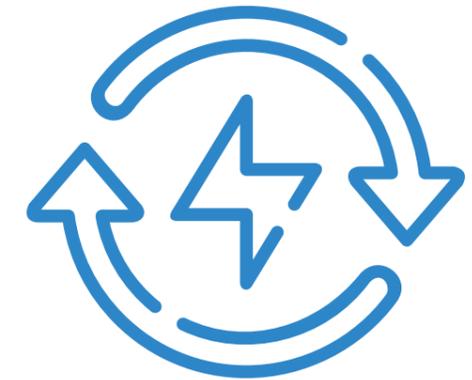


Biogas plant operator is trained before the biogas plant is handed over into his care. Photo: PF Fluid.

Source: <https://www.kg.undp.org/content/kyrgyzstan/en/home/presscenter/articles/2020/05/biogas-plants--a-promising-area-for-shifting-towards-renewables-.html>, Posted on May 12, 2020



Change for the better in Kyrgyz Republic's renewable energy sector



Installation of 0.8 kW photovoltaic systems on ranger houses in the Enelchek gorge. Photo: Tatyana Vedeneva.

The expediency of the accelerated development of renewable energy sources in the Kyrgyz Republic is accentuated by the current shortage of electric energy – today the energy sector faces an acute problem of commissioning new capacities, both large and small, for production of electrical energy.

At the same time, renewable energy sources can provide competitive energy supply, reducing the negative impact of traditional energy sector on the environment and human health, opening up opportunities for universal access to inexpensive, reliable, sustainable and modern energy sources for various categories of consumers, which is one of the obligations of the Kyrgyz Republic to achieve the Goals United Nations in the field of sustainable development (SDG-7).

More than 90% of all electricity in the republic is generated by large hydroelectric power plants. However, hydro resources of small rivers in the republic constitute only 1.47% of total electricity generation in Kyrgyzstan, produced by 18 small hydroelectric power plants with a total capacity of 53.86 MW.

With the assistance of experts from the Center for Renewable Energy and Energy Efficiency Development (CREEED), implementing partner of the UNDP-OFID “Energy Access Small and Medium Development” Project in the Kyrgyz Republic, the Government of the Kyrgyz Republic has developed and approved the Regulation on the conditions and procedure for the implementation of activities for the generation and supply of electricity using renewable sources of energy on October 30, 2020.

Considering the temperature rise in the region, contributing to melting glaciers, with the mean precipitation rates remaining virtually unchanged, reductions in water resource availability can be expected. Thus, diversification of renewable energy sources in the energy mix shall be considered as crucial for ensuring energy security of the country.

This means that the “rules of the game” have been finally developed for investors and entrepreneurs who want to produce electricity using RE systems and supply it to the grid. This is just one of the possible modes of operation of RE systems, according to the current edition of the «Law on Renewable Energy» of the Kyrgyz Republic.

Despite the fact that the Kyrgyz Republic is one of the countries with significant potential for renewable energy, solar, geothermal energy, wind and biogas technologies are still used in very rare cases and only for own energy needs.

TORO Ltd., biogas plant with digester volume 60 m3. Photo: Tatyana Vedeneva.



First approved in 2008, the RE Law was amended several times in order to give rise to the development of the renewables market in Kyrgyzstan, but each time an obstacle was the lack of by-laws, both in relation to the activities for the generation and supply of electricity, and in relation to land issues, as well as the fact that the payment for electricity generated with the help of renewable energy sources at an increased tariff was included in the costs of the already unprofitable distribution companies of the power industry .

The main changes introduced to the RE Law in July 2019, were: first - compensation for additional costs of distributing companies for the purchase of electricity generated using renewable energy sources. Now these costs will now be taken into account when calculating and approving the national electricity tariff for consumers, which takes the load of distribution companies. The second - is the revision of the FIT coefficients to the maximum tariff at which RE-electricity will be purchased - now the coefficient is 1.3 for all types of RE, which, of course, stimulates the development small hydroelectric power plants instead of other renewable sources. Third, quotas for RE capacities have been introduced - the establishment of the total electric capacity of



Generators of Kalininskaya small hydro power plant, installed capacity 1.4 MW. Photo: Tatyana Vedeneva.

RE stations, who will be able to receive an increased tariff by region and by type of renewable energy sources for a certain period of time.

Thus, the current legislation defined the fundamental principles and conditions for carrying out activities in the field of renewable energy sources, but there was no mechanism regulating the procedure for the generation and supply of electricity using renewable energy sources within the established quotas, outside quotas, for own needs and on a contractual basis.

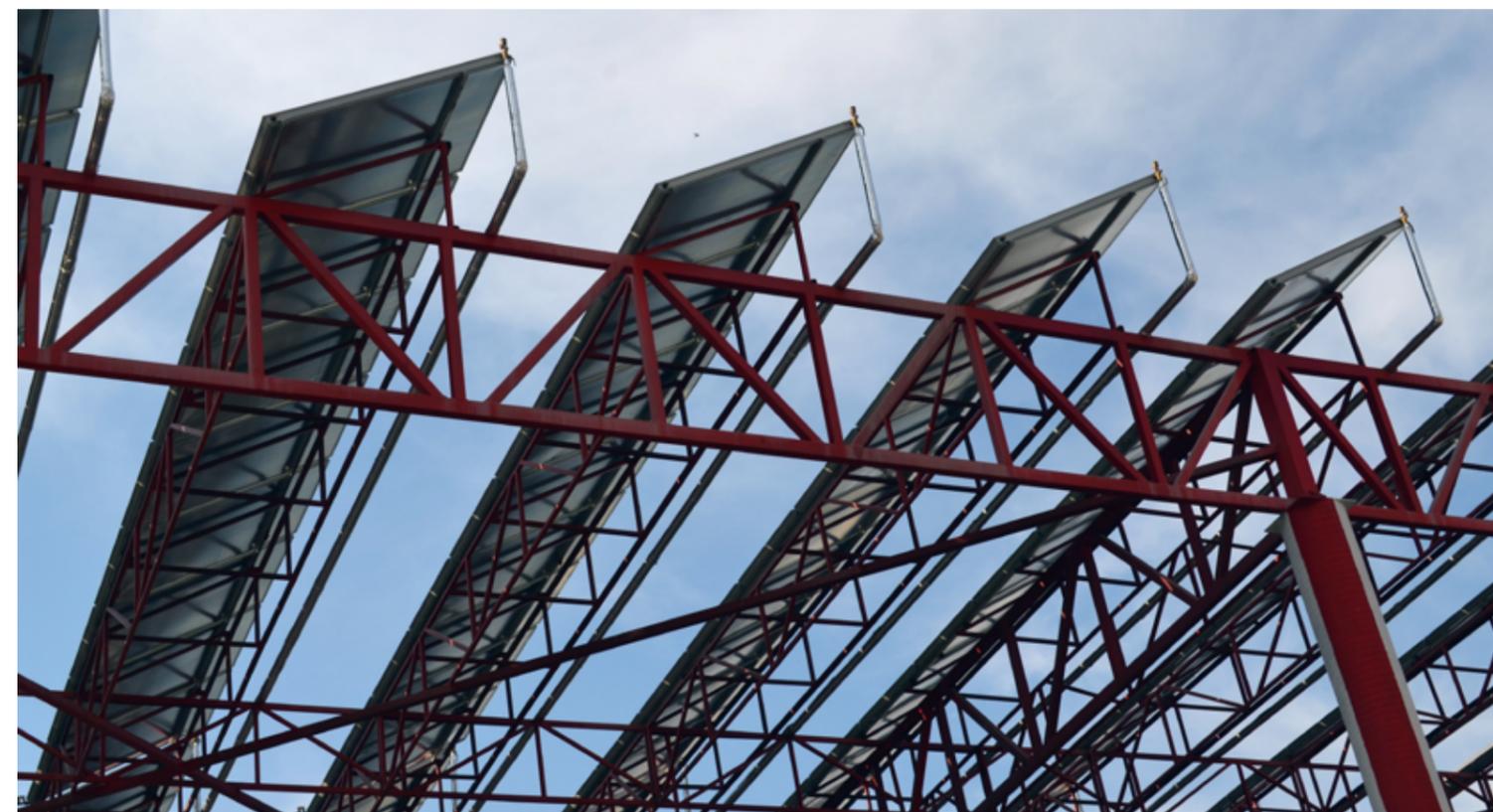
The approved Regulation the conditions and procedure for the development of activities and the supply of electricity from renewable energy sources, have been developed for implementation of the norms and requirements of the Law of the Kyrgyz Republic «On Renewable Energy Sources».

Regulation defines:

1) conditions and procedures for the implementation of activities of generation and supply of electricity from renewable energy sources (hereinafter - RE) and regulating the legal regime of generation and supply of electricity using renewable energy sources within the established quotas, regardless of quotas, on a contractual basis and consumption for own needs;

2) mechanism of interaction between all parties involved in the generation and supply of electricity activities process with the use of renewable energy sources (the authorized state bodies, local state administrations, local authorities and RE actors) with the aim to differentiate and increase the responsibility in terms of compliance and procedures stipulating the process for the supply and the fulfillment of contractual obligations for the supply of electricity using RE.

Regulation defines Renewable Energy entities as «natural and legal persons, foreign natural and legal persons, individual entrepreneurs who have



Solar water heating system with a total capacity of 0.6 MW, Boiler house «Rotor», Bishkekteploenergo. Photo: Tatyana Vedeneva.

expressed the intention and / or are operating in the sphere of generation (all types of legal regimes), supply (sale) of electricity generated using renewable energy sources.»

In addition to RE entities, the process of generating and supplying electricity using RE is currently involves:

- the authorized state body for the development of energy policy - the State Committee for Industry, Energy and Subsoil Use of the Kyrgyz Republic (GKPEN);
- the authorized state body for regulation of the fuel and energy complex - the State Agency for Regulation of the Fuel and Energy Complex under the Government of the Kyrgyz Republic (GARTEK);

- authorized state bodies in the field of regulation of land legal relations and local authorities;
- distribution enterprises.

The role, rights and obligations of each of the participants are also defined in the Regulation.

For FIT and other preferences, Regulation provides procedure for the inclusion of renewable energy entities in the State Register of RE entities. Inclusion in the Register of RE entities - official source confirming the legal status of a RE entity and issuing an official document (certificate), resolves the problem of securing and confirming the legal status of a RE entity. Maintaining the Register of RE entities is also needed to ensure the assessment and statistical accounting of electricity generated using RE.



PV system with installed capacity 3KW, First Aid Station. Photo: Tatyana Vedeneva.

The Regulation also describes in detail all four of the legal regimes and stages of activities for the generation and supply of electricity using renewable energy sources:

- supply of electricity using renewable energy sources within the framework of quotas,
- supply of electricity using renewable energy sources outside the quotas,
- supply of electricity using RE on a contractual basis,
- generation of electricity using renewable energy sources for their own needs.

Thus, renewable energy entities have the right to claim a tariff preference for a grace period within quotas established by GKPEN.

Quota for RE are defined as «set by a State Committee on industry, energy and natural resources of the Kyrgyz Republic (GKPEN) amount of installed

electric capacity of power plants using RE by regions and RE types for a certain time period, whose generation of electricity will be reimbursed at a maximum rate for the end users, times the FIT coefficient.»

Tariff preferences in the amount of the maximum tariff for end consumers (2.24 soms^[1]), with the use of a multiplying coefficient (1.3) during a grace period (no more than 10 years), for RE stations within capacity quotas, is provided to RE entities included in the Register of RE entities. Capacities within the limits of quotas are allocated according to the «first application filed» rule, in the order of priority of the application for a tariff preference.

The RE entity, after exhausting the volume of quotas of installed capacities and / or when constructing a RE power plant outside the quotas, when supplying electricity to distribution companies, is provided with a tariff for the RE electricity it generates at the

level of the maximum tariff for end consumers (2,24 soms) , minus the cost of the transit service of the electric networks company, for the payback period established by GARTEK (no more than 8 years) .

To determine the «rules of the game», Regulation:

- 1) Determines the procedure for considering applications by RE entities for obtaining tariff and other preferences;
- 2) Establishes requirements for RE entities on the need to prepare a feasibility study, design and estimate documentation, go through the procedure for coordinating the connection of a RE facility to power grids and obtain architectural and planning conditions (AAP) and technical specifications (TU) for connecting RE plants to networks;
- 3) Determines the requirements for RE entities to obtain a license in cases provided for by the legislation of the Kyrgyz Republic;
- 4) Describes the process for providing and establishing tariffs for the supply of electricity generated using renewable energy within the specified quota, and outside quota for the duration of the payback period;
- 5) Determines the procedure for concluding a contract for the supply of electricity generated using RE;
- 6) Provides a procedure for the acceptance of power plants using RE into operation and defines the rules for the operation of RE facilities.

Now the Regulation has already entered into force, and the GKPEN is preparing to approve quotas for the first few years of work with renewable energy sources.

The adoption of the Regulation is a big positive step towards improving the energy and environmental security and improvement of electricity supply due to increase of the share of renewables in the



TORO Ltd., biogas plant with digester volume 60 m3.
Photo: Tatyana Vedeneva.

energy balance of the country, creating jobs in the design , construction and operation of RE plants , providing incentives to renewable energy equipment manufacturers and suppliers as well as creating conditions for the development of a market for renewable electricity, which one of the main goals of the UNDP-OFID Energy Access Small and Medium Development” Project in the Kyrgyz Republic.

Center for Renewable Energy and Energy Efficiency Development (CREEED) held a webinar on November 12, 2020 to clarify issues related to working with the new “Regulation on the conditions and procedure for the implementation of activities for the generation and supply of electricity using renewable energy sources”, video recording and presentations of experts can be found on the website of the Green Energy Platform - <https://www.greenenergy.kg/blog-ru/renewable-news-kr-2020-1/>.

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Source: <https://www.kg.undp.org/content/kyrgyzstan/en/home/blog/2020/change-for-the-better-in-kyrgyz-republics-renewable-energy-secto.html>, Posted on December 22, 2020



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