Closing renewable energy and energy efficiency market gaps in Kyrgyzstan

as approach to promoting urban sustainable development

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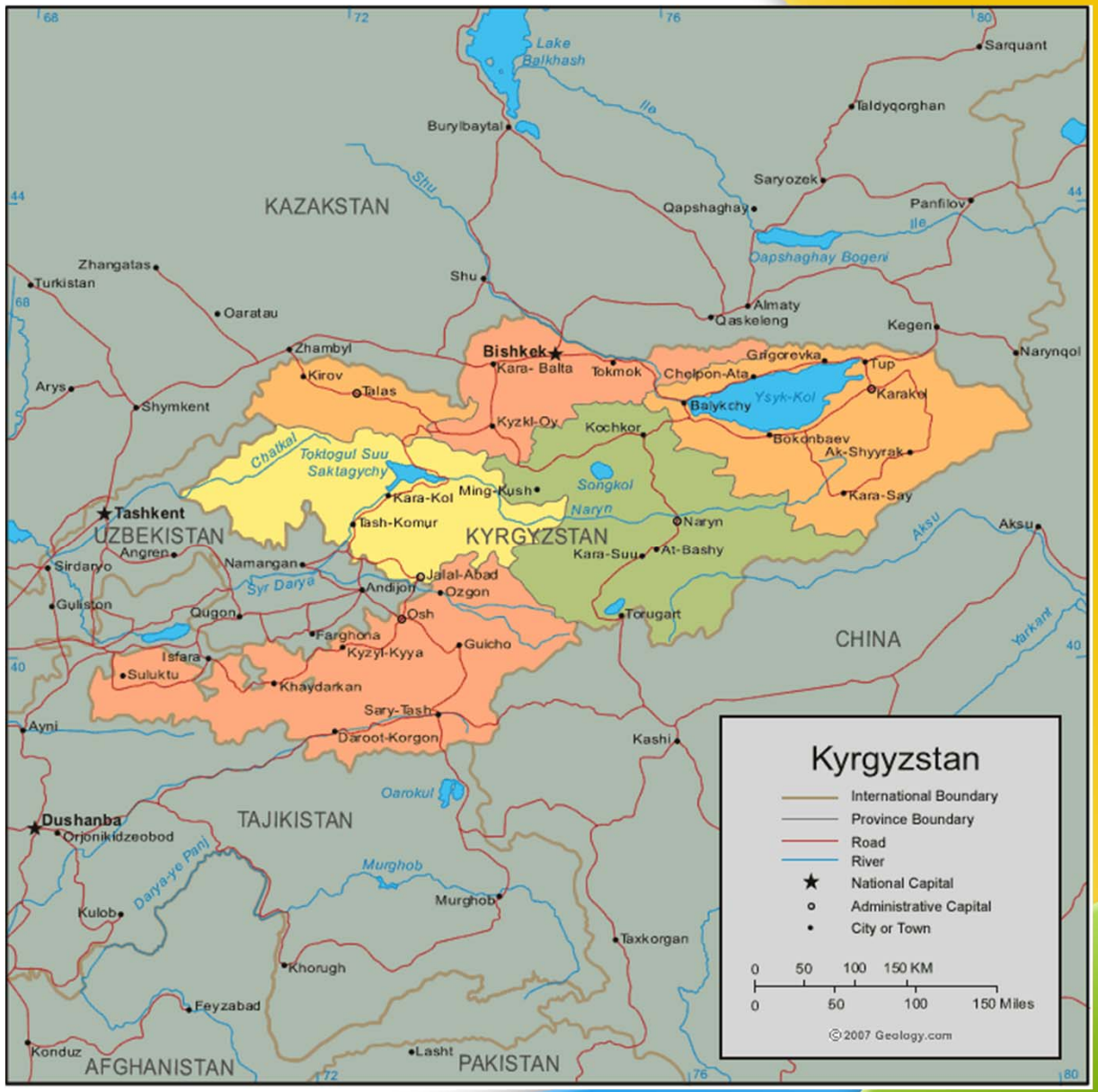
Background:

- **Kyrgyz Republic:** over 90% of territory – mountains=difficulties in delivering energy
- **Population distribution:** 5,8 mln, 66% live in the rural areas, 2 largest cities – Bishkek (16%) and Osh (4,6%)
- Good **solar**, **hydro** and **biogas** potential



Background:

- **Energy system of the KR:**
  - **7 large HPPs** (i.c. 3030 MW) dependence on water reserves=climate, depreciation of equipment over 50%
  - **and 2 TPPs** (i.c. 716 MW),
  - **9 small HPP** (i.c. 38.5 MW) – only 3 of them private, 1 new

Total electricity generated (GWh) in 2013 by:		
Coal and coal products	0,8956	6,27%
Hydro - small (under 50MW)	**0,2819**	**1,97%**
Hydro - large (over 50MW)	13,0967	91,75%
Total	**14,2742**	**100,00%**

- **Energy production crisis**
  - 2013-2014 produced and consumed 14 billion kWh,
  - in 2015 already **consumption was higher than production** and around 1 bln kWh electricity was imported from Kazakhstan

Background:

- **Energy consumption structure**
  - In 1999 HH consumed 4,2 billion kWh (30% of total consumption),
  - in 2012 – already 7,2 billion kWh(63%)
- **Seasonal variations in demand**
  - During warm time of the year- 22-23 million kWh /day ,
  - During cold period - 70 million kWh /day (3 times as much).

- **Price for electricity (cost of generation=0,02 USD)**

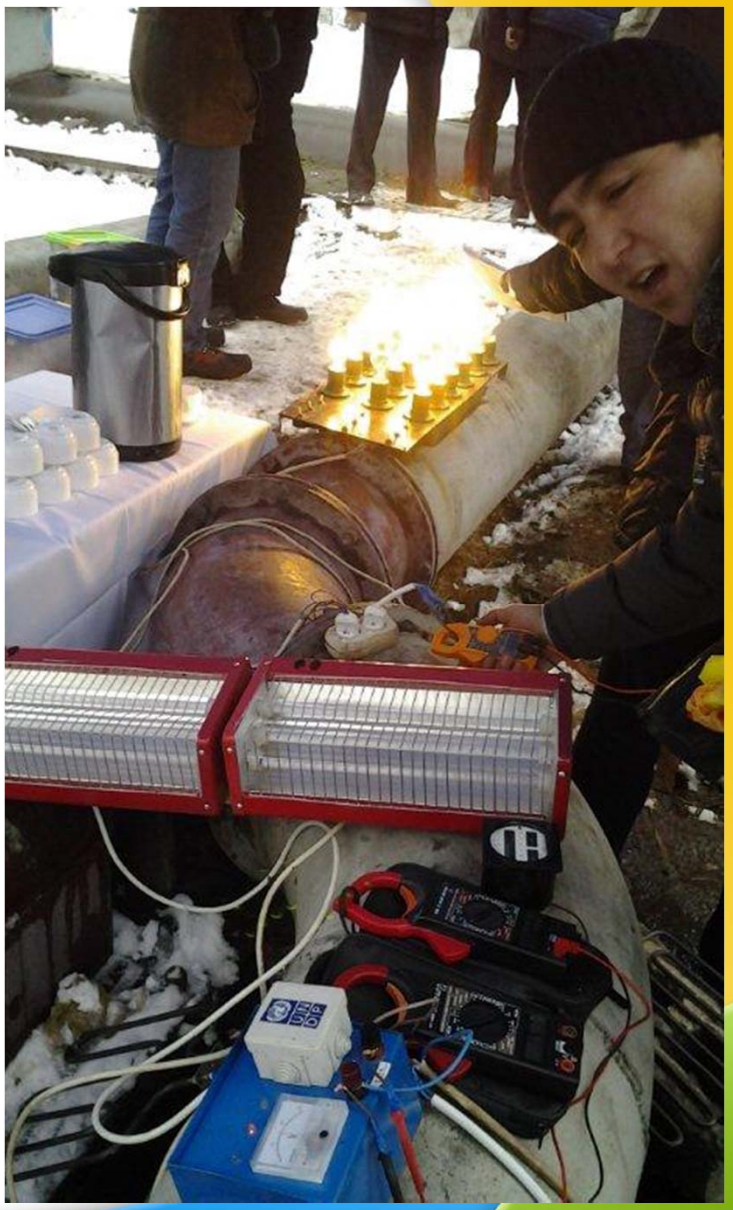
Period	Price, USD	Type of consumer	% of price increase
Up to Aug 2015	0,010	private consumers	
	0,028	other consumers	
After Aug 2015	0,011	private consumers up to 700 kWh per month	10,00%
	0,033	other consumers	15,46%

Examples of implemented solutions:

- **Biogas plant for utilizing up to 5 ton food waste per day =** 330 hectares of fertilized land + 500 m2 of heated space + cooking for 30 people

Examples of implemented solutions:

- **Micro hydro on rivers and channels:** these micro HPP (each around 15 kW i.c.) are used for heating of the premises of Bishkek Channel Management Authority, facility also used for testing HPP equipment

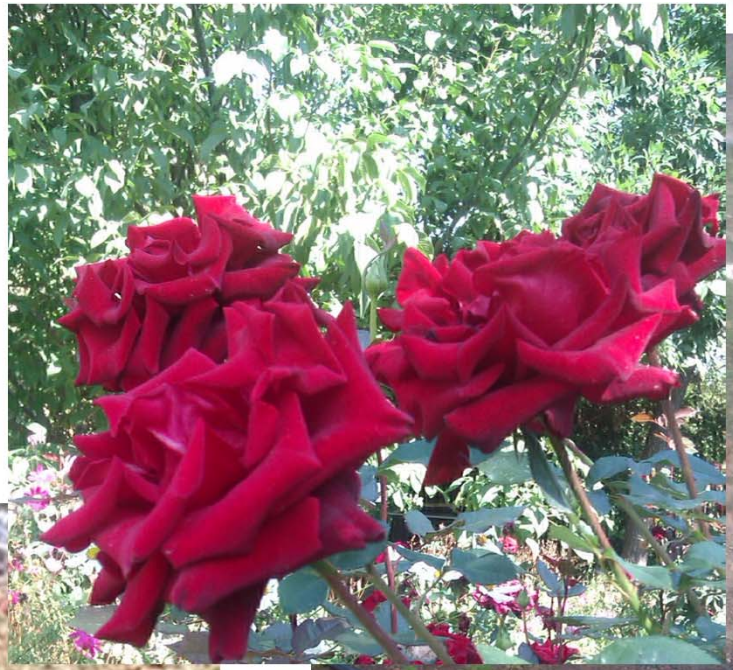


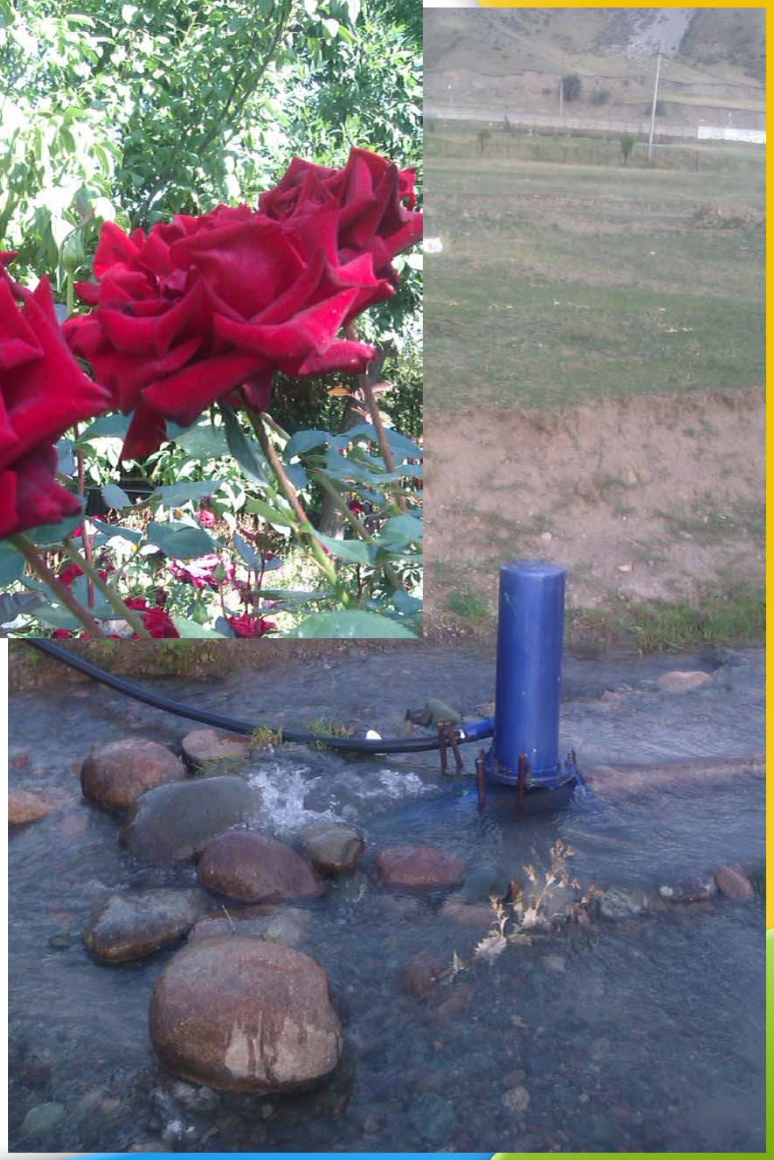
Examples of implemented solutions:

- **Solar PV and SWH:** PV system with capacity of 16.4 kW supplies electricity for Homeless Center for 108 children in Bishkek, SWH system for 500 liters is used for daily hot water, 100-liter system used for kitchen needs

Examples of implemented solutions:

- **Hydro pumps:** used by cafes for drip irrigation of flowers and fountains





Examples of implemented solutions:

- **Energy efficient building:**
- Energy efficiency of Osh school for 850 pupils, built with support of Turkish Government and designed based on CNaR KR 23-01:2009 (Thermal protection of buildings) and CR 23-101:2009 Designing thermal protection of buildings is 50%, energy consumption is 71,8 kWh/m2, EE class = B

Market gaps - policy

- **General policy exists in form of:**
- Law on Energy System; Law on Electrical Energy System;
- Law on Energy Saving; Law on Energy Efficiency of buildings; CNaR (SNIP) Thermal protection of buildings (EE class of buildings, establishes class definitions and minimal class for new buildings)
- Law on Renewable Energy (2008, 2012); tariffs for 8 years for electricity from RES
- National Energy Program for 2008-2010 and Strategy of Development of the Energy Sector until 2025;
- National strategy of Sustainable Development and Program for transferring to Sustainable Development 2013-2017;
- **New developments:**
- Concept of Developing Small Hydro Energy Sector up to 2017 (July 2015); Methodology on calculating the price to be paid for electricity generated with use of RE (Aug 2015) – contradicts Law on RES!
- Program of the KR on Energy Saving and Planning of Energy Efficiency Policy was approved only on (Aug 2015); introduces planned energy savings, energy intensity and GHG emission decrease up to 2025, ESCOs, etc
- **No mechanisms for implementation of existing legislation, specific legislation is developing only for hydro**

Market gaps - clients

- Little information on the **benefits and costs** of the green technologies and EE solutions;
- No reliable information on the **suppliers**, no tools to access their **reliability**;
- Very few **demonstration projects**, and most all scattered across country;
- Little access to **full services** – from system choice through to installation, maintenance, repairs;
- Misunderstanding of the technologies and subsequent intent to save money on specialists leads to **poor implementation**;
- **Little local expertise**, all experts are located in the 2 largest cities – Bishkek and Osh;
- **Low costs of electricity** make RE projects economically unviable, unless business depends on reliable constant energy supply;

Market gaps - financing

- Existing finance solutions (Kyrseff (EBRD), EE programs (IFC), etc) follow standard procedures and **demand collateral for EE loans**;
- **Interest rates are still high** – around 20%;
- No capital for **early development stages** of the producers/suppliers of solutions/services.

Market gaps - companies

- **Limited capacity** of firms in financial, operational and HR management
- Limited understanding of **marketing and client service**

Market gaps - technology

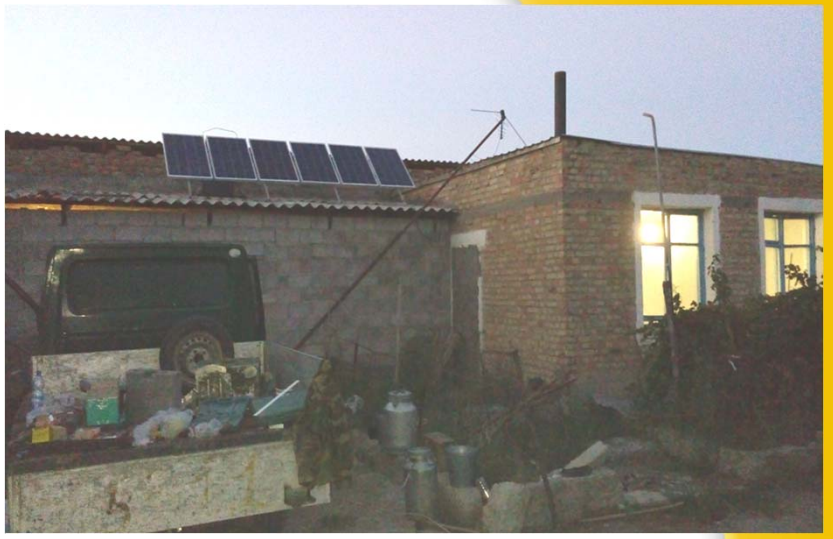
- Limited access to **production facilities** required for development/adaptation of clean energy solutions;
- Limited and **decreasing expert/specialist pool**, especially in rural areas

Market development matrix:

Market development degree/area	No market	Emerging market	Growing market	Mature market
Technology	Proof of principle and concept, basic research	**Proof of viability**	Scale up	Commercial
Companies	1-2 individuals, bringing friends/family	**Start-ups, hiring first specialists**	Company growth (specialists, then operational)	Established
Financing	State of **international organizations**	Venture capital	Credit (Debt market)	Public equity market
Clients	No interaction	**Early adopters, pioneers**	Rational purchase	Interaction and feedback
Policy	General regulation	**Sectoral regulation**	Specific positive regulations	Comprehensive framework

Development priorities:

- Improvement of **legislative framework**, development of secondary acts and mechanisms;
- Implementation of a number of **demonstrational projects** in all regions of the KR;
- **Monitoring, maintenance and repairs** of existing equipment/buildings;
- Provision of reliable **information about the suppliers and technologies** for consumers;
- Creation and development of the **expert network**, in urban and rural areas of the KR;
- Development and provision of **comprehensive services** as well as standard solutions;
- Ensuring **quality of services** through introducing industry standards, certification/quality evaluation programs;
- **Supporting existing producers and NGOs**, development of sector cooperation.



Development priorities:

Implemented projects:

- **«Capacity building of local consultants on Renewable Energy and Energy Efficiency in the Kyrgyz Republic»** project for BAS EBRD in the KR, 2012-13.
- **Installing 12 Solar 3-kW PV systems in rural areas of the Kyrgyz Republic** with JGH Group, Denmark for a UNDP/WHO/UNIDO project **"Providing rural First Aid Station with reliable electricity supply»**, 2012-13 and **9 Solar 2-kW PV systems in Republic Karakalpakstan, Uzbekistan** with JGH Group, Denmark for **UNDP Uzbekistan, 2014**.
- Supporting **Fluid PF** in implementation of **4 biogas projects** with international organizations (UNDP, BAS, private companies) and **overseas expansion to DPRK and Croatia**, 2012-13.

Development priorities:

Implemented projects:

- Market assessment for **Financing Sustainable Energy Through Remittance Flows** with **BASE for SECO, 2014.**
- **Installing solar hot water system** for **"Osh-Nuru" hotel** in Osh city, KR with the support of BAS Programme, **2014-15**.
- **Market assessment for Solar Water Heating Technologies** in selected CIS countries: Kyrgyzstan, Kazakhstan, Uzbekistan, Tajikistan, Azerbaijan, Moldova and Ukraine, **IFC, 2014.**
- **Feasibility Assessment for implementation of a Green Village Prototype in KR**, **for UNDP, 2015.**
- **Current projects:**
- **Installation OF solar water heating systems for heating and hot water supply in FAS of Ugut and Kyzyl-Zyldyz villages of Naryn province**, financed by **UNDP, 2015.**

Thank you for your attention!

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