

## Expanding Access to Modern Energy Services in Transition Countries: the Republic of Georgia

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Assuring access to modern energy services to the population is a crucial step to improve human well-being and stimulate economic and social development. The International Energy Agency (IEA) identifies the lack of access to modern energy services as one of the main obstacles to overcome in order to achieve the UN Millennium Development Goals.

The definition of modern energy services includes both access to electricity and to clean cooking facilities (e.g., fuels and stoves that do not cause air pollution in houses). In its 2011 World Energy Outlook, IEA argued forcefully about the need to find and mobilize the resources required to extend access to modern energy services to the poor around the world.

Transition countries are typically not considered particularly problematic as access to energy services is concerned. However, in transition countries the coverage is sometimes far from complete and substantial efforts are still required to ensure the full coverage.

A clear case is the one of the Republic of Georgia. Most of the infrastructure used for the transmission of electricity and the transportation of gas was seriously damaged (and/or deteriorated substantially) in the years immediately following the separation of the country from the Soviet Union (1991). Despite impressive improvements taking place after the rose revolution (2003), some challenges are still ahead.

### Access to Electricity

According to 2012 data from the Statistical Office of Georgia (Geostat), 100% of Georgian households had access to electricity.

However, the Ministry of Energy of Georgia has recently published a list of 36 villages for which this is not true. In the list one can find high mountain villages from Adjara, Racha-lechkhumi & Kvemo Svaneti and from Mtskheta Mtianeti. There are also villages from Kakheti, Shida Kartli, Kvemo Kartli, Samtskhe Javakheti and Imereti.

The Ministry of Energy of Georgia has estimated the total cost of bringing electricity to the villages to be of about 5.5 million USD. This is the cost of the “on-the-grid” solution: villages will be connected to the grid (i.e., new transmission/distribution lines will be built). The estimated cost of access per household shows a large variation (Table 1): from about 900 USD per household in the village Janjghari (Adjara) to about 86000 USD per household in the village Tkemlovana (Sida Kartli).

The cost of granting access to the grid to households that are not yet connected to it can, therefore, be quite high.

A way to reduce these costs, could be moving (in some cases) from the “on-the-grid” to an “off-the-grid” solution. Renewables can provide interesting “off-the-grid” opportunities. For example, solar energy generation seems especially promising in the Georgian case. The annual radiation of the sun in Georgia is estimated to be good (1250-1800 kWh/m<sup>2</sup>), particularly in isolated mountain locations. An investigation of the cost of installing sufficient solar generation capacity to cover the needs of an average household (500 watt generating capacity, plus accumulators) has quantified the necessary initial investment at approximately 6000 USD<sup>1</sup>. While almost four times higher than the lowest cost of connection to the grid, this amount is 14 times lower than the highest one. Considering the energy savings and the expected long life of the investment (20-30 years for the panels and 3-8 years for the accumulators) and the flexibility of this solution – thanks to which fixed costs do not increase significantly even for isolated households – this definitely looks like an interesting alternative that could save the Georgian government substantial resources.

### Access to Clean Cooking Facilities

The challenges are substantially larger if we consider the access to clean cooking facilities. Household consumption for heating and cooking purposes is one of the causes of large biomass consumption in Georgia (315 thousand tonnes of

Region	Range (lowest-highest)
Adjara	872-1545
Imereti	16537-22879
Kakheti	7394-18788
Kvemo Kartli	2323-7359
Mtskheta-Mtianeti	2727-21717
RKLS (?)	7925
Samtskhe-Javakheti	9764
Sida Kartli	2121-86364

Source: Ministry of Energy and Natural Resources of Georgia

Table 1. Access Cost per Household (USD)

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oil equivalent in 2011 – more than 10 per cent of Georgia’s total final energy consumption – of which 265 tonnes are used by the residential sector – amounting to 28% of the energy consumption by the residential sector). The high incidence of biomass in the energy consumption of Georgian households is consistent with the fact that less than 50 per cent of them (45.8 per cent in 2012) is connected to the natural gas grid.

The situation (already much better than in the recent past) is expected to improve, thanks to large investments by SOCAR Georgia Gas<sup>2</sup>, that reports having already invested about 147 million USD since 2008, building 2,300 km of gas lines and giving access to gas to more than 160 thousand new customers. More investment for the future has recently been announced. The new Georgian Ministry of Energy and Natural Resources has developed a joint plan together with SOCAR Georgia Gas, according to which over 86,000 Georgian families will be provided with gas by the end of 2014. At the end of the process (for which investment of at least 40 million USD are expected according to a very conservative estimate) a total of 150,000 additional users should be connected to the natural gas network.

This, combined with the efforts to ensure full access to electricity at a reasonable price should substantially improve the condition of Georgian citizens, as far as access to modern energy services is concerned.

While the obstacles that Georgia has to overcome to assure full access to modern energy services to its citizens are still substantial, the impressive results achieved in the last decade and the initiatives being undertaken presently seem to suggest that the final goal could be achieved in the not too distant future. The costs of achieving such goal (and the time required in the process) will obviously depend on the capacity of Georgian institutions (and especially of the Georgian Ministry of Energy and Natural Resources) to keep a flexible approach, making full use of all the available options, ranging from direct public intervention to the use of market forces.

#### **Footnotes**

<sup>1</sup> This estimate is based on the experience of a Georgian firm specialized in the installation of stand-alone solar generation systems in remote areas of the country: <http://www.sun.org.ge/>

<sup>2</sup> SOCAR Georgia Gas is a subsidiary of SOCAR Energy Georgia. SOCAR is the State Oil Company of the Azerbaijan Republic.

#### **References:**

International Energy Agency (2011). World Energy Outlook 2011. OECD/IEA, Paris.

Website of the Georgian Statistical Office (Geostat): <http://geostat.ge>

Website of the Ministry of Energy and Natural Resources of Georgia: <http://www.energy.gov.ge/>

Website of the Georgian National Investment Agency: <http://www.investinggeorgia.org>

Azernews: [http://www.azernews.az/oil\\_and\\_gas/57481.html](http://www.azernews.az/oil_and_gas/57481.html)

	2011	2012	% of Population In Georgian Regions (2012)
Kakheti	37.5	37.2	9.1
Tbilisi	91.5	93.1	26.1
Shida Kartli	24.7	31.8	7.0
Kvemo Kartli	46.0	50.8	11.4
Samtskhe-Javakheti	16.2	15.4	4.8
Adjara A.R.	12.1	17.7	8.8
Guria	14.9	15.9	3.1
Samegrelo	3.1	2.9	10.7
Imereti	31.3	34.5	15.7
Mtskheta-Mtianeti	30.5	31.7	2.4
Georgia	43.8	45.8	

Source: Geostat, 2013

*Table 2. Percentage of Households Provided with Central System Gas Supply*