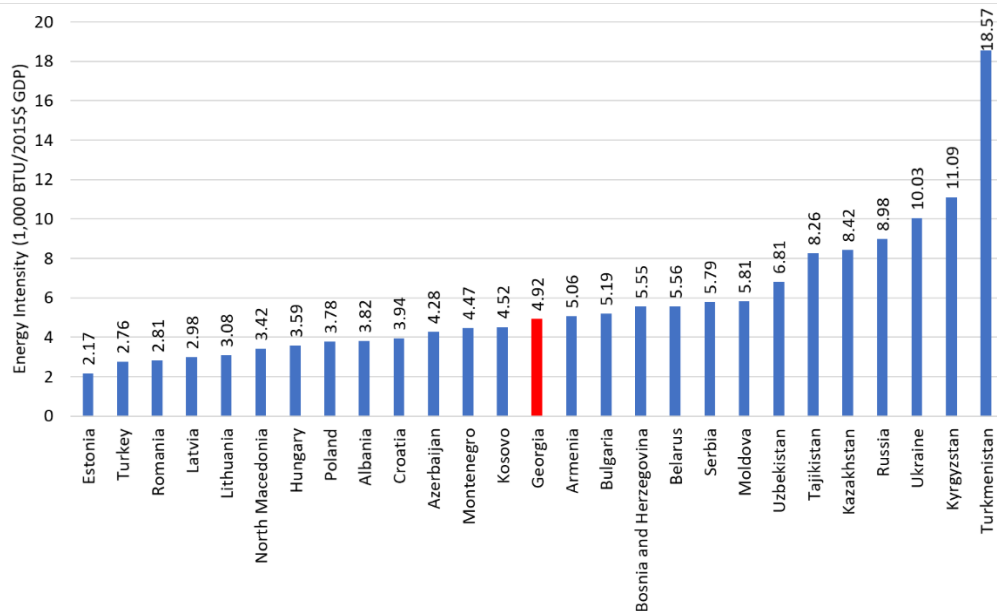


Georgia Energy Efficiency Policy Note

1. **Objective.** The purpose of this Note is to: (a) summarize the key benefits of realizing untapped energy efficiency potential for Georgia’s economy; (b) summarize the priority areas for energy efficiency investments; (c) outline sustainable financing mechanisms for those investments; and (c) describe the key next steps for the Government to expedite energy efficiency investments.

2. **Georgia has made impressive progress in reforming the power sector, but still has large untapped energy efficiency potential.** All consumers have continuous 24-hour electricity service, up from 2–6 hours of service in the early 2000s. From the late 1990s to 2010, collection of billed electricity increased from 20 percent to 100 percent, and power system losses decreased from more than 20 percent to about 10 percent. Georgia has made progress with improving its energy efficiency, however, there is potential for further improvement. Figure 1 shows that Georgia ranks 14th in energy intensity among 27 countries in the Eastern Europe and Central Asia region; however, there is still room for improving energy efficiency.

Figure 1: Energy Intensity in Eastern Europe and Central Asia



Source: United States Energy Information Administration.

3. **Despite progress with creating an enabling environment for energy efficiency and some ongoing investment projects, many residential and public buildings in Georgia remain underheated and are not energy efficient.** Underheating is caused by: (a) the inability of buildings to retain heat because of poor thermal insulation; (b) heating devices that are inadequate for achieving required thermal comfort levels; and (c) widespread use of firewood-burning heaters that are highly inefficient. Data on building envelopes suggest that most buildings in Georgia, regardless of type, have relatively poor or no insulation in the roof or walls,

contributing to underheating. Buildings with poor heat retention require substantially more energy to heat.

4. **Many households still do not have access to modern heating solutions.** Firewood (46 percent of households) and natural gas (45 percent) are the primary heating sources in Georgia. Electricity is used for heating by 6 percent of households; other sources, such as coal, animal waste, and wood processing residues are used by 3 percent of households. In rural areas, more than 78 percent of households rely on firewood, with only 15 percent using natural gas and 2 percent using electricity. Firewood heating provides low levels of thermal comfort and causes indoor air pollution that can lead to long-term health problems.

5. **The annual economic cost of underheating is estimated at about US\$100-127 million (0.7 percent of GDP in 2019) in form of lost lives, healthcare costs, and foregone economic opportunities.** Low energy efficiency of buildings also impacts occupants who are likely to become ill from prolonged exposure to cold and poor indoor air quality resulting from the use of traditional fuels for heating. In addition, underheated schools lead to higher rates of absenteeism and a measurable decline in academic performance; underheated health facilities lead to lower recovery rates for patients; and underheated private businesses can suffer from lower worker productivity and loss of business. Improving energy efficiency in buildings could reduce these problems and potentially prevent hundreds of cold-related deaths and thousands of cold-related emergency hospital admissions per year.

6. **The Government has adopted important legislation to promote energy efficiency.** This includes the following laws and policies:

- a. **Law on Energy Efficiency (2020):** Removes barriers to improving energy efficiency, establishes a framework for promoting and implementing energy efficiency measures to meet Energy Community obligations (e.g. improvement of energy efficiency, reduction of CO₂ emissions) sets procedures for developing national targets and adopting action plans, and implements supervision and monitoring of energy efficiency policy.
- b. **Law on Energy Efficiency of Buildings (2020):** Promotes the improvement of energy performance of buildings, establishes a methodology for calculating energy performance, and sets rules and procedures on energy performance certification.
- c. **National Energy Efficiency Action Plan (2019-2020):** Establishes investment and policy measures to reduce the use of energy resources in order to improve competitiveness, reduce the need for energy imports, and reduce greenhouse gas emissions. Sets energy savings targets by sector, including the public sector: 78 GWh by 2020, 231 GWh by 2025, and 374 GWh by 2030; commits to renovating one percent of public building stock each year from 2019, in line with Energy Community requirements. Calls for €18.5 million in public sector investments in 2019–2020.

7. **Some projects are underway to improve energy efficiency, which can be scaled up.** The Government, with support from development partners, has started implementation of some energy efficiency investment programs.

- a. €105 million KfW and EBRD Project for Energy Efficiency in Public Buildings in Georgia. The Project aims reconstruction of about 100 public buildings with energy efficient and renewable energy technologies. The project provides combination of loans and grants (80% loans and 20% grants). It is estimated that the Project would benefit 47,000 people and help to save 37,000 MWh/year of energy and 11,000 tCO₂ equivalent of emissions per year during the useful lifetime of energy efficiency retrofits.
- b. €42 million EBRD industrial energy efficiency project aimed at energy efficiency in public and industrial sectors. The financing was made available through credit lines with financial intermediaries—Energocredit and Green Economy Financing Facility (GEFF). EBRD has invested more than €42 million, helping 40 companies and more than 29,000 households save more than 16,663 CO₂.

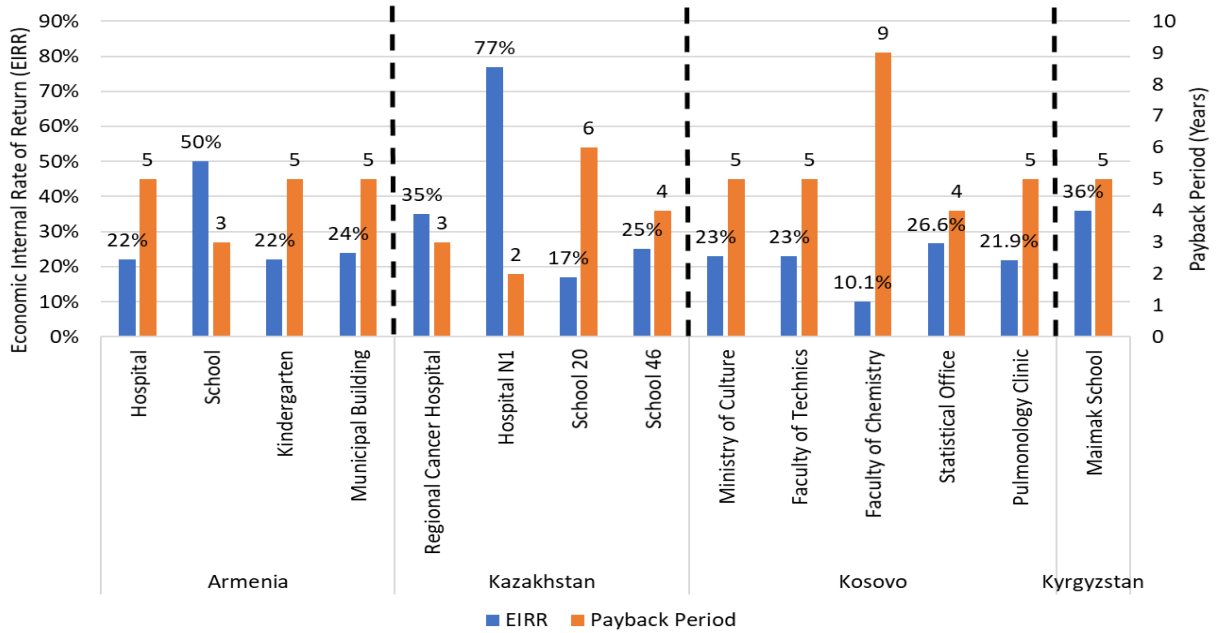
8. Sustainably financed energy efficiency investments are good candidates for stimulating post COVID-19 economic recovery as they are fast to implement and create jobs. Investments in energy efficiency are particularly well suited for this purpose as they are more “shovel ready” than large energy infrastructure projects and also offer higher returns with much lower initial capital outlays. Such investments, if carefully planned, may also offer opportunities—better heating and ventilation systems, for example—to slow the spread of COVID-19 or reduce morbidity or mortality associated with infections. Energy efficiency investments are also more likely to create longer-term jobs that are more labor than capital intensive and less likely to require foreign expertise and technology than in some other sectors.

Rationale for Scaling Up Public Sector Energy Efficiency Investments?

9. Typical public sector energy efficiency investments in the region have a median payback period of 5 years. The returns on investments in public sector energy efficiency interventions are attractive because the interventions are typically low cost (e.g., improving electric lighting in government buildings, use of variable speed drives, and repair or replacement of valves in buildings’ heating and water systems) or purely organizational in nature, and hence no cost. Evidence from several countries in the ECA region confirms the attractive payback periods from such investments.¹ Figure 2 below shows the economic internal rate of return (EIRR) and simple payback period for energy efficiency investments in public buildings in Armenia (insulation of building envelopes, and upgrades to heating, cooling, lighting, and power systems), Kazakhstan (insulation of building envelopes, and upgrades to heating, cooling, lighting, and power systems), Kosovo (insulation of building envelopes and replacement of exterior doors and windows), and Kyrgyzstan (insulation of building envelopes, replacement of exterior doors and windows, and installation of ventilation systems with heat recovery). EIRRs range from 10 to 77 percent, with a median of 24 percent. Payback periods range from two to nine years, with a median of five years. The energy efficiency improvements proposed for public buildings in Georgia (insulation of building envelopes, replacement of windows, and installation of individual gas heating systems) are similar to the improvements to public buildings in these countries, and therefore would similar EIRRs and payback periods.

¹ See, for example, World Bank. 2008. “The Other Renewable Resource: The Potential for Improving Energy Efficiency in Armenia.”

Figure 2: Economic Internal Rate of Return and Payback Periods for Energy Efficiency Investments in Public Buildings



Source: Results of Energy Audits under World Bank Financed Projects.

10. Public buildings are good candidates to kick-start energy efficiency retrofits because they under the control of the state or local governments. Whereas the Government may only *indirectly* be able to influence private sector investment in energy efficiency (e.g., through changes in standards or codes, lines of credits through banking sector), it has the advantage of being able to *directly* influence energy efficiency in public sector buildings, such as schools and health care facilities, and directly reap the benefits of energy savings. The Government can implement organizational measures such as allowing budgetary institutions to retain or reallocate savings resulting from energy efficiency investments or reshaping procurement rules to allow for awards for energy efficiency retrofit contracts to be based on highest net present value, which allows taking into account both investment costs and the anticipated energy savings, instead of lowest upfront cost. Savings from energy efficiency measures frees up fiscal resources for constrained state and municipal budgets, savings that can be redirected to meeting other needs.

11. Innovative procurement approaches can stimulate the emergence of energy service companies. Procurement rules can be tweaked to allow public entities to enter into multi-year performance-based contracts with energy service companies or Energy Service Companies (ESCOs). ESCOs are private firms who provide technical assistance and sometimes financial support in order to lower the transaction costs of energy efficiency investments; ESCOs can also assume the burden of upfront investment and turn it into an annual payment stream, thus removing the main barriers to energy efficiency investment. The companies use their expertise in the design and implementation of energy efficiency projects to guarantee energy savings for their clients from the investment. The public sector demand for energy efficiency equipment and services can help support nascent suppliers of these products and services until they are able to

expand those products and service offerings to other sectors. This guarantee is formalized in an energy performance contract/energy service agreements.

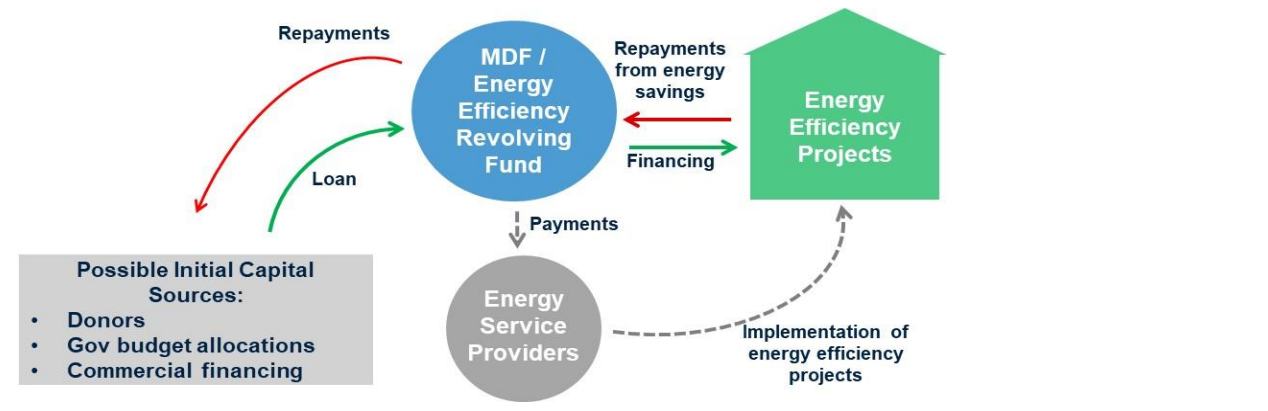
Financing Needs

12. About US\$1.4 billion or 9 percent of 2019 GDP is required for energy efficiency investments in residential and public sectors, US\$200 million of which is for public buildings. The largest share of investments – \$1.2 billion - is required for energy efficiency retrofits for apartments and individual houses. The building stock is quite large and energy inefficient, thus, the investment requirements are quite significant even if only retrofits with highest payback periods are financed. The public sector also requires about US\$200 million in investments considering the total public building floor area of 3 million square meters and the estimated investment price of about US\$65 per square meter.

Sustainable Financing Mechanism

13. A revolving fund mechanism could be implemented by the Municipal Development Fund (MDF). Considering the large size of financing requirement, it is essential to design and implement sustainable financing mechanism for energy efficiency investments that would not require constant sovereign borrowing for those needs. MDF is well suited to move into the role of the champion and implementing entity for energy efficiency investments in the public sector. The MDF could fulfill the role of an energy efficiency agency—like those found in many countries in the region—to have the role in financing the energy efficiency interventions through a revolving fund mechanism. Such funds typically provide low-cost loans or loan guarantees, and—after initial capitalization—are kept financially sustainable by using a revolving mechanism. Figure 3 shows an energy efficiency revolving fund mechanism could be introduced with the purpose of specifically financing energy efficiency investments in the public sector. Savings from these projects would then be used to pay back the loans so new loans can be made. Because many energy efficiency projects have positive financial rates of return, capturing these cost savings and reusing them for new investments creates a more efficient use of public funds than typical budget- or grant-funded approaches. Therefore, the introduction of such sustainable revolving fund mechanisms on the foundation of the existing entities would allow the Government to promote energy efficiency without repeated sovereign guaranteed borrowing.

Figure 3: Energy Efficiency Revolving Fund



Key Next Steps

14. The following key steps are recommended to further the efforts to address the heating issues and scale up ongoing energy efficiency investments in the public sector.

- Design a revolving fund mechanism to sustainably finance the energy efficiency investments in residential and public sectors while minimizing the impact on additional sovereign borrowing by the Ministry of Finance. This would also include detailed implementation arrangements with focus on innovative procurement methods.
- Carry out detailed assessment of options to sustainably address the issue of heating given continuing large reliance on firewood with resulting negative environmental and healthcare implications.
- Design financing mechanisms for addressing the issue of heating using clean energy sources.

15. The World Bank stands ready to engage on this subject considering our vast experience in advising clients on similar issues in various countries of Europe and Central Asia region and beyond.