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Study

Resource Efficiency Gains and Green Growth Perspectives in Georgia

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- Energy consumption in Georgia's industry is very inefficient, energy intensity is high. More than 70 per cent of primary energy supply is imported, fossil fuels make up more than 70 per cent.

- Georgian politics lack a comprehensive legislative framework for greening the economy, in particular as this seems to be no priority of the Georgian government. Various regional and international organisations (OECD, World Bank, USAID, EBRD) have set up energy efficiency and energy saving projects and provide obligations for the implementation of legislative measures. There is almost no public debate about green growth issues.

- Most technologies and materials used in Georgian industry and buildings still date back to Soviet times. Accordingly, the main potential for green growth and green jobs lies in the industry and building sector. However, there are various obstacles: lack of modern technologies in the private sector, lack of awareness about economic benefits in the government, general public and the private sector, low tax and tariff incentives and limited domestic credit.

Content

Background Information

Georgia is a small mountainous country located in the South Caucasus. In the wake of the collapse of the Soviet Union, due to the poor state of the economy there was a significant decrease in the impact of industry and energy production on the environment.

Georgia accounts for only a tiny proportion (0.1 per cent) of global GHG emissions.[1] Carbon dioxide emissions amounted to 1 tonne per capita in 2006, which is very low compared to a global average of 4.3 tonnes and 2.8 tonnes for the transition economies. However, emissions have been on a rising trend against the backdrop of strong growth in economic activity. According to UNECE's second performance review, in Georgia between 2000 and 2006 the situation worsened moderately due to increases in emissions of CO_2 (58 per cent) and N_2O (38 per cent), but CH_4 emissions dropped by (17 per cent). Increases in CO_2 are mostly due to the revival of Georgia's economy and the subsequent rise in transportation. Decreases in CH_4 are primarily due to improved maintenance of gas pipelines, which has led to a significant decline in leakages from the natural gas transmission and distribution system. The agriculture and waste sectors have been less responsive to the changes since the early 1990s.[2]

In recent years, efforts in the power sector – mainly the rehabilitation of old HPPs and transmission lines, as well as the introduction of new infrastructure and a number of structural reforms – have led to more stable supplies of electricity to the population and local industry. The diversification of gas supply – now Georgia exports gas from Azerbaijan and Iran, having previously been fully dependent on Russia – also increases security of energy supply.

It should be emphasised that Georgia is still highly dependent on imported fossil fuels, which puts the country at high risk of economic and political dependence. Georgia consumes six times less energy per capita than Norway and Finland and two-and-a-half times less than Greece. However, Georgia uses 4.5 times more energy per unit of GDP production than these countries; although the Georgian economy and population consume less energy, this consumption is very inefficient.

It has been calculated that cost-saving energy-efficiency measures (replacement of incandescent bulbs with low-energy ones, insulation of buildings, transfer of motor transport to gas consumption, energy-efficient stoves, new technologies, introduction of daylight saving time) would make it possible to reduce energy consumption by approximately 25 per cent, improve energy efficiency, decrease dependence on imported fossil fuels and perhaps hundreds of millions of dollars.[3] Georgia has considerable potential for the reduction of GHG emissions by improving energy efficiency and increasing the share of renewable-energy sources, notably wind and hydro. Additionally, this would help reduce Georgia's reliance on fuel imports, thus contributing to increased energy security.

Overview of Energy Consumption

In 2007, the Total Primary Energy Supply (TPES) in Georgia was 3336 Kilotonnes of Oil Equivalent (KTOE). Total Final Consumption (TFC) was 2432 KTOE; 72 per cent of the supplied primary energy was imported, of which 41 per cent was natural gas and 29 per cent oil products;[4] 60 per cent of consumed energy (TFC) constitutes oil and gas; 20 per cent of energy comes from electricity produced by hydropower stations, while 15 per cent of consumption is fuelwood.

In 2008, TPES was 2988 KTOE and TFC was 2461 KTOE. In 2008, the residential sector consumed 35 per cent, the communal and public service sectors 11 per cent, transport 25 per cent and industry 12 per cent of TFC. The structure of the energy balance remained unchanged in 2006–2008, with small variations.

GDP in 2009–2010 generally reflected the country's economic development over the past five years. Trade and industry (manufacturing industry, 9.1 per cent, mining, 1 per cent) account for the largest shares of GDP, at 16.1 per cent each. Public administration accounts for 13 per cent, transport and communication 11.5 per cent, agriculture 8.4 per cent and health and social welfare

1.Second environmental performance review, Georgia, 2010, UN ECE, http://www.unece.org/fileadmin/DAM/env/epr/epr_studies/Georgia per cent20II.pdf

2. ibid

3. World Experience for Georgia, www.weg.ge

4. IEA as of 2010, www.iea.org

6.7 per cent. Construction contributes 6.1 per cent of GDP and electricity and water up to 5.5 per cent.

Approximately, half of the GDP produced by industry in 2009 was generated by the food sector (including tobacco and beverages). The relative contributions of various industrial sectors has remained comparatively constant over recent years. However, this may be subject to change in the medium term as a result of further investments in industry.[5] For example, growth was observed in the mining sector from 0.6 per cent in 2009 to 1 per cent in 2010.

As already mentioned, after the collapse of the Soviet Union the level of pollution decreased; however, it increased again along with industrial development. It is noteworthy that emissions have fallen greatly compared to the 1990s and will hopefully remain lower due to the introduction of new technologies. The government of Georgia is striving to develop the industrial sector, including light manufacturing and mining and is looking for opportunities to develop the car industry.[6] Other priority development areas include tourism, energy (construction of HPPs and electricity export) and agriculture.[7]
Strategic Vision for Energy Efficiency in Georgia

The government has a general vision for the necessity of energy efficiency. However, this direction is not declared to be a priority in energy policy; nor is there the necessary legislative framework. The Law on Energy and Natural Gas only briefly mentions the need to promote improvements in the efficiency of energy generation, transmission, dispatching, distribution, import, export and consumption, as well as natural gas delivery, import, export, transportation, distribution and consumption. As indicated by the relevant stakeholders, the lack of a legal and regulatory framework impedes the efforts to implement energy efficiency programmes in Georgia.[8]

The long-term priorities of energy sector development are laid out in the document »Main Priorities of State Policy in Georgia's Energy Sector« adopted by the Georgian Parliament in 2006. The Policy document has some progressive aspects. However, it also contains certain problems and tendencies that create some obstacles for the development of energy efficiency and new renewable energy.

The main priority and objective of the Policy Document is to ensure energy security, based on performing the following tasks: complete re-equipment of the technologically obsolete and physically worn-out technical base should be carried out. Besides, state energy policy focuses on energy efficiency and saving, namely (i) the formation of legislative and institutional frameworks for increasing energy efficiency in the industrial and household sectors, and signals the need (ii) to study and implement the measures necessary to use heating and cogeneration systems, as well as to use renewable energy sources. However, the Policy Document fails to prioritise energy saving, implementation of energy-efficiency measures, demand-side management and issues related to heating.[9] It does not offer any concrete proposal to develop the sector in future, starting from an overall assessment of energy efficiency potential, the development of a legislative framework and follow-up action plans.

For the Georgian government, the priority for energy security is still security of supply. The main aim of energy security – reduction of demand for energy and energy dependency – does not deserve the attention it receives from the government, despite a number of international commitments undertaken in that field.[10] Georgia is a party to the Energy Charter, but not to the Energy Charter Protocol on Energy Efficiency. Becoming a party to the protocol on energy efficiency is one of the major rec-

5. SOE Georgia 2010, www.soegeorgia.blogpost.com

6. See: http://www.investingeorgia.org/upload/file/Automotive_Sector_Study.pdf

7. See: www.economy.ge

8. Transparency International Georgia, www.transparency.ge

9. Centralised heating systems went out of service in Georgia at the beginning of the energy crisis. Nowadays, virtually nothing is implemented in this regard, except for a pilot project by the Global Environment Protection Fund which aims to supply certain districts of Tbilisi with geothermal waters and has been halted because of the lack of co-financing on the part of the state. No statistics are available on how much of consumed primary energy is spent on heating and hot water supply. It is noteworthy that, according to international statistics, on average 25–30 per cent of consumed primary energy is heating. The electrical energy system provided some heating, which brought about rather serious results for the system. Apart from this, the use of large amounts of oil, gas and firewood stoves in high-rise buildings caused concomitant environmental problems, pollution of the air in residential places, deterioration of health and so on.

10. It should be noted that in 2007, during ratification of the second loan agreement of Enguri hydropower plant rehabilitation, the Parliament of Georgia took a commitment that by January 1, 2008 Georgia would have had a complete legislative package on energy efficiency and renewable energy sources. Resolution of Georgian Parliament No. 4457 of March 15, 2007 on Ratification of the Second Loan Agreement of the European Bank for Reconstruction and Development

ommendations to the Ministry of Energy from UN ECE.[11] It is worth mentioning that the EU-Georgia Action Plan within the framework of the European Neighbourhood Policy considers it a priority not only to adopt legislation on energy efficiency and renewable energy sources, but also to take steps to work out an action plan for its implementation (including a financial plan) and to strengthen the institutions working on these issues.[12] However, the annual strategies for implementation of the EU Georgia Action plan neglect the need to prepare legislation as well as an action plan (including a financial plan) for the development of energy efficiency and renewable energy sources.

This is not really surprising since the government thinks that practical measures (including the development of legislation, financial incentives, implementation of pilot projects and so on) are »a matter for the market«, and the market itself will regulate and develop energy efficiency and renewable energy. The Ministry of Energy is considering the introduction of step-by-step tariffs as a key energy-efficiency tool on the pretext that »such a tariff system will encourage consumers to save electricity« through electricity stock-taking and control, as well as supplying rural areas with gas. However, while these measures are important, these are not sufficient for the wider dispersion of energy efficiency.

The fact that there is no strategy and vision for energy efficiency supporting the legal basis and institutional environment is alarming. In 2008, the development of the USAID-funded Energy Efficiency Law with the participation of the Ministry of Energy was suspended.[13] In addition, during the same year the Parliament did not adopt the integration of energy-saving requirements in the Building Code.

Organisations such as the OECD, the World Bank, USAID, EBRD and KfW have already supported some interesting initiatives in the energy efficiency field, including feasibility studies, implementing pilot projects in various areas and facilitating the removal of key barriers to energy efficiency development in the legislative and regulatory fields.

In the meantime, in the absence of a sound and reliable legal framework, a robust state and a coherent financial strategy, numerous missed political opportunities undermine the efforts of different international organisations in the region and create problems for the implementation of pilot projects; they also restrict the interest and wider involvement of the private sector in the area and hampers the creation of green jobs.

An important precondition for implementing energy efficiency measures is thus the adoption of appropriate legislation and the development of plans and programmes promoting energy efficiency. According to the OSCE report,[14] to improve energy efficiency countries must have good energy efficiency policies based on the criteria proposed by UNEP in 2006:

- environmental effectiveness;
- economic efficiency (cost-effectiveness);
- budgetary cost;
- ability to implement and enforce;
- support from stakeholders.

In addition, the study suggests that the policy should set quantitative targets and clear timeframes and objectives, as well as collect monitoring information on a regular basis.

The recent report Green Business Support Strategy for Georgian Private Sector Organizations (2011)[15] highlights the energy sector and the energy efficiency of buildings as sectors with high potential for green business in Georgia, as environmental effectiveness coincides with the economic variety.

Among the obstacles, the study identifies the following issues: (i) no separate government agency for promoting energy efficiency; (ii) lack of modern technologies in the private sector; (iii) a lack of awareness about economic benefits from energy efficiency and renewable energy

11. Second environmental performance review, Georgia, 2010, UN ECE, http://www.unece.org/fileadmin/DAM/env/epr/epr_studies/Georgia per cent20II.pdf

12. European Union – Georgia Action Plan within the framework of the European Neighbourhood Plan (Chapter 4, 4.6.2), November 2006, http://ec.europa.eu/environment/enlarg/pdf/enp_action_plan_georgia.pdf

13. It is still not clear when the development of legislation will restart.

14. Review of the implementation of the OSCE commitments in the field of energy efficiency, 9 September 2011, Promotion of common actions and cooperation in the OSCE area in the fields of development of sustainable energy and transport, concluding meeting Prague, 14–16 September 2011.

15. See: http://www.bec.ge/images/doc/green per cent20business per cent20strategy per cent20eng.pdf

projects at all levels: government (national, regional and local), private sector and general public; (iv) few tax and tariff incentives; (v) limited availability of domestic credit (also due to the low awareness of the local banking sector); (vi) limited outreach of existing programmes to the broader population. Therefore, if a proper legal and financial framework was in place, energy efficiency could become a leading sector for the development of a green economy in Georgia and for increasing green job opportunities.

The potential for energy efficiency in various sectors in Georgia, as well as the initiatives undertaken by different international organisations and the private sector will be reviewed in the sections below.

Energy Efficiency Initiatives

There have been a number of important energy efficiency initiatives over the past decade with the support of various international organisations. The pioneers were the so-called Green Energy Brigades, the initiative implemented by Friends of Earth Georgia, together with the Czech environmental NGO Hnuti Duha (Friends of Earth Czech Republic), implementing energy saving pilot projects in different regions of Georgia.

The first evaluation of the energy saving potential of non-residential sector was conducted within the framework of the Least Cost Plan for Georgia's Energy Sector project,[16] supported by USAID. Since 2000, there have been a number of large-scale energy efficiency initiatives, research, promotion and pilot projects mainly supported by USAID and the European Commission through various programmes and projects, Georgia-Norway cooperation and some other donors. The activities include the assessment and promotion of energy efficiency and renewable energy potential, training of practitioners, certification of energy engineers, as well as implementation of various pilot projects in different parts of Georgia. The pilot projects addressed both the residential and the non-residential sector (industrial enterprises and public entities (schools, hospitals and so on).

Since 2009, Winrock International has been implementing the project the New Applied Technology Efficiency and Lighting Initiative (NATELI) with USAID. It includes the improvement of energy efficiency, focusing on public buildings and hospitals, procurement and instalment of limited efficiency improvements; building local capacities and long-term capacity-building programmes in energy auditing and design and economic and financial analysis of energy-efficiency investments; promoting energy efficiency to the public; and facilitating access to financing for energy efficiency investments, as well as a pilot-level component that will focus on promoting residential energy efficiency by working with condominium associations and Tbilisi Municipality and energy efficiency in higher education with the Georgian State Technical University.

The project is implemented with the support of the Energy Efficiency Center,[17] World Experience for Georgia (Independent Think Tank), Sustainable Development and Policy Center (NGO) and Energy Efficiency 21st Century (NGO). These are the key organisations that have been promoting energy efficiency in Georgia in recent years, providing different assessment reports and carrying out pilot projects.

The programmes and projects implemented by international organisations play quite an important role in promoting energy efficiency in Georgia. In 2010, Tbilisi City Hall joined the initiative of the Covenant of Mayors for Climate Change Mitigation, under which Tbilisi should become a »low carbon city« by 2020. Tbilisi City Hall worked out a Sustainable Energy Plan for Tbilisi, with the support of the INOGATE SEMISE project[18]. It should be mentioned that the Action Plan released in 2011 contains all the main priorities for reducing CO_2 emissions by 25 per cent by 2020. The document was prepared with the broad participation of interested stakeholders, including various IFIs (World Bank, EBRD, ADB), bilateral donors KfW[19] and GIZ[20] , representatives of the relevant ministries, and interested NGOs and private companies. It should be noted that the Action Plan not only identifies priorities in different sectors, but also estimates the

16. Least Cost Plan for the Energy Sector in Georgia, Final Report, Burns & Roe, 1998.

17. Established within the framework of the EU Tacis Project »Creation of an Energy Efficiency Centre and Development Natural Energy in 1998«.

18. See: www.inogate.org

19. KfW Bankengruppe, www.kfw.de

20. The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, www.gtz.de

cost of the work and allocates part of these costs to the capital city budget. This is to be welcomed.

Another important initiative for promoting energy efficiency in Georgia was taken by the European Bank for Reconstruction and Development (EBRD), when it opened an energy credit line of 35 million euros. The credit line was designed to increase the competitiveness of Georgian businesses. The corporate loans involve free energy audits, offering new energy efficient technologies. Later, the credit line was expanded and loans became available for individuals, too,[21] via the 15 per cent of the grant component covered by BP. The following major banks are participating in this credit line: Bank of Georgia, TBC Bank, Bank Republic (Société General) and Cartu Bank.

The credit line has three main features: (i) local banks use the credit line to provide commercial loans, at their own risk; (ii) every credit line is supported by a comprehensive, donor-funded, technical assistance package that helps potential borrowers to prepare loan applications and train local bank loan officers to process sustainable energy investment opportunities. This assistance is provided free of charge by a project implementation team consisting of international and local experts; and (iii) often a performance-related incentive fee is paid to the participating banks and to the end-borrowers.[22]

According to the NATELI survey, except for the above-mentioned banks, a number of other leading banks also expressed their interest in participating in the NATELI project and are willing to provide loans to creditworthy owners of hospitals for energy efficiency projects. These banks include ProCredit Bank, Basis Bank, Tao Private Bank, BTA Silk Road Bank, Liberty Bank, Kor Standard Bank, and VTB Bank of Georgia.

The approach taken by EBRD and USAID in general is to mitigate the major financial barriers, such as the high risk, low return/long payback, lack of domestic sources, weak project development, appraisal and technical assessment capacity, lack of energy efficiency project developers and lack of the relevant expertise.

21. See: www. Energocredit.ge

22. Review of the implementation of the OSCE commitments in the field of energy efficiency, 9 September 2011, Promotion of common actions and cooperation in the OSCE area in the fields of development of sustainable energy and transport, concluding meeting, Prague, 14–16 September 2011, www.unece.org/.../trans/osce/osceunece/19th_OSCE_2011_Final.pdf

Energy Efficiency Potential in Georgia

The energy efficiency potential is estimated by World Experience for Georgia,[23] the NATELI project[24] through various research projects, the Energy Efficiency Center[25] and Sustainable Energy Action for Tbilisi.[26]

The main problem with regard to energy efficiency in both the residential and the industrial sector is that the majority of technologies that remain from the Soviet era in the industry and energy sectors are obsolete and inefficient. This results in the inefficient use of resources and significant emissions to the environment. This has a negative impact on the latter, as well as on the economy. At this stage, therefore, economic and environmental interests in the residential, industrial and energy sectors coincide.

According to expert assessments (based on the analysis of already implemented projects in industrial and public sector entities[27]), in case of the implementation of standard energy efficiency measures (energy efficient lighting, heating, hot water supply, air conditioning, modification of low efficiency engines, variable-speed drives, use of residual heat, installation of new technology), the total energy saving potential is about 450 GWH. For example, the energy saving potential of the street lighting and traffic lights in the capital of Georgia, Tbilisi, is estimated at about 3 million kWh or GEL 250–300 thousand per year, while the energy saving potential for Tbilisi industrial and commercial entities is 71 million kWh electricity and 18 million cubic metres of gas.

Losses in Distribution Networks

Improving the energy distribution sector remains the most important energy efficiency measure to be implemented in the Georgian energy sector. Distribution systems are owned by private companies and are still subject to heavy losses; these losses can be reduced significantly by implementing cost effective measures. Improvements in the distribution sector can save approxi-

23. See: www.weg.ge

24. See: www.nateliproject.ge

25. See: http://www.eecgeo.org/en/eecp-project.htm

26. See: http://helpdesk.eumayors.eu/docs/seap/1537_1520_1303144302.pdf

27. See: www.weg.ge

mately 500 million kilowatt-hours (kWh) of electricity and approximately 180 million cubic meters of gas for the Georgian economy. This represents approximately 7 per cent of total electricity consumption and approximately 10 per cent of gas consumption in Georgia by 2006.[28]

Losses in the Electricity Distribution Network

The Sustainable Energy Action Plan (SEAP) for Tbilisi[29] reports that JSC Telasi (Tbilisi energy distributing company) suffers at least 12.4 per cent losses.[30] According to the WEG study in 2006, however, JSC Telasi's losses are up to 16 per cent. Due to improved control and installation of individual meters the amount of illegal consumption has been reduced. The SEAP for Tbilisi covers plans to reduce commercial losses in the electricity distribution network (transfer from the existing 6kWh to a 10khW distribution network, increasing the capacity of central distribution points from 8MW to 12 MW and shifting from the existing 35kW to a 110kw distribution network).

The WEG study shows that commercial losses can be cost effectively reduced to 6 per cent in Telasi and to 10 per cent from 20 per cent in the united distribution company Energo-Pro, which distributes electricity in the regions of Georgia.

Losses in the Gas Distribution Network

There are still losses in the gas network. Since 2000, however, as a result of the repair of gas pipelines, losses have decreased significantly. In 2000, natural gas losses amounted to 6.78 per cent. After the repair of gas pipelines and improvements in accounting, losses decreased to 3.44 per cent in 2006.[31] However, there is still some room for improvement, especially in Tbilisi. Kaztransgaz (Tbilisi gas distribution company) launched a project in 2008 to reduce methane leaks in aboveground infrastructure in the Tbilisi gas distribution system under the UNFCCC Clean Development Mechanism (CDM).[32] The total emissions reductions achieved for this period since 2009 are 194,420 tonnes of CO_2. It is expected that after repair works the annual reductions would be 339,197 tonnes of CO_2 emissions. Another project on Leak Reduction in Aboveground Gas Distribution Equipment in SOCAR Georgia's[33] gas distribution system is under validation by CDM and UNFCCC and is aimed at a reduction of 171,185 tonnes of CO_2 equivalent annually all over Georgia.

Residential Sector

The residential sector in Georgia also has a huge energy efficiency potential, due to the high share of the residential sector in the energy balance. The World Experience for Georgia (WEG) has estimated the following energy saving potential in the residential sector through lighting, space heating and energy efficiency wood stove promotion initiatives.[34] Taking into consideration the high level of poverty,[35] especially in rural areas,[36] coupled with high energy prices, energy efficiency measures will positively impact fuel poverty elimination.

The results of the study show that there is significant energy saving potential in lighting through the replacement of incandescent bulbs by energy efficient bulbs, constituting 25–40 per cent of general consumption in Tbilisi, at 145 GWH/year. Extrapolating this result throughout Georgia yields the possibility of saving 340 GWH a year. Taking into account the role of fuel wood in Georgia's energy balance (15 per cent of TFC), reducing fuel wood consumption would not only impact household expenditure positively, but also decrease environmental impacts

28. Energy Efficiency Potential in Georgia, www.weg.ge

29. Capital of Georgia, with 1.5 million inhabitants.

30. See: http://helpdesk.eumayors.eu/docs/seap/1537_1520_1303144302.pdf

31. Second National Communication.

32. Project Partner Climate Change Capital Fund II s.a.r.l. , United Kingdom.

33. Gas distribution company operating in the regions of Georgia.

34. Methodology based on Energy Auditing Electricity utilisation dynamic for three types of consumers in Tbilisi. The first category covers consumers whose average monthly consumption equals 5–100 kWh ((36 per cent of Tbilisi houselholds). The second category consume 100–300 kWh/month on average (40 per cent). The third category consumes more than 300 kWh/h (10 per cent). So-called closed flats consuming less than 5 kWh/month of energy, involving 14 per cent of Tbilisi households, has not been taken into account.

35. Around 500,000 families (1.6 million people) are registered by social services as beneficiaries of social benefits for destitute families, available at: http://ssa.gov.ge/index.php?mid=1447

36. See: http://www.ruralpovertyportal.org/web/guest/country/statistics/tags/georgia

and deforestation, with all relevant consequences.[37] According to WEG estimations, wood stoves used in Georgia have a typical efficiency of 35–40 per cent. Energy efficient stoves typically can have an efficiency of up to 70–80 per cent, which makes it possible to save around 1 million cubic meters of fuel wood. This would significantly reduce the impact on the environment through decreased forest cutting and CO_2 emissions.

Space Heating and Buildings: Energy Efficiency Potential in the Residential and Non-Residential Sectors

According to research, Georgia uses 40–50 per cent more energy for heating per square meter of floor space than EU countries with the same climate.[38] As a result, 80–90 per cent of the energy consumed in Georgia's residential sector is used for space heating.[39] In general, buildings in Georgia consume about 40–45 per cent of all energy for heating purposes. The problem is equally acute for residential, office and industrial buildings. The thermal resistance to heat losses of the buildings, for instance, in Tbilisi is three to four times less than recommended for energy efficiency for the Tbilisi climate zone. Therefore, energy efficiency measures are more than relevant for the existing stock.

In general, there are two directions with regard to the energy efficiency of buildings:

(i) energy efficiency potential in the existing building stock (residential and non-residential);

(ii)energy efficiency potential in new construction.

Energy Efficiency Potential in Existing Building Stock (Residential and Non-Residential Sector)

According to WEG, the quickest way to mitigate energy losses, post-construction, is the weatherisation of external windows and doors; this saves about 20–30 per cent of estimated heating energy.

WEG studies and SEAP of Tbilisi show that 85 per cent of residential buildings in Tbilisi require insulation work. The simple weatherisation works could be considered the quickest way to mitigate energy losses of buildings, including the post-construction weatherisation of external windows and doors; this type of insulation work could help save about 20-30 per cent of estimated heating energy, which constitutes around 14 million cubic meters of gas and 40 million kWh of electricity.

Introduction of Energy Efficiency Measures in the Building Code

There are no effective mandatory or indicative EE standards in the Building Code. The old Soviet codes for the thermal engineering of buildings are implemented on a voluntary basis. As a result, the housing stock currently being built in Georgia will be a source of excessive energy losses for many years to come. Binding energy efficiency construction standards in the Code would oblige construction firms to build with materials and norms that maximally save energy on lighting, heating and air conditioning in buildings.

Thermal insulation has the potential to reduce construction costs by 10–15 per cent and residents' energy related building expenditures by 45–50 per cent. According to the Georgian Builders' Federation, up to USD 50,000 is lost every 24 hours during winter due to energy waste in Georgia.[40] It should be mentioned that there is already a more or less developed market and established private companies in Georgia that can provide and later enhance the production of energy efficient construction materials.

Green Growth Prospects in Georgia

Georgia still has no sustainable development strategy. The Georgia Action Plan under the European Neighbourhood Policy includes a commitment to work out a sustainable development strategy. However, in addition

37. See: http://rainforests.mongabay.com/deforestation/2000/Georgia.htm

38. The Energy Efficiency Perspective Of The Georgian Residential Sector. Prepared by Winrock International forUSAID, 2009. (www.winrock.ge/files/microsoft_word_-_energy_efficiency_of_residential_sector.pdf

39. http://www.geplac.ge/newfiles/Issue per cent20Paper per cent20Georgia per cent20EnC per cent20Membership_April per cent202010.

40. Energy Efficient Construction Materials Sector in Georgia, Sector Overviews, 28 March 2008.

to the fact that this has not yet commenced, »no significant progress can be recorded in the integration of environmental considerations into other policy sectors.« The absence of a sustainable development strategy is coupled with a weakening of environmental legislation since 2003. »Narrowly defined economic needs have been a primary driver for Georgian reforms; social and, especially, environmental issues were addressed based on economic considerations. Naturally, this approach led to a predisposition against any issue perceived as a ›barrier‹ to growth, missing the complexity of the subject.« Already in 2004–2006, when state policies were directed towards the minimisation of state intervention through complete liberalisation and deregulation, about 85 per cent of licensing legislation was abolished, including in the food, environmental, industry and vehicle safety spheres. Correspondingly, a number of control bodies were abolished or their functions were transferred to other organisations; as a result, quite a lot of issues were left without regulation.

Unfortunately, the system of environmental governance in Georgia is still characterised by frequent institutional and legislative changes, closely connected to the government›s course of liberalisation and desire to increase budget revenues by all means (including intensive use of natural resources and aggressive privatisation of public services and state property).

Georgia's development strategy is outlined in the government programme submitted to the parliament for approval.[41] Environmental protection and sustainable development are not considered a priority, as may be seen in the Medium-Term Expenditure Framework (MTEF) 2007–2010 and 2008–2011.[42]

According to MTEF 2008–2011, the Ministry of Environmental Protection should ensure maximum participation of the private sector in forest management, waste, rivers and water resource management. In addition, there is no requirement to adopt transparent and robust mechanisms for monitoring implementation and making adjustments. The programme's effect is also limited by the high level of personnel turnover in the Cabinet of Ministers.

The plans of the new Ministry of the Economy and Sustainable Development (the Ministry was renamed in 2010) in terms of supporting sustainable development are still vague. At the end of 2010 the Ministry was promoting the development of the Green Georgia project, envisaging the import of electric vehicles to Georgia and promoting alternative energy sources.

At the end of 2011, the Ministry, in cooperation with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, launched a web portal, Greengeorgia.ge, within the framework of the project »Building up investment promotion services in Green Sector«, and will serve as the government platform for information exchange and international positioning in the sector.

While the concept acknowledges that Green Growth is one response to the development challenges facing Georgia, in general it represents a continuation of »business as usual«, with some greening elements. It emphasises renewable energy and the potential of clean energy manufacturing, mainly through the construction of new energy generation facilities, mainly large hydropower plants, to ensure a low carbon development path.

The Global Green New Deal analysis[43] focuses on energy-efficient buildings, sustainable energy, sustainable transport, sustainable agriculture and freshwater which, on one hand, could ensure economic, employment and environmental benefits and, on the other, deliver gains quickly. These areas are particularly important for Georgia, while representing potential for green business development in the country.

As correctly noted in Europe's Environment,[44] an integrated approach with regard to the potential for green economy development is generally absent. With regard

41. At present, the Georgian government programme »United Georgia without Poverty« (adopted by the Parliament in February 2009) is based on the strategic view »Georgia without Poverty« first adopted in 2007. Social issues remain a priority, although they are mainly understood as the obligation of the state to directly subsidise broad categories of the socially disadvantaged. There is no mention of the environment at all, to say nothing of a »green economy«.

42. »Development of sustainable principles for utilization of natural resource«, Basic Data and Directions for 2007–2010, Government of Georgia, available at: http://www.geplac.ge/newfiles/Georgian per cent20Documents/Government per cent20of per cent20Georgia per cent20Basic per cent20Data per cent20and per cent20Directions per cent20for per cent202007-2010l.pdf

43. Global Green New Deal, Policy Brief, United Nations Environment Programme. March 2009, available at: www.unep.org/pdf/A_Global_Green_New_Deal_Policy_Brief.pdf

44. An Assessment of Assessments, European Environmental Agency, 2011, available at: http://www.eea.europa.eu/publications/europes-environment-aoa/3-green-economy.pdf

to energy efficiency, Georgia has recently completed a review of the potential for growth and policy options (World Enterprise for Georgia 2008). However, other important aspects of the green economy, including future scenarios, Environmental Impact Assessments/SIA (green economy), LCA and tourism (resource efficiency) are paid little attention. Likewise, there is much poorer coverage of newer aspects, such as CSR and environmental accounting. As well as national assessments, a significant number come from global or regional organisations, or for example, IISD (2011) and private bodies, such as the Carbon Disclosure Project.[45] It stressed that there is a need to pay more attention to other topics, such as natural capital and green accounting, green skills and linking the green economy to competitiveness.

However, another challenge facing Georgia is that, as in other developing countries, innovation is spread through non-research based channels, mainly the purchase of machinery and related technologies. As underlined by researchers, Georgia has no innovation policy: on one hand, this makes innovation processes slower, and on the other, it reduces Georgia's absorptive capacity for innovation and technologies.[46] In the activities of the Ministry of Energy and Natural Resources, as well as the Ministry of Environment Protection, the innovation component should be especially high, as may be confirmed by global practice. However, in Georgia, both ministries have only limited links with science and research.

All these undermine the potential not only for development of innovation, but also for development of the economy and green jobs. Such potential is clearly visible with regard to energy efficiency in the construction sector. There are a number of companies interested not only in importing energy efficient building materials and technologies from abroad, but also in starting extensive production locally. For example, Wood Services Ltd[47] was set up to study and launch innovative and leading construction technologies based on sustainable development principles in the Georgian market. It offers many original services and products to architects, builders and engineers in Georgia, as well as neighbouring countries.

The NATELI project study »Sectoral Overview of the Energy Efficient Construction Materials Business in Georgia« lists companies with the potential to produce energy efficient materials in case of increased awareness and demand. It stresses that the energy efficient construction materials' sector has high growth potential if it is supported by a strong and competitive construction industry. Georgia can produce materials based on perlite, glass wool, rock wool and polystyrene. That also means the creation of new job opportunities and the development of a green market in the sector.

There are no statistics on green jobs (based on the ILO definition). However, the potential is significant. In Georgia, around 37,000 persons are employed in the construction sector, while approximately 2500–3000 (mainly seasonal) are engaged in the production of energy efficient construction materials and light construction materials.[48] If, in addition, for example, public building insulation programmes are introduced in the near future, in accordance with Tbilisi's Sustainable Energy Action Plan (SEAP), it will mean a significantly increased workforce and employment opportunities. In addition, a significant number of green jobs will arise through the development of local renewable energy sources (solar panels,[49] biogas[50] and so on), but as with regard to energy efficiency, legal, financial and research support are needed.

Public Debates on Energy Efficiency Issues in Georgia and Political Opportunities

The main efforts of the Georgian government are focused on the development of energy infrastructure (transmission lines, construction of new HPPs). Despite commitments to harmonise energy legislation with EU directives little progress has been made that would support the inclusion of Georgia in the EU Energy Community.[51]

The development of energy infrastructure is important for further development of the country, and the construction

45. See: http://www.eea.europa.eu/publications/europes-environment-aoa/3-green-economy.pdf

46. Innovation processes and efficient country management: opprtunities within the framework of eastern partnership, Oleg Shatberashvili, 2011, www. inoved.ge

47.www.woodservice.ge

48. Sectoral Overview on the Energy Efficient Construction Materials Business in Georgia, Winrock, www.nateliporject.ge

49. See: http://www.nateliproject.ge/files/swh_systems_in_georgia_-_cost-benefit_analysis__en__1.pdf

50. See: Bioenergy.ge

51. Georgia expressed its desire to become a member of the EU Energy Community (it currently has observer status).

of the Black Sea Transmission Line[52] is a good example of a long-term profitable project. However, support is essential for large-scale energy efficiency projects (at both the legislative and practical levels). These are economically viable, since they are oriented to resource saving.

There is also no public debate on how Georgia's energy sector should develop further. In recent years the Georgian government has tried to position the country as a future regional renewable energy hub.[53] The government announced that it would support the construction of 18 HPPs in 2012. The plans include highly controversial large hydro cascades, mainly in the mountainous areas of Georgia, including the Khudoni HPP (702MW, annual output 1.5 TWh) on Enguri, the Nenskra cascade (600 MW), the Namakvani cascade (450 MW, annual output 1.6 TWh) and the Nenskra Cascade (438 MW, 1.2 TWh). The planned projects do not comply with the principles of sustainable development and they may have serious negative impacts on the environment, drastically changing the social and demographic situation in Georgia's mountainous regions and also contributing to the destruction of cultural heritage. In addition to the social and environmental problems related to the large dams, it turns out that the principle »Build, Own, Operate« (BOO) promoted by the Georgian government with regard to HPP construction would not bring in sufficient revenues to justify the wholesale transformation of the landscape and the devastation of environment, to say nothing of the thousands of people who would be forced to resettle.[54]

However, rather than ensure a wider public debate about the appropriateness of constructing large hydro power plants, the government has stubbornly repeated that decisions regarding the construction have already been made and that they will not be changed (in situations in which an EIA document has not been prepared and permits are not available). That has given rise to a significant protest movement on the part of the people affected,[55] as well as CSOs.[56]

It should also be noted that the Ministry of Energy is quite open when implementing projects funded by international financial institutions. The Ministry holds public discussions and invites cooperation from a wide range of different institutions. For example, cooperation was quite fruitful in the implementation of the Black Sea Regional Energy Transmission Project.

In general, public participation in the issues related to energy policy is problematic. Despite great public interest, some documents – for instance, the memorandum signed with RAO-EES on the Enguri hydropower plant – is still confidential. Political parties are fairly passive and rarely involved in the debates on energy issues. This may be caused by the fact that the majority of political parties emphasise the political and socio-economic problems of the population. They clearly lack expertise on the issues of sustainable development, environmental protection and Green Business, as well as the European integration aspects. Political party programmes usually lack clear links between economic development, environmental protection and social welfare. Thus far the political parties have shown little interest in energy sector development.[57]

According to the Ministry of Energy, it actively cooperates with two NGOs on energy efficiency issues: the Energy Efficiency Centre and Energy Efficiency and Environmental Protection. However, it is not clear whether any consultations on political issues take place with these organisations or whether cooperation amounts to nothing more than subcontracting these organisations for project implementation. In general, it is necessary that a wide range of organisations be involved in discussions on energy efficiency and renewable energy issues.

In general, there is an almost complete lack of public debate and understanding of the role that energy efficiency could play in the sustainability of the country's energy system and in economic development.

52. Project financed by EIB, EBRD and KfW.

53. Regional Power Transmission Enhancement Project, Georgia, www.adb

54. Policy Brief, Georgian Energy Sector development prospect http://www.greenalt.org/webmill/data/file/publications/policy_breif_energy_policy_ENG.pdf

55. Letter from the citizens of Khaishi, 16 December 2011, www.greenalt.org.

56. NGO letter to President Saakashvili, 21 December 2011, www.greenalt.org

57. For example, so far only the Social Democratic Party has expressed its concerns about the plans of the government to start the construction of 18 HPP in 2012, 29.12.2011. http://news.boom.ge/geo/12/20111228/1523049/

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