



ENERGY EFFICIENCY BRIEF

Tbilisi, Georgia

The Copenhagen Centre on Energy Efficiency functions as the global thematic Energy Efficiency Hub of Sustainable Energy for All (SEforALL), and accordingly works directly to support the SEforALL objective of doubling the global rate of improvement in energy efficiency by 2030.

The Copenhagen Centre fulfils its mission through:

- assisting policy change in countries and cities, with knowledge, insights and technical support
- accelerating action through innovation in delivery models, public-private partnerships, finance and project development
- raising the profile of energy efficiency by communicating success and supporting outreach.

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IN CONCLUSION

- There are a number of high impact opportunities to improve energy efficiency in Tbilisi that could be prioritised across transport, buildings and industry sectors. These actions could allow Tbilisi City Hall to consider increasing its level of ambition by raising its current emission reduction target of 20 per cent in 2020 to 30 or 40 per cent by 2030.
- Increased data collection and monitoring of energy use in Tbilisi will help develop an improved understanding of where and how energy is being consumed. Collection of this data can then help inform and enable the evaluation of policies, programs and tools to help improve energy efficiency.
- There is a need to further build capacity of energy efficiency experts across transport, buildings and industry in Tbilisi through train-the-trainer workshops, staff exchanges, study tours and other activities. Targeted information, education and awareness activities along with showcasing Tbilisi's success stories through various communication channels, including Tbilisi's Energy Efficiency Information Centre, presents an opportunity to promote energy efficiency action and change behaviours.
- Tbilisi City Hall and the Government of Georgia have established a strong collaborative relationship that will support the delivery of the National Energy Efficiency Action Plan, which, along with other city-level initiatives, is well placed to deliver energy efficiency improvements across key sectors in Tbilisi.
- The *Copenhagen Centre on Energy Efficiency* has a strong knowledge base on best practice energy efficiency, and is working with the City of Tbilisi to improve and support energy efficiency, helping the city to refine its strategy, define its priority opportunities, get connected with delivery partners and accelerate investments for implemented projects. For example, Tbilisi and the Government of Georgia have the opportunity to partner with some international initiatives such as Sustainable Energy for All's (SEforALL's) Global Energy Efficiency Accelerator Platform. These sectoral-level initiatives cover vehicle fuel efficiency, buildings, district energy, industry and appliances and lighting.

INTRODUCTION

Tbilisi, the capital of Georgia, has a population of 1.1 million which accounts for 30 per cent of Georgia's population. Tbilisi produces almost half of Georgia's Gross Domestic Product and contributes about one-third of the country's greenhouse gas emissions.

Located at the crossroads between Eastern Europe and Western Asia, the city's climate is moderately humid subtropical with average temperatures of 2°C in the winter and 25°C in the summer. Tbilisi is a typical transition economy city: both population and economic activity are growing rapidly, which presents new challenges particularly in the transport and buildings sectors. Improvements in energy efficiency offer an essential component of sustainable development and reducing dependency on fossil fuels in both Tbilisi and throughout Georgia. Electricity tariffs continue to increase over time, meaning that energy efficiency interventions will be offering higher energy savings to households, businesses and government.

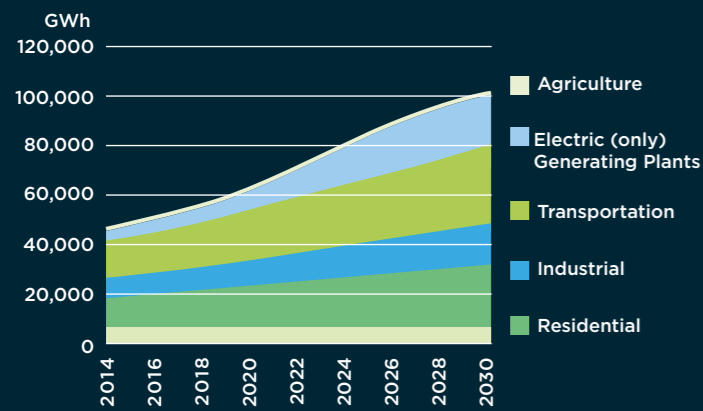
Georgia will soon be releasing its first National Energy Efficiency Action Plan (NEEAP), which covers a comprehensive set of policies and cross-sectoral measures in power, transport, industry, buildings and services. Energy demand in Georgia stems primarily from transport (33 per cent), the residential sector (30 per cent) and industry (15 per cent). In 2017 Tbilisi released its Land Use Master Plan 2030 to increase the efficiency of infrastructure investment, create a balanced road network to reduce traffic congestion and establish a network of green spaces. The success of both plans will rely on cooperation with Tbilisi City Hall and its residents, presenting a range of opportunities to showcase the city's action and leadership on energy efficiency.



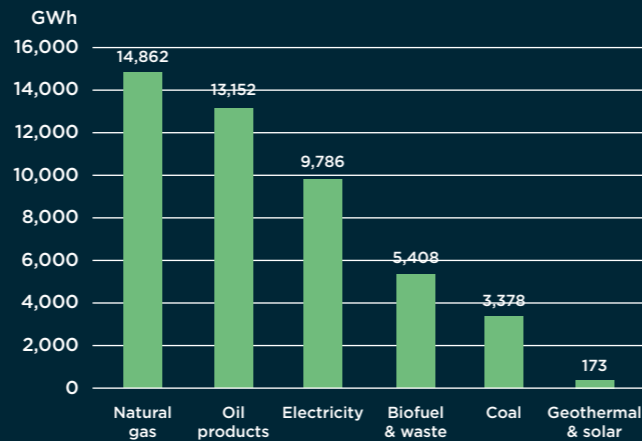
TBILISI CITY PARTNERSHIPS AND COMMITMENTS

- Member of Covenant of *Mayors for Climate and Energy*: Tbilisi has pledged to reduce CO₂ equivalent emissions to 20 per cent below 1990 levels by 2020.
- Member of *100 Resilient Cities*.
- Tbilisi has established a twinning arrangement with 15 cities in Europe, which started in 1975 with Saarbrücken, Germany.
- Each year Tbilisi hosts the Local Economic Development Forum, where ideas and experiences are shared and cooperative activities are established among key stakeholders wanting to contribute to the development of cities and municipalities.

Primary energy demand in Georgia according to sector - 2014 to 2030



Final energy consumption in Georgia by fuel in 2014



TRANSPORT SECTOR

'The City of Tbilisi is prioritising improvements to its public transport network, which will deliver multiple benefits including reduced congestion and improved air quality'

David Narmania, Mayor of Tbilisi City

CURRENT STATUS

The transport sector contributes the largest amount of greenhouse gas emissions in Tbilisi. The rising number of vehicles is resulting in increased congestion, air pollution and road accidents. The Metro System, which opened in 1966, serves an average of 450,000 passengers per day but requires modernisation. Both public transport and infrastructure need to be improved in order to enhance mobility, particularly for pedestrians and bicycles.

EXISTING INITIATIVES

- **Tbilisi Buses** - In May 2016 the European Bank for Reconstruction and Development (EBRD) provided Georgia with a sovereign loan of up to EUR 27 million to be on-lent to the City of Tbilisi, along with co-financing of EUR 7 million from the Eastern Europe Energy Efficiency and Environment Partnership (E5P), for a new fleet of 143 low floor buses. In 2016 many diesel-fuelled buses were replaced with those fuelled by compressed natural gas. The funding will also support the city's development of a Bus Route Restructuring Study to optimise the interface of different modes of transport.
- **Tbilisi Bus Network Improvement and Pilot Surface Transit System** are two projects being funded by the Cities Development Institute for Asia (CDIA). A core bus network of 20 routes has been identified, which will be supported by a secondary network in urban areas and a tertiary network serving nearby villages. The proposals involve the integration of the bus network with other public transport modes, including the metro and minibuses. They are proceeding with conceptual designs for a bus rapid transit scheme and a tram scheme for a pilot surface transit corridor that will serve one of the densest and poorly connected districts, Didi Dighomi. A Parking Strategy for Tbilisi was released in May 2017 that proposed comprehensive parking measures to improve mobility and support a more effective transport system.
- **Pre-feasibility Study for Metro Upgrade** - In February 2017 CDIA commenced a project preparation study targeting the modernisation of the facility and the improvement of its operation to meet technical, operational, safety and accessibility standards. Two expected outputs include: 1) a metro upgrade

and refurbishment plan with itemised definition of components and associated costs and benefits; and 2) a phased investment plan for the metro modernisation.

CONSIDERATIONS FOR TRANSPORT MASTER PLAN

The Transport Master Plan will be informed by a number of initiatives underway such as the results from the bus restructuring study that will identify the number, type and service being offered by buses, and if they are adequately servicing the network. The plan needs to consider many aspects such as:

- road infrastructure, including consideration of pedestrians and bicycle paths
- upgrade of metro
- regulation of number of taxis
- development of a Transport Model to gather real time information to support smarter decisions such as traffic light management for more efficient flow of vehicles
- extension of cable car network.

PRIORITY OPPORTUNITIES

- A Transport Master Plan that includes sustainability strategies and measures is urgently required in Tbilisi. This Plan will support the development of an integrated transport system that delivers a fast, efficient, safe and more reliable service for the city's residents and visitors. This system requires the infrastructure to allow a hierarchy of transport options - walk, cycle, metro, buses, private transport and freight.
- The Tbilisi Parking Strategy that was released in May 2017 needs to be incrementally implemented and enforced, starting with awareness-raising campaigns, small pilot zones and subsequent monitoring of the impacts.
- Transit-oriented development helps to ensure that compact and mixed-use development occurs within a short walk of high quality transit options. This creates "urban villages" where commonly used services (shops, restaurants, schools, parks, etc.) and a significant number of jobs are easily accessible without a car.
- Communication and provision of consumer information (for example, electronic displays or applications for smart phones showing routes, schedules, fares, discounts, incentives and real-time notifications) is required to increase the uptake of public transport.

BUILDINGS SECTOR

'The City continues to demonstrate its commitment to improve the municipal building stock and welcome other initiatives to help improve building efficiency'

David Narmania, Mayor of Tbilisi City

CURRENT STATUS

The majority of Tbilisi's buildings were constructed between 1960 and 1990, and approximately 10-15 per cent of them are in poor condition. While the energy efficiency potential of Tbilisi's building stock is large, there is currently no Building Energy Code and a lack of energy performance regulations for new construction. Other key challenges in the building sector include low energy prices, making it difficult for households to prioritise energy efficiency, limited availability of energy efficient products on the local market and lack of energy efficiency loans offered by local banks.

EXISTING INITIATIVES

- **Green City Action Plan** - An EBRD credit loan to reduce the energy consumption of Tbilisi's buildings, including kindergartens and City Hall.
- **Rehabilitation of 10 municipal buildings** - Funded by Tbilisi City Hall.
- **Building Codes** - The Danish Government and Nordic Environment Finance Corporation (NEFCO) are planning to support the Georgian Government to introduce energy efficiency regulations for buildings, product labelling, and renovation of public buildings.

PRIORITY OPPORTUNITIES

- Introducing energy performance standards for new buildings and energy performance criteria for renovation of existing public building stock at the national level is expected to deliver improvements to the thermal performance of the building stock in Tbilisi. The delivery of training programs that target energy managers, energy auditors and construction companies in Tbilisi will help drive the transition to energy efficiency improvements in new and existing building stock.
- There is an opportunity to develop a strategy to renovate existing buildings, starting with municipal buildings to lead by example, then focusing on residential buildings, using experience from the European Union with adaptation to local conditions.
- Once Building Energy Code and standards are adopted at the national level, an implementation strategy is needed for their effective enforcement at the city level. Ideally, it should be accompanied with building energy performance certification and labelling, as well as incentives for developers to go beyond the Building Energy Code.
- Showcasing the energy savings and multiple benefits from improving energy efficiency of a sample of both public and private buildings may further accelerate the uptake of energy efficiency practices in the building sector. For example, benefits accruing from building efficiency improvements of Tbilisi City Hall and selected kindergartens, retirement homes and apartment blocks could be showcased and utilised as a model for further replication.
- There is a large potential to improve the efficiency of heating systems, and increase the share of renewable energy in district heating of public, commercial and residential buildings.
- Opportunities also exist for increasing the installation of solar hot water systems in Tbilisi through increased education and awareness, incentives, grants and training activities.
- The City of Tbilisi could showcase its leadership in energy efficiency through green public procurement for purchasing products, services and buildings that are energy efficient, demonstrating good practice for the private sector to follow. For example, technical specifications could be included in tender documents to purchase efficient products such as heating, ventilation and air conditioning, lighting and office equipment.

INDUSTRY SECTOR

CURRENT STATUS

The industrial sector in Georgia offers significant energy saving potential (~30 per cent) and financially viable energy efficiency investments, particularly for large/medium companies operating in iron and steel, chemicals, non-metallic minerals production and food and beverages. Awareness remains low on the benefits of investing in energy and resource efficient technologies and services, especially among corporations, small and medium enterprises (SME's) and households.

EXISTING INITIATIVES

UNIDO's Regional Resources Efficiency and Cleaner Production (RECP) Demonstration Project is supporting energy audits and providing capacity building in Georgia. The project provides guidance to SMEs, experts, municipalities, and central governments on how to introduce RECP into manufacturing.

PRIORITY OPPORTUNITIES

- Encouraging greater adoption of energy management systems in Tbilisi's industrial sector would assist to better understand consumption patterns, encourage change in consumption behaviour, optimise equipment efficiency and identify technical opportunities.
- Support is needed for SMEs to improve energy efficiency through establishment of targeted training and networks to share experiences to improve energy efficiency through establishment of targeted training and networks to share experiences.
- Currently, there are no official qualification, accreditation and certification schemes for industry in Georgia, which is to be addressed in Georgia's National Energy Efficiency Action Plan. It is important that Tbilisi develops a pool of qualified experts on energy management systems and energy efficiency technologies to support the transition in the industrial sector.
- Key activities in the National Energy Efficiency Action Plan would support improved energy efficiency in Tbilisi's industrial sector, including minimum performance standards and labels for industrial equipment, as well as energy savings agreements for energy intensive industry.
- The steel mill near Tbilisi has been modernised and could be further showcased as a model for improving energy efficiency and for further replication.
- Free or low-priced energy audits could help to identify potential energy efficiency improvements to large, medium and small customers along with encouragement to implement recommendations. These audits are likely to trigger investments.