

Penetration of EE and RE Technologies in Georgian SMEs



**Ministry of Economy and
Sustainable Development of Georgia**



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List of Abbreviations

CoM	Covenant of Mayors
CSAP	Climate Change Strategy and Action Plan
EE	Energy Efficiency
EED	Energy Efficiency Directive
EU	European Union
FEC	Final Energy Consumption
GEFF	Green Economy Financing Facility
GoG	Government of Georgia
MoESD	Ministry of Economy and Sustainable Development of Georgia
MEPA	Ministry of Environmental Protection and Agriculture
NDC	Nationally Determined Contribution
NECP	National Integrated Energy and Climate Plan
OECD	Organisation for Economic Co-operation and Development
RE	Renewable Energy
RDI	Research, Development and Innovation
SDGs	Sustainable Development Goals
SFT	Sustainable Finance Taxonomy
SMEs	Small and Medium-sized Enterprises
UN ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
VRF	Variable Refrigerant Flow
WOM	Without Measures Scenario

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Chapter 1: Introduction

SMEs can play an important role towards achieving Sustainable Development Goals (SDGs). It is crucial to reduce the energy footprint of SMEs, by improving their efficiency and encouraging application of renewable energy generating technologies. These in turn can deliver energy savings, greenhouse gas emissions reduction, productivity and competitive benefits to SMEs. These benefits then flow to the wider economy as a more resilient SME sector creates job opportunities and economic growth.

In all OECD countries, SMEs account for the vast majority of companies, value added and employment generated. In Georgia, according to the 2018 data, the number of active enterprises amounted to 127,219, out of which 1,735 are medium and 125,100 small sized enterprises. The share of SMEs in the total number of active enterprises constitutes 99.7% (medium – 1.36% and small – 98.34%).¹ Therefore, the Government of Georgia (GoG) recognizes the importance and role of SMEs in economic development and is committed to the further improvement of the business environment in order to enable SMEs to develop and grow.

Support of the private sector development in general, and especially the development of SMEs, is one of the main aims of the GoG's economic policy. Consequently, it is one of the priorities of the “Socioeconomic Development Strategy of Georgia” - Georgia 2020 (June, 2014), as well as the government programme “Toward Building a European State 2021-2024” (December, 2020)²

Moreover, Georgia developed and adopted an Small and Medium-sized Enterprises Development Strategy for years 2016-2020 and later for 2021-2025 with the objective to enhance competitiveness of SMEs in domestic and international markets and support modernization of technology upgrading in SMEs. One of the 5 strategic directions is focused on facilitation of Research, Development and Innovation (RDI) in SMEs.

The fact that today SMEs represent 99.7% of all existing Georgian enterprises, clearly shows its importance, both in terms of economic and social point of view. In a market economy, in terms of social impact, the greatest role for handling employment problems lies on the development of

¹ OECD (2019), Access to Green Finance for SMEs in Georgia, Green Finance and Investment, OECD Publishing, Paris, <https://doi.org/10.1787/dc98f97b-en>.

² GoG (2020), Government Program 2021-2024 Toward Building a European State, https://www.gov.ge/files/41_78149_280277_GP.pdf

SMEs, as they employ a major part of the population and ensures the growth of their income. Noteworthy is the fiscal effect of SME development, that has a positive impact on the state budget, both on revenue as well as expenditure parts. The value added by SMEs as the share of total value added by enterprises in 2019 amounted to 59.3%.³

It should be highlighted that the share of employment in SMEs in total employment in enterprises has significantly increased over the last few years and amounted to 65% in 2019. And it is noteworthy that in terms of employment in the business sector, one of the largest is small enterprises, where 339,2 thousand people were employed in 2019, which accounts for 44.8% of the total employment.⁴

In 2019 the turnover of the business sector in Georgia amounted GEL 109 billion, 90% of which is generated from 5 sectors - industry, construction, trade, transport and logistics, art and recreational industry. The SME turnover is also increasing, which amounted to GEL 48,5 billion in 2019, representing 44.5% of the total turnover.⁵

The share of SMEs in total output is different, particularly, in 2019 the output of Small and Medium sized Enterprises was GEL 27,7 billion and accounted 58% of total output. Output of Medium-sized enterprises represented 26%, whereas of small enterprises accounted 32% of the whole business sector.⁶

It should be mentioned, that COVID-19 crisis and ongoing war in Ukraine has sparked interest in reducing costs and increasing productivity in many businesses. The companies should consider improving resource efficiency by investing in energy efficiency and renewable energy and adopting circular economy principles as well as achieving optimization of water and energy

³ Ministry of Economy and Sustainable Development of Georgia, SME Development Strategy of Georgia 2021-2025, http://www.economy.ge/uploads/files/2017/ek_politika/sme_strategy/2022/sme_strategy_2021_2025_eng_2.pdf.

⁴ Ministry of Economy and Sustainable Development of Georgia, SME Development Strategy of Georgia 2021-2025, http://www.economy.ge/uploads/files/2017/ek_politika/sme_strategy/2022/sme_strategy_2021_2025_eng_2.pdf.

⁵ Ministry of Economy and Sustainable Development of Georgia, SME Development Strategy of Georgia 2021-2025, http://www.economy.ge/uploads/files/2017/ek_politika/sme_strategy/2022/sme_strategy_2021_2025_eng_2.pdf.

⁶ Ministry of Economy and Sustainable Development of Georgia, SME Development Strategy of Georgia 2021-2025, http://www.economy.ge/uploads/files/2017/ek_politika/sme_strategy/2022/sme_strategy_2021_2025_eng_2.pdf.

consumption through introduction of smart technologies and energy generation from waste products. Careful monitoring of input use can help to reduce operational costs.

Legal basis and strategic documents supporting the SME sector

Georgia is already well advanced in creating the legal ground for implementing and promoting energy efficiency and renewable energy policies. The Law of Georgia on Energy Efficiency which was developed in compliance with the Energy Efficiency Directive (EED) of the EU was adopted in 2020. The general purpose of the Law is to increase energy savings in the country and it defines the obligations and responsibility measures for industry and economic sectors in the process of energy consumption efficiency. Article 19 of the Law includes a requirement for the Ministry of Economy and Sustainable Development of Georgia (MoESD) to develop programmes for small and medium-sized enterprises (SMEs) that encourage them to undertake energy audits and implement the energy efficiency measures identified as a result of energy audits. Moreover, the Law envisages that the MoESD shall develop programmes for SMEs in order to provide information on the benefit of the introduction of energy management systems.⁷

The Law of Georgia on Promoting the Generation and Consumption of Energy from Renewable Sources which was developed in compliance with Renewable Energy Directive (RED) of the EU was adopted in 2019. Its objective is the encouragement of generation and consumption of the energy received from various renewable sources. Article 13 of the Law envisages that the Government of Georgia shall ensure the availability of guidelines for designers, architects and other relevant parties to enable them to appropriately take into account the combination of energy received from renewable sources, high efficiency technologies, and central heating and central cooling, when designing, constructing, and reconstructing industrial territories.⁸

However, all above-mentioned legal provisions bear largely the recommendatory and advisory nature and does not create any obligations for SMEs. In addition to the legal basis, several strategic policy documents adopted by the GoG also state the need for energy efficiency and renewable energy measures in the industry sector and promote introduction of such measures.

⁷ Parliament of Georgia (2020), The Law of Georgia on Energy Efficiency, <https://matsne.gov.ge/en/document/download/4873938/0/en/pdf>.

⁸ Parliament of Georgia (2019), The Law of Georgia on Promoting the Generation and Consumption of Energy from Renewable Sources, <https://matsne.gov.ge/en/document/view/4737753?publication=1>.

Small and Medium-sized Enterprises Development Strategy 2021-2025

According to the Georgia's SME Development Strategy 2021-2025, the introduction of environmentally friendly measures in entrepreneurial activities in Georgia has already begun, that should contribute to the strengthening of green development in the economy and the widespread introduction of environmental standards.

The development of an economy based on knowledge and innovation is one of the priorities of the GoG. This is very important for increasing the competitiveness and productivity of companies. The low rate of implementation of innovation and modern technologies in the business is one of the main factors resulting inefficiency of SME production and in low added value.

Among the successful reforms Georgian Government has conducted are the Innovation and Entrepreneurship Policy. Through the budgetary support, the MoESD established two sister agencies, Georgia's Innovation and Technology Agency (GITA) and Enterprise Georgia, with the main aim of promoting SME development and strengthening SME competitiveness. Both agencies provide financial support to SMEs, as well as a broader range of services that includes access to special infrastructure, mentoring, trainings and various advisory services. Despite various international rankings, acknowledging Georgia progressing in the field of innovation and technology component, this issue remains a challenge and needs further development.⁹

The strategy highlights that the access to green finance is quite limited in Georgia. Commercial banks mainly use the green finances administered by the international financial institutions. Major part of these resources are invested to finance RE projects and goes to large enterprises. The access to such resources are limited for SMEs. The financial system has a key role to play in sustainable development, therefore, there is no sustainable development without sustainable financing.

That being said, it is important to put emphasis on the importance of the Sustainable Finance Taxonomy (SFT) recently elaborated by the National Bank of Georgia. SFT is consisted of Social and Green taxonomies. Commercial banks and microfinance organizations mainly use their own definitions of green credits and based on that define the activities that can be considered eligible for green credit. Taxonomy broadens existing definitions, hence increases the number of projects

⁹ Ministry of Economy and Sustainable Development of Georgia, SME Development Strategy of Georgia 2021-2025, http://www.economy.ge/uploads/files/2017/ek_politika/sme_strategy/2022/sme_strategy_2021_2025_eng_2.pdf.

which can be defined as green and sustainable. SFT will attract more foreign and local investments and increase financing possibilities for SMEs planning to undertake measures for resource-efficient and clean production.¹⁰

Nationally Determined Contribution and Climate Change Strategy and Action Plan 2021-2030

According to the updated Nationally Determined Contribution (NDC), Georgia is fully committed to an unconditional limiting target of 35% below 1990 level of its domestic total greenhouse gas emissions by the year of 2030; Also, Georgia is committed to a target of 50-57% of its total greenhouse gas emissions by 2030 compared to 1990, in case the global greenhouse gas emissions follow the 2 degrees or 1.5 degrees scenarios respectively, with the international support.¹¹

The industry sector is one of the major contributors to GHG emissions and in 2017 accounted for about 17% of national GHG emissions, making it the 3rd largest emitter sector in the country. Emissions attributable to the industry sector are divided into two groups: direct industrial emissions, including energy use-related emissions and non-energy emissions, and indirect emissions from electricity consumption.¹²

It is projected that emissions in the industry sector could increase by about 90% compared to 2015 levels, reaching almost 6.00 MtCO₂e in 2030. Two-thirds of the projected emissions would be generated from industrial processes, and one-third would be from energy consumption. The reason behind the GHG emissions growing trend is not only the economic growth but also inefficient and outdated technologies.

Georgia's Climate Change Strategy 2021-2030 states that in order to implement the vision from the NDC, the identified goal is to support the low carbon development of the industry sector by promoting climate friendly, smart and innovative technologies and services to achieve a 5% emissions reduction compared to emissions projected under a reference scenario. According to the strategy, this goal of reducing the level of greenhouse gas emissions from industrial processes and from energy consumption of industrial facilities can be reached by introducing modern

¹⁰ National Bank of Georgia (2022), Sustainable Finance Taxonomy, <https://nbg.gov.ge/en/page/sustainable-finance-taxonomy>.

¹¹ Ministry of Environmental Protection and Agriculture of Georgia (2021), Nationally Determined Contribution, <https://mepa.gov.ge/En/Files/ViewFile/35777>.

¹² Ministry of Environmental Protection and Agriculture of Georgia (2021), Georgia's 2030 Climate Change Strategy, <https://mepa.gov.ge/En/Files/ViewFile/50123>.

technologies. More specifically, this objective includes reduction of emissions from industrial processes and from energy consumption by industrial facilities by replacing the current method of cement production with the energy-saving dry method of production and equipping the nitric acid producing enterprise with modern technologies. The latter removes about 95% of N₂O emissions from their production cycle. The emissions reduction from cement and nitric acid production will amount to 571 ktCO₂e by 2030, of which 352 ktCO₂e accounted for cement and 416 ktCO₂e to nitric acid.¹³

Although the above-mentioned strategy covers all major industrial sectors, the industry part of the 2021-2023 Action Plan itself includes only few sub-sectors of industry. It is being planned to add other areas of industry and identify relevant activities in the next update of the Climate Action Plan.

Involvement of SMEs to address climate change is essential. Given the scale and pace of emissions reductions needed, it is critical that companies across the board urgently act to reduce carbon emissions both in their direct operations and in their supply chains.

National Integrated Energy and Climate Plan

The final draft of the National Integrated Energy and Climate Plan (to be adopted in 2023) involves the development of an incentive system to encourage industry to implement cost-effective energy efficiency measures. This specific measure also represents one of the defined EE alternative policy measures that the article 5 of the Law of Georgia on Energy Efficiency mandates the government to implement for reaching declared EE target for 2030.

Incentive programmes to encourage energy efficiency in industry can take many forms. Given the relatively small size of Georgia's industrial sector, energy-saving agreements will signal to industry that the Government is supportive of energy efficiency investments by first introducing support mechanisms and introducing a carbon fee on fossil fuels and electricity by 2025 which could be reduced based upon the achievement of efficiency benchmarks according to a voluntary agreement.

¹³ Ministry of Environmental Protection and Agriculture of Georgia (2021), Georgia's 2030 Climate Change Strategy, <https://mepa.gov.ge/En/Files/ViewFile/50123>.

The measure would involve the Georgian Government negotiating and then agreeing with key industrial actors and/or sub-sectors on a series of realistic energy performance targets, with interim milestones. Targets will be performance related, i.e. energy or emissions per unit of production. These negotiations would likely be:

- bespoke for large, energy-intensive industry organisations
- top-down/ generic for sub-sectors with large numbers of SME operators

Targets for such a scheme will be challenging but realistic and be based on energy-audit findings and/or benchmark comparisons between the Georgian Enterprise and typical and best international practices. Overall, the targets will be broadly in line with the Georgian Government's long-term targets to improve energy performance across industry between now and 2030. In moving forward with such a measure, the process will:

- Start with recognized energy-intensive sectors and/or very large sites
- Over time, be rolled out to medium and smaller energy-intensive sectors and/or sites as Government become confident in the process

The measure will initially be voluntary, and there will be incentives to participate/disincentives not to participate. Over time, if deemed necessary, the agreements may become mandatory for certain industrial actors.

Objectives of the Project

The Government of Georgia is committed to achieving SDGs. In this context, the MoESD with the support from the UN ESCAP, has developed the SDG 7 Road Map for Georgia in 2020. One of the recommendations from the SDG 7 roadmap is to improve the energy efficiency in the industry sector which suggests different measures e.g. installing LED lighting, improve boilers and steam/hot water distribution systems, and install energy-efficient motors, pumps, fans and compressors.

In line with the above findings, the Government has identified an important area of industrial development and aims to support SMEs to improve their energy efficiency. This also links with SDG 9, which is about building resilient infrastructure, promoting inclusive and sustainable industrialization and foster innovation. It has a particular link to the target 9.4 - by 2030, upgrade

infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes. Improved energy efficiency will also support SDG 13 and strengthen the capacity of Georgia to achieve its NDC under the Paris Agreement.

The overall goal of the current project which MoESD is implementing in cooperation with UN ESCAP is to define current status of penetration of EE and RE technologies in SMEs and provide relevant recommendations for the public and private sectors in order to increase the penetration of above-mentioned technologies. Increased use of EE and RE technologies in SMEs will significantly contribute to the achievement of various targets defined by relevant national policies in the field of energy efficiency, renewable energy and climate change as well as will contribute to the economic and social matters.

Chapter 2: Baseline Data Collection on EE and RE Practices in SMEs

This chapter represents a brief overview and an explanations of the data collection and analysis methods that were used during the research.

Survey was selected as the most relevant research method of data collection for the identified research case.

In order to be able to conduct a survey the first step was to determine the relevant tool/instrument for collecting the data and the questionnaire was chosen as such. A questionnaire was used to gather data from respondents about their attitudes, experiences, opinions and factual information. Questionnaires were used to collect both quantitative and qualitative information.

By designing the specific questionnaire, the experts have created valid and reliable questions that address the research objectives, placed them in useful order, and selected an appropriate method for administration. The questionnaire type which was delivered to the respondents was self-administered questionnaires that were sent online through e-mail. Questions included in the questionnaire were open-ended.

The questionnaire was divided into following 5 sections:

1. First section required the general information regarding the SMEs where the factual information was to be filled in. This comprised questions such as: company name, staff number, location, sphere of activity, list and amount of manufactured products, energy consumption (per separate energy categories), etc.
2. The second section was designed as to reflect the ideas of the SME owners. For example, if the company has previously thought about installing RE or increasing EE, and if they had thought what would be the main considerations or issues of key importance for decision-making and implementation.
3. The third section was dedicated to particularly RE field to establish whether the SME has installed RE technology and generates energy either in form of solar, wind, hydro or biogas. Moreover, this part aimed to find out the share of RE in total energy consumption of a particular company.
4. The fourth section was customized to identify the implemented EE measures in lighting, heating, cooling and ventilation systems, as well as to determine the application of heat pumps for increasing energy efficiency of the company. The additional goal of the questions in this part was to define classification of lighting, cooling, heating, ventilation systems according to the energy efficiency labelling categories.
5. The fifth section aimed to grasp the overall effect of the implemented RE and EE measures by determining the quantity of energy savings in total as well as electricity and natural gas separately.

A survey was attributed to collect and analyze data from a specific group of people, in particular business owners of small and medium-sized enterprises. Survey research also involved defining the appropriate sample group among numerous amount of small and medium-sized enterprises. Overall the target group included 20 SMEs across the country, who were chosen from the internal contact data base of the MoESD. These SMEs were identified based on the following principle: their participation in previous awareness raising activities organized by the MoESD regarding the EE and RE role and benefits in production cycle.

Next undertaken step based on the methodology included data cleaning, analysis and interpretation.

It is highly relevant to mention several limitations which were identified during the research. Besides the fact that 20 SME owners were asked to fill in the questionnaire, the total number of filled in questionnaires amounted to only 8. Mostly the first section, general information part was fully provided from the SMEs, whereas most questions from the rest of the four sections were left blank or partly filled in.

Due to the limitations, the information received from the questionnaires was analyzed alongside with the Georgia's SME development strategy 2021-2025, which is a national strategic document with the description of current situation, identified challenges and potential solutions. This combination allowed experts to define the environment of SMEs working in the area of energy efficient products and services and renewable energy in Georgia, identify major problems and barriers for implementing RE and EE measures as well as the existing best practices of already implemented measures in RE and EE separately. Overall, this enabled us to formulate policy recommendations for improving the current environment in the country.

Chapter 3: Analysis of the environment that SMEs working in the area of energy efficient products and services and renewable energy in Georgia

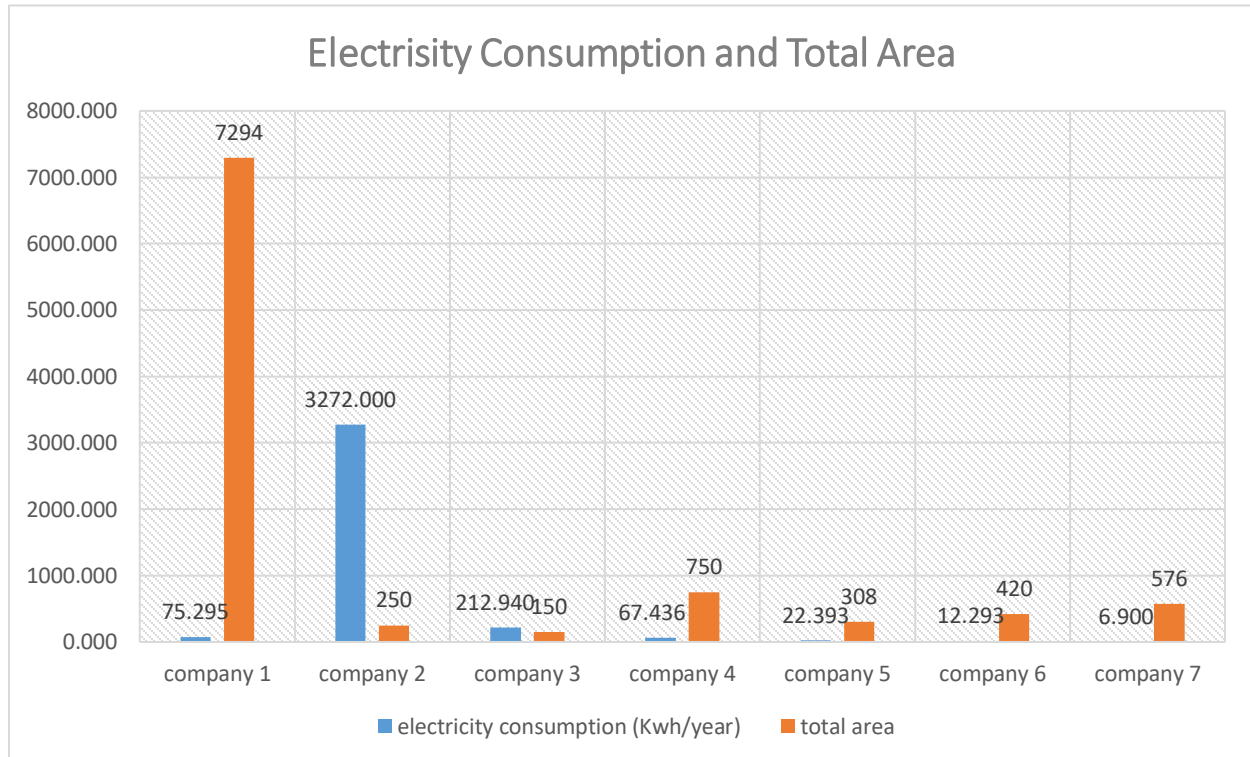
- Distribution via activity sphere and location (SMEs)

Participating SMEs were representing the following major categories: renewable energy generation, energy equipment/appliances production and wholesale trade, and real estate. Particularly, SMEs are either generating electricity from renewable sources such as hydro and wind, producing or trading with heating/cooling/ventilation units, or provide brokerage services in real estate.

It is possible to generalize the acquired information from this sample group to the whole Georgia, as the location of participating SMEs covered western, eastern, southern and central regions of the country. Two of the SMEs are operating in Svaneti region (western Georgia), two - in Tbilisi (capital city), one - in Mtskheta-Mtianeti region (central Georgia), one – in Shida Kartli region (central Georgia), one – in Kakheti region (eastern Georgia), one – in Kvemo Kartli region (southern Georgia).

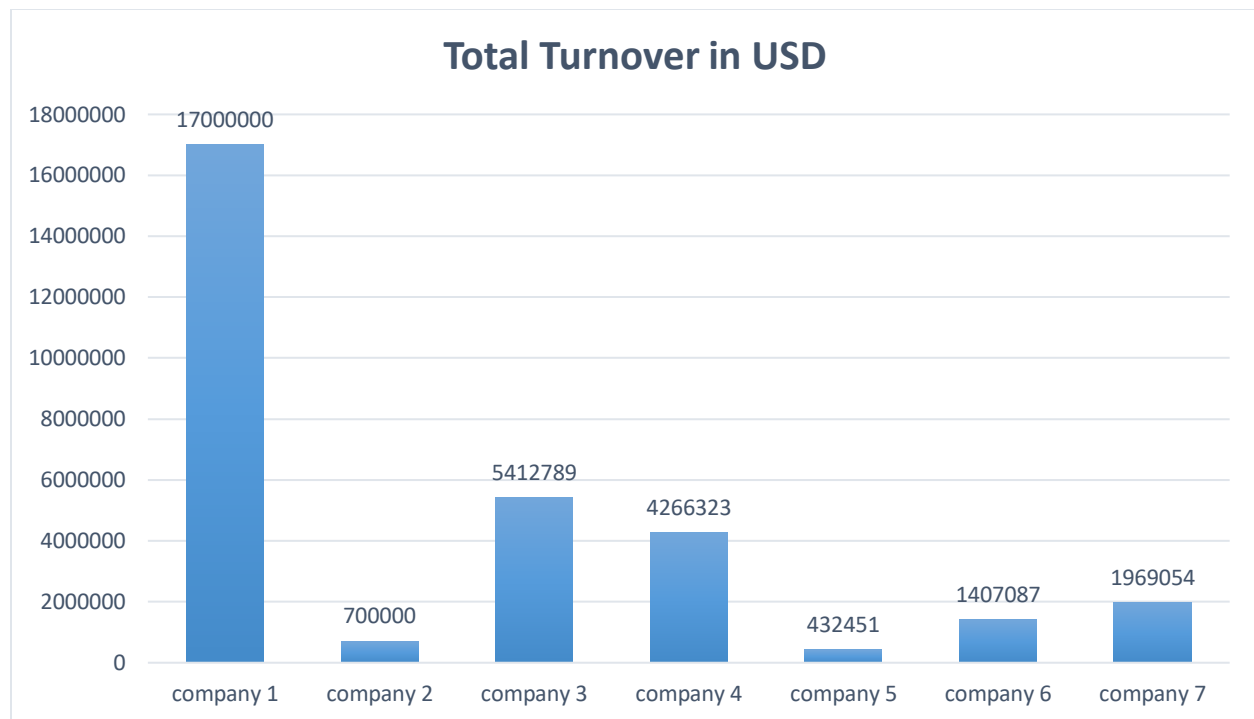
- Energy consumption data (SMEs)

The only type of energy consumed is electricity, as all of the SMEs filled in gas consumption box as not applicable. Electricity consumption widely varies from 3,272 kWh/year to 212,940 kWh/year and it is not proportionate at all to the amount of total area in use. The number of buildings in use varies from 1 to 3, with the average of 2, and the largest electricity consumer occupies 150 m², whereas the smallest being 250 m².



The most common type of fuel used for the transportation of vehicles of the company is Gasoline, accompanied by the small number of diesel-fueled vehicles.

The average number of staff members mostly varies between 10 and 20, with the only exception of 55. Total turnover in USD can be divided into three categories: 3 companies have under 1 million USD, 2 companies – from 1 to 2 million USD, 2 companies – around 5 million USD and the 1 company has the highest turnover of 17 million USD. It is important to notice that the company with the highest turnover is a wholesale trade company of heating, cooling and ventilation units and does not have a production line.



- Implemented measures (SMEs)

From the results of the surveys, it can be concluded that application of renewable energy technologies and energy efficiency measures are unfortunately not a high priority for SMEs. The current level of energy management within SMEs is very low.

The most common measures implemented are related to technical systems, i.e., lighting, ventilation, heating and cooling, which are lower risk and have quick payback, avoiding any risks to the production line or product quality. Less favored measures are those related to the installation of renewable energy technologies to generate clean energy.

Total energy savings are connected to lighting, heating, cooling and ventilation. In the lighting system light bulbs are replaced with LED lighting system with the energy efficiency label of A class. For making heating and cooling systems more energy efficient heat pumps are installed, particularly Variable Refrigerant Flow (VRF) system heat pumps. Energy efficiency label for ventilation units also corresponds to the A class.

While energy efficiency measures are limited in number, they can still be considered as diverse, whereas renewable energy measures are focused only on one kind of renewable energy technology installation, specifically Solar PVs.

- Identified problems/barriers

The survey and the analysis of SMEs development strategy revealed that there are several underlying causes resulting in the very low penetration of EE and RE in small and medium-sized enterprises.

First, it should be highlighted that the number of questions left blank in the sections regarding RE installation and energy efficient or inefficient systems as well as SMEs development strategy indicate that there is a lack of knowledge and low level of awareness.

Investment costs i.e. capital expenditure with long payback periods is the second important problem. Generally, payback periods beyond 3 years are not considered attractive by the companies involved. Therefore, the biggest share of investments in EE measures corresponds to the quick payback period investments, such as LED lighting, installation of heat pumps in cooling and heating, etc.

Low energy prices on Georgian electricity market can also be identified as the factor which is killing incentive for implementing EE and RE measures. Electricity price is very affordable nowadays and the share of expenditures for energy bills in total expenditures is very small.

The most common consumption-monitoring methods are based on energy bills and energy meters, and despite that almost absolute majority of surveyed SMEs do not have separate metering for lighting, heating, cooling, ventilation, etc. However, still many of the SMEs in general are not even aware of their energy related expenses, and are not using state of the art sensors and meters to monitor and control their energy consumption. Furthermore, a limited number of small and medium-sized enterprises have undertaken an energy audit to date. This coupled with the low priority that SMEs give to energy management, creates the big barrier to effective energy management in SMEs.

Regarding the financing of energy efficiency measures, the surveys' results show that SMEs do not have the necessary budget for investments in energy efficiency. Own funding is the most common case, while there is a lack of awareness regarding funding opportunities at the local or international level, including grants, loans, national support schemes (such as net metering system in Georgia), etc. This becomes more crucial in the absence of effective support schemes, the lack

of understanding of energy efficiency financing by banks and other sources, and the bureaucracy, resulting in a lack of motivation.

SMEs face more severe credit conditions than large enterprises. Banks may not be as motivated to engage with SMEs, as the transaction costs of smaller loans are proportionately higher. Low-accessibility to long-term financial resources prevents manufacturers to make investments in resource efficient technologies. Access to such type of “green” finance is quite limited in Georgia. Commercial banks mainly use the “green finances” administered by the International Financial Institutions. In the last decade IFIs administered 400 million USD and major part of these resources were invested in Renewable Energy projects but went to only large enterprises. The access to such resources is limited to small and medium-sized enterprises.

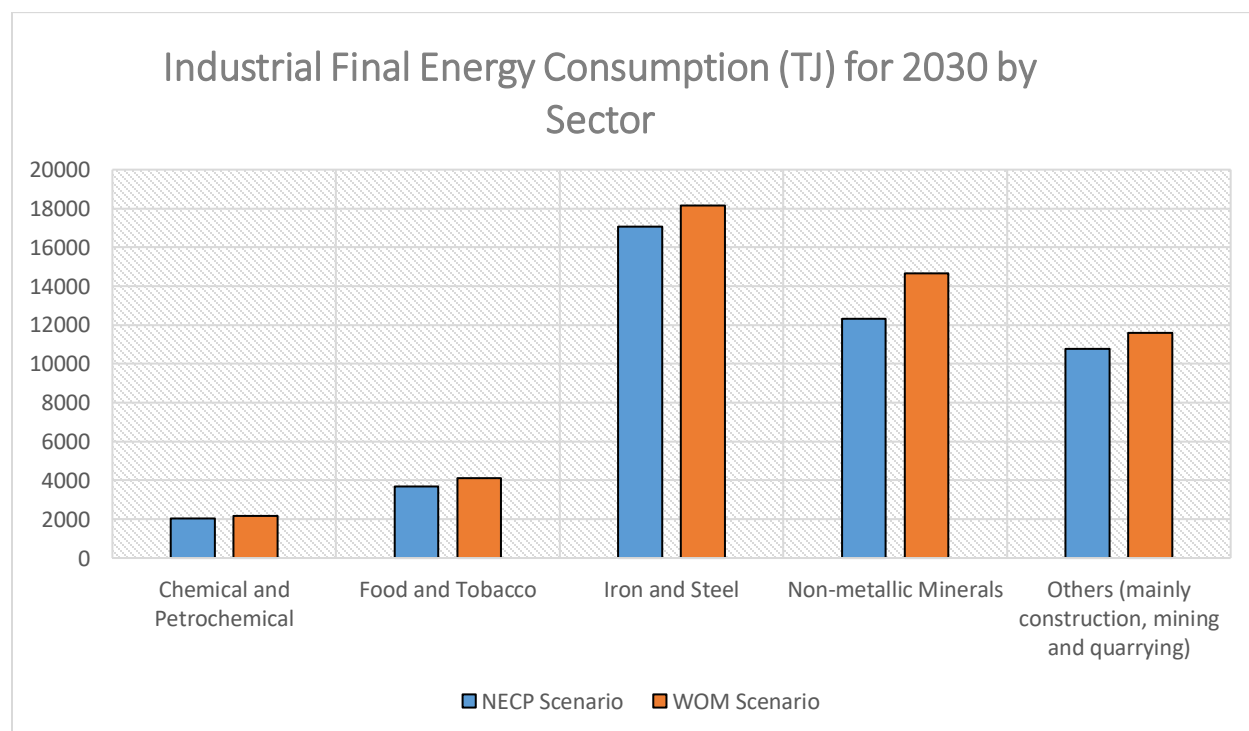
Poor knowledge of energy efficient technology might lead to an over or underestimation of the risks associated with the investment. Consequently, SMEs may set a very high threshold for profitability of energy efficiency investments and be disappointed when the results do not meet the expectations. For instance, SMEs may expect a new technology triggering a huge leap forward in terms of efficiency, halving energy bills, with little or no investment and a negligible risk. This may happen only in a few cases. Vice versa, SMEs may underestimate the benefits which EE measure can bring and not be willing to take an action.

The existence of certified energy audits is crucial in the country as many things depend on their expertise. Some energy audits are focused on selling a single commercial solution (e.g. selling a new piece of equipment) instead of analysing the whole production process to identify the best opportunities for energy efficiency. Furthermore, some SMEs focus only on the core production processes, overlooking the large potential improvement in energy efficiency that can be achieved in cross cutting technologies.

Chapter 4: Projection to 2030 based on alternative approaches with different shares of RE and EE in SMEs

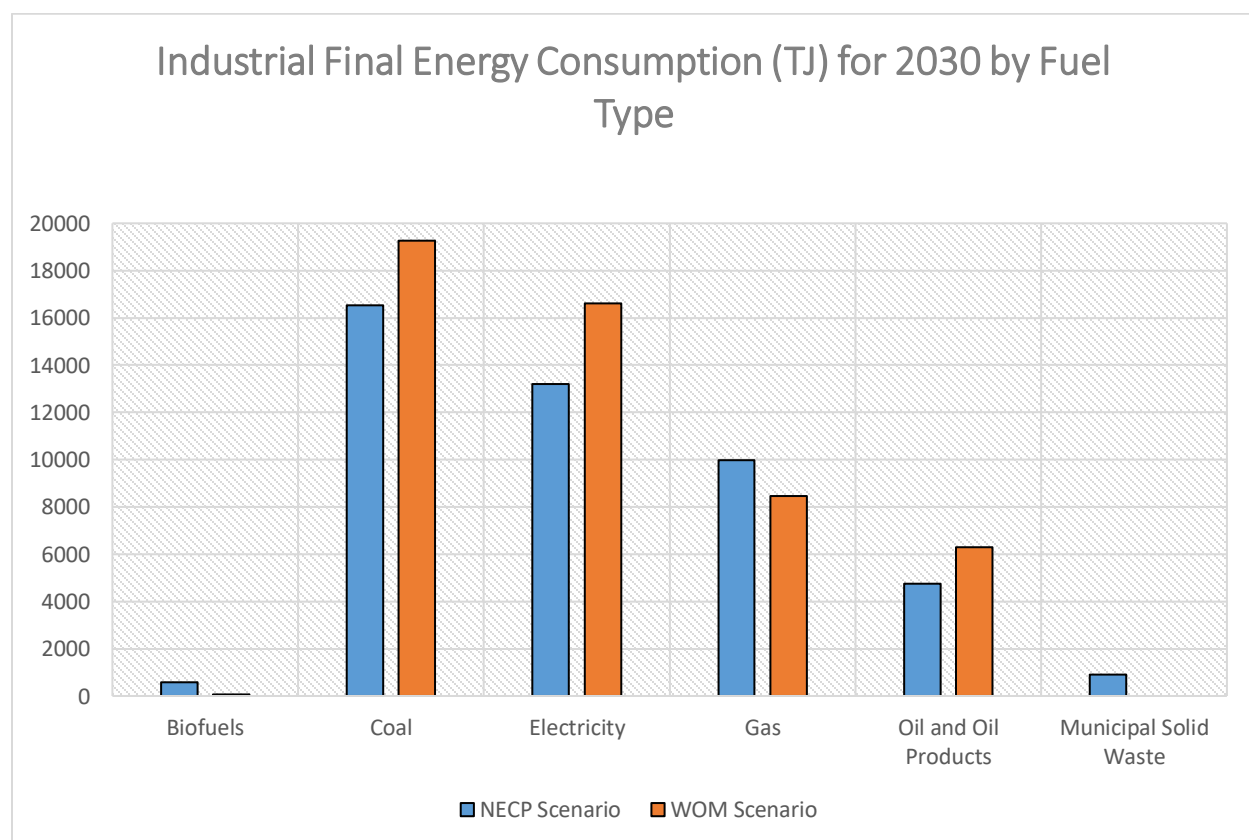
The National Integrated Energy and Climate Plan considers two alternative projections for year 2030. First projection comprises various measures envisaged under NECP and second projection is without the measures i.e. WOM scenario.

If we look at the Final Energy Consumption (FEC) in industry per sector for 2030, data can be analyzed according to five different categories: chemical and petrochemical, food and tobacco, iron and steel, non-metallic minerals and others (mainly construction, mining and quarrying). If no measures are undertaken until 2030, FEC in chemical industry will amount to 2176.16 TJ, while with the NECP measures it will slightly decrease to 2048.15 TJ. In food and tobacco sector, by WOM scenario FEC will reach 4106.45 TJ while with NECP measures it has a potential to decrease by 11% to 3689.96TJ. The potential of decreasing energy consumption in iron and steel sector amounts to 6%, from 18146.04 TJ in WOM scenario to 17063.26 TJ in NECP scenario. Sector of non-metallic minerals has the biggest potential in energy savings. In WOM scenario, FEC reaches 14666.35, while with NECP measures it can decrease by 16% to 12319.49TJ. In case of the rest of industry, which mainly includes construction, mining and quarrying, FEC has the potential to decrease by 7% with NECP measures, from 11584.66 to 10786.32TJ.

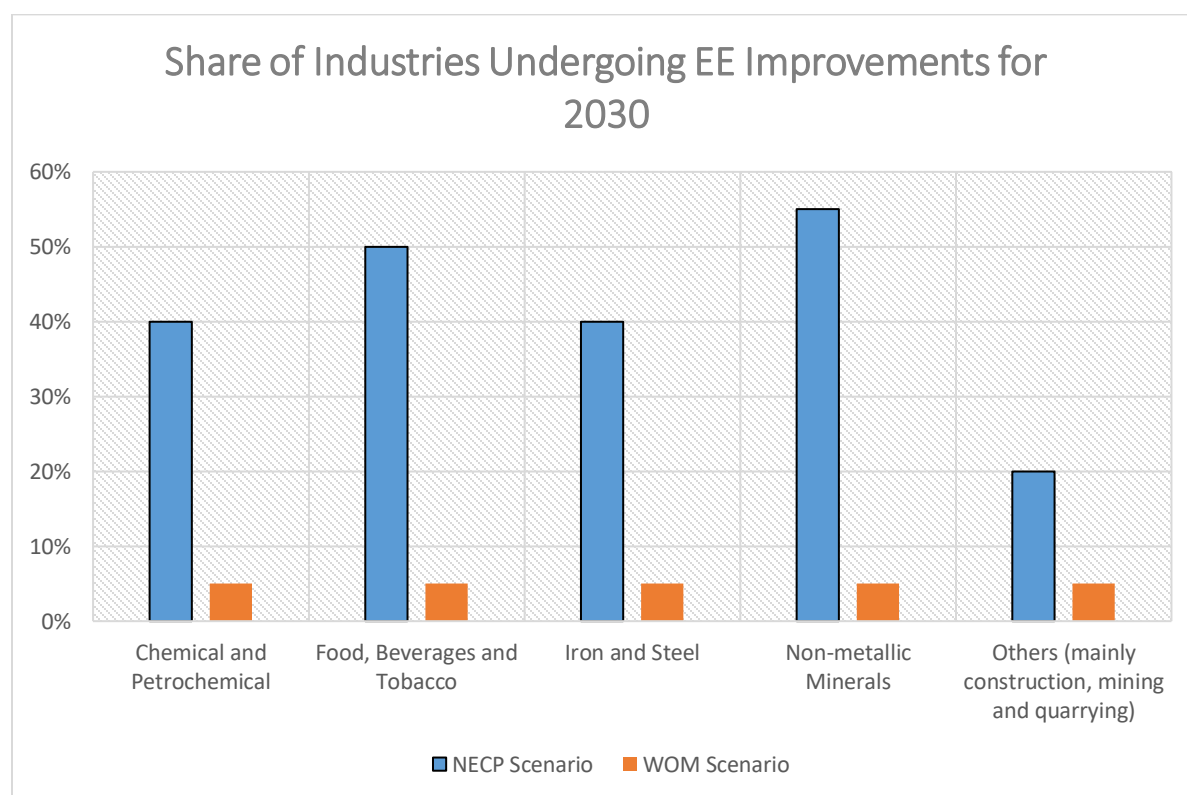


Projections to 2030 for Final Energy Consumption in industry by fuel type to a certain extent provides information on the planned uptake of renewable energy and energy savings potential in conventional energy sources.

According to WOM scenario, coal share in FEC reaches 19269.26 TJ by 2030, while with NECP measures it decreases to 16532.86 TJ. It is noteworthy that the reduction of coal consumption is estimated based on the measure of starting recovering energy from municipal solid waste. While in WOM scenario there is no energy generation from municipal solid waste at all, in NECP scenario 15% of coal consumption can be substituted by energy recovered from municipal solid waste, which is estimated to amount to 894.99 TJ by 2030. Very significant increase of around 770% of biofuel consumption is estimated with NECP measures, from 65.65 TJ in WOM scenario to 570.66 TJ in NECP scenario. Electricity consumption decreases by 21% from 16615.32 TJ in WOM scenario to 13187.4 TJ in NECP scenario. Consumption of oil and oil products are estimated to decrease by significant 24%, from 6282.21 in WOM scenario to 4750.24 in NECP scenario. Natural Gas is the only type of conventional fuel, consumption of which is estimated to increase with NECP measures by 18% in 2030. In WOM scenario it will reach to only 8447.21 TJ while with NECP measures it gets as high as 9971.04 TJ.



In all five industrial sectors the share of industries which undergo energy efficiency improvements equals to 5% in WOM scenario, while with the planned NECP measures, their share varies from the minimum 20% to the maximum 55%. Energy efficiency improvements for iron and steel as well as chemical and petrochemical industries are 40%. Food, beverages and tobacco and non-metallic minerals have energy efficiency improvements of 50% and 55% respectively. And the lowest share of EE improvements i.e. 20% falls on the rest of the industry, mainly construction, mining and quarrying.



Furthermore, NECP includes the projections regarding the CO₂ emission reduction for year 2030 as well. While there is no data for separate industrial sectors, NECP presents aggregated data for the whole industry. It is estimated that with NECP measures CO₂ emissions will reach 2188.45 kt, while in WOM scenario it will amount to 2257.21 kt. Overall, current NECP measures has the potential to only slightly decrease CO₂ emissions in industry.

Chapter 5: Summary of discussions from the stakeholder consultation workshop

Stakeholder consultation workshop aimed to communicate research findings with the representatives of various public and private institutions and get new insights and remarks from their side to enrich the analytical study and formulate better policy recommendations.

The first widely discussed issue concerned absence or lack of energy consumption data from the Georgian SMEs. Major barrier in this regard is that either, SMEs do not have information on their energy cost (in case it is included in rental price), or they have general data and not disaggregated for different energy systems. The one suggestion from the stakeholders was to address this barrier via establishing a mechanism for separate benchmarking of the information/data on energy intensity for different industrial sectors. In addition to the already identified barriers in the analytical report, stakeholders mentioned issue of confidentiality in the data collection process as an important challenge. According to their experience, the energy consumption data of the enterprises is mostly confidential, thus the only problem is not the lack of information but the reluctance of sharing it with the public or interested parties.

While brainstorming how to make data collection process work, stakeholders mentioned the possibility of engaging GITA and Enterprise Georgia (sister agencies under the MoESD) in the process. Both agencies provide financial support to SMEs, as well as a broader range of services that includes access to special infrastructure, mentoring, trainings and various advisory services. These agencies have already defined set of the information, which is obligatory to be filled in by the SMEs, if they want to become their beneficiaries. However, there might be a possibility to integrate energy consumption data of SMEs in the required data set, making it possible to determine the energy intensity of at least those SMEs that are or planning to become beneficiaries of GITA and Enterprise Georgia. However, it was also mentioned that even if these two agencies manage to collect energy consumption data from the enterprises, they might not be able to share it due to their own confidentiality issues as well.

The importance of awareness raising and capacity building was highlighted during the workshop several times. The need for such activities was stressed especially in connection with the new “I-GO” tool, which is an online assistant to be translated and adopted to Georgian context soon. The

I-GO initiative has been developed by the Green Industry Platform to help upscale SME resource efficiency efforts. At the core of the I-GO initiative is the I-GO Assistant, a rapid online SME self-assessment and navigation tool that, as a first step, produces a tailored list of recommendations on how best to approach improving the resource efficiency of a particular SME's operations. The tool matches an SME to the most relevant resource efficiency knowledge and support services that can help it implement the recommendations, considering the SME's resource efficiency status, geographical location, and sector of activity. To ensure this process is smooth and successful, first needed step is to raise awareness of the business owners why implementing resource efficient measures can be beneficial for them. Once SME owners already have an understanding of the benefits, they will be motivated to use online assistant. At this stage, it is crucial to build their capacity on how to collect and report relevant data. Without the step by step actions, it will be hard to receive the benefits from the platform.

As the follow up to the policy recommendation to divide SMEs in different target groups and address their needs separately, stakeholders discussed possible ways for implementing this idea in practice. Raised issues concerned the following topics: what should be the criteria based on which SMEs will be distributed to various target groups, which stakeholders should engage in the process of defining these criteria, which target group should be prioritized by the government, etc. Stakeholders agreed that there is a need to conduct working group meetings to address the issue.

The second major matter of discussion was regarding the two interlinked issues, huge bureaucracy in terms of ensuring access to the green finances and lack of proper in-house skills in SMEs. On the one hand, bureaucratic procedures accompanying green financing possibilities for the enterprises is discouraging business owners from applying to such finances. Moreover, stakeholders' experience showed that even if SMEs apply and get finances, they do not have capacity to deal with continuous paper work of financial reporting in order to prepare proper reports throughout the year and provide it upon request from green funds or the government. As SMEs have limited number of staff, it is an additional burden for them to hire an employee specializing in green finance reporting. Therefore, it is crucial to work on enhancing in-house skills of the SMEs.

The mandatory obligations for the industry appeared to be the issue of concern for the private sector as they were eager to determine if the government was planning on introduction of any

mandatory measures in terms of energy efficiency and renewable energy in the near future. During the discussion, it was clarified that the only mandatory obligation as of now is the obligation of conducting energy audits in the first category enterprises in every four year (not in force yet) and that the upcoming measures for SMEs will be initially voluntary and create incentives for participating. The government will ensure to create some incentive mechanisms and/or support schemes for enterprises. Moreover, private sector was eager to gain information if the total cost for the implementation of planned and adopted legislative/policy measures and set ambitious targets is calculated. They were interested in gaining the information regarding the ratio of government side budget financing to the private sector financing needed for the implementation.

Overall, stakeholder consultation workshop proved to be the very valuable tool for enriching the analytical report, getting fresh perspectives from public as well as private sector and formulate policy recommendations, which would be the best fit for the actual needs of Georgian SMEs.

Chapter 6: Best practices in the area of energy efficiency relevant to SMEs

1. Energy efficient equipment to double asphalt-concrete production

Lagodekhautogza Ltd is a Georgian construction company, established in 2000 located in Lagodekhi municipality, village Phona. The company specializes in road construction and production of cement-concrete and asphalt-concrete.

In 2020, the company decided to increase its asphalt-concrete production capacity, however it faced a challenge: their production machine was outdated, and it could not support increased production volumes. In addition, Lagodekhautogza was looking for ways to decrease their manufacturing costs.

Taking such an important decision on the modernization of the production in the conditions of pandemic and uncertainty was very courageous, the company had strong understanding that the implementation of the project will make their products more competitive in the market with increasing demand for high quality products and importance of roads construction/rehabilitation for the economic recovery of the country.

The company applied for GEFF (Green Economy Financing Facility) funding and received free technical assessment for the project. GEFF consultants evaluated the project, conducted financial

and technical analysis and gave recommendations that helped Lagodekhautogza achieve their goals.

An investment of around USD 247,942 allowed the company to upgrade its production machines to new energy efficient ones and to increase production by 55% compared to previous years.

Furthermore, Lagodekhautogza can now save up to 160 MWh per year, which translates to around USD 9761 in energy cost savings each year. Through this investment, the CO2 emissions from production were decreased by 62 tonnes per year.

This project¹⁴ is a good example of how a single investment can help businesses achieve their goals and lessen their impact on the environment.

2. New energy efficient hotel in Zugdidi

COVID-19's impact on the hospitality and tourism industry has been devastating and unprecedented.

A brief recovery in the summer months of 2020 especially at the expense of domestic travel inspired the hopes of a quick recovery for the tourism sector, but the fall/winter wave of the pandemic crashed those hopes. The Government support to the sector, lift of restrictions to travel, requirements of testing and vaccination certificates from travelers create grounds for the recovery of the sector.

Angelteri, a young up-and-coming company, established in February 2020 is determined to contribute to the development of the tourism industry in Zugdidi by building an energy-efficient hotel.

From the start of the project, the company paid close attention to the topic of sustainability. The hotel's



¹⁴ Green Economy Financing Facility (GEFF) in Georgia, success stories, <https://ebrdgeff.com/georgia/en/projects/road-to-energy-efficiency/>.

management aims for their operations to have as little impact on the environment as possible. Therefore, energy-efficient measures were considered, and it was decided that the 31-room hotel would be powered using renewable energy sources.

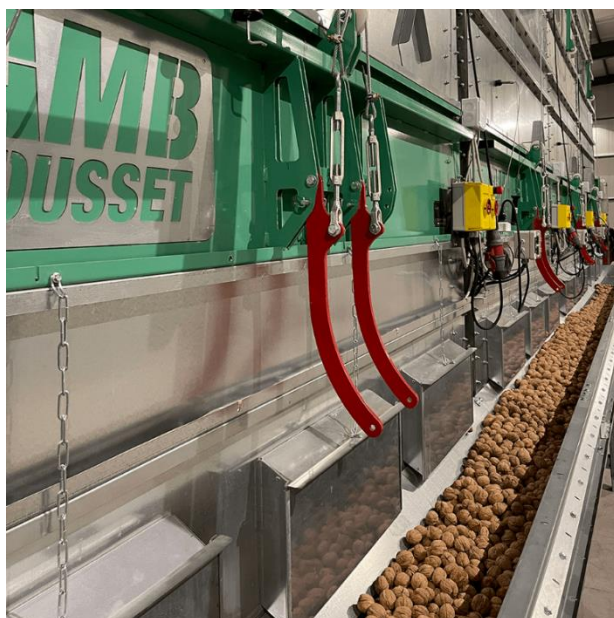
To meet these requirements, Angelteri applied for GEFF financing¹⁵ through one of the programme's partner financial institutions. A team of GEFF experts performed a technical and financial analysis of the project. Among other things, GEFF consultants calculated expected energy and potential CO2 savings.

As a result of the USD 166,968 investment, the new hotel in Zugdidi will be able to save up to 300 MWh per year, which amounts to USD 8,474 in energy bills.

Thanks to energy-efficient technologies, such as heating, cooling and lighting systems, the building will have a lower carbon footprint and emit 58.28 tons less CO2 per year.

With the world facing the problem of climate change, projects like these are vital to decreasing carbon emissions in the building industry, which account for 39% of the world's energy-related CO2 emissions. Angelteri Ltd is a good example of how building-owners can take an active role in creating healthy and comfortable environments for work, life and play.

3. Energy efficient building for walnuts' production



Anigozi LTD started out in the Georgian agricultural industry by planting and harvesting walnuts, which the company supplied to local markets, in addition to exporting to various countries.

After years of working in the field, the company decided to upgrade their operations completely, in order to ensure the high quality of their product. The first step of their strategic plan

¹⁵ Green Economy Financing Facility (GEFF) in Georgia, success stories, <https://ebrdgeff.com/georgia/en/projects/building-a-better-future/>

was to build a facility to store their produce as well as house their operations.

Seeking out new opportunities, the company applied for green financing. As part of the application process, Anigozi LTD received a detailed assessment of the project's technical and financial parameters from GEFf consultants¹⁶.

An investment of USD 220,019 will make it possible for the company to construct in 2021 an energy-efficient building that will lead to annual energy savings of 3.5 MWh per year and energy bill savings of USD 2,930 annually. Decreased energy consumption will result in better environmental performance of the company - annual reduction of CO2 emissions by 3.8 tons per year.

With the construction of the new energy efficient building all the walnuts and almonds harvested by Anigozi LTD will be processed and stored in a facility which offers the necessary conditions essential for maintaining the quality of the company's product. The implementation of the project will create employment opportunities to local population. In addition to creation of employment opportunities the project implementation will contribute to increase the competitiveness and the export potential of the company.

4. Energy efficient furnace to reduce energy costs for metal processor



AMB Alloys Ltd, located in the industrial city of Rustavi, is a producer and supplier of various types of ferroalloys.

Due to the high demand for silicomanganese, ferromanganese, ferrosilicon and other ferroalloys in nearby countries, the founding partners of AMB Alloys decided to build a ferroalloy plant. The project

¹⁶ Green Economy Financing Facility (GEFF) in Georgia, success stories, <https://ebrdgeff.com/georgia/en/projects/efficiency-in-a-nutshell/>.

required a large investment, however, the company was determined to pay it back in a relatively short amount of time. The implementation of the project is very important for the country's post-Covid economic recovery and increase of exports.

AMB Alloys applied for GEFF financing through a partner financial institution and requested a free technical assessment of their future project¹⁷. The GEFF team in Georgia performed project analyses and assessed the potential for energy savings, as well as the financial-technical parameters and risks.

The USD 822,000 investment allows the company to reduce its energy consumption by 4.3 MWh per year, which translates into annual savings of USD 215,000. This helps the company achieve its goal and will repay the investment out of energy savings in just four years. The new ferroalloy furnace will also mean a reduction in CO2 emissions by 1,7 tons per year, reducing the negative impact on the environment.

Chapter 7: Best practices in the area of renewable energy relevant to SMEs

1. Renewable biomass replaces natural gas in asphalt production¹⁸

Location-Khashuri municipality, village Agarebi

Asphalt producing company “Mshenebeli 2019” located in Khashuri municipality village Agarebi implemented resource and energy efficient measure which envisaged replacement of a 3,000 kW natural gas burner on a rotating furnace with a solid fuel heat generator assembled at the Georgian Technical University (installed device is patented).



¹⁷ Green Economy Financing Facility (GEFF) in Georgia, success stories, <https://ebrdgeff.com/georgia/en/projects/english-metal-processor-invests-in-furnace-to-upgrade-production/>.

¹⁸ UNECE (2021), Guidelines and best practices for micro-, small and medium enterprises in Georgia in delivering energy-efficient products and in providing renewable energy equipment, https://unece.org/sites/default/files/2021-03/Georgia_MSME_EE_RE_Report.pdf.

As a solid fuel agricultural waste - grape cake is used. The installed heat generator consumes 600 kg of grape cake in an hour and replaces 300 m³ of natural gas.

According to the plant operational plan the installed solid fuel generator will work 1600 hours a year consuming 960 tons of grape cake and substitute 480,000 m³ of gas.

As the grape cake is by product (waste) in wine making, currently the wineries happily give grape cake for free and asphalt plant has only to transport the free grape cake to the site.

As calculated 1 ton of dry grape cake will cost the plant about 35 USD. The annual expenditure for biomass fuel will amount to 33,600 USD while the annual expenditures on the natural gas would have been-about 160,000 USD.

Investments of up to 7,000 USD in locally produced heat generator will result in economic and environmental benefits.

As a result of installation of solid fuel heat generator utilizing renewable biomass (grape cake) instead of imported natural gas the annual savings for the plant will be 126,400 USD. The implementation of the project, especially during the pandemic with increased tariffs for energy carriers is very important as it resulted not only in the economic savings for the company, but also preservation of jobs and increased competitiveness in the market of construction materials.

As for the environmental performance of the company, the reduction of CO₂ emissions will amount to more than 900 tons per year.

2. Establishment of renewable energy (biomass) supply chain in pilot Georgian CoM municipality¹⁹

Location - Telavi Municipality

Establishment of biomass (vine prunings) supply chain in Telavi municipality is carried out in the framework of EU funded project “Biomass Energy and Energy Efficient Technologies as a Sustainable Energy Solutions for Georgian CoM signatories”

¹⁹ UNECE (2021), Guidelines and best practices for micro-, small and medium enterprises in Georgia in delivering energy-efficient products and in providing renewable energy equipment, https://unece.org/sites/default/files/2021-03/Georgia_MSME_EE_RE_Report.pdf.

Opposite to removal of vine prunings from the vineyard and burning them (widespread practice of handling prunings in Georgia) causing air pollution with carbon dioxide and other gaseous emissions, the project demonstrated a new sustainable and



economical use of prunings- their collection, bailing and - after drying - use for combustion purposes. One ton of dried vine prunings can substitute about 550 m³ of natural gas or 3 m³ of fuelwood which is currently used in many village schools and kindergartens. In addition to savings on imported natural gas the utilization of biomass (vine prunings) has environmental benefits in terms of reduced emissions of GHGs into atmosphere.

As a result of the economic crisis caused by COVID-19 pandemic, up to 100 thousand Georgians lost their jobs, the establishment of the new company which provided employment to 5 persons is though small but very important contribution to the post-crisis recovery in the country.



The main components of biomass supply chain in Telavi municipality are:

- Vineyards and vineyards pruning residues;
- Necessary equipment for collection and processing vineyard prunings - round-baler and trimmings and bale chipper produced by Italian company "CAEB International", tractors and truck;
- Warehouse for vine pruning bales' storage and drying;
- Processing dry bales with bale chipper;
- Transportation of chipped biomass to the municipal buildings as fuel to be burnt in modern autonomous heating systems - at project pilot phase kindergartens.

Investments for the establishment of the biomass supply chain amounted to 111,916 EUR. In the pilot stage, for the provision of heating for two kindergartens annually 500 MWh energy received from burning fossil fuels will be saved, which will result in annual reduction of CO2 emission of 170 tons. Annual monetary savings for two municipal kindergartens will be up to 16,000 EUR.

Recovery of vine prunings for energy is one of the most significant innovations in the agricultural sector: apart from relieving producers of disposal costs, introduction of new agricultural technology and machinery the process has economic return resulting from the conversion of biomass into energy and the related commercialization on the national market.

Total volume of biomass in the Telavi municipality can be estimated at about 17,400 tons, which provides for application of gained experience throughout municipality and other CoM signatories from viniculture region of Kakheti.

3. ProCredit Bank head office in the list of green buildings²⁰

Location - Tbilisi, ProCredit Bank Head Office

The Head Office of ProCredit Bank Georgia in Tbilisi has entered into the list of green buildings around the world. It is the first building in Georgia to have its resource efficiency confirmed with an EDGE international certification. The large glazed façade frontage and atrium provide natural daylight along with an energy-efficient building envelope as well as low-E coated windows.



The whole building is lit by LED lighting with occupancy sensors and lighting controls. The energy efficient equipment for heating and cooling ensures a comfortable ambient air while saving energy at the same time. In the case of green buildings, it is not only the building itself that is important

²⁰ UNECE (2021), Guidelines and best practices for micro-, small and medium enterprises in Georgia in delivering energy-efficient products and in providing renewable energy equipment, https://unece.org/sites/default/files/2021-03/Georgia_MSME_EE_RE_Report.pdf.

but also the consumption of resources, which is why ProCredit Bank Georgia has installed one of the first rainwater harvesting systems in the country.

On top of this, ProCredit is the only bank in the country to operate its own two grid connected solar power plants – with the system being used not only to generate electricity for internal use but also to charge its fleet of electric vehicles. The solar modules installed represent the latest technology glass-glass, bifacial



frameless solar modules. One of the two solar micro systems is installed on the roof of the building, to supply the building with electricity and provides partial shading from the direct sunlight coming through glass. The second solar power plant which provides electricity to the charging terminal of electric vehicles is installed next to the building, on the roof of a small parking type construction.

The total area under both solar PV system is 500 square meters and total peak power is up to 100 kW. As estimated by the “Sun House” Ltd, designer and installer of the solar plants, the annual electricity generation by the solar systems will amount to 135,000 kWh, with payback period about 6 years. In the period 19 June 2020 – 9 February 2021, the two solar micro plants have generated 68,030 kWh of electricity and contributed to the reduction of CO2 emissions by 5.58 tons.

By implementing various energy efficiency and renewable energy measures, applying resource efficiency especially in the time of pandemic is a good example to follow by the developers in charge of construction of residential and public buildings, especially with the consideration of the fact that during the pandemic the works in the construction sector continued almost at the same pace. Moreover, the bank offers new financing opportunities to SMEs that are planning investments in energy efficiency, renewable electric power and environmentally friendly initiatives under the Green Economy Financing Facility (GEFF) program.

4. Eco-friendly furniture made with clean power²¹

Location-Tbilisi

Established in 2007, GeoLatex is a company based in Tbilisi that imports and distributes a wide variety of medical supplies and other products throughout Georgia.

In 2021, the company began manufacturing eco-friendly



ergonomic furniture for children and young adults. The investment proved successful; however, due to the resulting increased energy demands and rising electricity rates, the operational costs of the new production line were quite high. This motivated the management of GeoLatex to look for alternative sources of energy. After conducting extensive research, it was decided to invest in a solar power plant.

With the help of a partner financial institution, GeoLatex applied for GEFF financing. The detailed project was submitted to the GEFF experts who analysed the various components of the project and estimated the benefits for the company of using solar energy. The required technology with the appropriate certification was quickly found in GEFF's Green Technology Selector, which greatly simplified the loan application process.

The investment amounted to US\$ 100,000 and enabled the company to install a solar power station with a capacity of 198 kW. This will allow GeoLatex to generate 267 MWh of energy annually and save US\$ 36,000 in energy costs. With such a high return on investment, the company will be able to repay its loan in exactly 3 years. Each year, GeoLatex will reduce its CO₂ emissions by 138 tonnes, which amounts to a significant reduction of the company's negative impact on the environment, considering the power station's lifespan of 20+ years. The project is supported by the Green Climate Fund (GCF) and the Austrian Federal Ministry of Finance (BMF).

²¹ Green Economy Financing Facility (GEFF) in Georgia, success stories, <https://ebrdgeff.com/georgia/en/projects/eco-friendly-furniture-made-with-clean-power/>

Conclusions

The research was dedicated to the identification of general conditions in Georgia in which small and medium-sized enterprises are currently operating in terms of energy efficient measures and renewable energy technologies.

It is the distributed nature of this energy consumption, split between many thousands of individual businesses that makes it so challenging to reach SMEs. SMEs are a very heterogeneous group of enterprises to be targeted with uniform incentives. However, in SMEs energy savings opportunities are smaller per entity and distributed more widely. This makes it difficult to reach out to a large number of SMEs.

The conducted survey and research managed to define the main characteristics of SMEs, identify main implemented measures in RE and EE and detect the most common challenges and barriers that SMEs face nowadays in Georgia.

Considering all the barriers investigated, energy efficiency and renewable energy is effectively a marginal issue for the management of most SMEs.

In a nutshell, the most common barriers for energy efficiency improvement investments in SMEs are related to economic reasons, the need for capital expenditure, the lack of time resources, limited in-house skills and the low awareness about the multiple benefits. Moreover, SME decision-makers consider energy efficiency improvements to have low priority compared to other investments or that they are not necessary at all. Additionally, there is a lack of SME staff with proper skills and expertise and shortage of personnel to monitor and access the energy footprint.

Based on the identified challenges, several policy recommendations are included in the research, with the high potential of increasing EE and RE penetration in SMEs. Increased use of EE and RE technologies in SMEs will significantly contribute to the achievement of various targets defined by relevant national policies in the field of energy efficiency, renewable energy and climate change as well as will contribute to the economic and social matters.

Recommendations

1. Consider mandatory energy audits for SMEs. Businesses that undertake an energy audit are more likely to implement energy efficiency and renewable energy measures, therefore ensuring that SMEs undertake audits by making them mandatory is an important first step towards realising the energy-saving potential of SMEs.
2. Government should discuss the issue of confidentiality in the data collection process as an important challenge. As the energy consumption data of the enterprises is mostly confidential, data owners are reluctant to share it with the general public or any interested party. Therefore, it is crucial to think of the solutions how information confidentiality issues with regard to the energy consumption can be addressed differently.
3. Reach out to SMEs effectively via integrated approach. It is crucial to combine measures to address the information and skills needs of SMEs altogether in specific policies or programmes. Information measures can include energy audits, site visits, case studies and demonstrations, “how to” guidance materials, etc., for improving skills of the working staff appropriate capacity building workshops and trainings should be carried out.
4. Encourage a range of support mechanisms. Providing information alone is not enough to drive uptake of energy efficiency. SMEs need additional support through the implementation phase in order to remove the perceived risk, therefore GoG should offer a range of services that cover information, training, external support, and finance.
5. Promote the multiple benefits of energy efficiency and renewable energy technologies. Cost is not the only factor that drives investment decisions in SMEs. The wider benefits such as improving staff comfort and wellbeing and enhancing brand image should be used to show how EE and RE projects align with the strategic objectives of the business.
6. Develop suitable financial mechanisms. Lack of finance has been identified as one of the main barriers to implement energy efficiency and renewable energy measures in SMEs. Less bureaucratic access to tax incentives, grants, loan funds, and energy tariff structures could all incentivise investments in energy efficient and clean production. Moreover, as the cost of investment for the changes involved is high, it will be beneficial to implement measures for either decreasing the cost or making available public funding to bridge the existing gap.

7. Build stakeholder partnerships and train stakeholders at all levels. It is important for SMEs and their staff to understand the importance of energy management, but it is equally important for energy experts, finance providers, and other multiplier organisations to recognise their role in supporting SMEs through the energy transition. Where necessary, these stakeholders should be open to changing their approach to meet the specific needs of SMEs.

8. Understand the particular barriers and needs of each SME target group. It is the distributed nature of this energy consumption, split between many thousands of individual businesses, that makes it so challenging to reach SMEs. SMEs are a very heterogeneous group of enterprises to be targeted with uniform incentives. As it is very challenging to reach out to a large number of SMEs, it is highly relevant to divide them into several target groups and explore their problems and address their needs separately.

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Annex 1. Blank Questionnaire

General Information						
Information			Unit	Comment		
Company Name						
Number of Staff						
Total turnover in USD. (if not confidential)						
Number of buildings (in use)						
Total area (in use)			m ²			
Location						
Sphere of Activity						
amount of products manufactured						
List of Manufactured Products						
number of motors/compressors etc.						
typo of wasttes created and amount						
Number of vehichels company used						
Fuel used by Vehicles (Disel, Gasolin, or Evs)						
Electricity Consumption			Kwh/year			
Electricity Consumption per square meter (in total)			Kwh/m ²			
Natural Gas Consumption			m ³ /Year			
Natural Gas Consumption per square meter (in total)			m ³ /m ²			
Additional Questions						
Has the company thought about installing RE or increasing RE? If not, what has been the main reason?						
Has the company thought about implementing EE measures or increasing EE? If not, what has been the main reason?						
Is the company ready to increase EE and RE? If so, what would be thier key consideration for decision. Such as payback period, etc.						
Renewable Energy (RE)						
Type(s) of Used Renewable Energy (RE)	PV Panels		Wind		Biogass	
Number of Equipments						
Total Installed Capacity	Mw		Mw		Mw	
Generation from RE	Kwh/Year		Kwh/Year		Kwh/year	
Share of RE in Total Energy Consumption	%		%		%	
Energy Efficiency (EE)						
Lighting System	Energy Efficient	Non Energy Efficient	Comment			
Type of Lighting System						
Classification of Lighting System (A,B,C,D,E,F,G)						
Number of Lighting Bulbs						
Energy Consumption of Lighting System (Kwh/year)						
Heating System	Energy Efficient	Non Energy Efficient	Comment			
Fuel/Energy Type Used for Heating						
Classification of Heating System (A,B,C,D,E,F,G)						
Energy Consumption of Heating System (Khw/year)						
Cooling System	Energy Efficient	Non Energy Efficient	Comment			
Fuel/Energy Type Used for Cooling System						
Classification of Cooling System (A,B,C,D,E,F,G)						
Energy Consumption of Cooling System (Khw/year)						
Ventilation System	Energy Efficient	Non Energy Efficient	Comment			
Classification of Ventilation System (A,B,C,D,E,F,G)						
Energy Consumption of Ventilation System (Kwh/year)						
Heat Pumps			Comment			
Type of Heat Pumps						
Classification of Ventilation System (A,B,C,D,E,F,G)						
Number of installed heat pumps						
Energy Consumption of heat pumps (Kwh/year)						
In Total			Comment			
Energy Savings	Kwh					
Saved Electricity	Kwh					
Saved Natural Gas	M3					