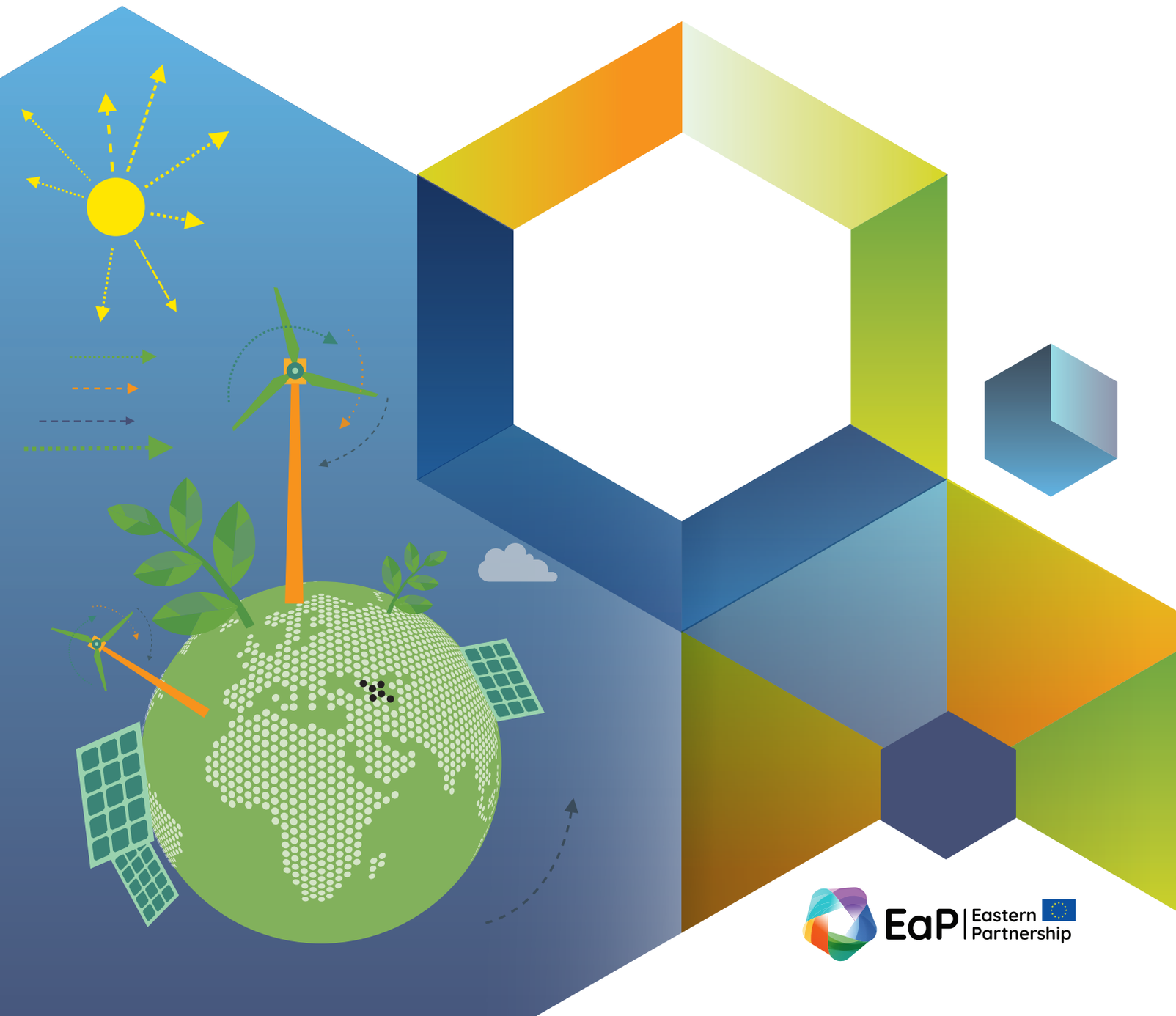
Funded by
the European Union

Assessing private sector role/ opportunities in NDC and CSAP and draft LT-LEDs

International Consultant,
Fortunato COSTANTINO



EaP Eastern Partnership

Funded by the European Union

Abstract

This report was written as a part of the EU4Climate project currently supporting the Ministry of Environmental Protection and Agriculture of Georgia and other national partners in developing various climate related strategies and policies and addressing the implications and/or opportunities for private sector during the NDC implementation process.
The overall objective of the assignment is to assess the NDC, CSAP and draft Lt-LEDS to identify what is the role and/or opportunities for private sector within the NDC, CSAP and draft Lt-LEDs and identify actions that would involve the collaboration with private sector.

The consultant also developed a set of recommendations to identify opportunities for private sector to contribute to the NDC target achievement.

4 October 2022

Content

Acronyms and abbreviations

AA	Association Agreement
ATQ	Assessment of Transition Qualities
BEEPS	Business Environment and Enterprise Performance Survey
CAGR	Compound annual growth rate
CGS	Credit guarantee scheme
CIS	Commonwealth of Independent States
DCFTA	Deep and Comprehensive Free Trade Area
EBRD	European Bank for Reconstruction and Development
EEC	Eastern Europe and the Caucasus
EIB	European Investment Bank
ESCO	Electricity system commercial operator
EU	European Union
EUR	Euro
EPG	Economics, Policy and Governance (EBRD)
FDI	Foreign direct investment
FX	Foreign exchange
GCI	Global Competitiveness Index
GCR	Global Competitiveness Report
GDP	Gross domestic product
GEL	Georgian lari
GHG	Greenhouse gas
GII	Global Innovation Index
GNERC	Georgian National Energy and Water Supply Regulatory Commission
GSE	Georgian Stock Exchange
GSP	Generalised Scheme of Preferences
GVA	Gross value added
GVC	Global value chain
HPP	Hydroelectric power plant
IFI	International financial institution
IMF	International Monetary Fund
LiTS	Life in Transition Survey
LLC	Limited liability company
LPI	Logistics Performance Index
LSE	London Stock Exchange
MFN	Most favoured nation
MSME	Micro-, small and medium-sized enterprise
NBG	National Bank of Georgia
NEAP-3	Third National Environmental Action Programme of Georgia
NEET	Not in education, employment, or training
NDC	Nationally Determined Contribution
NPL	Non-performing loan
NRI	Network Readiness Index
OECD	Organisation for Economic Co-operation and Development
PIACC	Programme for the International Assessment of Adult Competencies
PISA	Programme for International Student Assessment
PPP	Purchasing power parity
SIGMA	Support for Improvement in Governance and Management
SME	Small and medium-sized enterprise
SOE	State-owned enterprise
SSO	Sectoral skills organisation
TANAP	Trans-Anatolian Gas Pipeline
TAP	Trans-Adriatic Pipeline
TFC	Total final consumption
TIMSS	Trends in international mathematics and science
TIBR	Tbilisi Inter-Bank Rate
TPES	Total primary energy supply
TPP	Thermal power plant
TVET	Technical and vocational education and training
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
US	United States of America
WEF	World Economic Forum
WGI	Worldwide Governance Indicators
WJP	World Justice Project
WPP	Wind power plant

PART 1

Context and Background of NDC, CSAP, LT-LEDS

1. INTRODUCTION

In April 2021, the Government of Georgia adopted its updated **Nationally Determined Contribution (NDC)** and the **Climate Strategy 2030 and Action Plan 2021-2023 (CSAP)** as an NDC implementation tool.

The updated NDC has enhanced, in terms of mitigation, its unconditional (35%) and conditional (50-57%) GHG emissions reduction targets by 2030 compared to 1990 levels, while in terms of adaptation, it commits to improve its adaptive capacity to climate change by mobilising domestic and international resources for the sectors particularly vulnerable to climate change.

Additionally, the NDC contains sectoral mitigation targets, gender, and climate change provisions to enhance the role of women as change agents through their participation in decision-making processes. It further plans to encourage gender analysis, capacity building, and knowledge sharing in the frame of climate change-related projects.

Based on the GHG inventory (1990-2015), a set of measures has been identified for each sector to assess the feasible target for mitigation in each sector. A reference and a policy scenario have been calculated for seven economic sectors – transport, buildings, energy generation and transmission, agriculture, industry, waste, and forestry.

The sectoral targets for mitigation stated in the updated NDC follow the assumptions and methodologies used by the Climate Strategy and Action Plan.

The CSAP covers seven sectors, namely: Energy Generation and Transmission, Transport, Buildings, Industry, Agriculture, Waste Management and Forestry. The Action Plan also contains sector specific targets, objectives, and mitigation measures relevant to the period 2021-2023. It is envisaged to re-examine the CSAP every three years. The next iteration will be prepared in 2023 for the period 2024-2026.

Georgia's adaptation objective confirms the commitment to continue studying its adaptation capacity for different economic sectors, as well as to plan and implement the respective adaptation measures by mobilizing domestic and international resources for those sectors particularly vulnerable to climate change. The NDC includes several adaptation measures to be adopted as part of the National Adaptation Plan in order to achieve the above-mentioned target. These measures refer mainly to assessments to develop the adaptive capacities for a range of sectors, e.g., agricultural production, coastal and mountainous ecosystems, human health, etc.

Gender and climate change have also been addressed in the NDC, referring to the national Gender Equality Law and informing on the ways and means how the involvement of women will be further increased.

The **NDC** and the **CSAP** development processes had a **participatory approach** from the beginning. The development of both documents was officially initiated on the 18th September 2018 at "Georgia's First Climate Change Conference. Representatives of the public institutions, Civil Society Organisations, private companies and academia were involved in the development process to different extents.

In January 2020, the Georgian Government established a high-level coordination mechanism, the "**Climate Change Council**", to coordinate effective implementation of Georgia's climate change policy and climate change-related international commitments. The Council has ten permanent members from key ministries in Georgia. In addition to this, the regions and municipalities are represented through the Heads of the Governments of the Adjara and Apkhazeti Autonomous Republics and the Chairperson of the Coordination Team of the Covenant of Mayors Signatory Municipalities.

Georgia has pursued wide-ranging reforms, underpinned by its European aspirations and, more recently, its commitment to implementing its Association Agreement with the European Union (EU). While these reforms have slowed significantly in recent years, they have transformed the Georgian state and economy, lifting its potential growth rate and improving its standard of living. With gross domestic product (GDP) per capita still considerably below that of the EU, strong private sector-led economic expansion remains paramount to bring the economy in line with that of its European neighbours.

To advance its economic convergence with the EU economies, Georgia needs to **address the following private-sector constraints**:

- Transformation and application of Georgia's public-sector governance framework remains incomplete, emphasising the need to **keep governance standards high** on the reform agenda.
- **Political volatility** is influencing immediate investment decisions, as well as the country's long-term reform progress.
- Weaknesses in public administration, public procurement and corporate governance standards could be improved by **introducing further digital solutions**.
- The **skills of the labour force** are one of the most pressing obstacles to private sector competitiveness, and requires including stronger national technical and vocational education and training (TVET) and advancing digital skills.
- Georgia's productivity growth would also be boosted by **addressing persistent inclusion issues**, such as gender disparities and territorial imbalances.

- Foreign investment could facilitate the penetration of foreign markets if the **declining trend in greenfield investments can be reversed.**
- **Better access to finance** would improve the resilience and competitiveness of Georgian companies, especially small and medium-sized enterprises (SMEs). The banking sector is well managed and regulated, comfortably capitalised, consistently profitable and relatively efficient in channelling credit to the real sector.
- Georgia's energy sector plays a prominent role in the economy. Latest reforms have been focused on harmonisation with EU regulation, including the ongoing **electricity-market liberalisation**.
- **Clarifying the regulatory framework for renewables**, in particular non-hydro technologies, would be conducive to further investment. Georgia is in a prime position to take advantage of the long-term business opportunities offered by decarbonisation.

Today, increasingly private companies are pledging to contribute to stop climate change by reducing their own greenhouse-gas emissions (GHGs).

The challenge is mainly for two types of enterprises:

- **Organizations that aim to achieve net-zero emissions**, which means removing as much greenhouse gas from the air as they put into it.
- **Organisations that would use carbon credits to offset emissions** they can't get rid of by other means.

2. ECONOMIC GROWTH AND THE PRIVATE SECTOR INVOLVEMENT

Georgia needs steadily solid economic growth to catch up with its European peers and increase real incomes.

The Covid-19 pandemic has temporarily stopped the convergence process. Strong business environment reform efforts over the past 15 years have lifted the potential growth rate of Georgian economy.

However, the increased openness of the economy makes it more susceptible to adverse external shocks, such as the global financial crisis in 2008 and the Covid-19 pandemic in 2020. While its openness also puts Georgia in a better position to benefit from the recovery in global demand, the economy's high dependence on tourism adds uncertainty to the speed of its recovery.

Stronger economic growth is needed to close the prosperity gap and rectify regional imbalances.

Georgia is a small and fast-growing economy hamstrung by its very low level of development at the start of its transition. Despite tripling income per capita since then, it still has much to do to catch up with more advanced economies, such as the EU Member States.

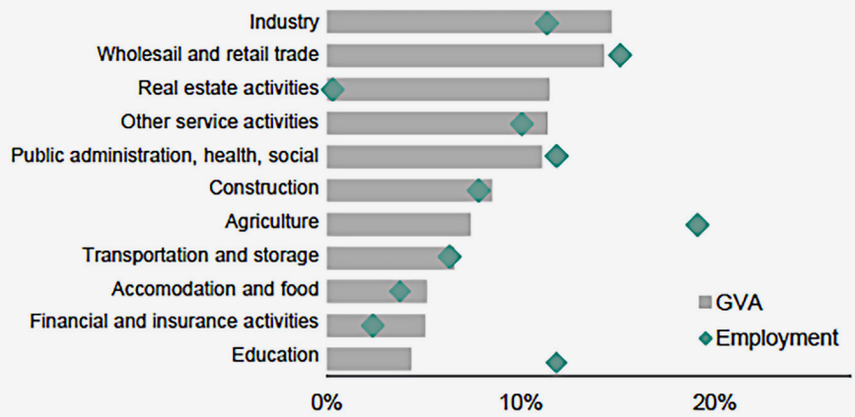
Georgia's economy and growth model are relatively diversified and service oriented.

Georgia remained closely linked to Russia, both economically and politically, after the collapse of the Soviet Union in 1991, but **adopted a more liberal course** after the November 2003 'Rose Revolution'.

Reductions in taxes and regulation and **new trade links** with Turkey and the EU have been used to boost inward investment, especially into **transport, communication, finance, tourism, and energy** (including hydropower) to reduce reliance on Russian oil and gas.

Services comprise around 70% of GDP, with tourism growing rapidly to match industry's GDP share at 23.5% in 2015.

Agriculture has benefited from reform and, with forestry and fishing, **still accounts for around 8% of GDP**.



Source: *National Statistics Office of Georgia, National Bank of Georgia (NBG)*

Agriculture's dominant role in employment and modest contribution to Gross Value Added (GVA) indicate a **high dependence on subsistence farming** and a **lack of job opportunities**

Industry was traditionally clustered in the Tbilisi, Rustavi, and Kutaisi regions. Abkhazia, while conflict-damaged, remains industrially important, its Inguri dam and generator complex being the main domestic power source.

Turkey has overtaken Russia as the leading inward investor and source of imports, with Russia and Azerbaijan still taking most exports.

The Baku-Tbilisi-Ceyhan (BTC) oil pipeline, linking Azerbaijan's main oil terminal to Turkey's Mediterranean refineries, has from 2006 increased energy security and yielded significant transit fees, while Azerbaijani gas supplies flow down the Baku-Tbilisi-Erzurum (BTE) pipeline. A turnaround into energy export is central to reducing the current account deficit.

The EU also takes around 30% of Georgian exports after signing an Association Agreement, including a Deep and Comprehensive Free Trade Area (DCFTA) pact in 2014.

On the **production** side, **growth is fairly diversified**, though the importance of industry has been waning while the contribution of services, including domestic trade, has been on the rise

Dependence on foreign financing reduces Georgia's resilience to adverse shocks

Georgia investment-to-GDP ratio is one of the highest of the developing economies and most investments originate in the private sector.

Foreign Direct Investment (FDI) inflows as a share of GDP have remained high (6-12% of GDP) for most of the past 12 years, confirming that the **business environment is conducive to investment**.

Since Georgia adopted the Estonian corporate tax model in 2017, the composition of FDI has shifted somewhat from new equity investment to reinvested earnings.

FDI inflows are quite diversified, with most going to higher value-added sectors, such as **transport, communications, finance, energy, manufacturing, construction and real estate.**

Although **Q1 GDP growth was estimated at 14.4% y/y**, full-year 2022 prospects have worsened due to the war between (and consequent recessions in) Russia and Ukraine.

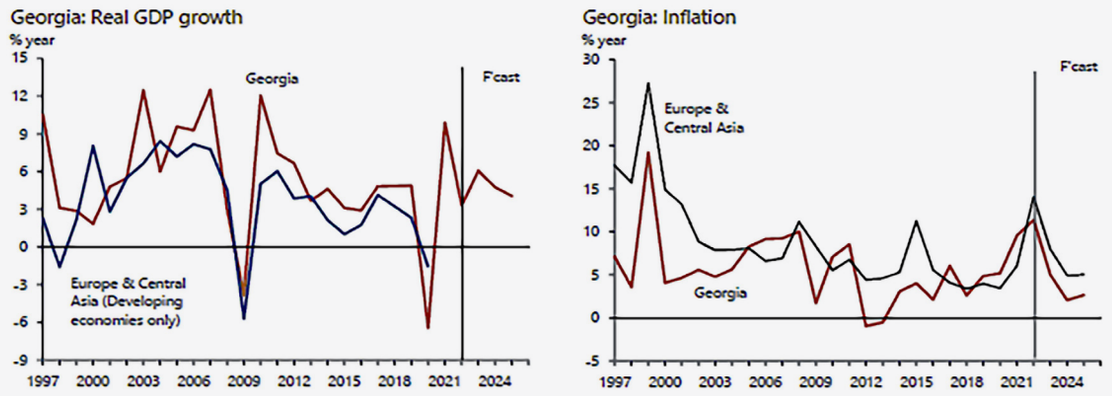
Georgia's **inflation rose to almost 10% in 2021** amid trade disruption and deficit spending during the pandemic and is set to be pushed above 11% this year by food and fuel price hikes.

GDP growth is dropping towards 3%, reflecting last year's unexpectedly strong rebound as well as sharp fiscal tightening and the fall in export growth and Foreign Direct Investment (FDI).

The outlook improves significantly in 2023-25, with inflation dropping steadily and GDP growth rebounding to 6% next year, staying close to 5% in 2024. However, current account deficits throughout the period are wider than previously forecast, and GEL exchange rates are correspondingly weaker, though still appreciating gently against the US dollar from 2023 as inflation subsides.

GDP growth was always expected to slacken after the rebound in 2021 as pandemic restrictions eased, but its downward trajectory has been worsened by Russia's return to a more aggressive foreign policy. A growth acceleration is possible in 2023 if the conflict abates, and a shallower slowdown in 2023-24 would keep the medium-term growth rate above 4%.

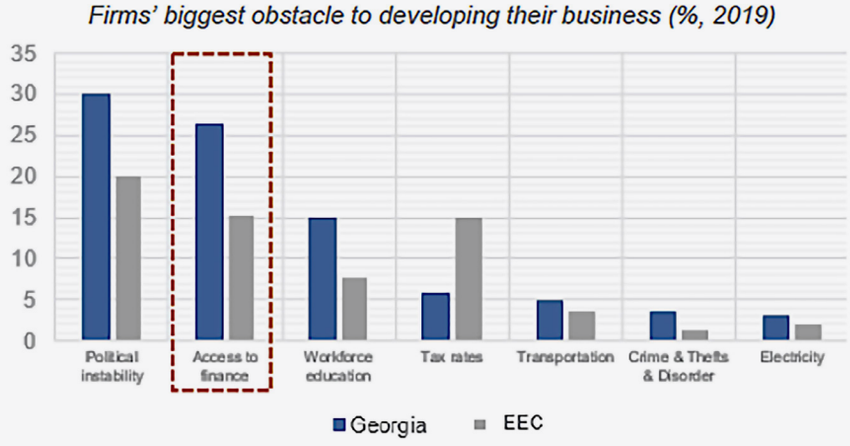
Inflation has sharply risen over the past year, reaching 12.8%y/y in April. This forced further monetary tightening in Q1 – the National Bank's half-point increase to the refinancing rate in March took it to 11%, the highest since the global financial crisis in 2008. The Bank was reacting to an inflation spike already worse than in 2015, the last time a Russia-Ukraine conflict caused a global surge in energy prices.



Source: *Oxford Economics/World Bank*

Despite this good performance compared with other Eastern partnership countries, access to finance remains a chronic problem for Georgian SMEs. Financial literacy levels are still limited compared to OECD countries, and the enforcement of creditors' rights can be improved. The promotion of greater competitiveness in the banking sector is also necessary to facilitate more sustainable access to finance for SMEs.

Firms in Georgia consider access to finance to be the second-largest obstacle to doing business.



Internal funds are the dominant way of financing company operations and investments, followed by a far smaller share of bank loans. Credit constraints limit firms' propensity to invest, potentially impeding their growth prospects. Aggregate SME demand for loans in Georgia remains high, though lower than the average of the EEC region. Nearly half of firms need a loan, while only one in three manages to get one, with the rest either rejected or discouraged from applying.

The country's comparably lower share of credit-constrained firms but higher rejection rate suggests more stringent risk assessment and credit terms. However, the easing of credit constraints should not come at the expense of high prudential standards, which contribute to the stability of the banking system.

Georgia Bank Lending Rate was reported at 12.620% pa in Mar 2022.

UNIT	LAST	PREVIOUS	MIN	MAX
% p.a.	12.620 Mar 2022	12.820 Feb 2022	10.110 Dec 2019	25.250 Jan 2009

The average interest rate charged to SMEs in Georgia is high by OECD standards but has declined since 2009-2010. At the same time, collateral requirements remain high.

The effects of high collateral requirements are further exacerbated by the relatively low acceptance of movable collateral. Loan dollarization also continues to be high, which still makes a lot of challenges for local companies.

Firstly, because the interest rate on local currency is expensive even without naming other problematic aspects and secondly, because of extremely unstable exchange rate the formal 2.5 times cheaper foreign currency loan could end with more problems even then the loan in local currency.

Aa alternative sources of SME financing, before pandemic crisis, there were approximately 70 micro-finance organisations registered in Georgia and supervised by the National Bank. Since 2010, microfinance lending to SMEs has grown steadily. The main clients of microfinance institutions in Georgia are non-bankable micro and small enterprises. In addition, the volume of loans to individuals is almost 50 times the volume of loans to legal entities.

Georgia's capital markets legal and regulatory framework has been strengthened by various reforms of late. Legislation has also been adopted to establish mandatory private pension and investment funds, which should support the development of a local institutional investor base.

The corporate bond segment is still underdeveloped, and bank lending is effectively the main source of funding for the corporate sector, especially for SMEs.

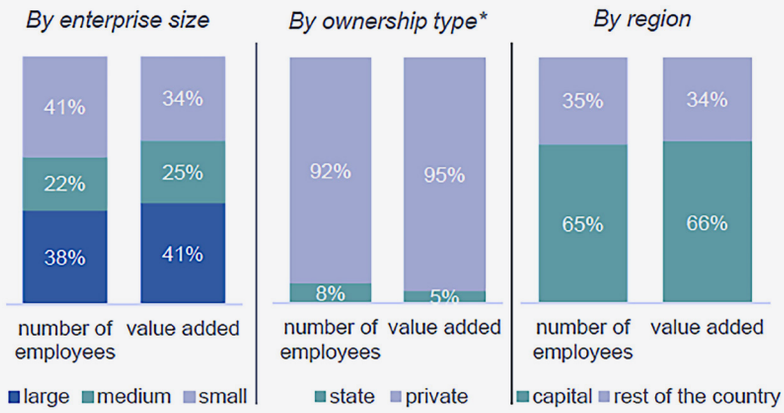
A small number of Georgian companies have chosen to list on international stock exchanges rather than the GSE, where liquidity is negligible.

Georgia's capital-market infrastructure is fragmented, with separate infrastructural entities for corporate and government securities.

A shared strategic vision and greater coordination among key stakeholders are needed for the further development of capital markets.

The private sector dominates, characterised by a strong entrepreneurial spirit, but lags when it comes to digitalization.

Georgia's **economy is dominated by the private sector** and its value creation is highly concentrated in the capital, Tbilisi.



Source: Portulans Institute (2020); WIPO (2020); PwC (2020a); National Statistics Office of Georgia; World Development Indicators
**Note: Business survey, employment data by ownership, 23% are employed in the public sector (PwC, 2020b)*

According to the **Georgian National Statistics office**: **small businesses** are considered as those **with less than 50 employees** and/or **up to 12 million GEL annual turnover**; **medium size business** employ from **50 to 250 persons** and/or have a **turnover between 12 and 60 million GEL**; business with **more than 250 employees** and turnover **over 60 million GEL represents the big scale business**.

DEFINITION OF SMALL BUSINESSES

CRITERIA	SMALL ENTERPRISE	MEDIUM ENTERPRISE	LARGE ENTERPRISE
# of Employees	≤ 50	51 - 249	≥ 250
Turnover	≤ GEL 12 million (EUR 3.3 million)	GEL 12 – 60 million (EUR 3.3 – 16.4 million)	≥ GEL 60 million

According to the **Law on the Georgian National Investment Agency**, the SME definition is based on employment size and turnover customized to Georgia's specificities and is used for the compilation of official statistics on the SME sector. **Medium enterprises employ up to 100 persons annually** and have a **turnover up to GEL 1,500,000** annually. **Small enterprises employ up to 20 persons annually** and have an **annual turnover up to GEL 500,000**.

DEFINITION OF SMES

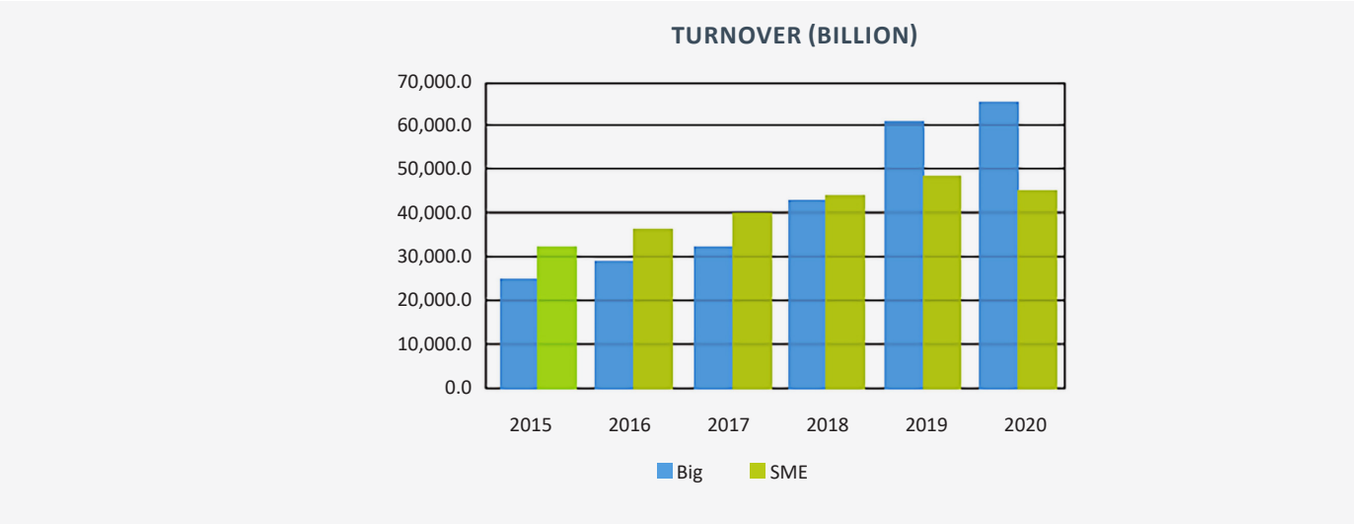
TYPE	EMPLOYMENT	TURNOVER
Small	Up to 20 employees per year	Up to 500,000.0 GEL per fiscal year
Medium	Up to 100 employees per year	Up to GEL 1, 500,000.00 per fiscal year

TYPE	TOTAL GROSS INCOME
Micro	Up to GEL 30,000.00
Small	Up to GEL 100,000.00

The **Georgian Tax Code**, which has been in force since January 2011, **provides a different definition for small enterprises and also sets out the criteria for micro businesses**. **This definition is used for taxation purposes only** and was introduced to allow the provision of preferential treatment for small and micro businesses.

According to the Georgian Tax Code, **small enterprise status** is granted to entrepreneurs (natural persons), whose **gross income** from their economic activity during a calendar year **does not exceed GEL 100,000**. The status of **micro business** – to entrepreneurs (natural persons), who does not use hired labour, conduct economic activity independently and h**ave an annual gross receivable up to GEL 30,000**.

Small businesses are taxed either at 3% or 5% of their taxable income. The taxable income of small businesses is taxed at 5%. The 3% rate of income tax applies if the entrepreneur can prove that his/her costs incurred (except for the cost of salary paid to employees) amounts to 60% of the gross income. **Micro businesses are exempted from income tax**. The main purpose of introducing the micro and small business status and preferential tax treatment was two/fold: facilitation of registration of such businesses and reduction of the tax burden. According to Revenue Service statistics, after introduction of new Tax Code, 83,231 micro and small enterprises have been registered, out of which 39,470 are micro and 43,761 small. **According to the Tax code of Georgia, businesses turnover not exceeding GEL 100,000 per annum are exempt from VAT**. In addition, the supply of primary agricultural products is not subject to VAT.



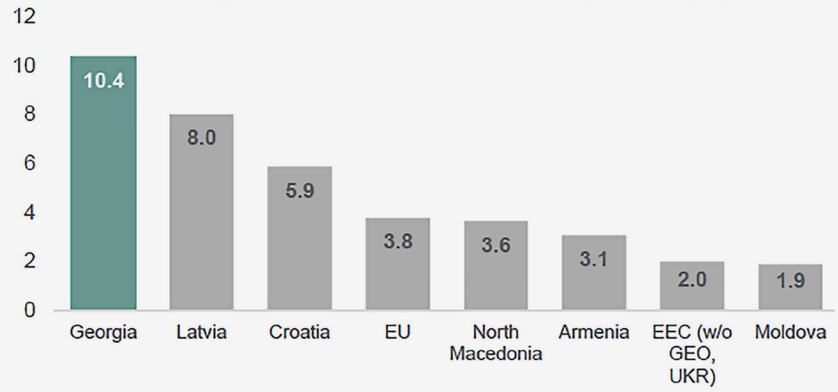
Certain businesses defined by the government are rated with taxes rate. However, should be noted that according to the size of the local economy, these numbers could be exaggerated. For instance, if **in the USA or Germany, a company with employers' number of 45 persons could be counted as a small business, in Georgia such companies are rarely defined as "small"**.

Because of such segmentation, **the total majority of active companies in Georgia representing the SME sector is 99.8%**, while **the number of active big companies is only 300**.

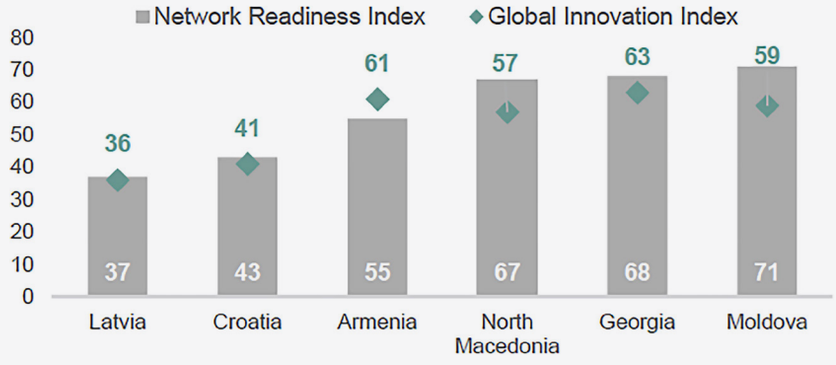
Despite the financing gap of 18% of GDP (*SME Finance Forum, 2021*) and other types of challenges faced by **SME sector in Georgia**, they **still have significant impact on Georgian economy** and **represent 41% of total turnover**, **58% of employment**, **59% of value added** and **58% of total output**. This does not yet add the inclusiveness and diversification they provide to local economy, which can never be achieved by big companies.

It is important to note that even the country's good business environment is matched by a **strong entrepreneurial spirit**, it has relatively **low digital preparedness** and lags on innovation, ranking out of 131 on Network Readiness Index and 134 on Global Innovation Index countries.

Number of newly registered LLCs per 1,000 working-age people, 2018



Rank out of 131 (Network Readiness Index) and 134 (Global Innovation Index) countries, 2020



While overall labour productivity is growing gradually, a **large proportion of employment** is concentrated in **traditional sectors with low productivity**.

This could suggest that the Georgian economy has **limited ability to create highly skilled jobs** in more productive sectors or lacks the skills needed for higher-value-added jobs. The activity rate is higher among men and in urban areas.

Employment rates and economic activity in 2020 were considerably higher in rural than in urban areas. Such results are influenced by large-scale self-employment outside of the capital, in large part through subsistence farming activities. Women tend to have lower unemployment rates, but are also significantly less active in the labour market.

Unemployment has increased since the outbreak of Covid-19. **Informal employment remains stubbornly high**, accounting for slightly over one-third of employees in the non-agricultural sectors.

Result: **labour-force skills do not match the evolving needs of businesses**.

A rapidly growing share of Georgian firms reports poor labour-force skills as one of the main constraints on business, likely reflecting the evolving needs of companies in the wake of Georgia's economic development.

Our **Private Sector SWOT analysis** helps to identify a limited number of key development needs and potentials, on which regional policy of Georgia is to concentrate in coming years.

A further introduction of the best European practice offers the possibility, in case of implementation of further reforms and administrative potential is built, to extend the scope and magnitude of development activities important for achieving modern regional development policy goals.

STRENGTHS	WEAKNESSES
• Favorable business environment • Simplified administrative procedures • Easy procedures for starting a business • Advisory and consultancy services for SMEs • Low tax burden and preferential tax regime for micro and small businesses • Easy and low-cost access to regional and international markets • Liberal foreign trade regimes: Deep and Comprehensive Free Trade Area (DCFTA) with the EU and FTAs with SIC countries and Turkey, GSP with USA, Canada, Switzerland, and Norway • Existence of SMEs supportive institutions • Governmental programmes for SMEs promotion • Foreign language skills among young population	• Lack of business skills and business experience • Low level of competitiveness • Low productivity • Low level of innovation and R&D and insufficient collaboration between public R&D institutions and SMEs • Limited capacities for technology absorption • Insufficient level of human resources • Lack of knowledge on foreign markets • Low capacity for export and internationalization • High costs for new technologies/manufacturing equipment • High cost for consultancy services for SMEs • Difficulties in closing business
OPPORTUNITIES	**THREATS**
• Increased access to finance • Well-developed alternative financing • Effective utilization of DCFTA - opportunities for export diversification • Support to SMEs in adaptation of DCFTA requirements • Existence of strong and well-functioning public institution in charge of implementation of DCFTA requirements • Labour market demand-oriented VET system • Diversification of production • Enhancement of international cooperation and internationalization of SMEs • Well-developed advisory and consulting services • Increased innovation capacities and technology absorption potential • Establishment of modern entrepreneurial culture • Development of lifelong entrepreneurial learning • Integration in European Enterprise network - trade links with EU based companies • Target oriented support to SME-by-SME institution • Increased involvement of SME sector in policy elaboration process	• Possible external economic factors (financial crisis, decrease of demand on international markets, etc.) • Possible downturn of economy • Political uncertainty • Low investment in SME sector • Insufficient export capabilities • Low capabilities of SMEs in terms of international competition • Insufficient knowledge of DCFTA requirements and low level of adaptation • Insufficient participation of SMEs in business educational programmes • Insufficient knowledge of export market requirements

Advancing the green transition and ensuring energy sector sustainability

By signing the Association Agreement with the EU and joining the Energy Community, Georgia has committed to transforming its energy sector in compliance with the bloc's 3rd Energy Package.

Georgia has been making significant efforts to harmonize its legislation with that of the EU, increase market access between the EU and Georgia, promote free and competitive trade in the electricity and natural gas markets and comply with security-of-supply requirements.

The country adopted a **new energy law**, followed by the Electricity Market Model Concept, in 2020. The document reflects the government's vision of the general structure, arrangements for and functioning of the Georgian electricity market, sets out its future structure and describes the rights and responsibilities of market participants. It lays out the **guiding principles** for the organisation and functioning of a wholesale electricity market in Georgia, thus helping to meet the country's obligations under the Energy Community Treaty, and aims to **establish an attractive environment for investors** by developing competitive and transparent electricity markets (Government of Georgia, 2020).

3. INSTITUTIONAL SETUP

Georgia is a semi-presidential republic with the President as the head of state. The President appoints the Prime Minister, who serves as the head of government and heads the Cabinet of Ministers. The President and the Cabinet ministries form the executive branch of power in Georgia, charged with conducting domestic and foreign policy. The Georgian Parliament is the supreme legislative authority and checks government activity according to the Constitution.

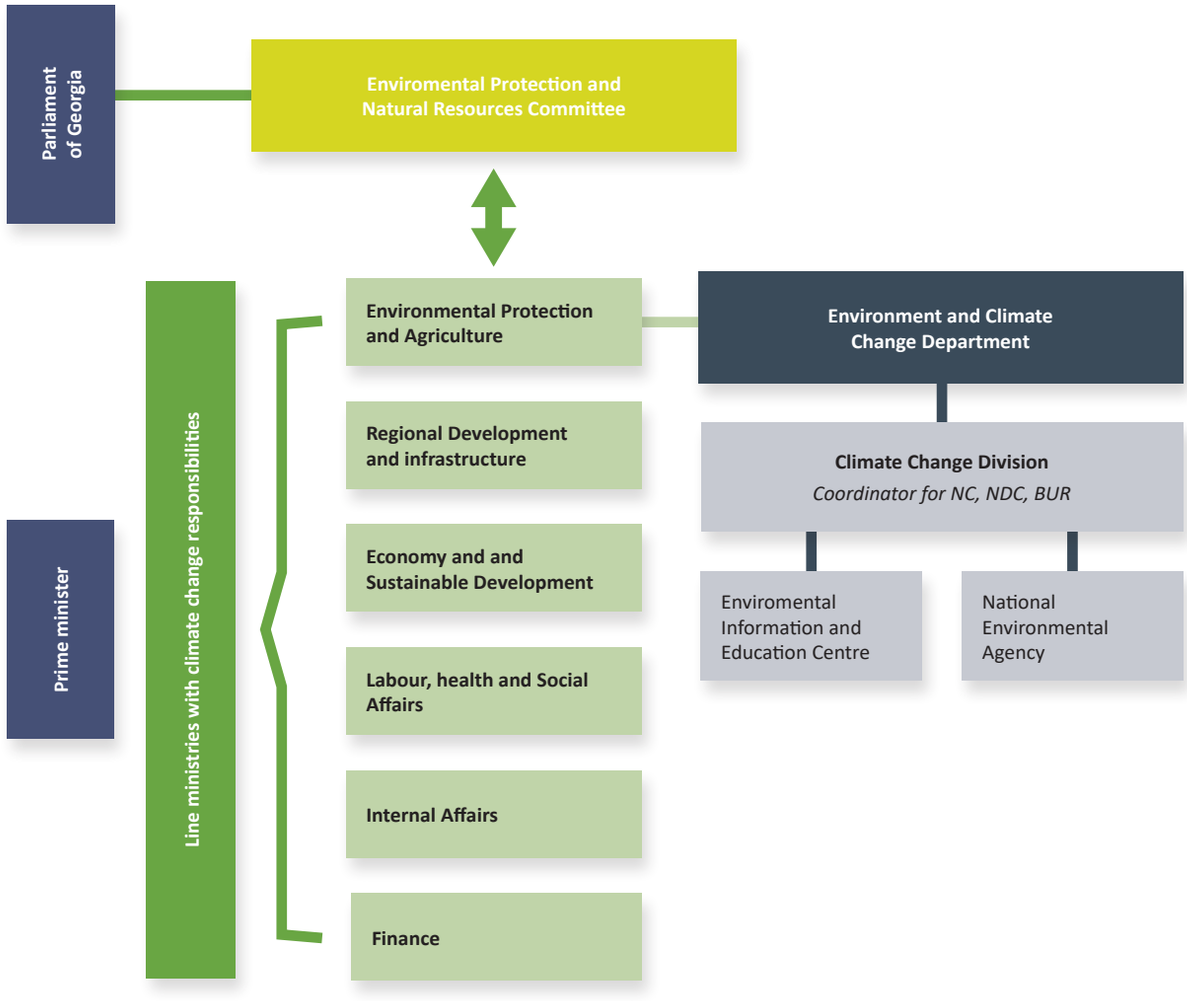
Until the first quarter of 2018, the GoG contained 14 ministries, with the Ministry of Environment and Natural Resources Protection (MoENRP) as the primary institution responsible for implementing UNFCCC and Kyoto targets as well as overall climate change legislation, policy and strategy through the coordination with key line ministries and entities.

The Prime Minister of Georgia announced a governmental reshuffling at the end of 2017 with the GoG condensing to 11 ministries.

MoENRP has now merged with the Ministry of Agriculture to become the Ministry of Environment Protection and Agriculture (MoEPA), which absorbs MoENRP's previous climate-related responsibilities.

The new MoEPA consists of structural subdivisions, territorial authorities, state sub-agencies, and public state-directed legal entities.

The Environment and Climate Change Department within **MoEPA houses the Climate Change Division (CCD),** who handles coordinating national-level climate mitigation and adaptation measures, directives from multilateral environmental agreements and developing the climate change chapter in National Environmental Action Plans (NEAP).



The CCD continues coordination for the preparation of major climate-related Georgian outputs to the UNFCCC, including NCs, NDCs and BURs, and the development of Georgia's Climate Action Plan 2021-2030 along external stakeholders.

The National Environmental Agency (NEA), another state-directed legal entity, disseminates warnings of expected natural disasters or cases of extreme environmental pollution and works with the CCD to implement long-term adaptation measures.

Other ministries contributing to climate-related projects are as follows:

- Ministry of Economy and Sustainable Development **(MoESD).**
- Ministry of Labor, Health and Social Affairs **(MoLHSA).**
- Ministry of Regional Development and Infrastructure **(MoRDI):** MoRDI implements infrastructure projects with long-term benefits for communities, including the national waste management system.
- Ministry of Internal Affairs **(MoIA**): MoIA oversees policy and law enforcement in Georgia.
- Ministry of Finance **(MoF):** MoF prepares the annual fiscal budget to reflect the main priorities of economic development of the country.

PART 2

Assessment of the NDC from the Private Sector perspective

4. BACKGROUND OF GEORGIAN NDC

Georgia's GHG emissions decreased by 72% (nearly 13 Mio t CO2eq) between 1990 and 1995.

The lowest value has been reported for 2001 with 9,6 Mio t CO2eq, since then emissions have increased to 17,8 Mio t CO2eq. in 2017.

This is also caused by a **strong increase of GDP** (+56% between 2010 and 2017), **dominated by the service sector.** The increased economic activity in connection to a decrease in population by 16%, the GDP per capita shows a remarkable increase of 86%, while GHG per GDP dropped by 39%.

Georgia is fully committed to an unconditional limiting target of 35% below 1990 level of its domestic total greenhouse gas emissions by 2030.

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.

	SUB-MISSION DATE	TIME FRAME	COVERAGE	TYPE	OBJECTIVE	MITIGATION TARGET (BASE YEAR)	OTHER TARGETS	ADAPTATION
INDC	8 May 2017	2021-2030	all gases excl. LU- LUCF economy wide	condi-tional	25% reduction below BAU scenario = -40% compared to 1990 levels	-40% (1990)	conditional and unconditional target for forests	information included
				uncon-ditional	15% reduction below BAU scenario	-32% (1990)[1]		
Upda-ted NDC	5 May 2021	2021-2030	all gases excl LU- LUCF economy wide	condi-tional	-50-57% of its total green- house gas emissions by 2030 compared to 1990	-53% (1990)[2]	sectoral goals	adaptation measures included
				uncon-ditional	35 % below 1990 level of its domestic total greenhouse gas emissions by 2030	-35% (1990)		

(1) This value has as such not been presented in the NDC but has been calculated based on the information provided in the NDC.
(2) The INDC presents the targets as a range from -50 to -57%.
(3) The INDC presents the targets as a range from -64 to -67%.

The updated **Nationally Determined Contribution (NDC)** of Georgia sets Climate Action Plan for the determination of mitigation measures contributing unconditional and conditional mitigation targets achievement. Georgia has determined the next decade, between 1st January 2021 and 31st December 2030, to be the timeframe for the implementation of the country's Nationally Determined Contribution.

The CSAP defines the following sectoral target, which are also included in the NDC:

- Transport: 15% below reference level by 2030
- Buildings: encourage application of energy efficient technologies and services
- Energy generation and transmission: 15% below reference level by 2030
- Agriculture: encourage climate smart agriculture and agritourism
- Industry: 5% reduction compared to reference scenario
- Waste: encourage climate-friendly innovative technologies and services through effective implementation of separation practice and principles of circular economy
- Forestry: increase the carbon capturing capacity through the forestry sector by 10% compared to 2015 level energy generation and transmission

Georgia is also committed to study its adaptive capacity to climate change by mobilizing domestic and international resources **for the sectors particularly vulnerable to climate change**.

From the Private Sector perspective, the NDC – as mentioned in Part 1 – consider that the **service sector** is **dominant** in the Georgian economy and its share is **68% in total economic activities**.

The shares of **industry** and **agriculture** in the total economic activities are approximately **24%** and **8%**, respectively (source: National Statistics Office of Georgia).

5. GENERAL BACKGROUND ANALYSIS OF COUNTRY NDCS IN THE WORLD

The Paris Agreement is the biggest success in global climate policy thus far.

As indicated by UNFCCC, with the adoption of the Paris Agreement, governments established climate ambition on a transformational scale by setting a goal of limiting global warming to

well below 2°C and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels.

As we know, the **framework** that is supposed **to translate this ambition** into reality is the **Nationally Determined Contribution (NDC),** where each government is asked to pledge a target to reduce emissions and to increase its ambitions over time.

Unfortunately, **the concept of NDCs today still has significant shortcomings**. The understanding of them will help having a **constructive approach in evaluating the Georgian** one.

For example (on global basis):

- **NDCs are not formulated in a consistent or easily comparable way.**

  There are differences in terms of how emission reductions are measured (absolute or emissions-intensive reductions); in terms of the baseline year against which reductions are measured; whether the NDC is economy-wide or sector-specific; and whether it covers all GHGs or just carbon dioxide (CO2).

  This makes it difficult to take stock globally of progress towards the Paris targets. It also makes it difficult to understand how voluntary offset markets might eventually dock into international accounting and transparency systems under the Paris Agreement.

- **Many NDCs have two or more ambition levels**

  One level that the government pledges to fulfil on its own (referred to as 'unconditional targets'), and another with a higher ambition level if additional international climate financing is provided (referred to as 'conditional targets').

  The consequences are unclear: can international financing only come in after the government has fulfilled its own NDC target? If not, **what is the appropriate way to account impact between the fulfillment of unconditional and conditional targets?**

- **NDCs are neither legally binding nor enforceable.**

  While the Paris Agreement encourages Parties to increase their climate ambition when they update their NDCs every five years, a government can opt to adjust its NDC upwards or downwards without facing any major retributive consequences.

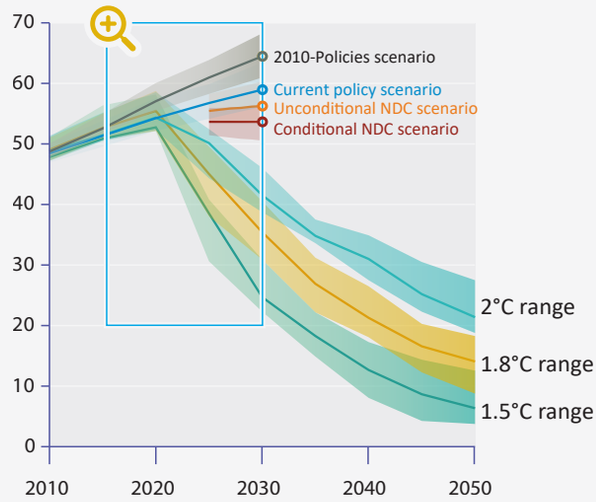
- **NDCs are not implemented consistently.**

  Some governments have started to implement secondary binding domestic legislation to achieve emission reductions. Others have not done so, and some have even enacted policies that are fundamentally at odds with their own NDC pledges.

  A 2018 report *(Nachmany and Mangan)* comparing NDC targets with domestic legislation showed that out of the 157 Parties who submitted economy-wide targets in their NDCs, only 58 adopted economy-wide targets in their domestic laws, with only 17 of these Parties showing domestic targets consistent with the targets set in their NDCs.

These shortcomings point to the difficulties of relying solely on governments to set ambitious NDC targets backed by credible climate policies and action.

The UN Emissions Gap report (2020) clearly shows that we are not on track to achieve the Paris Agreement targets, even with the conditional pledges of NDCs, as shown in the graph below.



6. HOW SHOULD THE GEORGIAN PRIVATE SECTOR STEP UP CLIMATE ACTION? MAIN TAKEAWAYS FROM GEORGIAN NDC ASSESSMENT AND LINKED POLICIES/PLANS

"*Georgia's ambitious goals to develop a low-emission economy and promote climate-smart technologies are reinforced by our climate commitments under the Paris Agreement, the Association Agreement with the European Union, and other international treaties…* ***access to carbon markets will help Georgia implement its climate agenda*** *and move forward to building a climate-resilient society*". Solomon Pavliashvili, Deputy Minister of Environmental Protection and Agriculture on Sept 27th, 2022, at Global Carbon Market, Tbilisi.

*"**Swapping carbon credits** is a win-win idea that limits carbon emissions and **brings much-needed financing** to countries like Georgia to help in their green transition,"* noted Nick Beresford, UNDP Resident Representative in Georgia. *"I am grateful to Switzerland and Japan for being the pioneers in Georgia under the Ministry of Environment's leadership. We now need to put this great idea into action"* (earlier in 2021 and 2022, Georgia signed bilateral agreements with Switzerland and Japan that will allow carbon trading once Georgia is ready to activate this mechanism. The carbon trade revenues will provide Georgia with additional funding for sustainable and climate-smart development).

Georgia's prospects in the Global Carbon Market are currently the **focus of carbon trade impacts on reducing emissions** and achieving green development, steps needed to access the market, and the **engagement of the public and private sectors.**

I could not have a better starting point for this analysis, since there is no way to implement the NDC if the Private Sector will not have interest for doing it.

Leadership by the private sector is imperative to keep global warming from overshooting the 1.5°C climate target of the Paris Agreement. A shift to climate-friendly business practices from Private Sector is necessary and transformational.

Every single industry sector will be affected, and Georgian enterprises (as we have seen mostly SMEs) who adapt will see great business opportunities while those who lag behind will be at risk.

The private sector in Georgia can and should play a key role in accelerating global decarbonisation efforts. It can be part of the solution in several ways: by going beyond current policy mandates to reduce emissions across companies' global operations and value chains, and by deploying capital to support emission reductions outside of these value chains.

However, **private sector climate action remains timid**. **Why?** There are a number of reasons.

Low-carbon technology often faces an incremental cost disadvantage. Increasing low-carbon investment will require that these barriers be addressed so as to bring perceived or real project risk down to levels that can be mitigated by the market. Which market? Carbon Markets? Carbon Pricing?

The private sector will invest where it receives an adequate return for the risk it bears in the underlying project activity. This risk is a function of myriad factors—perceived investment climate, policy stability, pricing signals, to name a few.

- Many of these risks can be mitigated by the market; however, if there is a gap in financing or if the cost of mitigation becomes too high, the private sector will not invest.
- A **carbon price and sustained carbon markets** will provide the revenue enhancements that some emissions reducing projects need in order to generate the returns required to compensate the private sector for the risks involved.
- In the absence of such a price and market, judicious use of public financing will be required to catalyze private sector investment.

The **voluntary carbon markets** can play a crucial role in Georgia in channeling private finance into transformational carbon projects, whose environmental and social impacts can be clearly measured and traced.

These are the expectations and the open objectives of the GoG effort in implementing the famous Article 6 of Paris Agreement in co-operation with foreign countries (e.g. Japan, Switzerland)

There are three main challenges for unlocking Private Sector participation:

1. For carbon credit suppliers, **the lack of a forward demand curve for carbon credits**, which would provide suppliers with a signal to invest in new projects to meet that future demand, **is a problem**.
2. The second challenge is the **persistently low market price for carbon credits**, which is caused by a surplus of carbon credits available **in the voluntary market**, and which undermines the business case for investing in new and high-quality projects to achieve an appropriate rate of return.

   Internationally, the cost of emitting greenhouse gases (GHGs) – in other words, the price of carbon, set by governments – is still too low. At around USD 5–10/ton, the price of carbon does not accurately reflect the true cost of the damage it incurs, in terms of harm to the environment, health and society (*source: World Bank*). One ton of carbon needs to be priced at more than USD 100 to correctly reflect its true cost (*Stiglitz and Stern, 2017*).

   What does it mean of the Georgian Private Sector interested in Mitigation projects investments? The low price on carbon (which allows companies to emit at a low cost), means that green projects do not attract enough investment finance because the rate of return is too low. If the carbon credits these projects generate cannot be sold at more than USD 10/credit, then investors (both international financial institutions and local banks) are not interested in investing in these projects.

   The business case to support decarbonisation efforts in, for example, the agricultural sector, or carbon capture, utilisation, and storage, is not there when the carbon credit price is low.
3. On the carbon credit demand-side, **many companies in Georgia are currently unfamiliar with how the voluntary carbon market works** and how it can play a role in meeting net zero targets. Industry bodies such as the International Carbon Reduction and Offset Alliance (ICROA), reporting standards such as the Science-Based Targets Initiative (SBTi), and initiatives such as the Taskforce on Scaling the Voluntary Carbon Markets, can help to provide clarity and guidance for companies that are financing voluntary carbon projects, on their way to meeting corporate targets.

The **role of the private sector in ramping up climate finance is absolutely essential**, particularly in light of the highly insufficient action by governments to implement the Paris Agreement.

In designing energy and sustainable development strategy, Georgian policy makers often focused on the role of larger companies and banks in financing and implementation.

They should consider more explicitly the role of SMEs in delivering national targets. These targets should include those related to both **energy efficiency** and **wider resource efficiency**:

- **Better consideration of SMEs in the development of green financing frameworks**
  It is not clear to what extent smaller SMEs have been considered during development of the National Energy Efficiency Action Plan (NEEAP) and now the draft LT-LEDS.
- **Understanding the role of SMEs in delivering national policies and targets**.
  Georgia is committed to delivering its climate and sustainable development goals through a range of public and private strategies. For these types of programmes, SMEs and their participation should be an explicit consideration.
- **Better estimates of SME financing requirements as part of the green transition.**
  More robust estimates are required that downscale the national estimates of climate finance set out as consequence of the NDC. These would show what percentage of finance is likely to be required by public vs. private actors, and by SMEs.
  This would be particularly important for priority thematic areas such as energy efficiency, buildings upgrade and small-scale renewable energy.

Green and sustainable investment is not efficiently viable while Georgian SMEs experience wider challenges in accessing finance.

Georgian SMEs will need to invest in and modernize their businesses to improve competitiveness.

The recommendations for the **Private Sector Development** strategy include five priority actions:

- **Amend the legal framework on public grants**
  Georgia needs to amend the laws regulating the provision of public grants.
  Amending the Law on Grants (PoG,1996) is a prerequisite for the design of effective SME support policies implemented by EDA/Enterprise Georgia, GITA and other institutions that aim at providing financial assistance to companies struggling to access bank lending in Georgia.
- **Improve SME banking capacity**
  Georgia should **improve the capacity of its banking sector to serve SMEs better**.
  With particular emphasis on Green Lending, the GoG should partner with key stakeholders such as the National Bank of Georgia and the Association of Banks of Georgia to develop country-wide capacity-building programmes for SME banking.
- **Promote financial education targeting SME entrepreneurs**
  Georgia could put in place financial education initiatives to **improve entrepreneurs' financial skills**.
  SMEs need greater knowledge of the financial products available in the market, as well as how to produce credible business plans and sound financial statements for loan applications.
  Enterprise Georgia has taken some positive steps already. Further support could be organised through regional Chambers of Commerce and possibly with the participation of the National Bank of Georgia and the Association of Banks.
- **Expand credit guarantee schemes as a risk-sharing mechanism between lenders (banks), borrowers (SMEs) and a guarantor (the state or a private entity).**
  The GoG introduced a new credit guarantee scheme (CGS) to promote SMEs' financial inclusion and address difficult collateral requirements. The budget for this scheme is rather modest, and the scheme can be further adjusted and expanded.
  A CGS effectively creates market-based incentives for banks to lend more to Private Sector.
- **Improve alternative non-bank and equity financing for SMEs**.

The venture capital environment in Georgia should be further strengthened to **foster improved access to capital for private and promising businesses**. A fund would act as a catalyst for private capital and to match early investment in SMEs with high-growth potential.

Public sector involvement could phase out as private markets mature. The government could also promote alternative forms of asset-based financing. These could include leasing and factoring (i.e. the sale of accounts receivable to a third party). In addition, it could promote awareness of investment opportunities, and support establishment of a network of business angels to provide expertise and capital through dedicated events.

Potential Sources of Donor Funds and Donor Co-Financing Assessment include EU funding for the jointly prioritized areas such as balanced territorial development, green and health. Potential funding opportunities at a regional level can be explored in areas such as access to finance, digital, and green.

As part of the Green Cities Programme supported by the Green Climate Fund (GCF), funding can be provided to support technical assistance and investments in municipal infrastructure, transport, buildings, industries, energy, water, solid waste, and land use.

Additional support from Multi-Donor Accounts will also be explored. Potential funding sources include the Early Transition Countries (ETC) Fund and the Small Business Impact Fund (SBIF) for supporting SME development and growth. The E5P (Eastern Europe Energy Efficiency and Environment Partnership) is another potential source of grant funding for sustainable infrastructure projects in Georgia.

The level of involvement of International Organisations has been summarized below by sector and typology of contribution:

EBRD ბიზნესის სფეროები

		სექტორები									ურთიერთგადამკვეთი თემები			
		მრეწველობა, კომერცია და აგრობიზნესი					მდგრადი ინფრასტრუქტურა		საფინანსო ორგანიზაციები		სტრატეგიული ინიციატივები			
საორიენტაციო საშუალო წლიური ინვესტიციები/ გრანტები (მლნ. ევრო, 2016-2020)		აგრობიზნესი	წარმოება და სერვისები	ქონება და ტურიზმი	TMT	ბუნებრივი რესურსები	ელექტროენერგია	ინფრასტრუქტურა	საბანკო მომსახურება	არასაბანკო საფინანსო ორგანიზაციები	მწვანე ეკონომიკა	ინკლუზია და სქესი	ადგილობრივი ვაჭრობა და კაპიტალის ბაზრები	მცირე ბიზნესი
ADB *	308	€P					€P	€P	€			€P	P	
EIB	270	€					€	€	€					€
AFD **	203						€P					€P		€P
KfW	188						€P	€P				€P		
World Bank	123	€P		€P	€P			€			P	€P		
EU	120	€P	€P					€			€	€	€P	€P
USAID	47	€P						€				€	P	€P
IFC	47		€				P		€	€	P			€
AIIB	45						€	€	€P					€P
BSTDB	32						€		€					€
EBRD	300	€	€P	€P	€	P	€P	€	€	€	€P	€P	€P	€P

€ მნიშვნელოვანი ინვესტიციების სფერო

P მნიშვნელოვანი პოლიტიკური ჩართულობის სფერო

● აქცენტი უმეტესწილად კერძო სექტორზე

○ აქცენტი უმეტესწილად სახელმწიფო სექტორზე

The classification of SMEs can affect where green finance is directed within the Georgian economy, particularly by international financial institutions (IFIs).

As mentioned in Part 1, until recently, the Georgian Tax Code and the Law on National Investment Agency were used to define SMEs in Georgia and these definitions differed.

The National Statistics Office of Georgia accounted for business using a different approach. In order to streamline these definitions, in March 2017, the National Statistics Office approved a new methodology for the SME registry. This new methodology became effective in 2018.

CATEGORY	NO OF EMPLOYEES	AVERAGE ANNUAL TURNOVER (GEL)
Small	<50	<12 000 000
Medium	51-249	12-60 000 000
Large	>250	>60 000 000

For the sake of comparison, EU definition of SMEs:

CATEGORY	NO OF EMPLOYEES	ANNUAL REVENUE (EUR)	TOTAL ASSETS (EUR)
Single enterpreneur/ micro	11-50	<2 000 000	<2 000 000
Small	11-250	<10 000 000	<10 000 000
Medium	51-250	<50 000 000	<43 000 000
Large	>250	>50 000 000	>43 000 000

For example, the **Bank of Georgia uses different classification criteria**. Companies with an annual turnover of GEL 1.5 million-20 million, or a loan exposure of USD 150 000-2 000 000 qualify as small and medium-sized companies in the Bank of Georgia classification.

Given the structure of the economy, **many borrowers considered as corporate clients by local banks under the Georgian classification are considered eligible for SME under the EU/IFI definition.**

IFI credit lines tend to use international (e.g. EU) standards. As a result, **Georgian banks have lent larger amounts to smaller numbers of corporate clients (e.g. loans of USD 1 million+) rather than focusing on smaller-scale SMEs in the Georgian context.**

For what it concerns the implications and challenges of the Private Sector as fundamental element of success for the implementation of NDC (we will discuss more technically in the Chapter dedicated to CSAP assessment), we have to reinforce the message that SMEs continue to face significant barriers when seeking access to Green Finance.

We have already mentioned the general issues including the level of interest rates, the tenor and collateral requirements, etc. in Part 1.

But for what it concerns specifically **Green Finance**, we can recommend further actions to improve the terms on which SMEs can access it:

- **Exploring new green financing instruments**

  For example, concessional green instruments/funds to help widen access and improve the terms of environmental finance for SMEs in underserved market segments.

  Or offer green credit enhancement, such as blended finance with lower rates and longer tenor, or risk mitigation instruments for green lending portfolios, such as first loss and partial credit guarantees.

- **Expanding green finance distribution channels for smaller SMEs**

  Smaller SMEs struggle to access IFI-supported green finance credit.

  GoG must consider promoting green finance through other channels (e.g. microfinance) and somehow mitigate the higher cost of finance and shorter tenors.
- **Promoting concessionality**

  IFIs are committed to not distorting commercial lending markets for energy-efficiency and renewable-energy lending.

  But the **cost of finance remains an issue**.

  IFIs should encourage **differential pricing for green lending instruments**, promoting to transfer interest rate benefits to Private Sector (end borrowers) and reduce currency exposure for SME investment in energy efficiency and renewable energy.
- **Using existing institutional structures to channel funding to SMEs**

  The role of state funds or entities such as the JSC Partnership Fund, the JSC Georgian Energy Development Fund or Enterprise Georgia could be expanded to incorporate a green mandate and support redirecting financial flows towards climate and green growth agendas.

  This is especially the case in underserved sectors or companies such as SMEs.
- **Upgrade and develop the role of Enterprise Georgia (EG) to become the most useful vehicle to support the scale up of green investment in Georgia.**

  EG has an established network and platform to engage with smaller-scale companies across the country.

  The MESD and Enterprise Georgia should consider providing grants to SMEs to cover part of advisory costs to implement resource efficiency, an environmental management system or other environmental measures.

7. FINDINGS AND CONCLUSIONS

Georgia has actively begun increasing their commitment towards climate change mitigation and building capacity in environmental institutions recently, although there is still much room for further improvement.

While Georgia is clearly showing initiative in the field through establishment of their legislative trends and institutional framework, the preparation stage for establishing solid roadmaps towards meeting their NDC target is young.

Georgia's current policies scenario is underdeveloped, and it is expected that GoG's main references for achieving their NDC target will emerge soon (e.g. LT-LEDS).

Assessing Georgia's mitigation potential indicates there is an emissions reduction potential of at least 8.1 MtCO2e across the sectors by 2030. **This would allow Georgia to meet their conditional NDC commitment but not their unconditional commitment.**

In the transport sector, **modernizing the LDV fleet** to improve the emissions-intensity of passenger transport and increasing the penetration of low-emission vehicles are a **high priority**, together with an **improvement of the service and quality of the urban public transport** sector. The reduction of LDV activity and shift to public transport will also have co-benefits in decreasing air pollution (Georgia has one of the most dangerous rates of urban air pollution in the world).

The Georgian **industry** sector also carries potential to decarbonize by setting up a robust energy audit and BAT system to assess cost-effective energy efficiency projects. This system can both modernize the industry and set up the foundation for green growth into the future.

The **waste** sector has recently moved towards a model of congregating waste to large regional landfills, giving rise to the potential for methane capture and utilization projects.

Common themes inhibiting mitigation action in Georgia include an **insufficient supply of legislative regulations on emissions, domestic expertise and technology, financing opportunities and infrastructure**.

Donor funding will be needed to achieve the strategic objectives to enhance Private Sector competitiveness and strengthen international linkages. Moreover, to use concessional finance to promote support green transition, renewable energy capacity, quality infrastructure (e.g. water, wastewater, energy), cross-border connectivity, transport linkages, digital infrastructure; risk participation and capacity building advisory support to enable access to finance for underserved segments (e.g. gender, youth, local SMEs); technical assistance on equal opportunities, skills development, and reducing gender imbalances in the workforce and for policy dialogue to strengthen governance towards green transition; regulatory and legal reforms to improve business climate.

Finally, linking Georgian NDC to long-term mitigation strategies will be key in ensuring efficient use of resources, particularly crucial for responding to climate change amidst and following the COVID-19 crisis.

Co-ordinated processes for LT-LEDS and/or long-term goals and NDC render long- and short-term alignment more effective, avoiding duplication of efforts and allowing for regular exchange of information between the two.

LT-LEDS and NDC must be aligned, inter alia, in terms of institutional arrangements, systems for monitoring and assessing progress, and revisions or review cycles. A good starting point may be that of ensuring that both processes are supervised by the same lead institution.

In the context of NDC and LT-LEDS alignment, it could be useful for Georgia to establish **MRV and M&E (Measurement, Reporting and Verification (MRV) and Monitoring and Evaluation (M&E) systems)** arrangements that are **common to both the NDC and the LT-LEDS**. In addition, MRV and M&E systems that are common to both the LT-LEDS and the NDC can also result in reduced costs and streamlined institutional structures, as they can rely on common personnel, data collection and management processes.

In order to co-ordinate MRV and M&E systems of LT-LEDS and NDCs, it could be useful to **identify key indicators that are common to both** the NDC and the LT-LEDS.

Georgia is actively **pursuing a strategy of implementation of Article 6 P.A. with some countries.** Japan established the Joint Crediting Mechanism in 2010 to promote cooperation on mitigation activities in multiple sectors with developing countries. Japan has recently signed an agreement with Georgia.

In 2013, the Swiss government mandated the Climate Cent Foundation to use part of its remaining assets of CHF 100 million – at least 20 million – to finance Article 6 pilot activities with interested countries and the private sector until 2032. By 2030, the Climate Cent Foundation expects to be able to fund the reduction of more than 20 million t CO2, thereby offsetting over 5% of the Swiss GHG emissions in the years 2021-2030. In October 2020, Switzerland and Peru signed the world's first bilateral agreement on Article6 collaboration.

Recently, also Georgia signed a cooperation agreement with Switzerland.

For the **private sector** is a starting point to consider and strategize their participation to voluntary carbon markets through investment in mitigation (energy, industry, waste) and adaptation (agriculture, forestry) projects.

PART 3

Assessment of the CSAP from the Private Sector perspective

8. BACKGROUND OF THE GEORGIAN CSAP

In 2020 the Ministry of Environment Protection and Agriculture (MEPA) with technical assistance of GIZ developed Georgia's 2030 Climate Change Strategy and 2021-2023 Action Plan (CSAP).

The 2021-2030 CSAP identifies measures and actions that support the development of the Georgian economy and infrastructure in a way which sets Georgia on a pathway to meet its international obligations and national ambitions for climate change mitigation.

It serves as an **action plan for the implementation of Georgia's existing NDC,** but also as an important orientation to inform the determination of an appropriate and realistic level of ambition when updating the NDC in future revision cycles.

The action plan CSAP will be updated on a 2–3-year cycle, to be aligned with future revisions of the NDC and the NECP – ensuring coherence between sectoral policies, the NDC, and the NECP. The Climate Strategy and Action Plan identifies a long-term vision for the reduction greenhouse gas emissions for 2030 and Specific activities for 2021-2023.

By 2030 overall greenhouse gas emissions should not exceed 29.25 Mt CO2eq. Sectoral targets to reduced emissions by 2030 compared to business-as-usual include: Energy generation and transmission 15%, Industry 5%, Transport 15%. The Plan also sets a target to increase CO2 Absorption capacity of forests 10% from 2015 level, and deploy climate friendly technologies in Buildings, Agriculture, and waste management.

Action Plan is prepared in accordance with the Government of Georgia Ordinance No 629, 20 December 2019, on the "Approval of Planning, Monitoring and Evaluation of Policy Documents."

Historical and Baseline indicators of the impact values are taken from 1990-2015 Georgia's National GHG Inventory.

"Reference Scenario Projection" is calculated in different models, and the results are aggregated in the LEAP model. It refers to the indicator's expected index in case the intervention is not implemented, and it is compared with the desired "Final Target Value" of the indicator.

The "Baseline" of output indicator of the objective refers to the latest existing and available data, and it is compared to intermediate and final target indexes of the output indicator of the objective.

Although many activities in the Climate Action Plan are carried out by the Private Sector, they are implemented with the high involvement of the public sector.

In the budget part, only the approximate amount of direct, additional costs is included. Consequently, the budget does not indicate indirect costs, including time allocated by the public servants. Due to the specifications of climate change mitigation measures, in some cases, private sector investments are indicated, although these amounts are not included in the total budget of the Climate Change Strategy and Action Plan.

This analysis focuses on Georgia's sectoral mitigation policy coverage with the lens of the Private Sector with two objectives: a) identifying and understanding gaps in each sector of activity involved and b) explore the potential for Sectorial action, based on relevant experiences from international comparables cases.

Where CSAP actions are expected to achieve NDC sector targets, we will highlight actions to meet climate targets with opportunities for growth and development.

Where we believe that CSAP actions cold fall short of targets, we will suggest actions potentially capable to help achieve them.

> The **Climate Strategy and Action Plan do not include direct guidelines for the representatives of private sector**; however the document aims to strengthen and encourage their participation and **this analysis will try to address some follow up to be presented.**

Georgia's updated NDC and Climate Strategy and Action Plan are the first documents to be **reviewed by the newly established Climate Change Council (CCC) of Georgia.**

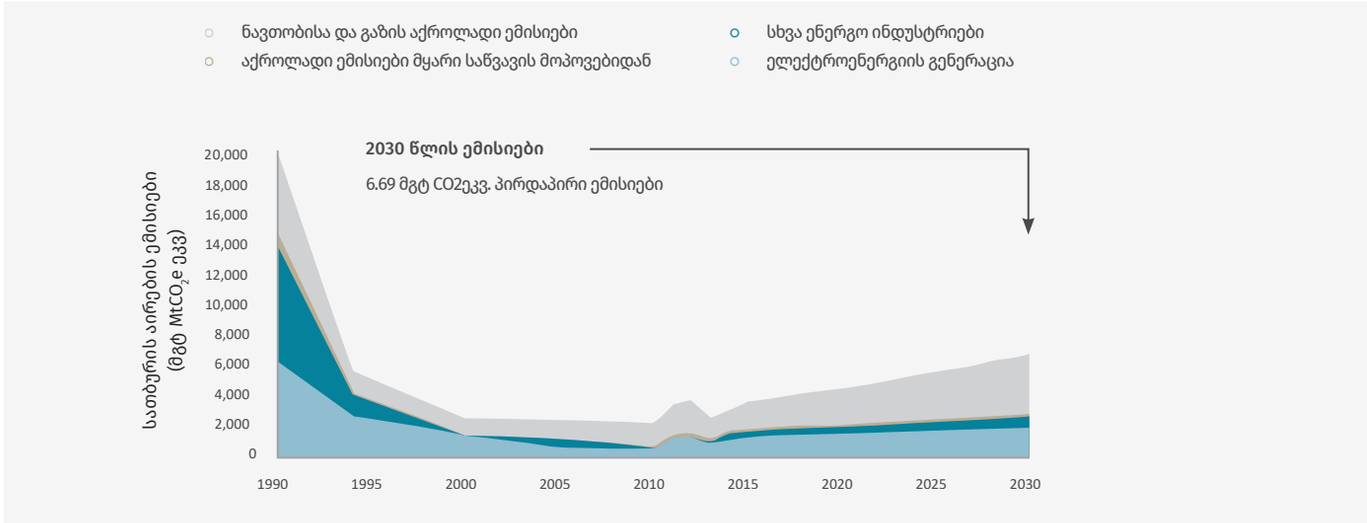
Georgia's sixth and latest national inventory was submitted in 2021 to the United Nations Framework Convention on Climate Change (UNFCCC) by the Ministry of Environmental Protection and Agriculture (MEPA) through the Fourth National Communication of Georgia (MEPA, 2021). Emissions totaled ca. 17.76 MtCO2e in 2017, with the majority of emissions from fossil fuel combustion for energy disaggregates the emission sources into energy end-use sectors and shows the emissions profile with sector and sub-sector detail.

Transport (24%), agriculture (20%), energy generation (17%), and industry (17%) sectors represented the largest emitters for Georgia in 2017, while buildings and waste made up the remaining emissions.

The mitigation measures developed for the CSAP are differentiating by sector of activity; only for the transport and waste sector substantial emissions-reducing measures were planned in the current cycle while the agriculture, buildings, industry, and energy generation sectors did not.

The Climate Strategy and Action Plan also support the implementation of Georgia's commitments under the Sustainable Development Goals (SDGs). The measures set out in the Action Plan will significantly contribute to the achievement of SDG goal 13, which is specific to climate action.

From the Private Sector perspective, we provide few potential priority areas for consideration in each industry, that could also serve as guidance or inspiration for policy design and planning, and mitigation potential and cost estimate, derived from available literature.



9. ANALYSIS OF THE IMPLEMENTATION STATUS FROM THE PRIVATE SECTOR PERSPECTIVE - ENERGY GENERATION AND TRANSMISSION

Electricity consumption in Georgia is significantly lower compared to other countries in Europe but is projected to steadily increase in the coming years. Over the past decade, electricity consumption was increasing at a rate of approximately 4.8% per year (GNERC, 2019). Emissions in the sector are expected to increase by approximately 77% from 2015 levels to 6.69 MtCO2e in 2030 under a reference scenario.

The implementation of CSAP actions for the sector leads to projected emission levels of 5.47 to 5.62 MtCO2e in 2030, an approximate **30% improvement from projected emission levels without any action**. Georgia's updated NDC for the sector has the goal to limit emissions to below 5.69 MtCO2e in 2030. This suggests that implementation of all CSAP actions would overachieve NDC targets for the sector.

AMOUNT OF GHG EMISSIONS FROM ENERGY GENERATION AND TRANSMISSION SECTOR (KTCO2E)

HISTORICAL	BASELINE	MEDIUM-TERM TARGET	MEDIUM-TERM TARGET	REFERENCE SCENARIO PROJECTION	FINAL TARGET	SOURCES OF VERIFICATION
1990	2015	2024	2028	2030	2030	2030 National GHG Inventory
19,855	3,654	4,425	5,212	6,691	5,687 (-15%)	

In order to achieve these targets, planned actions from the CSAP include:

- Support renewable energy (wind, solar, hydro, biomass) generation
- Improvement of average efficiency of thermal electricity plants
- Strengthen the capacities of renewable energy integration in the transmission network of Georgia
- Develop new policy documents and legislation for the energy sector

Policy Gaps involving Private Sector in investments to reduce emissions

Georgia's energy generation and transmission sector is still lacking effective financial instruments. Three potential priority areas have been highlighted for consideration in the energy generation and transmission sector:

1. **Introduce an overarching carbon pricing scheme**

   Carbon pricing instruments may include a carbon tax or an emissions trading scheme into the power generation sector, for example by charging a tax to power producers per unit of fossil fuel.

   An emissions trading scheme can be included within a carbon tax programme, or standalone, to provide a degree of flexibility.

   Currently, Georgia does not have an overarching carbon pricing or national emission trading scheme in place or planning.

2. **Introduce a feed-in tariff for renewables**

   A feed-in tariff for renewables that also covers solar PV and wind power provides financial incentives for rapidly scaling up renewable energy capacity in Georgia.

   Implementation of a sound and economically sustainable support scheme for renewables provides the necessary long-term financial incentives and market framework to attract large-scale investments from the Private Sector.

3. **Phase out fossil fuel subsidies completely**

   Fossil fuel subsidies for natural gas in Georgia amounted of 6.7% of budget spending in 2017.

   This is a significant loss of potential budget revenues which could be redirected towards **additional energy efficiency improvements** which can lead to higher macroeconomic stability, improved energy security as well as additional environmental benefits. Gas subsidies for thermal generation brings down retail prices, which in turn does not encourage energy savings.

POLICY OPTION	OVER-ARCHING	CHANGE ACTIVITY	ENERGY EFFICIENCY	RENEW-ABLES	OTHER LOW CARBON	NON-ENERGY
Overarching sector-specific strategy	Policy planned					
Overarching carbon pricing scheme or emissions limit	No policy in force					
Removal of fossil fuel subsidies	No policy in force					
National energy efficiency target			At least one policy in force			
Support for highly efficient power plants			At least one policy in force			
Renewable energy target				At least one policy in force		
Renewable energy target for electricity				Policy planned		
Support scheme for renewables				Policy planned		
Grid infrastructure development				At least one policy in force		
Sustainability standards for biomass use				No policy in force		

At least one policy in force | Policy planned | No policy in force | Not Applicable

Implications for the Private Sector

1. A carbon price provides an economic signal to polluters who can decide whether to continue to pollute and pay for it, to suspend their polluting activity or to invest in technology that reduces the emissions of their activity.

Conventional technologies enjoy an artificial advantage over other greener practices because many of the external costs associated with high-emitting technologies are not internalized in the price of production or consumption. The use of a carbon price can reduce or remove this artificial advantage, allowing other cleaner options to become more competitive and viable.

2. **Georgia will need to increase its renewable energy capacity**. This is attractive for the country due to its large potential for renewables, including an estimated annual generation potential of 4TWh from wind and favourable solar conditions with approximately 6,500 sunlight-hours annually. New renewable energy projects are on hold in anticipation of a new market model or support scheme.

SHARE OF RENEWABLE ENERGY IN GEORGIA'S ELECTRICITY GENERATION

	BASELINE	MEDIUM TERM TARGET	MEDIUM -TERM TARGET	MEDIUM-TERM TARGET	MEDIUM-TERM TARGET	FINAL TARGET	SOURCES OF VERIFICATION
Year	2018	2022	2024	2026	2028	2030	Ten-year network development plan of Georgia
Value	78%	72%	76%	82%	85%	87%	

Georgia is methodically advancing towards realising its renewable energy potential. According to local solar technology vendors, interest in solar energy has doubled or even tripled in the last period.

However, developing the country's RE potential comes with its own challenges. For instance, larger-scale solar power stations require significant investments, which in turn depend on the creation of an attractive environment for direct and foreign investment**. With the deregulation of the energy market, it is difficult for investors to predict what may happen in the coming years.** Therefore**, it is particularly important to have instruments that can ensure a guaranteed income for the investor,** even during the return period of their own capital.

The main challenge for investors today is to predict what the price of electricity might be tomorrow. Market liberalisation reforms have been initiated and the hourly trading market open, but many questions still remain about the market, especially regarding what the price drivers for electricity will be. It is difficult for any developer or analyst to predict today what the price will be tomorrow. Such information is crucial, as forecasts must be made for a period of 5-10-20 years with such long-term investment projects.

The second overall challenge is communication and awareness-raising, which require consistent effort from both businesses and the government. Market participants and the general public have to aware of the benefits of developing RE. Businesses should know about the financial returns that the relevant investments provide.

Creating a competitive market is of course a good objective, but innovation needs to be anchored first in order to grow investor confidence in the market. **One way to build trust is to enable guaranteed purchase agreements for a short period while opening the free electricity market**. As the market become more stable, investors gain incentive and choose to become participants in open trading.

Another related challenge is the level of expertise available on the market. With RE gaining popularity only in recent years, the market for technology suppliers remains small. Therefore, as the number of relevant experts is limited, increasing demand could put a strain on their availability.

It is clear that Georgia's government is keen on developing a number of RE stations; however, the steps required to overcome the challenges above still remain to be seen.

For the benefit of the Private Sector shareholders, we remind that the Electricity Market Operator conducts its activities in compliance with the following legislative acts:

- Law of Georgia on Energy and Water Supply (842.212 KB)
- Georgian Energy Minister's Order on the Approval of Electricity (Capacity) Market Rules (985.608 KB)
- Georgian Government Decree "On the Approval of Mandatory Criteria for the Direct Consumers of Electricity" (240.860 KB)
- Concept of Electricity Market Model (106.742 KB)

- Georgian Law on the JSC "Partnership Fund" (40.224 KB)
- Georgian National Energy and Water Supply Regulatory Commission Resolution on Approving Network Rules (2,213.212 KB)
- On Approval of the Rule of Expressing Interest in Technical and Economical Study of the Construction, Construction, Ownership and Operation of the Power Plants in Georgia (221.919 KB)
- State Program "Renewable Energy 2008" about the Approval of the Rule to Enable Construction of Renewable Energy Sources in Georgia (815.613 KB)
- Extract From the Tax Code of Georgia (86.402 KB)
- Georgian National Energy and Water Regulatory Commission Decree on the Electricity Tariffs (163.341 KB)
- About Obliging the Some Generators of Electricity (Thermal Power Plants) to make a public service (57.668 KB)
- Georgian Government Decree On ''Approval of the Rule for Development and Implementation of Public and Private Cooperation Project' (314.710 KB)
- Georgian Government Decree on Feasibility Study of Construction and/or Construction, Ownership and Operation of those Power Plants, which are not the Projects of Public and Private Partnership (669.310 KB)

And the most relevant stakeholders involved in the Electricity Market in connection with the implementation of the CSAP are:

- Ministry of Economy and Sustainable Development of Georgia
- Georgian National Energy and Water Regulatory Commission
- Energo-pro Georgia
- Telasi
- Georgian State Electrosystem
- SakRusEnergo
- Partnership Fund
- Energotrans
- Peri
- GWP
- Engurhesi
- Bakuri
- International Energy Corporation of Georgia
- Georgian Railway
- Alliance Energy
- KG Energy
- Georgia-Urban Energy
- Kindzmarauli Corporation
- Association of European Energy Exchanges
- Association of Power Exchanges (APEx)
- Georgian Energy Development Fund
- "GTM Group" LTD
- "Rutavi Steel" LTD
- "Geosteel" LTD
- "Chiaturmanganum Georgia" LTD
- "Rustavi Azot" JSC
- "Rusalloys" LTD
- „RMG Copper" JSC
- "Heidelbergcement Georgia" LTD

ELECTRICITY MARKET MODEL – role of the Private Sector with the new model

GEORGIAN ENERGY EXCHANGE (GENEX) is the new electricity market.

This model implies a **free market**, where the **participants benefit from equal, nondiscriminatory conditions, and the competitive price is established transparently** giving customers the opportunity of free choice.

On April 16th, 2020, Government of Georgia adopted the Electricity Market Model Concept. The document sets the following novation principles in electricity trading:

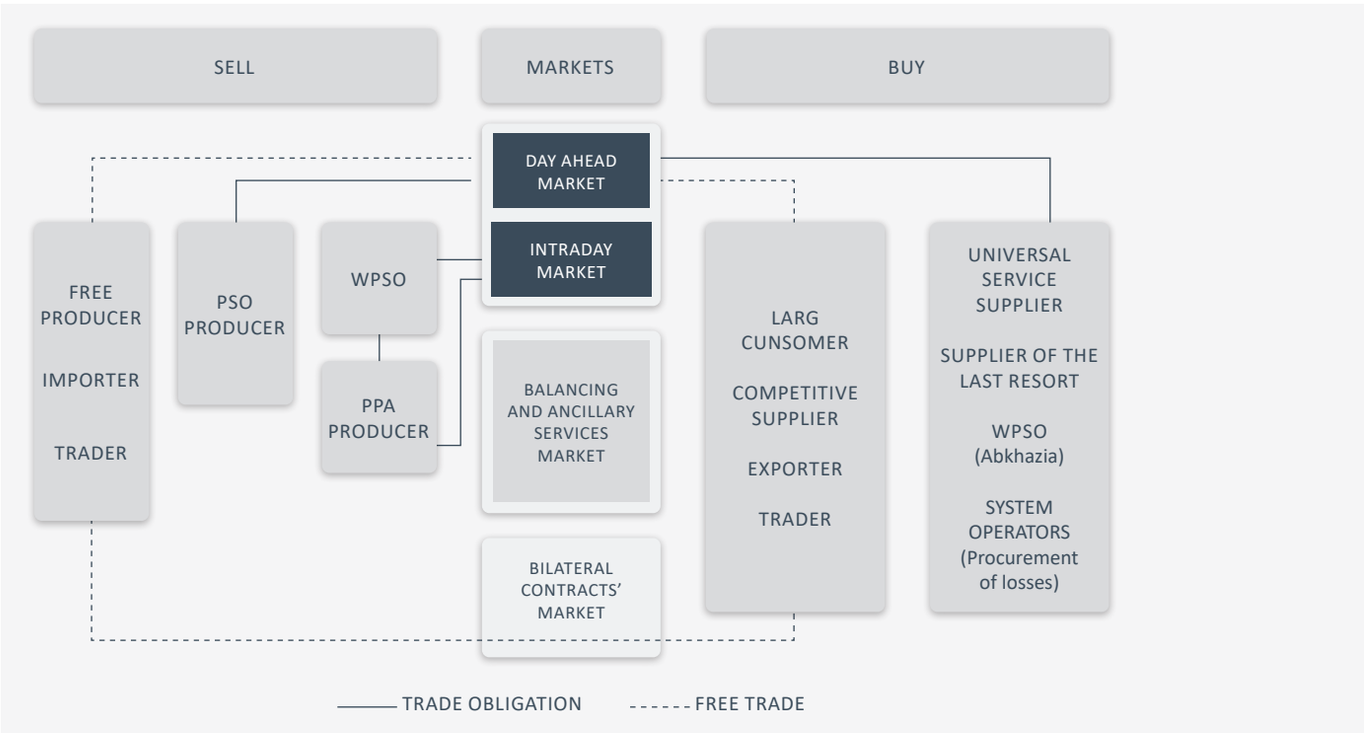
- Hourly trading and self-dispatching
- Imbalance responsibility
- Wholesale public service

Electricity Market Concept also sets the stages of market opening, as well as defines market segments and rights & responsibilities of market participants.

The energy exchange plays a special role in the ongoing reform of the Georgian energy sector and in the new market model. It will enable market participants to trade electricity on non- discriminatory terms, on a competitive basis.

The market price set based on the electricity supply and demand will give the right market signals to both, existing and new investors and this will ideally significantly **increase the interest in the Georgian electricity sector.**

Nord Pool was selected as a partner of the Energy Exchange. Nord Pool's experience and reputation is a clear message to both local and foreign investors and an important prerequisite for the success of Georgian market reform.



One of GENEX main challenges is the knowledge and awareness of exchange participants - the market will not function effectively if the participants are not ready enough to trade in the market.

Therefore, **for the involvement of the Private Sector the main focus is the widest engagement of private market participants.** This can be reached by intensive training on both theoretical and practical market functioning, and all the international organizations that have been actively involved in the support of developing the exchange.

A strong participation of the Georgian private sector is expected during the next steps of GENX development. In particular, the following ones:

- Day-ahead dry-run simulative trading sessions
- Clearing and Settlement system setup Certification of member's representatives Members registration
- Establishing an efficient market surveillance and transparency system
- Day-ahead Market launching
- OTC Market Dry-run
- OTC Market Launching
- Cooperation with neighbouring and other countries on cross border trading possibilities for Georgia
- Intraday Market Dry-run
- Intraday Market launching
- Strengthen international cooperation, including collaboration with partner countries, exchanges, organizations, programs, and projects Member's capacity strengthening activities - exclusive cooperation with Nord Pool Academy
- Continuation of the media campaign to raise public awareness of energy sector
- Strengthen the GENEX team and its capacities

Potential role and opportunity of Carbon Pricing for the Private Sector

The EU ETS is estimated to have saved more than 1 billion tons of CO2 between 2008 and 2016, which translates to a reduction of 3.8% of total EU-wide emissions. Aside from the direct mitigation potential, revenues from carbon taxes can provide a source of financing for other climate change mitigation projects.

However, what could be the **potential benefit of the implementation of Article 6 P.A. for the private sector in Georgia**?

We have already mentioned about the Global Carbon Market event which brought together over 50 representatives of the Government, financial institutions, industry associations, businesses, civil society and international agencies together with Solomon Pavliashvili, Georgia's Deputy Minister of Environmental Protection and Agriculture; H.E. Akira Imamura, Ambassador of Japan to Georgia; Urs Beer, Deputy Head of Mission of the Embassy of Switzerland to Georgia; and Nick Beresford, UNDP Resident Representative in Georgia.

We also know that:

- Georgia is interested in exploring other potential areas for reducing emissions that will eventually enhance the country's progress in complying with the Paris Agreement temperature target of "holding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels" (Article 2. 1. a).
- Georgia, as a country not included in UNFCCC Annex I, can participate in only one of the three mechanisms set out in the Kyoto Protocol, namely the Clean Development Mechanism (CDM)
- Clean Development Mechanism (CDM) is a mechanism under the Kyoto Protocol that will enable projects in emerging economies that lead to a reduction of greenhouse gases, to get an extra revenue stream.
- CDM projects earn tradable, saleable certified emission reduction (CER) credits that can be used by industrialised countries to meet a part of their emission reduction targets under the Kyoto Protocol.
- Some CDM projects have already been registered in Georgia, the annual reduction of emissions is about 1.8 million tons of CO2. Under Article 6 of the Paris Agreement, the parties have agreed to set up new market and non-market mechanisms, considering the experience of the CDM and will be focusing their cooperation on climate policy issues.

YEARS OF REGISTRATION	PROJECT	REDUCTION (TCO2/eqYear)	CERTIFICATES ISSUED
21 September 2009	Leak Reduction in Above Ground Gas Distribution Equipment in the KazTransgaz-Tbilisi Gas Distribution System- Tbilisi, Georgia	339,197	822,647 CER (2009-2014)
10 October 2012	Leak Reduction in Above Ground Gas Distribution Equipment in 'Socar Georgia Gas' gas distribution system, Georgia	173,651	–
17 October 2012	Georgia: Enguri Hydropower Plant Rehabilitation Project	581,715	420,103 CER (2013-2014)
1 November 2012	Adjaristskali HPP project	391,956	–
21 December 2012	Gudauri HPP project	22,891	33,030 CER (2013-2015)
17 May 2013	Dariali HPP project	259,229	256,082 CER (2016-2018)

Benefits of CDM projects include investment in climate change mitigation projects, transfer or diffusion of technology in the host countries (Georgia), as well as improvement in the livelihood of communities through the creation of employment or increased economic activity.

Challenges for the development of CDM projects in Georgia by the Private Sector

Despite its previous successes and achievements, the global carbon market finds itself currently in a critical and uncertain period. The large number of mitigation activities initiated through the two most important project-based carbon market mechanisms - the Clean Development Mechanism (CDM) and Joint Implementation (JI) - has led to an increasing supply of emission reduction credits, which in recent years has superseded the demand for such credits.

Demand has tailed off considerably due to the global economic crisis, a stronger focus on domestic mitigation action, criticisms with regard to transaction costs and environmental integrity of the mechanisms, as well as the time lag in concluding a new major international climate change agreement with a clearly defined role for flexibility mechanisms not before 2012, as formerly planned, but rather only in 2015.

The argumentation between supply and demand has had a dramatic effect on the price of CDM and JI credits, which has plummeted in recent years. This market price collapse, amongst other challenges, has consequences for market and investor confidence, current actors in the market mechanisms, and future potential uses for international market mechanisms.

Recent analysis from NewClimate Institute shows that the large majority of CDM projects continued to operate their mitigation activities in 2014, although the majority no longer had a financial incentive to invest in verification and issuance of credits (Warnecke, 2015). Therefore, most of these projects operate without the support of market mechanism finance, whereas there is a considerable risk of project discontinuation for specific project types.

As we explained, Article 6 of the Paris Agreement establishes a new framework for international carbon market mechanisms. However, considerable uncertainty remains regarding how many countries will use international project-based credits for accounting periods both before and beyond 2020, and whether mitigation activities that have already been implemented will continue to be supported.

New Renewable energy sources

According to the 2020-2030 energy strategy, the country has the opportunity to increase the share of renewable energy sources (hydro, wind and solar), and thus reduce the share of imported electricity and generation of imported thermal power plants, thereby increasing the degree of energy independence and clean energy.

Just for illustrative purposes, some of the implemented or ongoing projects:

Implemented (2013-2016)	**Title:** Construction of the first wind power plant **Objective:** To develop generation from renewable energy sources Implementation level: National	**Budget:** 31.2 million. dollar Source of financing: (70% - loan, 30% - mobilized by "Qartli Wind Farm" partners) **Implementer:** Qartli Wind Farm Ltd	An average of 8.5 Gg of CO_2 per six years.	The annual potential depends on the amount of energy generated by the station in a particular year. National Grid Emission Factor (tons of CO_2 eq/MWh) by years: 2016 - 0.093 2017 - 0.094 2018 - 0.082 2019 - 0.126	The station operated in test mode in 2016. It was put into operation in 2017	**Reduced emissions:** 2016-0.8 Gg; 2017 -8.25 Gg, 2018-6.9 Gg., 2019- 10.7 Gg.	**Socio-economic benefits:** 35 jobs created. The availability of a new generation source has reduced dependence on imported electricity.
Implemented (2017-2020)	**Title:** Construction of Combined Cycle Thermal Power Plants Gardabani 1 and 2 **Objective:** To reduce gas consumption and corresponding emissions for electricity generation. **Implementation level:** National	**Budget:** $ 230 million Gardabani for 1 thermal power plant. $ 185 million Investment – Gardabani 2 **Source of funding:** Gardabani 1- Georgian Gas and Oil Corporation, Partnership Fund. **Implementer:** Chalik Energy - Gardabani 1 Gardabani 2 was implemented by the Georgian Gas and Oil Corporation.	An average of 200 bg of CO_2 per six years. The annual reduction depends on the output of a particular year an the emission factor of the same year.	The resources required for the actual output of the stations are compared to the resources of the existing inefficient Tbilissi thermal power plant. The efficiency of the combined cycle power plant is 54%, the efficiency of other existing thermal power plants is 31-33%. National Grid Emission Factor (tons of CO_2 eq/MWh) by years: 2016 - 0.093 2017 - 0.094 2018 - 0.082 2019 - 0.126	Gardabani 1 station has been built and has been operation since 2017 Gardabani 2- has been i operation since 2020	**Reduced emissions:** Gardabani 1 2016-108 Gg; 2017-110 Gg; 2018-147 Gg; 2019-255 Gg. Gardabani 2 Generation of Gardabani 1 for 2018-2019 is taken for evaluation. 2018 saved 147 Gg, in 2019 -255 Gg	**Environmental benefits:** Gas consumption is sharply reduced in the electricity generation sector and consequently the amount of emissions. **Social benefits:** Creation of additional jobs (Gardabani 1 employs 153 people) Also, the electricity generated by this station is more cost-effective and therefore the consumption of imported fuel becomes more rational.
Implemented (2010-2016)	**Title:** Preferential credit line "Energocredit" for investment in renewable and energy efficient technologies (household and commercial sector). **Objective:** To increase access to renewable and energy efficient technologies (reduce capital expenditures) and to promote **Implementation level:** National	**Budget:** $ 63.11 million issued by participating banks in the form of soft loans (subsidies). Program **Funding source:** European Bank for Reconstruction and Development (EBRD). **Implementer:** All major commercial banks were involved in the implementation of the program: TBC; Bank Republic; Bank of Georgia, Credo, Base Bank.	168 Gg CO_2 eq.	The data is provided by Energocredit in the form of a reduced emission amount. Internal methodology was used.	The program was implemented in 2010-2016.	Since 2016, 168 Gg of CO_2 eq. Decreases from projects implemented annually.	**Environmental benefits:** The introduction of renewable energy and energy efficient technologies has reduced fossil fuel consumption and harmful emissions into the atmosphere. **Social benefits:** Renewable and energy efficient technologies have not only helped beneficiaries reduce energy consumption, but also improved their living conditions and comfort levels. There was also support for local businesses, increased sales of products from companies participating in the program (energy efficient and renewable technology dealers) and their promotion.

Implemented (2012-2016)	**Title:** Establishment of the Climate Change Financial and Technology Transfer Center (FINTEC). **Objective:** To support the industrial and commercial sectors in equipping themselves with energy efficient and renewable energy technologies in order to reduce emissions, energy and water consumption and also to increase the efficient use of resources. **Implementation level:** National	**Budget:** $ 88 million. This is an international program and funds are distributed according to countries and regions. The amount allocated to Georgia depends on the number of applications made by commercial and industrial facilities. **Funding source:** GEF **Implementer:** European Bank for Reconstruction and Development (EBRD)	7.5 Gg. CO2 eq. Annually.	The annual potential of greenhouse gas emissions is calculated according to the internal methodology within the program.	8 projects were implemented in Georgia with the support of the program.	As a result of the implemented projects, 7.5 g of CO2 are saved per year from 2017.	**Social benefits:** promotion of local businesses and economy, introduction of modern green technologies, energy saving, efficient use of resources.
Implemented (2012-2017)	**Title:** Use of efficient wood stoves and solar panels within villages under NAMA. **Objective:** Introduction of renewable and energy efficient technologies in rural settlements **Implementation level:** Regional	**Budget:** NAMA was not initially approved on a large scale and budget and therefore the project was implemented with the help of various donors on a small scale. About 10,000 euros a year **Source of funding:** Various donors **Implementer:** WECF and the Green Movement	0.874 Gg CO2 eq. annually. In case of full implementation of the NAMA project, 30 Gg of CO2 eq. Annually until 2023, 157 Gg CO2 eq. until 2039.	The introduction of energy-efficient wood stoves on an existing scale saves an average of 2 tonnes of CO2 per year, while a solar water heater reduces emissions by an average of 1 tonne per year.	Since 2012, 642 solar water heaters have been installed, 91 energy efficient stoves and 50 buildings have been heated.	According to the monitoring results, a total of 874 tons of CO2 per year was saved by all measures.	**Environmental benefits:** The introduction of efficient wood stoves helps to reduce pressure on forests and improve indoor air quality. **Social benefits:** Development of regions, efficient use of resources, energy saving, improvement of living conditions for the local population, promotion of renewable and efficient technologies
Implemented (2010-2019)	**Title:** Construction of hydroelectric power plants in Georgia **Objective:** To harness the local potential of renewable energy. Measures and integrates stations built in 2010-2020. **Implementation level:** National	**Budget:** Unknown **Source of funding:** All stations were mostly built with foreign and local private investment. **Implementer:** Various local and foreign development companies	200 Gg CO2 eq. on average annually.	National Grid Emission Factor (tons of CO2 eq / MWh) by years: 2019 - 0.126	A total of 44 new hydropower plants were built in 2010- 2020 (29 stations in 2010-2017; 15 stations in 2018-2020).	Using the 2019 emission factor, 191 Gg of CO2 was saved. In 2019, the output of all new plants (built in 2010- 2020) was 1,519 GWh;	**Socio-economic benefits:** Technological development, creation of additional jobs (especially in the regions), development of regions (construction of a hydropower plant requires appropriate infrastructure (eg roads) which will remain in the use of the municipality)
Implemented (2015-2016)	**Title:** Installation of solar PV panels in 'Iliauni' and Tbilisi International Airport. **Objective:** Introduction and popularization of renewable energy (demonstration project) **Implementation level:** Local	**Budget:** $ 4.8 million. **Funding source:** Government of Japan (Grant) **Implementer:** Itochu Corporation, Fuji Furukawa Engineering & Construction Co.Ltd. Ltd. "Grusia".	0.06 Gg CO2 eq. annually.	National Grid Emission Factor (tons of CO2 eq / MWh) by years: 2016 - 0.093 2017 - 0.094 2018 - 0.082 2019 - 0.126	The system is installed illiauni and at the international airport. Power at the airport increased slightly from 316 kW to 325 kW.	The reduction in emissions from the generation of the panel installed at Iliauni and the airport is about 57 tons of CO2 eq. per year.	**Social benefits:** Promotion of renewable and modern technologies.

Ongoing (from 2018)	**Title:** Improving Energy Efficiency in Public Buildings. **Objective:** To improve the energy efficiency of public buildings (27 public buildings across the country, mainly schools) and to introduce renewable energy technologies in the selected buildings **Implementation level:** Regional	**Budget:** 5.14 million euros. **Funding source:** NEFCO, E5P and the Danish Ministry of Foreign Affairs **Implementer:** Municipal Development Fund	1.1-1.4 Gg CO2 eq. per year.	The reduction potential is assessed by the project's internal methodology.	Is in the stage of tenders and contracts. Physical work has not yet begun due to the pandemic.	NA	**Social benefits:** Rehabilitated public buildings and increased comfort levels, reduced energy consumption and the promotion of energy efficient and renewable energy technologies.
Ongoing (from 2019)	**Title:** Construction of the first solar power plant in the village of Udabno. **Objective:** To develop renewable energy and reduce dependence on imported energy **Implementation level:** National	**Budget:** $ 4.5 million **Source of funding:** Foreign investment. **Implementer:** Georgian Solar Company, a company founded by the Georgian Energy Development Fund, which owns 90% of the station's shares.	0.87 Gg CO2 eq. per year.	National Grid Emission Factor 2019 - 0.126 tons of CO2 eq / MWh. Estimated annual output is 6.9 million kWh	Construction was scheduled to begin in the fall of 2019, but due to financial problems, construction could not start on time.	NA	**Social benefits:** Creating new jobs, utilizing local renewable resources and reducing imports, technological development, stimulating the local economy (eg solar PV panel manufacturers, dealers and service companies)
Ongoing (from 2020)	**Title:** Rehabilitation of 26 public buildings and improvement of energy efficiency in Batumi. **Objective:** To improve energy efficiency in public buildings (25 gardens and 1 historic building) **Implementation level:** Local	**Budget:** 5.7 million euros. **Funding source:** German Development Bank KfW. Co-financing 10% by Batumi Municipality **Implementer:** Consulting company Fichtner	0.063 Gg CO2 eq. per year.	The project aims to reduce energy (gas) consumption in gardens by at least 20%. The average annual gas consumption of each garden is 6,500 m3. In case of reduction of consumption by 20%, 1,300 m3 of garden will be saved.	The consultant is being contracted at this stage.	NA	**Social benefits:** Development of local energy efficient construction market, introduction of energy saving and energy efficient technologies and popularization of construction practices.
Ongoing (from 2019)	**Title:** Construction of new hydropower plants **Objective:** To develop local renewable resources **Implementation level:** National	**Budget:** $ 543 million. **Source of funding:** Private investments **Implementer:** Local and foreign developer companies.	189.9 Gg CO2 eq. annually.	National Grid Emission Factor 2019 - 0.126 tons of CO2 eq/MWh. Estimated annual output is 1,507 GWh.	Of the signed memoranda, 22 stations are under construction, their total capacity is 323 MW.	NA	**Social benefits:** New jobs, infrastructure development (construction of access roads to the station, communications, etc.); Promoting the local economy, introducing modern technologies.

Ongoing (from 2019)	**Title:** Construction of 2 new wind power plants **Objective:** To develop local renewable energy potential **Implementation level:** National	**Budget:** $ 135 million **Source of funding:** Private investment **Implementer:** Development companies	43 Gg CO2 eq. annually	National Grid Emission Factor 2019 - 0.126 tons of CO2 eq/MWh. Estimated annual output is 342 million kWh.	The Georgian government has approved a project to build wind farms near Tbilisi and Kaspi. Construction is scheduled for completion in 2022.	NA	**Social benefits:** Creating new jobs, introducing new technologies, reducing the share of imported energy and enhancing energy security.
Ongoing (from 2016)	**Title:** Net Accounting Software **Objective:** To promote the development of renewable energy technologies **Implementation level:** National	**Budget:** NA **Implementer:** Initiated by GNERC.	0.374 Gg CO2 eq. annually	he average working hours for a solar anel in Georgia is 1,350 hours per ear. National Grid Emission Factor 019 - 0.126 tons of CO2 eq/MWh.	180 solar panels with a total capacity of 2.2 MW have been put into operation since the enactment of the net metering regulation (as of the beginning of 2020).	The average annual generation is 2,970 MWh. In 2019, greenhouse gas emissions were reduced by 374.2 tons of CO2 eq.	**Social benefits:** Promotion of modern renewable energy technologies and market development, utilization of local renewable resources and reduction of imported energy, stimulation of local economy (by developing solar panel market)
Planned (2020-2030)	**Title:** Construction of 5 solar power plants. **Objective:** To develop local renewable energy potential. **Implementation level:** National	**Budget:** to be specified after completion of the excavation phase **Funding source:** Private and foreign investment	16.6 Gg CO2 eq. annually.	Total capacity of 5 stations 93 MW, output 132 000 MWh. National Grid Emission Factor 2019 - 0.126 tons of CO2 eq/MWh.	The projects are in the research stage	NA	**Social benefits:** Utilization of local renewable potential, increase of the share of renewable energy in the energy balance, reduction of imported energy, creation of new jobs, development of the market of local renewable technologies
Planned	**Title:** Construction of hydroelectric power plants in Georgia **Objective:** To harness the local potential of renewable energy. Stations under construction licensing stage are reviewed (26 in total). **Implementation level:** National	**Budget:** $ 389 million. **Source of funding:** private and foreign investment **Implementer:** Local and foreign development companies	135.2 Gg CO2 eq. annually	The total planned output of 26 stations is 1,073 GWh. National Grid Emission Factor 2019 - 0.126 tons of CO2 eq / MWh.	These stations are in the process of licensing and obtaining a construction permit. The total capacity of the stations is 240 MW.	NA	**Social benefits:** Utilization of local renewable resources, reduction of imported energy, development of regional infrastructure (at the locations of planned stations), creation of new jobs, encouragement of the local economy, development of professional staff
Planned (2021-2020)	**Title:** Installation of energy efficient lighting in public buildings **Objective:** To save energy in public buildings **Implementation level:** National	**Budget:** 157,000 Euros (according to NEEAP) **Source of funding:** State budget **Implementer:** Ministry of Economy and Sustainable Development. Ministry of Regional Development and Infrastructure and Municipalities	0.176 Gg CO2 eq. annually.	Estimated savings are at 1.4 GWh by 2030. National Grid Emission Factor 2019 - 0.126 tons of CO2 eq / MWh.	This measure is implemented in stages, with the goal of -100% replacing inefficient lighting by 2022.	NA	**Environmental benefits:** Energy savings will reduce emissions of harmful substances into the air from thermal power plants. **Social benefits:** Demonstrate and popularize effective technologies; Save energy costs, encourage the production of local energy efficient lighting technologies

Planned (2021-2022)	**Title:** Tightening Customs Regulations on Inefficient Lighting Technologies **Purpose:** Complete replacement of Varvara lamps with efficient technologies **Implementation level:** National	**Budget:** 4.1 million euros (according to NEEAP). The budget is estimated according to the resources needed by the household and private sector to acquire new technologies. **Implementer:** Ministry of Economy Partner: Customs Department, Municipalities, Private Sector	6.1 Gg CO2 eq. by 2030	Energy saving capacity 48.7 GWh per year by 2030. National Grid Emission Factor 2019 - 0.126 tons of CO2 eq / MWh.	Tightening customs regulations is being considered by the government	NA	**Environmental benefits:** Energy savings reduce emissions of harmful substances into the air from thermal power plants. **Social benefits:** Encourage the production of local energy efficient lighting technologies, introduce modern energy efficient technologies.
Planned (2021-2023)	**Title:** Measures to Improve Energy Efficiency in Public Schools **Objective:** To save energy in public buildings **Implementation level:** National	**Budget:** 2.477 million euros **Source of funding:** International donor organizations **Implementer:** Ministry of Economy and Sustainable Development Partner: Ministry of Education, Ministry of Infrastructure	0.77 Gg CO2 eq. annually.	The methodology and assumptions were developed by the team working on the Climate Action Plan.	The implementation of the measure depends on donor funding, no amount is allocated from the state budget for this event.	NA	**Environmental benefits:** Energy savings reduce emissions of harmful substances into the air. **Social benefits:** Energy saving in public buildings (schools), promotion of energy efficient measures, improvement of learning environment (comfort).
Planned (2021-2023)	**Title:** Financial Support Measures and Awareness Programs to Encourage the Use of Solar Water Heaters in Buildings **Objective:** To promote the introduction of renewable energy technologies, reduce gas consumption **Implementation level:** National	**Budget:** Unknown **Source of funding:** Depends on the amount of assistance available. **Implementer:** Ministry of Environment and Agriculture	18.7 Gg CO2 eq. annually.	The methodology and assumptions were developed by the team working on the Climate Action Plan.	The implementation of the event depends on donor funding, no funds are allocated from the state budget for this event.	NA	**Environmental benefits:** Energy savings reduce emissions of harmful substances into the air. **Social benefits:** Introduce modern renewable energy technologies, develop the local market for solar water heaters and create new jobs.
Planned (2022-2023)	**Title:** Construction of 2 new combined cycle thermal power plants Gardabani 3 and 4 **Objective:** To close old, inefficient thermal power plants and replace them with efficient thermal power plants **Implementation level:** National	**Budget:** Confidential **Funding source:** Unknown **Implementer:** Gardabani 3-Gas and Oil Corporation Gardabani 4- will be selected on the basis of tender	On average 510 Gg CO2 eq. annually.	Generation of Gardabani 1 in 2019. National Grid Emission Factor 2019 - 0.126 tons of CO2 eq / MWh.	Technical-economic study of the stations is planned.	NA	**Environmental benefits:** Shutting down inefficient thermal power plants and reducing harmful emissions and gas losses. **Social benefits:** creation of new jobs, introduction of modern technologies in the electricity generation sector.

In December 2019, the Law on Encouraging the Production and Use of Energy from Renewable Sources, adopted by the Parliament of Georgia, provides a legal basis for mechanisms to promote the production of renewable energy, the so-called "development of support schemes". Such mechanisms in international practice are the "Premium Tariff", "Green Certificate", "Price Difference Agreement" and "Special Green Tariff". The purpose of these mechanisms is to facilitate the production of electricity from renewable energy sources (hydro, wind, solar).

Case sample for Financing Potential in (Green) Energy Production and Transmission

EBRD

Green Economy Financing Facility (GEFF) supports businesses and homeowners wishing to invest in green technologies.

GEFF goes beyond providing simple lines of finance. An experienced EBRD team of bankers and technical programme managers ensures consistent quality and innovation in the GEFF product and service delivery.

In addition, advisory services are available to help participating financial institutions and their clients enhance their market practices.

GEFF is supported by the following donors: Austria, Bohunice International Decommissioning Support Fund, BP, Canada, Climate Investment Funds, Czech Republic, Eastern Europe Energy Efficiency and Environment Partnership Fund, EBRD Early Transition Countries Fund, EBRD Southern and Eastern Mediterranean Multi-Donor Account, European Union, European Western Balkans Joint Fund, Germany, Global Environment Facility, Green Climate Fund, Japan, Kozloduy International Decommissioning Support Fund, Norway, Slovak Republic, Spain, Sweden, Turkey, Taipei China, United Kingdom.

Green Economy Financing Facility (GEFF) in Georgia is a credit line facility of up to US$54 million to participating financing institutions in Georgia to on-lend to residential and commercial clients investing in energy efficiency and renewable energy projects.

The experience of the GEFF in the region indicates that the presence of knowledge and expertise is crucial for technical projects such as solar, wind or hydro power plants. Many projects have suffered (decreased generation, damage to the station, etc.) precisely because of a lack of technical competence, poor installation or improper planning.

Energocredit provided a credit line of up to $100 million to participating financing institutions in the Caucasus for energy efficiency and renewable energy investments.

Who is eligible?

- Private companies, enterprises, firms, sole proprietors or other legal entities who wish to invest in eligible technologies;
- Vendors of equipment or materials listed on the Green Technology Selector who are interested in participating in the Facility's vendor financing programme;
- "Green" technology manufacturers, as listed on the Green Technology Selector, who are planning to sustain or expand the "green" part of their business.

Technologies available on the EBRD Green Technology Selector are eligible for financing under the GEFF without any further technical approval. The process of financing these technologies is simple.

Some green investments are too complicated for the simple "pre-approved" approach using the online Green Technology Selector (e.g. investment in multi-apartment buildings). In these cases, the EBRD provides assessment services – technical expert support for free to help Participating Financial Institutions and their customers identify the best solutions and ensure successful implementation of high-quality green economy projects.

The GEFF team offers expert advice that can help turn your green opportunities into a sound investment and make you stay ahead:

- assess investment compliance with GEFF eligibility criteria
- specify equipment and processes that meet your business needs
- identify additional green investment opportunities
- undertake financial analysis of various technology options
- do a post-implementation quality check of benefits achieved.

These services are provided by impartial experts competitively selected by the EBRD and are available free of charge to the businesses thanks to funding provided by the Green Climate Fund (GCF) and the Austrian Federal Ministry of Finance (BMF). These experts can provide advice to support business decision-making.

Financing partners

GEFF provides financing through local participating financial institutions. Currently, the following financial institutions participate in GEFF in Georgia are TBC Bank, ProCredit Bank, BasisBank.

Maximum financing amounts of a loan:

- up to US$ 300,000 for small and clearly defined project that comprise high-performing equipment and materials from the Green Technology Selector,
- up to US$ 1 million equivalent for all other large scale energy efficiency and renewable energy projects, where GEFF team can provide advice – to Individuals.
- up to US$ 5 million equivalent for all other large scale energy efficiency and renewable energy projects, where GEFF team can provide advice – to Businesses, Service Providers, Vendors and Producers.

Financing is subject to the usual financing criteria and assessment process of each participating financial institution.

For illustrative purposes, some **case stories** of private investors in Georgia:

JSC Graali-92

Since 1936, this company designs, produces, delivers and installs metal structures, such as bridges, building frames, industrial rooftops and various types of masts. JSC Graali-92 operates throughout the Caucasus region.

In order to maintain its leading position, the company decided to invest in a solar PV system that would generate almost 100% of its electricity consumption needs.

To finance the investment, JSC Graali-92 applied for GEFF financing through one of the Partner Financial Institutions. GEFF experts analysed the financial and technical parameters of the project and calculated the benefits the company would achieve by generating its own electricity.

The investment of US$ 400,000 will allow the company to save up to 643 MWh of energy each year, which amounts to around US$ 65,000 annually. Additionally, generating power from solar energy would lessen the negative impact on the environment, by avoiding CO2 emissions of 258 tonnes per year.

Project supported also by the Green Climate Fund (GCF) and the Austrian Federal Ministry of Finance (BMF).

GeoLatex

Company based in Tbilisi that imports and distributes a wide variety of medical supplies and other products throughout Georgia.

Increased energy demands and rising electricity rates brought the operational costs quite high. It was decided to invest in a solar power plant.

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. 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).

Shilda HPP

To minimise environmental impact on the construction, the management decided to use green technology and applied for funds from the EBRD's Green Economy Financing Facility or GEFF.

With help of GEFF consultants, who analysed the project in detail, the company was able to purchase energy-efficient electrical equipment that reduced CO2 emissions by 10,000 tonnes annually.

The installed capacity of the Shilda HPP is 5 MW, producing 32 GWh of electricity annually that is supplied to Georgian State Electrical System and is used in the country.

The project is supported by EU4Energy and the Austrian Federal Ministry of Finance (BMF).

Bond Market Potential

The capital market, despite some progress, is still at an early stage of development in Georgia.

Nevertheless, the domestic bond market has been expanding, and the corporate bond market has exhibited ample growth in recent years. Moreover, the share of domestically issued bonds denominated in the local currency has grown. Apart from that, the government securities market has expanded significantly throughout the past few years.

Even though green and sustainable bonds have not been issued in the local bond market, Georgian companies have started issuing these types of bonds in foreign stock exchanges.

JSC Georgia Global Utilities issued First Georgian Green Bond - In July 2020, JSC Georgia Global Utilities ("GGU") issued US $250 million green bond. The Notes were listed on the Global Exchange Market of the Irish Stock Exchange. The proceeds of the Notes will be used to **refinance all existing debt of renewable energy** and water assets. The Notes are qualified as 100% Green.

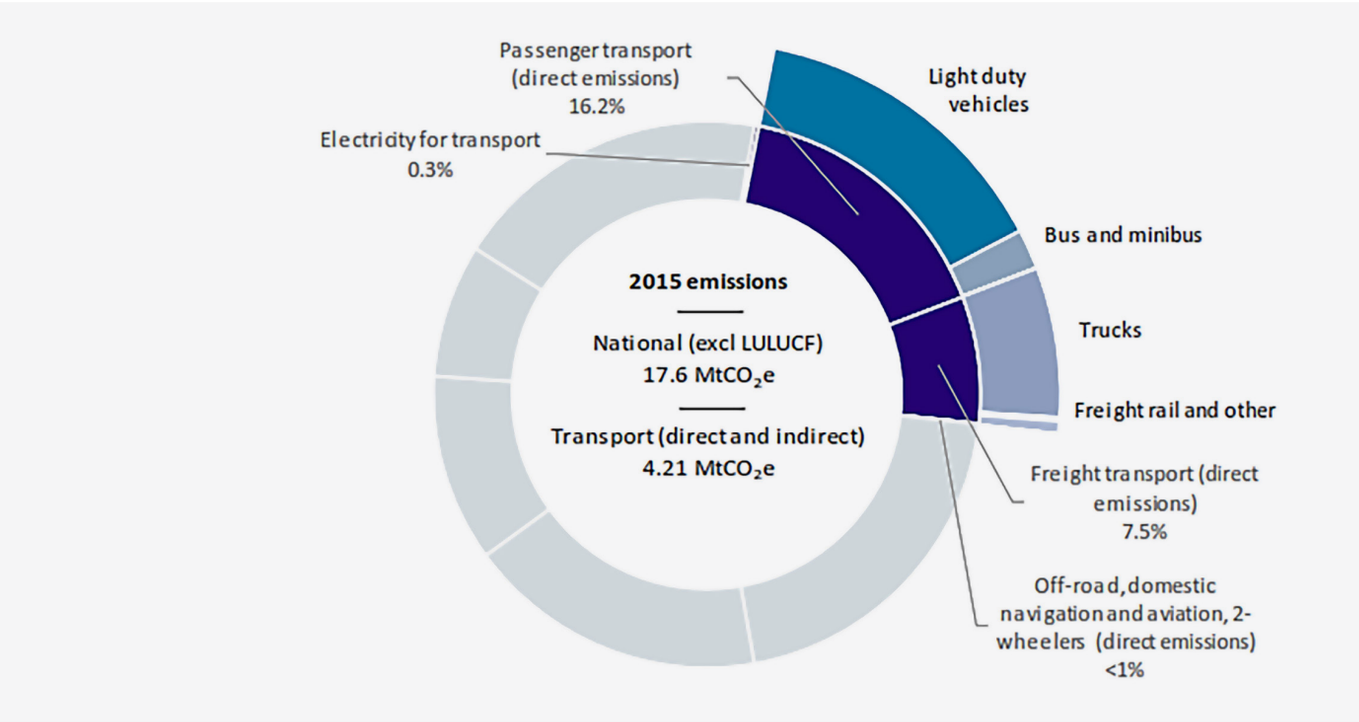
In May 2021, Symbiotics, a market access platform for impact investing, arranged the first Sustainability Bond ever issued in Georgia by raising USD 5 million in Georgian Lari equivalent for JSC FMO Crystal.

The Sustainability Bond is listed on the Luxembourg Green Exchange, and the proceeds will be distributed over a 3-year period. The Green loans will be used for financing energy efficiency, renewable energy, clean transportation, and sustainable agriculture projects.

10. ANALYSIS OF THE IMPLEMENTATION STATUS FROM THE PRIVATE SECTOR PERSPECTIVE – TRANSPORT

To implement the vision from the NDC, the identified goal is to reduce the greenhouse gas emissions in the transport sector by 15% below the reference scenario projection by 2030. Direct and indirect transport sector GHG emission levels were 4.21 MtCO2e in 2015 (24% of total national emissions), with 69% of emissions coming from passenger transport and the remainder from freight.

The implementation of CSAP actions for the sector leads to projected emission levels of 5.57 Mt-CO2e in 2030, a 22% improvement from projected emission levels without any action. Georgia's updated NDC includes the goal for the sector to reach 6.04 MtCO2e in 2030. This suggests that implementation of all CSAP actions would overachieve NDC targets for the sector.



Planned actions from the CSAP:

- Increase the share of low- and zero-emission and roadworthy private vehicles in the vehicle fleet
- Encourage the reduced demand on fossil fuel and the use of biofuels
- Promote non-motorized means of mobility and public transport
- Implement innovative, evidence-based initiatives in the transport sector
- Biodiesel production and sales
- Measures included in Tbilisi's Green Transport Policy Action Plan
- Measures listed in Batumi's Sustainable Urban Mobility Plan (SUMP)
- Emission (NEEAP) quality standards on the import of vehicles
- Develop international climate finance proposals for improved public and non-motorised transport (NMT)
- Develop cost-benefit analysis and feasibility study to identify best options for additional policies for improving emissions intensity of vehicles

Based on the above, we see these priority areas for enhanced action (CSAP)

- Replacing urban passenger transport with public transportation and non-motorised modes
- Replacing inter-city passenger transport with public transportation
- Improving efficiency of private light duty vehicles
- Shifting freight from road to rail transport

Policy Coverage and Gaps

In terms of policy coverage, Georgia's transport sector lacks a dedicated steering and implementing unit, as well as national strategies to implement low-carbon policies in a range of transport modes (e.g., e-mobility, non-motorised, freight).

Most mitigation planning has occurred at the municipality level (action plans) and covers a short horizon. While major national policy actions have started addressing important policy areas (retiring inefficient cars, providing incentives for electric vehicles (EV) and hybrids), there remain policy areas where potential deeper action has been identified for implementation. **Three potential priority actions have been highlighted for consideration in the transport sector:**

- Development of an **overarching e-mobility strategy** for electrified transport modes

  E-mobility penetration has only recently become prioritized in Georgia, primarily at the municipality level.

  There is no overarching e-mobility programme or strategy at the national or subnational level, although the first installations of charging infrastructure for private electric vehicles (EVs) and imports of battery electric buses (BEBs) started in 2018. **A comprehensive e-mobility strategy is a central element to allow the uptake of EV for passenger and freight transport modes**.

  Georgia will need to replace fossil vehicles with electrified modes and phase-out of fossil vehicles sales between 2030 and 2040.

  A strategic vision with synergistic policy packages is necessary to **send strong policy signals to attract the large-scale financing and manufacturing needed for urban planning and infrastructure projects**. Increasing **e-mobility penetration for private, public, and commercial transport** modes to replace fossil transport modes, coupled with a low-carbon electricity grid, reduces GHG emissions and creates a range of socioeconomic benefits.

- Development of national and municipal strategies for **non-motorised transport**

  Infrastructure for walking and cycling is lacking in most urban areas in Georgia, particularly in city capitals.

  The lack of non-motorised transport (NMT) options has been exacerbated with the COVID-19 pandemic. Without NMT services, transport activity is primarily shifted to Light Duty Vehicles (LDVs).

  Therefore, the development of a national non-motorised transport strategy, coupled with policy and urban planning guidance for municipalities, would directly address a priority policy area listed in the CSAP.

- Infrastructure and regulatory **reform of rail-freight sub-sector**

  Georgia is geographically located with access to maritime trade routes on the Black Sea coast creating advantageous trade hubs with high demand for freight activities and located at the crossroads of Europe and Asia, where strategic cargo is transported. The country's economic growth and sustainable development largely depends on the effective use of its potential as a transit country.

  Freight activity represented over 30% of transport GHG emissions in 2015 and is expected to double by 2030, with the majority currently carried by trucks on the East-West Highway.

  Infrastructure and regulatory reform of inter-city railroad systems also represent a long-term investment as freight carriage is key to railway profitability.

  The Private Sector would be critically involved in regulatory reforms, including separation of operations and infrastructure services, commercialization of operations, and building institutional capacity can improve the Railways' efficiency while addressing geopolitical strategies such as EU-Association Agreements (AA) and Deep and Comprehensive Free Trade Area (DCFTA).

  Georgian Private Sector would benefit from further infrastructure investments and regulatory reform to shift from road-freight to rail helping to fill a key policy area gap involving inter-city transport logistics and strategy.

  CSAP prioritisation to facilitate the shift has large climate mitigation potential given that rail-based freight is six times more energy-efficient than road-based and Georgian rail-

ways are completely electrified. The shift also generates additional SDG benefits through reduced pollution from trucking.

POLICY OPTION	OVER-ARCHING	CHANGE ACTIVITY	ENERGY EFFICIENCY	RENEW-ABLES	OTHER LOW CARBON	NON-ENERGY
Overarching sector-specific strategy						
Air quality standards						
Urban planning and infrastructure investment						
Support for modal share switch						
Energy/emissions performance standards for energy efficient vehicles						
Support scheme for biofuels						
Other support for low-emissions land transportation						
Tax on fuel and/or emissions						

At least one policy in force | Policy planned | No policy in force | Not Applicable

Since the 1990s, the function of Georgia as one of the sections of the Europe-Caucasus-Asia transport corridor has greatly increased.

The number of vehicles registered in Georgia is characterized by an increasing trend. The number of vehicles in 2018 has increased by 55% compared to 2007. Within the country, up to 25 million tons of cargo (approximately 59.9 percent of the total cargo transported) is transported annually by road and about 260 million passengers are transported.

International shipments are large. Annual shipments in 2011-2018 were in the range of 30 million tons. In 2018, international shipments increased slightly compared to the previous year, amounting to 31.1 million tons. Due to such volumes, the load on the main roads is large.

In terms of impact on Private Sector, it is believed that this modernization will directly contribute to domestic economic development by reducing freight transportation costs and better linking rural communities to Tbilisi and other urban centers in Georgia.

The highway infrastructure projects may have various impacts on decarbonisation pathways: road infrastructure modernization would likely encourage increased levels of road-based freight transportation activity and increased emissions along these routes. Modernized roads will also improve the fuel efficiency of vehicles travelling on these routes, and public modes of transport can benefit equally from inter-city road infrastructure modernization.

Georgia's transport sector is growing rapidly and unsustainably.

Most of the car fleet in the country is old. In addition, the mobility sharing and public transport in the sector is small. The car fleet has doubled in the last 10 years, which is quite alarming, and does not indicate a focus on public transport.

In 2015-2030, passenger activity could increase by 50%, while truck activity by 120%.

GDP growth has a stronger impact on trucks compared to passenger transport, as well as the geographical location of Georgia. International factors such as the demand for efficient international travel and trade between Central Asia and Europe contribute to the growth of Georgia's freight transport activity.

There is **no vision** for the transport sector in the country **as a unified system** and a strategy for its development at the national level. **The standards in the sector are very scarce**.

Only at the level of individual municipalities are strategically correct steps taken and the principles of sustainable development introduced. The bus fleet has been renovated and policy and strategy documents have been developed to help increase public transport system and non-motorized transport consumption.

These documents are:

1. Tbilisi Sustainable Urban Transport Strategy
2. Tbilisi Sustainable Urban Mobility Strategy (under development)
3. Rustavi bicycle travel strategy
4. Bakuriani Multimodal Transport Strategy (under development)
5. Regional General Scheme of Low Emission Public Transport in the Autonomous Republic of Adjara
6. Batumi Integrated Sustainable Urban Mobility Plan
7. Sustainable Transport Development Strategy and Action Plan of Khulo Municipality
8. Sustainable Transport Development Strategy and Action Plan of Keda Municipality
9. Sustainable Transport Development Strategy and Action Plan of Kobuleti Municipality
10. Sustainable Transport Development Strategy and Action Plan of Shuakhevi Municipality
11. Sustainable Transport Development Strategy and Action Plan of Khelvachauri Municipality.

Georgia has introduced tax breaks since 2018 to stimulate imports of electric and hybrid vehicles. This has significantly increased the share of hybrid vehicles in imported vehicles (from 5.5% in 2016 to 34.8% in 2018).

On December 1, 2017, the Government of Georgia adopted a Resolution on Periodic Technical Inspection of Vehicles. The decree entered into force in 2018 and aims to establish a unified organizational-technical and normative basis for periodic technical inspections of vehicles.

The Private Sector is mostly indirectly involved at enterprises level, and certainly concentrated in the shipping and logistics industry due to Georgia's unique location an international transit as important commercial opportunity, together with services and tourism.

As illustrative examples, some of the mitigation measures we identified:

Title: Biodiesel production in Georgia - "Biodiesel Georgia" Ltd **Purpose:** Reducing emissions by replacing petroleum biodiesel with biodiesel **Implementation level:** National	**Funding source:** Private investment **Implementer**: Ltd. Biodiesel Georgia **Other partner organizations:** Ministry of Internal Affairs; Georgian Biomass Association	32 Gg CO2 eq. annually by 2030	Using one ton of biodiesel instead of one ton of biodiesel saves 2.67 tons of carbon dioxide emissions into the atmosphere.	In July 2018, the enterprise "Biodiesel Georgia" Ltd (www.gbd.ge) was opened. After the test period, the plant reached the production of 10 tons of biodiesel per month. Products are sold in various networks of gas stations, in the form of 10% impurity in mineral diesel, under the brand name "B10 Biodiesel".	Greenhouse gas emissions have been reduced annually: 2018 - 0.48 Gg CO2 eq. 2019 - 0.63 Gg CO2 eq.	**Environmental benefits:** Emissions of harmful substances into the environment from road transport have been reduced. **Social benefits**: New jobs will be created. Worked oils from food establishments will be collected and processed.
Title: Urban mobility - expansion of the metro in Tbilisi. **Objective:** To expand the Tbilisi metro system with one additional station. **Implementation level:** local	**Budget:** 31.2 million euros **Funding source:** Asian Development Bank (ADB) **Implementer**: Municipal Development Fund	503 Gg CO2 eq. annually by 2030	The final energy savings were calculated based on the change in modality from individual vehicles to subway, based on the amount of energy consumption per 1000 passengers-km. A typical passenger travels 6.4 km. 28.16 million passengers per kilometer will be transported annually from personal vehicles to the subway.	The new metro station has been in operation since 2017.	The distance of the route has increased by 1.5 km and it is expected that this expansion will increase the number of passengers on the metro network by 4.4 million annually. The annual reduction in greenhouse gas emissions could not be calculated due to the lack of statistics.	**Environmental benefits:** Emissions of harmful substances into the environment from road transport have been reduced. **Social benefits**: New jobs created. A public transport system was developed. Increased economic activity in the vicinity of the metro station.
Title: Expansion and modernization of the Georgian Railway. **Purpose:** Increase the possible throughput of the railway line **Implementation level** - National	**Budget:** 147,384 million euros **Funding source:** Georgian railway **Implementer**: Georgian railway	46.2 Gg CO2 eq. annually by 2030	Energy savings are due to the switchover of freight transport by rail to railways. Based on the information provided by the Georgian Railway - monitoring of cargo per ton-km/year.	Currently, 86% of the total work is completed. Part of the project, which dealt with the modernization of railway infrastructure along the line and the construction of three tunnels.	Reduction of greenhouse gas emissions will be calculated as soon as the railway expansion works are completed.	**Environmental benefits:** Emissions of harmful substances into the environment from road-freight transport have been reduced. **Social benefits**: New jobs will be created.
Title: Measures to improve the transport system in Tbilisi **Purpose:** Improving the current transport and environmental situation, replacing the consumption of private cars with public transport. **Implementation level** - local	**Budget:** 27.5 million euros **Funding source:** European Bank for Reconstruction and Development (EBRD) **Implementer**: Tbilisi Municipality Government and **Other partner organizations:** Tbilisi Transport Company; Tbilisi minibus; Tbilisi Parking	100 Gg CO2 eq. annually by 2030	The final energy savings are calculated based on the energy saved as a result of replacing diesel buses with new, efficient CNG buses. Total final energy consumption savings are calculated based on the total market potential (number of buses replaced) over time.	In 2017, 143 MAN CNG buses were brought to Tbilisi; 310 buses will be added to Tbilisi in 2019. 10 main corridors have been identified and bus lanes are being marked in stages.	Reductions in greenhouse gas emissions will be calculated as soon as the project is completed and statistics collection begins.	**Environmental benefits:** Emissions of harmful substances into the environment from road transport have been reduced. **Social benefits**: new jobs will be created. The number of road accidents will be reduced.

Title: Measures to be taken to improve the transport system in Batumi **Purpose:** Improving the existing transport and environmental situation, replacing the consumption of private cars with public transport. **Implementation level:** Local	**Budget:** 2.5 million euros **Funding source:** European Bank for Reconstruction and Development (EBRD) **Implementer**: Batumi Municipality Government	7 Gg CO2 eq. annually by 2030	Reduction of greenhouse gas emissions is calculated on the basis of energy saved as a result of replacing obsolete diesel buses with new, efficient Euro-5 diesel and electric buses.	40 diesel and 10 electric buses have been purchased, and a pilot project is underway to separate the bus lane on Chavchavadze Street.	Reductions in greenhouse gas emissions will be calculated as soon as the project is completed and statistical data is collected.	**Environmental benefits:** Emissions of harmful substances into the environment from road transport have been reduced. **Social benefits**: new jobs will be created. The number of road accidents will be reduced.
Title: Improving the capacity, quality and efficiency of public transport systems and non-motorized vehicles **Purpose:** Improving the existing transport and environmental situation, replacing the consumption of private cars with public transport. **Implementation level:** Local (Zugdidi, Rustavi, Kutaisi and Gori)	**Budget:** 18.7 million euros **Funding source:** European Bank for Reconstruction and Development (EBRD) **Implementer**: Municipal government	141 Gg CO2 eq. annually by 2030	Reduction of greenhouse gas emissions is calculated on the basis of energy saved as a result of replacing obsolete diesel buses with new, efficient Euro-5 diesel and electric buses.	175 buses have already been purchased, the winner company will be identified which will determine the strategy of redistribution of these buses on different routes and also a transport authority will be formed in 6 cities which will continue to operate buses in the future.	Reductions in greenhouse gas emissions will be calculated as soon as the project is completed and statistical data is collected.	**Environmental benefits:** Emissions of harmful substances into the environment from road transport have been reduced. **Social benefits**: new jobs will be created. The number of road accidents will be reduced.

Barriers and challenges for the implementation

The transport sector in Georgia currently finds itself at the center of several major social issues and political discussions. The sector is at a crossroads: **investments in transport entail a high degree of locking due to long infrastructure and technology lifetimes**, so decisions on how to address these current issues will determine how the sector develops in the coming years and decades.

Development of Overarching E-mobility Strategy

High initial infrastructure costs; Low density of public and private charging points; Insufficient corporate and demand-side (including non-financial) incentives.

Development of national and municipality strategies for non-motorized transport

High investment needs for safe and convenient infrastructure projects; Revision of urban planning and space in city capitals; Public perception of pedestrian/cycling infrastructure quality, road safety, weather/temperature constraints, cultural and behavioural considerations.

Infrastructure investment and regulatory reform of rail-freight subsector

Lack of comprehensive impact analysis on infrastructure projects and priorities; Lack of long-term railway development plan and financing strategies for large-scale infrastructure.

Costs estimation Barriers and for the implementation

Development of Overarching E-mobility Strategy

L1 slow charging station (home charging infrastructure): 600-800 USD per charger DC fast charging station (public charging infrastructure) – 50/100/150 kW: 28/75/140k USD per station

Development of national and municipality strategies for non-motorized transport

Estimation based on other international cases:

4.5 km of NMT routes (Cape Town) 2.5M USD

116 km of NMT routes (Nairobi): 103M USD

370 km of NMT routes (Bogota): 1.1B USD

Infrastructure investment and regulatory reform of rail-freight subsector

Tbilisi-Makhinjauri modernization project (reconstruction 23-km, new 38-km, 7 tunnels): ~233M EUR.

BTK project (178km, 85% reconstruction, 15% new): 775M EUR.

Long-term Paris Agreement compatible trajectory

The objectives of the Paris Agreement have considerable implications for the development of the transport sector in Georgia: in contrast to the projected rapid growth of GHG emissions from transport in Georgia, emissions from the sector should peak as early as possible and reduce to zero in the second half of century (IPCC, 2018).

In other words, **compliance with the Agreement would implicitly require Parties to restrict short-term investments in fossil fuel-related transport infrastructure to the very minimum required, and to transition to a 100% zero carbon transport sector in the medium- to long-term**.

The Paris Agreement is based on a **"common but differentiated responsibilities"** principle, under which all countries are expected to fully decarbonise, although at different speeds and under different financial conditions.

Developed countries are expected to mitigate at a faster rate in comparison to developing coun-

tries to allow for development, and to provide technical and financial assistance for the decarbonisation of developing economies, such as Georgia. Thus, **Georgia should already work on a decarbonisation pathway that is in line with achieving the Agreement's targets while also compiling with other national development priorities**.

To expose the **potential of Private Sector implications**, it would be interesting **how the general trend transport emissions could follow under a decarbonisation scenario, compared to increasing emissions in the coming decades under current policies.**

For example, two different scenarios can represent different alternatives of how the transport sector could decarbonize:

1. A **"best-in-class"** scenario, based on the potential for replicating best practices of other countries
2. A **"Paris Agreement-compatible"** scenario, following global trends according to international sources

Both scenarios represent two different ways of how the transport sector could develop in the future in Georgia.

The resulting emission pathways are compared to a range of "2°C compatible" scenarios from international literature (IEA, 2017a, 2018; IPCC, 2018).

INDICATOR		BEST-IN-CLASS SCENARIO	PARIS AGREEMENT-COMPATIBLE SCENARIO
PASSENGER TRANSPORT			
Average emission intensity for non-electrified personal vehicle transport		**European Union targets:** • 95 g CO_2/vkm by 2020 for new cars • 15% reduction relative to 2020 by 2025 and 31-37.5% by 2030 (81 gCO2/vkm by 2025 and 59-68 g CO2/vkm by 2030) **Assumption for Georgia:** similar developments and targets with a 10-year delay, achieving average emissions intensity of **95 gCO_2/vkm by 2030** and **59-68 gCO_2/vkm by 2040.** Lower end for best-in-class scenario and upper end for Paris Agreement-compatible scenario. **Source:** European Federation for Transport and Environment, 2018; Climate Action Tracker, 2018b.	
Modal Split	**Share of public transport activity**	Mode shares according to the ambitious scenario developed for the European Transport Roadmap Report: • 45% of all trips made in 2050 with public transport modes **Assumption for Georgia:** Same recommendation as in European Transport Roadmap Report, assuming public transport includes bus and train activity and LDVs make up for the remaining share of rides (~55%). **Source:** Greenpeace (forthcoming)	Target for OECD Asia region under the Robust Governance (ROG) scenario which assumes that local governments play an active role to slow down the ownership and use of personal vehicles (LDVs) from 2020 oards: • 56% of all trips made in 2050 with public transport **Assumption for Georgia:** Same as assumption for Asia region, assuming public transport includes bus and train activity and LDVs make up for the remaining share (~44%). **Source:** OECD/ITF Transport Outlook, 2017. Chapter 5, Table 5.2.
Share of electrified passenger transport activity		'Good practice' scenario developed by Fekete et al. based on the 30% current share of EVs in new vehicle sales in Norway: • 17% by 2030; 35% by 2040 and 54% of the LDV fleet to be electric by 2050 • 20% by 2030; 39% by 2040 and 58% of the bus fleet to be electric by 2050 **Assumption for Georgia:** Same trend as in the 'good practice' scenario above referred. **Source:** Fekete *et al.*, 2015**;** Climate Action Tracker, 2018b.	Global transport sector benchmarks to limit warming to 1.5°C targets: • 43% by 2030; 94% by 2040 and 100% of the LDV fleet to be electric by 2050 • 55% by 2030; 98% by 2040 and 100% of the bus fleet to be electric by 2050 **Assumption for Georgia:** Same as global targets needed for LDVs and of public transport. **Source:** Kuramochi et al., 2018.

Freight transport			
Average emission intensity for non-electrified truck transport		**European Union targets:** • In 2025, 15% lower than in 2019 • In 2030, at least 30 % lower than in 2019 **Assumption for Georgia:** Same targets as for EU but compared to emission intensity levels in the baseline year (2015)**.** **Source:** European Federation for Transport and Environment, 2018	
Modal Split	**Share of rail freight**	Best practice example of European countries that transport high shares of domestic cargo by train: • Latvia, currently with 80% of freight by rail **Assumption for Georgia:** reach similar levels as in good practice example of Latvia, by 2050. **Source:** Climate Action Tracker, 2018	
Share of electrified freight activity		Based on EU's 30% electric trucks in new truck sales by 2030 target: • 16% by 2030; 37% by 2040 and 58% of the truck fleet to be electric by 2050 **Assumption for Georgia:** to reach similar levels as suggested for the EU and follow a similar increasing trend afterwards. Rail freight is 100% electric by 2030. **Source:** Climate Action Tracker, 2018	Global transport sector benchmarks to achieve full decarbonisation by mid-century: • 33%-42% by 2030; 75%-91% by 2040 and 99%-100% of the truck fleet to be electric by 2050 **Assumption for Georgia:** Same as in global targets, taking the lower end of the range as target. Rail freight is 100% electric by 2030. **Source:** Climate Action Tracker, 2018

Analysis: In striking contrast to the projected emissions growth under a BAU scenario, **emissions from the transport sector should peak and decline as early as possible to achieve the sector's decarbonisation in line with the Paris Agreement's objectives.**

Emissions for the transport sector under both the "Best-in-class" and the "Paris Agreement-compatible" scenarios would peak in the short term and start a declining path over the following decades.

Results: **although prioritizing modal shifts will reduce the level of electrification needed in the short term, a relatively high share of electric vehicles is necessary in all cases**.

As we pointed out before, ambitious policies in this area are currently lacking as there is no widespread electrification strategy for public transport in place, and financial incentives insofar have had mixed results. The demand for electrification has important implications on large scale infrastructure developments, e.g. rolling out the needed technology and infrastructure to support the increase of electric vehicles in the country and to support a shift to rail (passenger and freight) transport.

Task for Public and Private Sector: **find the right mix between modal shift and electrification for Georgia, considering its geographical, societal, and political context.**

Achieving the full decarbonisation of the transport sector also significantly relies on the decarbonizing of the electricity supply sector, in line with the Paris Agreement temperature limit.

International technical support programmes for transport sector

A number of programmes are currently underway to support the development of national and subnational strategy in the transport sector. Some of them, for illustrative purposes, include but not limit:

- The **Sustainable Low Emissions Transport Development** project, implemented by CENN and the UN Environment Programme (UNEP) under Global Fuel Economy Initiative (GFEI), supports Georgia to put in place the policies required to comply with the EU Association Agreement, specifically with regards to measures that will impact air quality.
- The **Green Cities** project, implemented by UNDP, supports the cities of Batumi, Tbilisi and Ajara with the development of integrated sustainable transport strategies, including modelling technical urban transport parameters and designing specific policy interventions.

- The **Capacity Development for Climate Policy (CDCP)** project implemented by GIZ and New-Climate Institute, under which this report is prepared, has supported the institutions responsible for climate change planning processes to align transport sector climate change mitigation planning, and to identify additional measures for climate change mitigation, for the development of the transport sector chapter of the 2021-2023 Climate Strategy and Action Plan.
- The **Urban transport advisory and technical assistance** projects implemented by AFD and supporting Tbilisi City Hall in SUMP implementation, Coordination processes and advising the Head of the Tbilisi Urban and Transport Development Agency and to Tbilisi Transport Company in Capacity building in Operation and maintenance, project management and supervision.
- The **Green Cities programme implemented by EBRD** supports Tbilisi Transport Company with its different projects in Corporate Development, Capacity Building and Stakeholder Participation, implementation of reforms for bus services in the City, including implementing the PSC and introducing the new bus network, the preparation and implementation of a Gender Equality and Inclusion Strategy. Also, provides gender advisory services for six regional cities.
- The **Sustainable Urban Mobility in the South Caucasus (Mobility4Cities)** Programme implemented by GIZ supports Tbilisi and Batumi municipalities in developing and implementing concepts and strategies for urban mobility, e.g. Sustainable Urban Mobility Plans (SUMPs), improves opportunities for training and academic qualification on sustainable urban mobility and develops recommendations to improve the national framework for urban mobility are developed in cooperation with responsible Georgian institutions.
- The **Sustainable Urban Mobility** project implemented by KfW supports Tbilisi and Batumi City Halls and Transport Companies to reduce Greenhouse gas emissions by introducing new ITS system on certain corridors, data center, traffic lights

Some Success stories

GrCF2 W2 - Tbilisi Bus extension EBRD Project

Provision of a sovereign loan of up to EUR 80 million to Georgia for on-lending to the city of Tbilisi for the benefit of the Tbilisi Transport Company Ltd, a municipal company, which operates buses, the metro system and cable cars in Tbilisi. The loan is divided in 2 tranches: EUR 65 million and EUR 15 million, respectively.

The project will **finance a new bus fleet of modern 12-meter low- floor compressed natural gas ("CNG") buses**, and rehabilitation/modernisation of bus depots for the city.

The investment will improve the reliability, safety and efficiency of public transport, while the CNG technology will reduce greenhouse gas emissions. The project will introduce low-floor buses, bringing significant social benefits by facilitating easy access for passengers with prams and shopping bags, especially women, and those with limited movement, including the elderly and the disabled. Moreover, the new buses will improve the safety of bus operations.

The project is part of Green Cities 2 ("GrCF2") and a follow-on investment to the Tbilisi Green City Action Plan ("GCAP").

GrCF2's primary goal is to achieve significant environmental improvements and promote the Green transition quality within the relevant cities. The Bank will also seek to introduce more robust policy advice, targeted studies and technical assistance.

The proposed project is expected to address the Green transition objectives on the back of significant environmental benefits through the provision of clean vehicles and the continued improvement of public transport services as a viable alternative to car-based transportation in Tbilisi. The

project will further support the Well-Governed objective through continued support of sector reforms and re-routing of bus services in Tbilisi.

The total project cost is €80 million. The project will also benefit from the technical cooperation assignments to support project preparation and implementation.

The environmental and social impacts associated with the purchase and operation of the new low-emission CNG buses will be mainly beneficial. The Project will contribute to improved accessibility and mobility for all user groups, air quality in the City, safety and efficiency of urban transportation.

The Environmental and Social Due Diligence ("ESDD") has been undertaken in-house and included a review of the Company's existing management systems, Environmental and Social ("E&S") monitoring and audit reports, ESAP implementation status and overall E&S regulatory compliance.

Assessment also included an analysis of environmental and social impacts and benefits associated with the Project, including compliance of the proposed bus specifications with the EU requirements.

GrCF - Batumi Bus Project

A sovereign loan of EUR 5.5 million to Georgia, on-lent to the City of Batumi for the benefit of Batumi Autotransport LLC, a municipal bus company. The loan is divided in 2 tranches: EUR 3.2 million and EUR 2.3 million respectively. Tranche 2 is co-financed by a capital expenditure grant of EUR 1.5 million from the Eastern Europe Energy Efficiency and Environment Partnership (E5P).

The Project aims to **improve and modernize bus operations in Batumi through the upgrade of its bus fleet.** The project will be complemented by a technical cooperation (TC) package to improve the operational and financial performance of the Company, through the Corporate Development Programme (CDP), assist the City to prepare a Green City Action Plan (GCAP) and raise public awareness on transport related issues.

The transition qualities promoted by the project are consistent with the GrCF. **The Green quality will be promoted through significant reduction in emissions of CO2 and local air pollutants.** The Well-governed quality will be promoted through the improved planning, supervision and monitoring of environmental activities under the GCAP as well as through improved contractual and regulatory arrangements for the bus operations in Batumi.

Wrap up of the potential and priorities engaging the Private Sector

Based on the gaps in the policy framework indicated earlier, and the priority action areas identified by the transport sector working group for the development of the Climate Strategy and Action Plan, the following measures and areas of action remain options for additional action with direct and indirect involvement of the Private Sector:

- Urban planning strategies to minimize transport demand: In Georgia, a National Strategy and Policy Framework on Sustainable Low-Carbon Urban Transport was developed with the support of UNDP and the Municipal government of Batumi. The strategy needs to be picked up by national stakeholders that can take responsibility to see its implementation.
- Instruments to improve efficiency of private light duty vehicles: The efficiency of private light duty vehicles will improve due to several of the actions in the 2021-2023 CSAP, but due to the age and poor efficiency of the current vehicle fleet, further improvements will remain a priority action area.
- Mandatory EV targets: the transport sector must begin to decarbonise in the next few years and move quickly towards zero-emission options. Several European countries are phasing out fossil fuel cars and switching to electric vehicles (EVs). Georgia could also consider developing an e-mobility programme or strategy to support the implementation of actions needed to increase the share of EVs in the country.

- Shifting urban passenger transport to public transportation and non-motorized modes: The 20213-2023 CSAP includes the enabling action of developing proposals for international climate finance to support action in this area, which is at the same time aligned with the climate action priorities of Georgia's Country Programme with the Green Climate Fund (GCF).
- Shifting inter-city passenger transport to public transportation: Improvements are being made to passenger rail services, including the provision of new and modern trains. Further, improving inter-city passenger transport quality as well as the railway system, are national mitigation priorities, as indicated in Georgia's Country Programme with the Green Climate Fund (GCF).
- Strategy or policy instruments for optimised and efficient freight and logistics: several potential plans and strategies have been developed that would have a positive impact for shifting freight from road to rail, but there remains a lack of clarity on what would be the most effective options to pursue. The 2021-2023 CSAP includes the enabling action of developing a cost benefit analysis and feasibility study in the future, in order to assess which would be the most attractive policy options in this area.
- Support schemes for sustainable biofuels: the use of renewable energy and biofuels in Georgia's transport sector is currently negligible, although some studies have already been carried out with significant interest from the Municipal government of Tbilisi and highlighting the potential to impulse agriculture developments in the country.

11. ANALYSIS OF THE IMPLEMENTATION STATUS FROM THE PRIVATE SECTOR PERSPECTIVE – BUILDINGS

This section of the CSAP addresses the **energy demand in residential, commercial, and public buildings**.

The objectives set by the state for this sector are related to both direct emissions, such as direct combustion of fuel in buildings for energy supply, as well as indirect emissions – consumption of electricity in buildings and other related issues.

Direct GHG emissions from **energy demand in buildings** accounted for 2.31 MtCO2e in 2017 (approximately 13% of total national emissions), pre-dominantly from residential buildings. In addition, the use of electricity in buildings also accounted for 0.8 MtCO2e in 2017, approximately 22% of the total emissions from electricity generation and transmission.

Georgia's updated NDC has not set an emissions target for the sector.

A comprehensive inventory of buildings has never been carried out in Georgia.

There is no aggregated, structured database in place with engineering-technical information about the building stock.

Thus, the information provided in the Climate Action Plan is based on the data compiled from the reports issued by various research projects and by the government.

Georgia made small steps to improve its record in the area of energy efficiency. It adopted a methodology for minimum energy performance of buildings calculation required under the Buildings Directive.

The institutional framework benefited from the decision of the Ministry of Economy and Sustainable Development to allocate more staff to the energy efficiency field.

Georgia's focus should be on the adoption of the large number of by-laws needed to implement the Energy Efficiency Law, the Energy Efficiency in Buildings Law, and the Labelling Regulation. Until this has been achieved, Georgia will remain non-compliant in many areas of the energy efficiency acquis.

Currently, **there is no national fund for energy efficiency, but large grant and lending programmes for energy efficiency in buildings started in 2021**.

Adequate engagement of the private sector requires the further development of the ESCO market.

Planned actions from the CSAP

The implementation of CSAP actions for the sector leads to projected emission levels of 4.6 Mt-CO2e in 2030, only a nominal improvement from projected emission levels without any action.

- Develop a system for energy efficiency certification of buildings
- Raising consumer awareness about energy efficiency
- Encourage energy-efficient approaches and installation of energy-efficient lighting in residential, commercial, and public buildings
- Support use of solar energy for water heating and use of energy- efficient stoves
- Train high professional standard personnel in energy efficiency

Our analysis on Implementation indicators

Energy efficiency targets and policy measures

The general 2020 target was set in the latest NEEAP. The specific targets required by the Energy Efficiency Directive were established by the 2020 Energy Efficiency Law. Georgia submitted the second Annual Progress Report to the Secretariat in 2021.

Energy efficiency in buildings

The Law on Energy Performance of Buildings is in place. The minimum energy performance requirements for buildings or building units and building elements and the national calculation methodology for buildings performance were adopted by the Government in July and September 2021. The adoption of the other key by-laws (certification rules, regulation on inspection of heating and air-conditioning systems) is pending.

Potential: direct emission reductions in soviet-era multiapartment buildings could reach approximately 72% through basic window and door weatherization, insulation of exterior structures and roof insulation.

Barriers: poor availability of information and statistical data on the existing building stock for policy formulation; Lack of affordable credit for retrofit; Lack of legal structures for collective action in multi-apartment buildings.

TA requirements: development of inventory and more granular statistical data on the existing residential building stock.

Energy efficiency financing

The Energy Efficiency Law promotes the use of ESCOs but does not include a framework to support public financing (i.e. an energy efficiency fund). Nevertheless, a large number of international technical assistance projects and financing programmes support energy efficiency measures, especially in the building sector.

Costs: Upfront capital expenditure less than USD 100,000, with 5-8year payback period, for envelope efficiency measures on multi-apartment buildings with ca. 100 apartments.

Energy efficient products - labelling

The Law on Energy Labelling was adopted in December 2019. It also transposes Regulation 2017/1369/EU. Nevertheless, the adoption of the fifteen product regulations required by the Law was delayed and some of the drafted product regulations need to be updated to reflect the latest versions. The rest are expected to be adopted by the Government before the end of 2021.

Efficiency in heating and cooling

Georgia has no district heating or cooling systems. An assessment of high-efficiency cogeneration and efficient district heating and cooling potential has not been conducted.

Barriers: the weakness of formal cooperation between homeowners in many multi-apartment buildings remains one of many barriers to the introduction of building-scale heating equipment or the revival of smaller-scale district-heating networks.

The feasibility of new small-scale district heating in newly constructed communities is yet to be thoroughly assessed. Feasibility studies and demonstration projects are required to test the feasibility of different potential renewable energy sources in different contexts. Policies can target support to specific technologies, prompt the development of demonstration projects and scale up successful applications.

Costs: Upfront capital expenditure of approximately USD 33,000, with a 3-year payback period, for central heating with biomass or geothermal on multi-apartment buildings with ca. 100 apartments.

Potential: the switch to renewable energy carriers can completely decarbonise spatial heating where used, an emissions source responsible for nearly 11% of national GHG emissions.

TA Requirements: feasibility studies for centralised heating systems using waste-to-energy, geothermal heat pumps, biomass energy and advanced solar thermal technologies, in different building contexts.

Policy coverage and gaps

The Georgia-EU Association Agreement binds Georgia to the implementation of a number of Directives related to improved energy efficiency in the building sector, including the development of new policies.

This has been one of several driving forces for the development and adoption of energy efficiency standards for new constructions, equipment and appliances. However**, the strength of those standards can still be developed further, and several other potential policy areas in the sector remain unaddressed**.

Remaining policy gaps involving the inclusion of the Private Sector include **urban planning strategies that address energy consumption in buildings, support schemes for renewable energy in the provision of heating, cooling, hot water and cooking, and taxation policy that targets energy consumption and fossil fuels in the sector**.

Two potential priority areas have been highlighted for consideration in the building sector:

- Financing instruments for residential energy efficiency improvements

  The poor energy efficiency performance of the existing building stock is an economic, social and environmental issue in Georgia. Georgia uses approximately 50% more energy per unit of floor space than EU countries with a similar climate, due to the poor energy performance of much of the existing residential building stock dating from the Soviet era.

  Despite encouraging developments at the policy and planning level in recent years, these efforts have not yet been able to affect a significant improvement on the availability of attractive financial instruments for the retrofit of theresidential building sector.

Financial instruments that support retrofit of building envelopes for existing residential buildings – such as insulation and weatherisation – can significantly reduce energy consumption for spatial heating and associated emissions.

A wide range of financial instruments exists including subsidised credit lines, as well as the establishment of energy service companies (ESCOs). Such measures should be complemented by awareness campaigns and other interventions to **address market barriers to ensure uptake from home- and building-owners**.

- District- and building-level heating with renewable energy

Most households in Georgia are heated by individual heaters, from natural gas, firewood or electricity.

Georgia's major cities are adequately endowed with geothermal and solar energy potential for heating. Sustainable biomass and waste-to-energy are also touted as attractive options. **These technologies are more feasible when applied at the district or building level.**

Anyway, a shift to renewable energy carriers for heating in buildings can lead to the decarbonisation of the greatest source of emissions in the building sector and a private sector has a huge stake on this.

Promising technologies – including waste-to-energy, geothermal heat pumps, biomass energy and advanced solar thermal technologies – are more feasible for centralised heat supply systems at the district- or building-level, than at the level of individual units in multi-apartment buildings.

POLICY OPTION	OVER-ARCHING	CHANGE ACTIVITY	ENERGY EFFICIENCY	RENEW-ABLES	OTHER LOW CARBON	NON-ENERGY
Overarching sector-specific strategy						
Urban Pplanning strategies						
Building codes and standards as well as support for high efficient construction						
Performance and equipment standards as well as support for highly efficient appliances						
Support scheme for heating and cooling						
Support scheme for hot water and cooking						
Energy and other taxes						

At least one policy in force | Policy planned | No policy in force | Not Applicable

ESCO Potential and Role for the Private Sector in Georgia for the Buildings and Real Estate domains

One mechanism to promote investment in energy-efficiency technologies is through energy performance contracting (EPC) undertaken by Energy Service Companies (ESCOs).

Under EPC, **an ESCO designs and installs energy-efficient technology for clients in the public, and private industrial, residential, or commercial sector**.

The ESCOs' remuneration is based on the amount of energy saved. After the term of the contract is complete, the value of the energy savings usually shared with the client. Thus, Energy Service Companies (ESCOs) provide a **promising opportunity to achieve** greenhouse gas emissions reductions in Georgia through **increased energy efficiency** in a variety of sectors. But, despite the simplicity of the concept, ESCOs have yet to gain a significant foothold in many developing countries such as Georgia.

A large number of programs and mechanisms have been established to help facilitate the growth. These include efforts by international agencies, including, most importantly, the World Bank, the European Bank for Reconstruction and Development (EBRD) and the United States Agency for International Development (USAID). These programs primarily involve funding for ESCO start-up, ESCO projects, partnership development, capacity building and loan guarantees, and have been critical for jump-starting ESCO development in many developing countries. Within developing countries, governments, development banks, commercial financial institutions, utilities and ESCO associations have also played a role in ESCO development.

Despite all of the programs and mechanisms to facilitate the growth of ESCOs, they have only experienced moderate success. A number of barriers serve to hinder ESCO expansion. Financing and administrative barriers are generally considered to be the most critical.

The **Private Sector faces some key barriers** to ESCO success in Georgia:

- **Difficulty accessing financing** due to scarce capital and immature banking sectors, lack of ESCO awareness of how to access financing, lack of lender knowledge of ESCOs or perceptions that the ESCO and/or client is not credit-worthy, and commercial financing rules that are inconsistent with energy-performance contracting (EPC) including preferences for working capital, large projects, asset-based financing, commercial risk, and short payback periods
- **High administrative and transaction costs**, including the technical challenges associated with designing projects and procuring equipment, complex and time-consuming contract negotiations, lack of a legal and institutional framework for ESCOs and complicated government procurement rules
- **Limited knowledge of ESCOs and reliability concerns** on the part of prospective clients and lenders with regard to what ESCOs do, energy efficiency in general, and the likelihood of achieving savings through energy-efficiency measures
- **Lack of human resources within the ESCO**, where knowledge of financing and marketing is often in short supply, and within prospective clients, who lack the technical capacity and experience to fully assess the benefits and risks of engaging in ESCO projects
- **Client preferences for in-house solutions** and other priorities for a wide variety of reasons, including preferences to keep jobs in-house, to prevent the divulgence of trade secrets, to avoid temporary shutdowns and a general preference to focus on increasing market share and production, rather than energy efficiency
- **Challenges of the EPC business model, including low profit margins**, the uncertainties associated with remuneration based on guaranteeing savings, risks associated with clients who do not fulfill their end of the contract and the costs associated with preparing complicated bids that may or may not be successful.

Key measures that could facilitate ESCO industry success in Georgia include:

- **Financing support structures and funding mechanisms**, including dedicated debt agencies, concessional financing and grants, and loan guarantees to jump-start ESCO industries and enable domestic commercial financial institutions to eventually take over as the primary source of lending for ESCO projects
- **Fostering domestic commercial financial institution support for ESCOs**, including encouraging a move to cash flow-based or project-based financing, funding small projects or bundling projects and establishing specific energy-efficiency financing programs and teams
- **Establishing appropriate energy-efficiency programs and laws**, including eliminating energy price subsidies and creating energy-efficiency agencies and energy-efficiency obligations and incentives
- **Engaging in ongoing information dissemination to potential clients with regard to energy efficiency and ESCOs,** with a focus on building partnerships and providing a clear —one stop shop‖ source of information that is updated regularly

- **Undertaking ongoing capacity building for ESCOs with regard to financing, contracting approaches, best practices, and technology with other ESCOs and clients, both domestically and internationally**, through a wide variety of approaches, including information dissemination, networking opportunities and training courses
- **Promoting increased energy-efficiency human resources**, both in ESCOs and at client sites through training programs or certification programs
- **Engaging in public and private sector demonstration programs to build ESCO capacity** and raise awareness through the creation of success stories
- **Creating public sector energy-efficiency programs whereby all public buildings are required to undergo energy efficiency upgrades,** creating a continuous demand for ESCOs
- **Establishing pre-qualification or accreditation programs** for ESCOs to reassure clients that ESCOs are reliable
- **Development or use of standardized contracts and monitoring and verification protocols**, such as the International Performance Measurement and Verification Protocol (IPMVP), to improve perceptions of ESCO reliability as well as to reduce administrative costs associated with contract negotiation
- **Encouraging joint ventures with multi-national ESCOs to help improve domestic ESCO capacity**, increase their knowledge of new technologies and help them to undertake large projects
- Promoting the geographic, technological or industrial **bundling of smaller projects** by either banks or ESCOs to **increase the viability of small projects**
- Considering **innovative ESCO models**, including super ESCOs, ESCO/building management models or ESCO/leasing company models.

In a dedicate guidance document, we will outline what ESCOs are and how they operate and how the Georgian Private Sector could be successfully involved and present potential and status in fostering investment in energy-efficiency technologies.

For illustrative and high-level explanatory purposes of this assessment, let's note that ESCOs usually offer the following services:

- Identification, development and design of energy-efficiency projects;
- Financing, or acquiring the financing, of the energy-efficiency project;
- Installation of energy-efficiency technology/equipment;
- Measurement, monitoring and verification of the project's energy savings.

ESCOs implement a variety of energy-efficiency measures, including high-efficiency lighting, heating and air conditioning, efficient motors, industrial process improvement, cogeneration, variable speed drives, waste heat recovery and centralized energy management systems.

ESCOs can be vendor-based or consultancy-based. Consultancy, or technically- based ESCOs, are often consulting firms that have a general expertise in engineering or energy efficiency. Vendor- or technology-based ESCOs are often energy technology suppliers, sometimes with a connection to a particular energy-efficiency equipment manufacturer.

The **potential role of the Private Sector in Georgia** – reminding that ESCOs are private firms and clients are mostly private SMEs and MidCaps - could be declined around these financing models, based on who makes the upfront investment:

- **Client pays** – The ESCO conducts a study and makes a proposal guaranteeing certain energy savings over the contract term. The client pays for the equipment and remunerates the ESCO for project implementation, based on the energy savings achieved.
- **Financial Institution lends money** – A financial institution signs a tri-party agreement with the client and ESCO, or one or the other, providing credit either to the ESCO or the client.

The ESCO conducts the study and guarantees certain energy reductions and then is remunerated for project implementation, based on the savings achieved.

- **ESCO invests** – The ESCO provides the funding to implement all necessary energy upgrades based on the ESCO's study and proposal. The client provides a bank guarantee for the cost of the investment. The ESCO guarantees certain energy reductions, receives operating and maintenance costs and receives a major share of the savings to recover its investment.
- **SPV invests** – SPV refers to a special purpose vehicle - usually a corporate body or partnership created to fulfill narrow temporary objectives to isolate financial risk, sometimes to secure loans. The ESCO buys the equipment and sells it to the SPV, who extends an operating lease for the equipment. The client pays its energy savings to the ESCO, as well as operating and maintenance costs. The ESCO pays the SPV lease rentals, which should be less than the energy savings. At the end of the contract term, the client should own the equipment.

As mentioned, we will dedicate a specific focus on remuneration models, barriers to success, funding mechanisms, policies and laws implicating Private Sector, accreditation and standardizations of the ESCO industry in a separate document/chapter.

Last observation is that some of the principles of energy efficiency and energy management programs for the Buildings sector can be applicable – in some cases with a different magnitude and sophistication – to the Industrial sector in Georgia.

12. ANALYSIS OF THE IMPLEMENTATION STATUS FROM THE PRIVATE SECTOR PERSPECTIVE – INDUSTRY

CSAP focuses on **emissions generated in the industry sector from industrial energy use and industrial processes**.

In this context, energy use includes emissions from the **direct combustion of fuels** on industrial sites, as well as **indirect emissions from consumption of electricity generated off-site**.

It is important to not that 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.

Direct GHG emission levels were at 3.01 MtCO2e in 2017 (17% of total emissions) for the industry sector, with 65% resulting from industrial processes (cement, ammonia and nitric acid, iron and steel, ferroalloys) and the remainder from energy use.

The implementation of CSAP actions for the sector leads to projected emission levels of 5.19 to 5.69 MtCO2e in 2030, a 10 to 26% improvement from projected emission levels without any action. Georgia's updated NDC for the sector has the goal to reach 5.69 MtCO2e in 2030.

This suggests that implementation of all CSAP actions would achieve or overachieve NDC targets for the sector.

Planned actions from the CSAP

- Reduce the level of greenhouse gas emissions from industrial processes and from energy consumption of industrial facilities by introducing modern technologies
- Develop a system for studying the emission factors in the industry sector and for data management

Priority areas for enhanced action (CSAP)

- Reducing emissions from steel production or support measures for the introduction of energy audits and certification schemes
- Shifting cement manufacturing industry towards the efficient use of waste for heating purpose

Analysis on policy coverage

Georgia's industry sector lacks an overarching strategy and dedicated policy action to bring the sector on a low emissions pathway.

Most existing and planned mitigation measures are voluntarily implemented by individual company actors rather than from national laws or policies, which limits mainstreaming of sector-wide mitigation action.

While national policy actions have started to address energy efficiency improvements, particularly for cement plants, there remain many policy areas where potential deeper action has been identified for implementation.

Three potential priority actions have been highlighted for consideration of the Private Sector in the industry sector:

- **Reducing clinker-to-cement ratio** and deploying innovative alternative materials

  The production of clinker is one of the main sources of industrial process emissions in Georgia, with production expected to considerably increase in coming years under a business-as-usual trajectory.

  Although the transition from wet to dry method for cement production is already covered in both NEEAP and CSAP, there is still room for additional process improvements including the substitution of clinker with limestone, fly ash or steel slag.

  Calcined clay or natural pozzolanas should be taken into consideration when setting clinker-to- cement ratio standards. Research suggests that such materials may be widely available in Georgia.

  Reducing the clinker-to-cement ratio in cement production is essential to bring the sector on a lower carbon pathway.

  Collaborative efforts among industry, public sector and research are needed to develop plant-level action plans. Reducing the clinker-to-cement ratio across cement plants in the country would reduce GHG emissions and create a range of additional sustainable development benefits.

- **Incentivizing fuel shift** in cement plants

  In 2019, almost all of the energy use in Georgia's cement sector was from fossil fuel sources including more than 80% from coal and 17% from natural gas.

  Substituting conventionally used fuels by alternative fuels that are less carbon intensive will be key to drive down emissions in the sector.

  This is an attractive measure for Georgia as shifting the cement manufacturing industry towards the efficient use of waste for heating purposes has considerable synergies with the introduction of a more sophisticated waste management system, aligned with EU legislation.

  Promising technologies – including co- processing waste or electrifying cement production – are available or currently being implemented internationally. Technical needs assessments for upgrading existing cement plants and feasibility studies for the different technologies are needed to assess the full potential in the context of Georgia. Policies can target support to specific technologies, prompt the development of demonstration projects and scale up application across the country.

- Encouraging **material shift** and reducing cement demand

  Concrete demand can be reduced up to 50% by taking new approaches towards design, using higher-quality concretes, replacing concrete with other materials, and increasing the share of concrete that is reused and recycled.

  Cement can be substituted with alternative materials such as wood in buildings and recycled concrete in road infrastructure.

Material intensity can be improved through optimised design and the increased use of filler materials. With a considerable amount of infrastructure and building projects expected in Georgia in the coming years, **developing a strategy for material shift and to reduce cement and concrete demand is highly relevant. Any avoided cement production is the cheapest and most efficient way of reducing emissions**.

For the Private Sector, the mapping and analysis of innovative approaches and international best practices can help to move this forward and align Georgian legislation with that of the EU, particularly the European Green Deal.

These measures should be complemented by an information campaign and exchange with industry and building sector stakeholders to enhance market awareness and acceptance and address existing market barriers.

POLICY OPTION	OVER-ARCHING	CHANGE ACTIVITY	ENERGY EFFICIENCY	RENEW-ABLES	OTHER LOW CARBON	NON-ENERGY
Overarching sector-specific strategy						
Overarching carbon pricing scheme or emissions limit						
Strategy for material efficiency						
Support for energy efficiency in industrial production						
Energy reporting and audits						
Minimum energy performance standards						
Sustainability standards for biomass use						
Support scheme for renewables						

At least one policy in force | Policy planned | No policy in force | Not Applicable

Potential

In the EU, a reduction of ~100kg CO2/t of cement can be achieved through clinker substitution and alternative raw materials, accounting for approx. 14% total emissions from cement production.

In 2019, approx. 1,600 GWh of coal and 325 GWh of natural gas were consumed in Georgia's cement sector.a This equates to roughly 630 ktCO2.

~600 kgCO2e per avoided tonne of cement or ~180 kgCO2e per avoided tonne of concrete.

Estimation of cost implications

For reducing clinker-to-cement ratio, for the EU case it was estimated that operational costs could decrease by EUR 3.1/t of cement with calcined clays, while retrofit costs would range between EUR 8-12 Million.

Increasing the rate of co-processing waste in the EU-28 cement industry from 43% to 60% could avoid the costs for about €12 billion of public investments in dedicated waste-to- energy incineration plants.

Examples of Private Sector good practices to be followed

1. The **Low-Carbon Transition Roadmap of the Global Cement Sustainability Initiative (CSI)** can serve as an overall guidance for the long-term development of the Georgian cement sector.

   Research experts and industry stakeholders have together mapped out mitigation actions, barriers and enabling actions. **Heidelberg Cement, which is operating most plants in Geor-**

gia, is a member of the CSI. With regards to clinker substitution, the 2018 roadmap has set a target of reaching an average global clinker ratio of 0.60 by 2050.

Increased support for RD&D is needed, particularly to advance the large-scale deployment of technologies that have already shown promise. **Public-private partnerships and green public procurement can help to generate early demand and can enable producers to gain experience and bring down costs**.

2. **The EU cement sector is world-leading in terms of alternative fuel substitution rates**, with an average substitution rate of about 60%. This is strongly driven by EU regulation as waste disposal is tightly regulated and landfilling costly. The use of waste materials with simultaneous energy recovery and material recycling, referred to as co-processing, further contributes towards achieving the objectives of the EU circular economy package.

   At the Kakanj plant in Bosnia and Herzegovina, Heidelberg Cement and GIZ, in form of a public-private partnership, have implemented a project to use industrial and municipal waste as an alternative fuel for cement production in line with the country's drive to establish a circular economy based on the EU model.

   An innovative project is currently being conducted in Sweden. Cementa, a subcompany of Heidelberg Cement, and the energy producer Vattenfall are working together on the CemZero project to **electrify cement production,** focusing on the calcination process. A feasibility study showed that **electrified cement production is technically possible and likely cost-competitive with other options** to substantially reduce emissions. Electrifying all cement production by 2030, could result in an emission reduction of around 5% of Sweden's total emissions.

3. The **EU Strategy for a Sustainable Built Environment** has been launched as a part of the **Circular Economy Action Plan** in line with the European Green Deal. The strategy will ensure that buildings are renovated and constructed in a sustainable manner. In the context of the revision of the Construction Product Regulation, the strategy will include a measurement for the sustainability performance of construction products, for example by introducing recycled content requirements for building materials. The strategy will further promote the cooperation between architects, local authorities and engineers, and foster skills and trainings to deliver energy-efficient designs and lower-carbon concrete mixes.

TA requirements for the Private Sector

Availability and feasibility analyses of alternative binding materials in the context of Georgia; Studies to prevent deterioration of cement quality.

Assessing the potential for sustainable biomass and co-processing in Georgia; Technical needs assessments for upgrading existing cement plants.

Mapping and analysis of innovative approaches and international best practices; Feasibility study for these practices in the context of Georgia.

13. ANALYSIS OF THE IMPLEMENTATION STATUS FROM THE PRIVATE SECTOR PERSPECTIVE – WASTE

The waste management sector is another contributor of GHG emissions. Direct GHG emission levels were at 1.56 MtCO2e in 2017 (approximately 9% of total emissions) for the waste sector, with 67% of sector emissions coming from solid waste disposal.

The implementation of CSAP actions for the sector leads to projected emission levels of 1.10-1.37 MtCO2e in 2030, a 35-54% improvement from projected emission levels without any action.

Georgia's updated NDC contains no emissions target for the sector in 2030.

Waste sector GHG emissions projections to 2030 (modelling conducted by sector experts and later integrated in LEAP model) are expected to increase by approximately 33% to up to 1.85 MtCO2e in 2030, under a reference scenario.

With the aim to introduce modern waste management models, Georgia actively cooperates with various international and donor organizations. At the initiative of the Ministry of Environment and Agriculture of Georgia and with the assistance of the EU, UNDP and the Government of Sweden, a necessary legal framework for the introduction of the EPR system has been developed. **The EPR system (Extended Producer Responsibility), is a concept that is considered to be one of the most important waste management mechanisms.**

Government of Georgia has adopted several technical regulations for the management of four different types of waste in the EPR system, including: **waste electrical and electronic equipment (WEEE), used oils, tires, and batteries and accumulators.**

This concept implies involvement of a large part of the private sector, starting from product manufacturers in the management of waste. Introduction of this system requires concerted action by the state, manufacturers, other economic operators, and the population, otherwise the system would not function effectively.

Planned actions from the CSAP

- Reduce GHG emissions from existing unauthorized dumpsites and non-hazardous landfills
- Support waste recycling
- Reduce greenhouse gas emissions from wastewater
- Develop a data-based waste management system
- Upgrade and improvement of Tbilisi's landfill
- Utilization of landfill gas in Kutaisi, Rustavi, and Batumi's non- hazardous waste landfill
- Paper waste recycling
- Capture and recovery of GHGs in Tbilisi, Batumi, and Kobuleti's wastewater treatment plants
- Education and awareness raising on organic waste management
- Establish a consolidated process for collecting and updating data for the waste sector

Identified Priority areas for enhanced action (CSAP)

- Improved data collection system
- Biodegradable waste management
- Establishing Maximum Permissible Limits (MPL)
- Moving towards reducing and recycling

Our analysis on policy coverage and gaps

Around 900,000 tons of waste is generated annually in Georgia and in 2018 still more than 75% ended up in landfill sites. While there are a few recycling companies in the country, they do not have access to all recyclable materials they could potentially process as **waste is not being properly separated**.

However, Georgia has set itself ambitious recycling targets in its Waste Management Strategy and Action Plan, and various support projects are currently being carried out. **The recycling of biowaste, though, is less of a focus to date.** The "Green Waste Recycling and Composting Centre" planned for Kutaisi is the first of its kind in Georgia; the experience should be adopted for building additional composting stations in the future, particularly for areas covering large parks or other green spaces.

To further promote biowaste composting, home or community composting can decrease the need for separate bio-waste collection and reduce waste transport and management costs. These measures align with obligations under the EU-Georgia Association Agreement.

The National Waste Management Strategy and Action Plan provides a strategic vision and important framework to bring the sector on a low emissions pathway.

With donor support, old landfills are being closed and new ones compliant with EU requirements are being constructed, and methane capture and utilization is gradually being implemented at landfills and wastewater facilities. While recycling targets (e.g. paper or glass) are included in the strategy, its **current version only calls for the development of concrete targets and measures to reduce the landfilling of biowaste**. While many municipalities are starting to integrate provisions from the Strategy and Action Plan, **actual progress on improved waste separation and reduction is currently limited.**

Two potential priority areas have been **highlighted for Private Sector consideration** in the waste sector:

- **Improving waste management for biowaste**

  Biowaste includes organic waste, such as food or green waste, that produces methane when dumped into landfills. Improved waste management for various other types of waste are already included in Georgia's National Waste Management Strategy and Action Plan and targeted by different projects.

  For biowaste both large-scale composting facilities and decentralized composting approaches, such as community composting, should be combined to cover different parts of the country. Public awareness and education are integral to ensure citizens engagement.

- **Reducing waste generation through Pay-As-You-Throw (PAYT) Schemes**

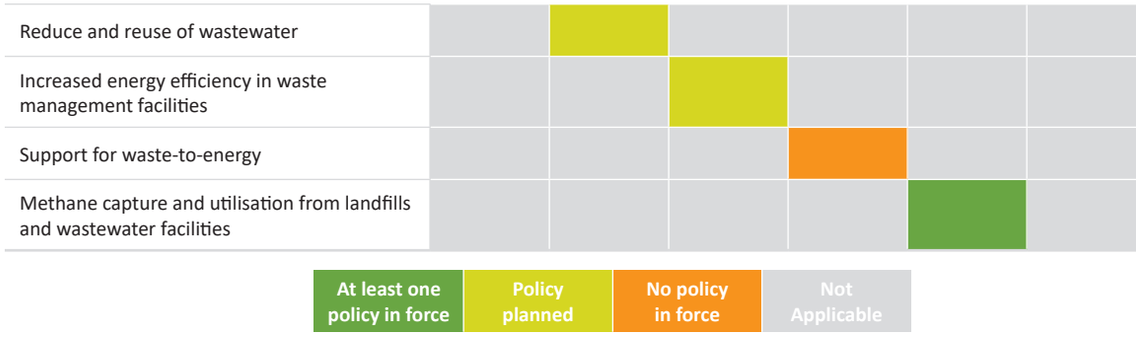
  Georgia's National Waste Management Strategy and Action Plan envisions Georgia to become "a waste preventing and recycling society", among other things, by implementing the "polluter pays principle".

  While concrete actions for introducing full cost recovery and extended producer responsibility (EPR) are planned and currently being implemented, additional measures to target the individual household level could be introduced in the medium term.

  Pay-As-You-Throw (PAYT) schemes are proven to have a significant impact on household waste reduction in many countries, particularly in Europe. Through an economic incentive, it leads people to act desirably rather than simply restricting undesirable behaviour. Such incentivization is proven to lead to waste reduction and is commonly associated with increased recycling rates. A gradual establishment of PAYT systems at the municipal level is most promising and strategic awareness and information campaigns engaging citizens are important success factors of such an intervention.

  The introduction of a PAYT scheme can be a cumbersome administrative process; the ongoing reform of Georgia's waste management system however provides a unique window of opportunity to ease implementation.

POLICY OPTION	OVER-ARCHING	CHANGE ACTIVITY	ENERGY EFFICIENCY	RENEW-ABLES	OTHER LOW CARBON	NON-ENERGY
Overarching sector-specific strategy						
Incentives to reduce landfilling and improved practices						
Recycling targets and practices for different waste sources						
Improved biowaste management						



Examples of Private Sector good practices to be followed

GHG emissions from waste are continuously decreasing in the European Union.

According to the EU Waste Framework Directive from May 2018, bio-waste must either be separated and recycled at source or collected separately and not mixed with other types of waste by the end of 2023.

Financed by EBRD and EU the existing landfill **in the Ukrainian city of Khmelnytskyi** is closed, and **two new cells with modern recycling and composting facilities are being constructed in line with EU standards**. The project is estimated to save 150 ktCO2e per year with 300,000 inhabitants covered. The city is buying new waste collection vehicles and containers to encourage residents, public institutions, and private businesses to separate their waste, accompanied by an educational campaign.

Slovenia has one of the lowest shares of bio-waste in municipal waste generated in all of Europe. Almost half of the population is covered by community or home composting. Education and promotion through the public waste management company Snaga, including many activities on social media, is an important success factor.

In October 2016, **Romania included in its waste framework legislation to implement PAYT schemes**. The country ranks among those in Europe with the lowest waste generation per capita.

An example of how to gradually introduce PAYT is the city of Salacea, which in partnership with Zero Waste Europe and Zero Waste Romania has successfully implemented a PAYT scheme with accompanying measures in 2018 leading to a reduction of 55% in waste generation. Besides introducing the PAYT scheme existing communal street bins and containers were replaced by a door-to-door separate collection system for different waste streams including bio-waste.

The involvement of all stakeholders, including local and regional authorities and waste operators as well as technical experts was key to success.

In France, 5.6 million people were covered by different PAYT schemes by 2019 and the Energy Transition for Green Growth law defines the objective of expanding the schemes to cover 25 million by 2025.

Practices vary between communities e.g., one approach is paying a fixed charge that includes an allowance for a number of garbage bags per year, and then paying an extra fee for each additional bag or a door-to-door pick up where each bin is electronically counted. **On average, practices have led to a reduction of non-recyclable waste of about 30-50%.**

Estimation of cost implications

The project in Ukraine (above) is being financed by a €36.5m financial package from EBRD and EU; The pilot project in Kutaisi has been estimated at €40,000. Research in Italy has shown that community composting can reduce costs by 34-50% compared to landfilling**.**

A 55% reduction in waste generation and decreasing the share of landfilled waste from 98% to 55% was achieved in Salacea.

In France, PAYT schemes are leading to a reduction of between 30% and 50% non-recyclable waste on average.

TA requirements for the Private Sector

Analysis of process and lessons learned from project implementation in Kutaisi.

Pilot project and study to assess feasibility and acceptance of community composting in the context of Georgia.

Infrastructure and financial feasibility analyses.

14. ANALYSIS OF THE IMPLEMENTATION STATUS FROM THE PRIVATE SECTOR PERSPECTIVE – AGRICULTURE AND FORESTRY

Important background note is that – according to the MESD (2019) - the agriculture sector employs up to 40% of the Georgian working population, but the majority of them are categorized as "self-employed", something aligned with the definition of small-scale subsistence farmers.

Manure management, particularly for cattle and swine, is a large source of emissions in Georgia's agriculture sector.

With industrialized farming, and thus emissions, expected to grow in the coming years, an **improved manure management system is a central element of any strategy to bring the sector on a low emissions pathway**.

With an eye to Private Sector, the use of lagoons to handle cattle and swine manure was identified as a feasible option in the context of Georgia in previous sector stakeholder consultations and has been highlighted as a priority area in the CSAP. Technologies for biogas digestion are mature in some markets but are not yet in widespread use in the country, due to **low awareness and poor accessibility to microfinance.**

Since the introduction of a net metering regulation in 2017, conditions for biodigester use are significantly more attractive for farm operators, who can generate savings or revenue from the utilization of captured biogas.

GHG emission levels were at 3.48 MtCO2e in 2017 (approximately 20% of total emissions) for the agriculture sector, predominantly from enteric fermentation, agricultural soils, and manure management.

The implementation of CSAP actions for the sector leads to projected emission levels of 4.62 MtCO2e in 2030, only a nominal improvement from projected emission under the reference scenario.

Georgia's updated NDC does not contain an emissions target for the sector in 2030.

Based on above, we identified these Priority areas for enhanced action:

- Improved data collection system
- Regulating burning practices and replanting windbreaks
- Regulating irrigation practices
- Regulating overgrazing and unsustainable use of soils
- Agroforestry direction

The identification of further mitigation action is critical for the sector.

Planned actions from the CSAP

- **Implement sustainable management of soil and pastures** and support the introduction of sustainable domestic animal feeding practices
- **Build capacities of generating scientific evidence** for development of climate-smart approaches in the agriculture sector

Policy coverage and gaps identified

While a Climate Smart Agriculture working group has been set up and several support projects are working on making Georgia's agriculture sector more profitable, it is lacking dedicated policies across all mitigation dimensions. Besides the mitigation measures directly linked to agriculture sector activities, it is important to tackle other policy- related barriers such as addressing land tenure rights in rural areas or providing access to affordable finance in the form of microcredits.

In a short period of time, Georgia has become highly reliant on synthetic fertilizers. With a growing value of agricultural output the use of synthetic fertiliser has more than tripled between 2010 and 2015, with the current level considerably higher than the global average. Training activities and awareness campaigns for farmers are needed to highlight the short- and long-term benefits of reduced fertiliser use, as well as options for organic alternatives.

Regulatory change to ensure long-term security of land-tenure is needed to further incentivize sustainable practices, while the development of a dedicated fertiliser strategy with clear reduction targets could be a helpful for guiding the transition.

Therefore, two potential priority areas have been highlighted for consideration in the agriculture sector:

- Improved manure management systems for cattle and swine

  The capture and utilization of biogas from livestock manure has the potential to reduce GHG emissions in Georgia's agriculture sector through methane avoidance. Anaerobic digestion facilities can be used on individual farms or on a cluster of farms to generate electricity, further reducing emissions when replacing fossil fuel use, such as natural gas, or avoiding tree removal for firewood.

  Georgia should start with assessing the feasibility of different manure management systems and their implementation in its specific country context.

- **Reduction of synthetic fertilizer** use

  A reduction of synthetic fertilizer application can significantly reduce emissions associated with agricultural soils.

  The use of such techniques is attractive to farmers if they are aware and trained in practices for more efficient fertiliser application. As emissions from synthetic fertilizer use are projected to further increase in coming years, if no action is taken, this is an important measure for bringing Georgia's agriculture sector on a low emissions pathway.

POLICY OPTION	OVER-ARCHING	CHANGE ACTIVITY	ENERGY EFFICIENCY	RENEW-ABLES	OTHER LOW CARBON	NON-ENERGY
Overarching sector-specific strategy						
Data collection framework						
Improved manure management						
Incentives to reduce emissions from enteric fermentation						
Improved crop and grazing land management						
Incentives to reduce synthetic fertilizer use						
Increased food productivity						
Incentives to reduce food demand						
Support for highly efficient farming machinery						

At least one policy in force	Policy planned	No policy in force	Not Applicable

Policy Achievements for the Private Sector

Signing the **Deep and Comprehensive Free Trade Agreement (DCFTA) created real perspectives for bringing the Georgian products to the EU market**. While implementing the EU Association Agreement, there were reforms implemented in a complex manner in all the areas, especially in the field of food safety.

Georgian entrepreneurs were given an opportunity to implement international and European standards gradually.

Consequently, the scope of production and delivery of quality products expanded, which supported to increase competitiveness of products at the international market.

The Ministry of Environment Protection and Agriculture has initiated and is currently implementing **"United Agro Project"** - a program aiming provision of agricultural links of primary production and storage implementations by cheap and accessible funds, promotion of agro insurance, arrangement of nurseries, to encourage plantation of modern orchards of perennial crops, co-financing of agricultural processing and storage enterprises.

Within the framework of the "United Agro Project", the total volume of agro-loans (as of 30.06.2019) already

exceeded 2,013,139,276 GEL (preferential agro-credit program); as of 30.06.2019, 7,473 ha of intensive fruit tree orchards have been planted (financed/approved 7,526 ha). As of today, 200 new enterprises have been financed, and 940 existing enterprises have been expanded and refitted.

Over the years, the Georgian government has been making significant efforts to develop rural areas, but at the state policy level, rural development was first established in 2017.

Accordingly, the Government of Georgia has elaborated **Georgia's Rural Development Strategy 2017-2020** and Action Plan for 2017.

The Rural Development Strategy of Georgia 2017-2020 sets out the priorities of the Government of Georgia and all the sectoral and multisectoral development related to rural development.

The strategy has three priority areas:

1. Economy and Competitiveness;
2. Social Situation and Living Standard; and
3. **Environmental Protection and Sustainable Management of Natural Resources**.

- Protection infrastructure was developed in three protected areas.
- One protected area is provided with demarcation information signs.
- Information infrastructure of ecotourism and eco-education importance was set up in 3 protected areas.
- The Machakhela National Park Management Plan was approved.
- At 160.4 ha, an array of forest was planted.
- 11,557 ha of agricultural land was insured.
- Construction of 1 new regional landfill has started.
- 3 automatic meteorological stations and 5 hydrological stations were installed and maintained.

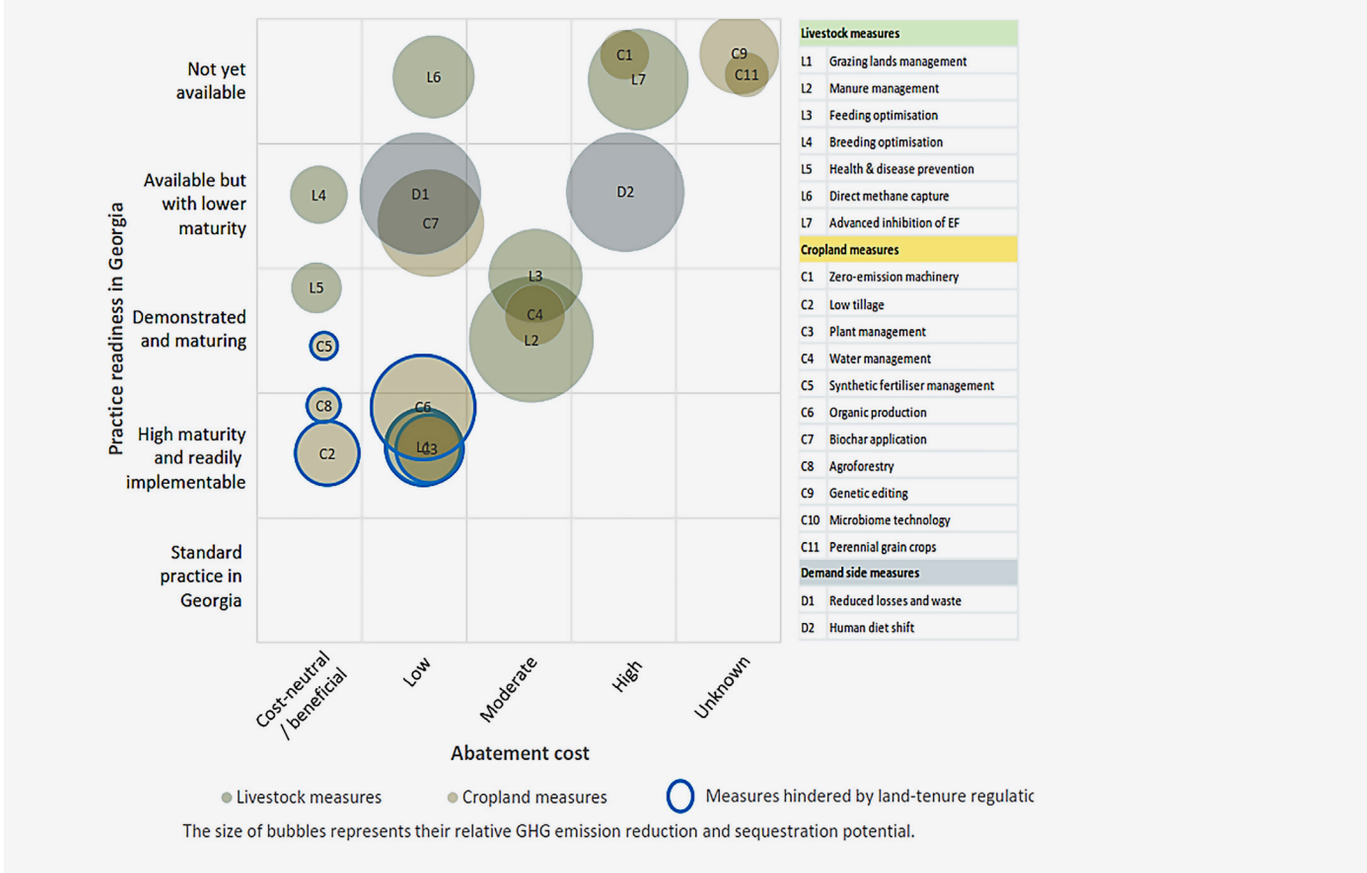
The direct beneficiaries of the Strategy are the rural population and the people employed in the Private Agriculture sector.

GOAL	INDICATOR	BASELINE	TARGET
Goal 1 - Competitive agricultural and non- agricultural sectors	Output of primary agricultural products and food products made by processing agricultural products Value of production in the business sector Export of agri-food products Average monthly incomes of households, calculated per one household in rural areas	GEL 9.3 bln18 (2018) GEL 450 mln19 (2018) USD 959 mln (2018) GEL 880 (2018)	GEL 12 bln (2027) GEL 770 mln (2027) USD 1,300 mln (2027) GEL 1,200 (2027)
Goal 2 - Sustainable usage of natural resources, retaining the eco-system, adaptation to climate change	Number of visitors to the protected areas Area of forests managed by sustainable management plans Amount of protected genetic resources	1,108.5 thousands of visitors (2018) 348,000 ha (2018) 3,719 (2018)	2,600 thousands of visitors (2027) 1,500,000 ha (2027) 4,641 (2027)
Goal 3 - Effective systems of food/ feed safety, veterinary and plant protection	Number of active private veterinary services Number of implemented activites/events aimed at increased awareness of consumers and producers To approximate the sanitary and phytosanitary regulatory legislation of Georgia to the EU respective legislation	15 units (2018) 74 activities (2018) 98 EU legislations (2018)	30 units (2027) 200 activities (2027) 272 EU legislations (2027)

Potential Action in climate smart agriculture practices of the Private Sector

A summary overview of illustrative potential measures for GHG emission reduction for the agriculture sector are summarized below.

These measures are mapped, according to the relative abatement costs of those measures and the readiness of technologies and practices in the Georgian context, in order to give an indication of the **accessibility and attractiveness of different measures for the Private Sector.**



The overview indicates that none of the 20 GHG emission reduction practices assessed have reached

Cropping systems supply-side measures for mitigation with Private Sector engagement

Many options already exist that could turn cropping systems into a net-sink for carbon, while there are a range of **new technologies and practices currently emerging** from research which could provide even more possibilities for climate change mitigation in the future.

Zero-emission farm machinery and equipment

Measure

The full electrification of farm machinery and equipment, including battery powered tractors, harvesters, and dryers, can reduce the direct emissions associated with energy use in agriculture.

Status

Most of the technologies are not yet available in Georgia. The electrification of large- scale farm machinery and equipment is not yet widespread in any country, but there are prospects for these technologies to become competitive in the mid- to longer-term future.

Potential

Up to 100 ktCO2e in 2030: Most of the emissions from energy use in agriculture could be reduced by the electrification of farm machinery and equipment, if combined with the generation of renewable electricity.

Costs

High (> 100 USD/tCO2e): As zero-emission vehicle technologies further develop and become cheaper to manufacture, they may eventually become a cost-competitive alternative to diesel-powered machinery in many countries. However, since the majority of farms in Georgia make use of older imported equipment, the high capital expenditure to acquire zero-emission machinery in likely to remain comparatively expensive for the foreseeable future.

Unlocking

Finance for demonstration: When a market for zero emission farming machinery becomes accessible for Georgia, finance for demonstration projects will be required to overcome high upfront capital costs.

Low tillage practices

Measure

Practice to reduced tillage and the retention of tillage residues can significantly improve the soil term quality of soils through enhanced soil aggregation, water retention and organic activity. Methods such as strip tillage, chiseling, disking, and no-till planting lead to the retention of crop residues as a covering to prevent soil erosion. This increases the carbon capture capacity of soils as well as reducing the release of nitrous oxide.

Status

Conservation- or zero-tillage is not widely practiced in Georgia. In most cases, there are no significant technological barriers to the adoption of low-tillage practices. Some practices require less machinery than conventional tillage cultivation, or can even be easily performed manually without machinery. The uptake of low-tillage practices is also negatively affected by lack of awareness and a short-sighted approach to land management, exacerbated by land property right issues.

Potential

Approximately 150 ktCO2e in 2030: Cropland plant management in warm-dry climate zones is estimated to have a climate change mitigation potential of approximately

0.35 tCO2e per hectare of cropland land each year (Smith et al., 2007).

Costs

Cost-neutral or cost-beneficial (~ < 0 USD/tCO2e): Savings can be incurred through decreased use of labour and heavy machinery for conventional tillage.

Unlocking

Training and awareness campaigns; regulatory change: The benefits should be attractive to farmers if they are aware and trained in plant management practices. Regulatory change to ensure long-term security of land-tenure will also further boost sustainable practices.

Cropland plant management

Measure

Soil quality can be significantly enhanced through the high input of diverse organic plant material. This includes crop rotation and the use of cover crops. The high organic input increases the carbon capture of the soil, and ensures a more efficient use of soil nitrates, and a reduction of nitrous oxide emissions.

Status

Unknown and requiring further investigation.

Potential

Approximately 170 ktCO2e in 2030: Cropland plant management in warm-dry climate zones is estimated to have a climate change mitigation potential of approximately

0.39 tCO2e per hectare of cropland land each year.

Costs

Low (~1-50 USD/tCO2e): Changes in planting practices do not necessarily require higher inputs or capital expenditures.

Unlocking

Training and awareness campaigns; regulatory change: The benefits should be attractive to farmers if they are aware and trained in plant management practices. Regulatory change to ensure long-term security of land-tenure will also further boost sustainable practices.

Cropland water management

Measure

The application of harvested water to irrigate croplands is an increasingly important measure for climate change adaptation in the agriculture sector.

Water harvesting and irrigation techniques may increase the resilience of cropland to drought and other extreme local or temporal weather events. Irrigation can have a significant positive impact for climate change mitigation due to the increased carbon sequestration potential of well-watered soils, as well as the increased production yield of the land which leads to a relative reduction in the emissions intensity of agricultural produce.

However, the irrigation of land may also lead to an increase in the application of synthetic fertiliser and an increase in nitrous oxide emissions. Accordingly, this measure is best pursued in

combination with other conservation agriculture measures, including organic soil restoration and low-tillage agriculture, to reduce soil erosion and offset the potential increase in the demand for synthetic fertiliser.

Depending on the method of harvesting and irrigation, additional energy inputs and associated emissions may also be incurred. Potential negative effects for emissions can also be reduced through the use of drip- or sprinkler-irrigation systems which require significantly less input and entail less soil erosion than flood irrigation.

Status

The share of irrigated cropland in Georgia has increased significantly in recent years from approximately 10% in 2012 to approximately 25% in 2020 (World Bank, 2020).

Irrigation has been prioritized by the national government, as indicated by the development of the 2017-2025 Irrigation Strategy for Georgia which includes the target to reach 200,000 hectares of irrigated cropland by 2025 (approximately 45%).

Irrigation practices can have negative effects because of runoff and water erosion as well as the salination of fields with dissolving salts and carbonates. To date there are no quality requirements for irrigation water in Georgia; raising groundwater levels make the water more vulnerable to be contaminated with mineral fertilizers and pesticide residues. Further, a significant amount of irrigation water is lost during transportation via old or malfunctioning ditches and channels.

Future action should therefore **focus on the improvement of transportation channels as well as regulating the use of irrigation water.**

Potential

Approximately 120 ktCO2e in 2030, if the share of cropland irrigated would be increased to approximately 50% by 2030: Water management in warm-dry climate zones is estimated to have a climate change mitigation potential of approximately 1.14 tCO2e per hectare of additionally irrigated cropland land each year, but can also have negative consequences if combined with increased fertiliser use or energy- intensive practices.

Costs

High (> 100 USD/tCO2e): Based on the costs of irrigation and drainage programmes in the past years, upfront capital costs can be high, especially since the most accessible irrigable land is already being irrigated. Higher precision drip-irrigation technologies are more expensive still.

Unlocking

Investment in scaling up: Investments into irrigation and drainage systems have significantly increased the proportion of irrigated land in recent years.

Synthetic fertiliser management

Measure

A reduction of synthetic fertiliser application, achieved for example through more precise application of fertiliser and more deliberate timing of application, can significantly reduce the emissions of nitrous oxide associated with the overuse of synthetic fertilizers. The overuse of synthetic fertilizers does not derive a productivity benefit, although results in costs and environmental degradation.

Status

Georgia has, in a short period of time, become highly reliant on synthetic fertiliser. The use of synthetic fertiliser in Georgia increased from 35 kg per hectare of arable land in 2010, to 150 kg in 2015, as the Georgian economy and the value of agricultural output, has grown. The current level of fertiliser input is now considerably higher than the global average.

Potential

Approximately 100 ktCO2e in 2030: Around 20% of the GHG emissions associated with synthetic fertiliser use could be offset through simple fertiliser management techniques, as seen in Montenegro (Government of Montenegro, 2020).

Costs

Cost-neutral or cost-beneficial (~ < 0 USD/tCO2e): The reduction of fertiliser input through more efficient application may entail cost savings for farmers without necessarily affecting yields.

In the longer-term, deeper reductions in fertiliser application can significantly improve the quality of soils (see organic soil restoration).

Unlocking

Training and awareness campaigns; regulatory change: The short- and long-term benefits of reduced fertiliser use should be attractive to farmers if they are aware and trained in practices for more efficient fertiliser application, or the use of alternative organic inputs. Public investments in fertiliser subsidies could in some cases be carefully redirected to training and awareness campaigns for fertiliser management. Regulatory change to ensure long-term security of land-tenure will also further boost sustainable practices.

Organic soil restoration and production

Measure

The organic restoration of soils takes the reduction of synthetic fertiliser a step further, to regenerate stable and fertile organic soils that do not require synthetic fertiliser. This involves a combination of several measures in addition to the reduction of synthetic fertiliser application, such as the increased application of manure on soils, and the revegetation of soils with shrub and creeper species.

The regeneration of organic soils can reduce nitrous oxide emissions associated with synthetic fertiliser use.

Status

Approximately 0.3% of cropland in Georgia was under organic agricultural production in 2017 (FAO, 2020a). In theory, organic agriculture is highly accessible; the measures available for organic soil restoration are mostly well-established practices that do not require the availability of new technologies.

Uptake is hindered by a lack of awareness on the benefits of organic agriculture.

Potential

Approximately 400 ktCO2e in 2030: Organic soils are estimated to have an increased carbon sequestration potential pf 0.9-2.4 tCO2e per hectare each year.

Costs

Low (~1-50 USD/tCO2e): Organic produce may fetch premium prices, while the costs for agricultural inputs may be reduced. Since it may take several seasons for organic fertility of soils to be restored, potential yield reductions in the short-term may cause organic farming to be perceived as a more costly option.

Unlocking

Awareness and training; regulatory change: Regulatory change to ensure long-term security of land-tenure, combined with awareness and training on organic agriculture and its long-term benefits, could enable farmers to change to their practices.

Agroforestry

Measure

Agroforestry involves the deliberate planting of trees in croplands and on pastoral lands.

Carbon sequestration is increased through the trees as well as the higher carbon sequestration of soils. This can include inter-cropping for the purpose of producing both agricultural and forestry-related produce, and boundary planting for demarcation and protection against eroding forces, among other forms.

Status

Approximately 25% of Georgian cropland in 2018 was accounted for by orchards and vineyards, much of which could be already classified as agroforestry (National Statistics Office of Georgia, 2020). Aside from this, the extent of deliberate agroforestry in cropping systems in Georgia is relatively low. **Conditions for agroforestry may be favourable in some locations; more extensive agroforestry is more feasible on smaller and non-mechanized agricultural plots**, which still represent a significant but ever reducing portion of Georgia's agriculture sector. **Agroforestry is also more feasible in locations where there is a good market for wood-related produce,** which is generally the case in Georgia where demand for forestry-produce – especially for energy – drives significant illegal logging. Agroforestry is highlighted in the CSAP as well as Georgia's Country Programme with the GCF as a national mitigation priority.

Potential

Approximately 50 ktCO2e in 2030: Agroforestry on croplands in warm-dry climate zones is estimated to have a climate change mitigation potential of approximately 0.33 tCO2e per hectare of suitable crop land each year.

The area of agricultural land which could be feasible for agroforestry in Georgia has not been assessed.

Costs

Low (~1-50 USD/tCO2e): **Upfront capital expenditures for planting forested areas on cropland are often quite low**, while part of these costs may be recouped if there is an easily accessible market for forestry-related produce, which is the case in Georgia.

Unlocking

Targeted awareness campaigns for high potential regions; land-tenure regulation change: For areas where agroforestry is especially feasible at lower cost, higher awareness of the potential and benefits could unlock action, which does not necessarily require high capital input expenditure in some contexts.

This would require a detailed mapping of agroforestry feasibility in Georgia in order to target campaigns effectively. Land tenure security would also be a pre-requisite for agroforestry in most cases, due to the long-term nature of investments made.

PART 4

Assessment of the draft LT-LEDS from the Private Sector perspective

15. OPPORTUNITIES AND OPTIONS FOR ENHANCING ALIGNMENT BETWEEN NDC AND LONG-TERM STRATEGIES

LT-LEDS are national, subnational, or supranational long-term strategies that envision a low emission development while considering broader national priorities that are in line with decarbonisation pathways.

Article 4.19 of the Paris Agreement

All countries should strive to formulate and communicate long-term low greenhouse gas emission development strategies (LT-LEDS) mindful of the long-term goal of the Paris Agreement

LT-LDES target is to develop a mid-century (gender-sensitive) low-emission development strategy aimed to support Georgia to fulfil the commitment of Paris Agreement on climate change, help in environmentally sound long-term planning in the following sectors, Energy, Buildings, Industry, Transport, Agriculture, Land Use, Land-Use Change and Forestry, Waste.

With the optics of the Private Sector, there are several reasons why it is be useful for Georgia to develop a LT- LEDS, such as:

- **LT-LEDS may be useful to guide long-term climate action:** a long-term vision for low-emis-

sion development is important to inform and ensure the coherence of short-term climate action with long-term climate goals.

- **LT-LEDS represent an opportunity for governments to ensure effective alignment of diverse policies, such as development and climate policies:** identifying and promoting the socio- economic co-benefits of climate change mitigation and adaptation can facilitate the achievement of multiple development objectives.
- **Developing LT-LEDS may help promote low-emissions development across different stakeholders:** as they reinforce linkages between climate change mitigation and other development priorities, LT-LEDS are a way to promote the public acceptability of ambitious transformation.
- **Developing LT-LEDS may enhance trust and improve the credibility of international commitments of Georgia:** the communication of LT-LEDS in line with the temperature goal set by the international community with the Paris Agreement can encourage greater efforts and ambition across countries.
- **Establishing LT-LEDS could help attract international support for Georgia:** by defining a long-term vision and by identifying priority areas of action, LT-LEDS can encourage flows of international finance aligned with climate objectives from bilateral and multilateral investors and donors

It is critical that **Georgia will learn the lesson from other countries which submitted LT-LEDS**. Outside of the UNFCCC context, several other countries have developed such strategies, including Indonesia and the United Arab Emirates. An analysis of 15 LT-LEDS (COM/ENV/EPOC/IEA/SLT(2019) highlighted that most LT-LEDS lay out a vision that focuses on decarbonisation, all the LT-LEDS examined proposed multi-sectoral plans, and all the strategies include at least the energy and/or electricity sector.

However, they were evidenced **clear weak linkages with NDCs, Sustainable Development Goals (SDGs) and other societal goals**: less than half of the LT-LEDS examined refer to the GHG or CO2 emission reductions targets expressed in their countries' NDCs yet.

LT-LEDS is a **voluntary strategy that guide Georgia to consider climate change mitigation and national socio-economic development in an integrated and strategic way**.

If properly structured, LT-LEDS have the potential to become a fundamental, robust and long-term planning tool that can facilitate the identification of socio-economic options and opportunities for low-carbon transformation.

The main goal of a **LT-LEDS in Georgia is therefore to identify potential low-emission pathways while considering synergies and potential co-benefits to ensure the achievement of multiple economic and societal goals**.

Because of their focus on development, their development process is unique to each country and t**here is no one-size-fits-all approach**. For Georgia, **from the perspective of the Private Sector**, these are the Foundational elements:

LONG-TERM	The strategy needs to cover a time horizon that is sufficiently long to capture the development of policies and programmes capable of shifting current socio-economic structures. Given the typically long lifespans of most infrastructure assets, **mid-century is considered as a suitable milestone for LT-LEDS developed today.**
LOW-EMISSION	The main goal of the strategy is to identify one or more low-emission pathways in line with development objectives. Despite the LT-LEDS process being a voluntary, country-driven exercise, low-emission development strategies are to be guided by Article 2 of the Paris Agreement and therefore strive to **identify emission pathways compatible with the temperature goal set by the Paris Agreement**.
DEVELOPMENT	LT-LEDS are, ultimately, development strategies aiming to ensure an improvement in the overall well-being of a society. This could include, according to national circumstances, **objectives of economic development, poverty reduction, improved education, food security, or health conditions**. The value-added of LT-LEDS, therefore, is that of identifying low-emission policies compatible with and, more importantly, promoting national development.

Why are LT-LEDS useful for the Private Sector?

Since LT-LEDS guide or inform long-term climate action, it can help the Private Sector to ensure the effective alignment with all policies in diverse areas, something confusing and overlapping (if not contradicting), and integrate climate change mitigation with other societal and economic objectives.

Ensuring alignment of policies within a country is key to facilitate the achievement of a wide range of objectives avoiding undesirable overlaps (OECD, 2015). If developed with a holistic and cross-sectoral approach, LT-LEDS can help a country achieving low-emission development, while meeting multiple societal and development goals, including achieving objectives set by the Sustainable Development Goals (SDGs). Planning long-term, low-emission strategies and can also help governments to better align financial and fiscal policies with long-term climate risks and opportunities.

Other elements of importance and usefulness of the LT-LEDS for the Private Sector are strongly connected with these observations:

1. **LT-LEDS can help Georgia to plan national action for a just transition for workers and communities**.

   In some sectors, the structural transformations needed for the transition to a low- emission economy may result in job losses.

   Because of their long-term and cross-sectoral character, LT-LEDS may help Georgia identify policy opportunities to minimise disparities among winners and losers, mitigating these negative impacts (UNFCCC, 2019).

   LT-LEDS could help anticipating impacts on employment and planning for adequate socio-economic protection for job losses. Georgia may therefore consider in LT-LEDS the areas where programmes for the re-skilling of workers or social subsidy schemes would be needed in the long-term.

2. **LT-LEDS can be a key instrument for sharing innovative strategies and best practices**
3. **LT-LEDS may promote the acceptability of ambitious climate mitigation across different stakeholders**.

   For the GoG, may promote co-ordinated action across different ministries and agencies.

   For businesses and entrepreneurs, LT-LEDS could serve as an indication of regulatory certainty and identification of national fiscal and financial priorities.

   For civil society, LT-LEDS can involve the broader community in the process of policy planning and facilitating their participation and engagement in the Georgia's action to mitigate climate change.

4. **For Georgia, LT-LEDS can send out signals of support needs to donors and financial institutions, thereby encouraging international inflows of finance**.

   Indication of priority areas and mitigation activities, as well as expected outcomes, can strengthen the case for international financial support. Communication of a long- term vision, clear and defined mitigation targets, predictability of climate-related support policies as well as increased level of ambition, would positively influence the ability to mobilise private climate finance.

At this stage od DRAFT of the document, it is not conclusive to make any final assessment, but we can surely **observe concrete opportunities for linking LT-LEDS to Georgian NDC**:

- **Ensure consistency across thematic areas and scenarios identified by the NDC/LT-LEDS**

  Ensuring consistency across thematic and sectoral areas of short-, mid- and long-term action can result in a more coherent end efficient national transition towards a low-emission economy.

- **Use the intermediate milestones within NDC as a means to implement the LT- LEDS**

  LT-LEDS may also contain interim targets (e.g. for 2025, 2030, 2035) that are in line with NDC cycles, which can be used to inform and shape a country's future NDC. This will have a **positive effect on the credibility of the strategy**, triggering a virtuous circle of implementation, providing confidence in the feasibility and benefits of the LT-LEDS.

  This process may **strengthen the enabling environment for the finance investments** needed to deliver on the long-term goal development and low-emission transition in the LT-LEDS.

- **Ensure synergistic and sustainable institutional and governance arrangements to link LT-LEDS and NDC processes**

  Strong governance will lay the **ground for strong co-ordination** between the two processes so that **both processes can leverage, build on and learn from each other.**

- **Co-ordinate the timing of launch/revision of LT-LEDS with the updated of NDC every 5 years**

  Changing national circumstances, assessments of performance of LT-LEDS implementation and other types of long-term considerations may provide useful inputs to new NDC. T

  he LT-LEDS implementation strategy may also be aligned with other types of national processes, such as review and approval of national budget or approval of new development programmes.

Stakeholder engagement and the Private Sector roles

Strong **stakeholder consultation – including the Private Sector -** and **engagement processes** spanning LT-LEDS development and implementation will result in more robust LT-LEDS.

Robust and transparent stakeholder engagement can include collaborating across a very wide range of actors, including scientists, businesses, civil society, and the public.

Engaging with relevant stakeholders may prove fundamental particularly when designing policy pathways and building scenarios, as it can contribute to the development of more realistic, and therefore more implementable, options. Moreover, **involving civil society could also be a way to make the process of design and implementation of the LT-LEDS less political**, which could strengthen the ambition of the strategy.

Meaningful stakeholder consultations must target the relevant stakeholders and be carried out in an effective manner.

For example, **our observation about sectoral coverage**: LT-LEDS would ideally cover economy-wide emission reductions, with a particular focus on emission-intensive sectors.

To date, **most of the submitted LT-LEDS include policy actions and measures aimed at achieving emission reductions in three sectors: energy, industry, and transport**. This looks to be also the case of Georgia. Nevertheless, sectoral opportunities for low-emission development may be significantly different – with forestry and agriculture being also key. Engaging Private actors in the consideration of specific sectors to be included in the LT-LEDS, it could be useful to identify leverage points for intervention. Sometimes, "a small change could lead to a large shift in behaviour" in unexpected cases.

Therefore, it is key to ensure that key stakeholders are identified and involved in developing the strategy. For example, it is important to **engage in particular with potentially negatively affected communities, businesses** and to build an inclusive shared vision in the society. This will **ensure a fair and just transition**, **increasing public acceptability** of the strategy. By engaging with vulnerable groups, it will be **easier to identify priority actions to outweigh negative socio-economic trade-offs.**

There are **different ways to engage meaningfully with stakeholders** in the LT-LEDS process. Stakeholder consultations can be carried out through the organization of workshops, where different stakeholders can engage as part of smaller working groups. It is important to ensure that stakeholders are able to exchange views in a free and open environment.

Long-term financial and investment vision involving the Private Sector in Georgia

The **inclusion of a long-term financial and investment vision** in Georgia's LT-LEDS can greatly facilitate the implementation of the transition to a low-emission economy.

From the Private Sector perspective this means:

- the **identification of national resources or funds** that are **readily available** in the short-term
- the identification of areas of actions where **further investments may be needed** in the long run
- potential policies and instruments that may be useful to **promote such investments**.

Also important: a long-term financial and investment vision can should include the **identification of planned investments that are incompatible with the transition to a low-carbon economy**, and considerations on long-term exit strategies from such investments, fundamental to **reduce the risk of stranded assets and lock-ins.**

It would be useful for Georgia to **include preliminary estimates of the overall implementation cost** of the strategy, including assessments of what can be covered by national budget and identify areas that may benefit from international aid and investments.

Finally, considering **investment and finance vision** in the context of LT-LEDS may result in various **co-benefits**:

- a vision for resourcing the strategy as part of a LT-LEDS could foster dialogues between Finance and Environment Ministries and alignment of fiscal and financial policies with a low-emission pathway, helping **reduce risk of misaligned fiscal incentives (impacting Private Sector)**.
- planning a long-term vision for fiscal budgets and investments may lead to **better policy alignment**.

  Some policy tools relevant for climate change mitigation – notably carbon pricing - can generate significant revenues that can thereafter be used to support investments aimed at reinforcing sustainable infrastructure and at achieving other national objectives.
- **Encourage investments**: LT-LEDS can **enhance policy and regulatory certainty for investors, encouraging investment from the private sector to financing the transition.**

  Investment decisions are ultimately conditioned by national priorities and financial policies. Setting a vision for the investments needed to implement the LT-LEDS could promote stability in the finance environment.

Bibliography

- [NBG (2019), "Roadmap for Sustainable Finance in Georgia", National Bank of Georgia, webpage (accessed 23 October 2019), https://www.nbg.gov.ge/uploads/finstability/roadmap/sustainable_finance_roadmap_eng.pdf.
- OECD (2018), Mobilising Finance for Climate Action in Georgia, Green Finance and Investment, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264289727-en.
- OECD (2016), Promoting Better Environmental Performance of SMEs: Georgia, OECD Publishing, Paris, http://www.oecd.org/env/outreach/Georgia%20pilot%20project%20report%20final%20EN.pdf.
- CDP (2017, October). Putting a Price on Carbon: Integrating climate risk into business planning. London, UK: CDP.
- CDP (2020, September). Foundations for science-based net-zero target setting in the corporate sector. Science-Based Targets initiative. London, UK: CDP.
- Climate Action 100+ (2020, December). 2020 Progress Report. London, UK: Climate Action100+.
- How should the private sector step up climate action? Renat Heuberger, South Pole
- EDF (2020, December 17). Mobilizing voluntary carbon markets to drive climate action. Washington DC, UK: EDF. Available at: https://www.edf.org/climate/voluntary-carbon-markets
- Gold Standard (2021). Vision + Impacts. Geneva, Switzerland: Gold Standard. Available at: https://www.goldstandard.org/about-us/vision-and-mission
- International Carbon Reduction & Offset Alliance (2018). Quality Assurance. Geneva,
- Switzerland: ICROA. Available at: https://www.icroa.org/Quality-Assurance
- International Carbon Reduction & Offset Alliance (2020, March). ICROA's position on scaling private sector voluntary action post-2020. Geneva, Switzerland: ICROA.
- Climate Change Expert Group Paper No. 2019(4) Key questions guiding the process of setting up long-term low-emission development strategies Marcia Rocha (OECD) and Chiara Falduto (OECD)
- Sector-level policy gaps for climate change mitigation in Georgia, Summary of policy coverage and ambition raising potential, NewClimate, 2022
- International Panel on Climate Change (2019). Special Report: Global Warming of 1.5 ºC. Geneva, Switzerland : IPCC. Available at: https://www.ipcc.ch/sr15/
- Singh, J. (2016), Energy Efficiency Financing Option Papers for Georgia, World Bank, Washington, DC, http://documents.worldbank.org/curated/en/825761475845097689/Energy-efficiency-financing-option-papers-for-Georgia.
- World Bank (2017), Georgia – Private Sector Competitiveness Development Policy Operation, World Bank, Washington, DC, http://documents.worldbank.org/curated/en/478801501725663367/pdf/Georgia-Private-Sector-Competitiveness-PD-07112017.pdf.
- Implementation of Nationally Determined Contributions, Georgia Country Report - Environmental Research of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety Project No. (FKZ) 3716 4111 80
- Christopher Blaufelder, Cindy Levy, Peter Mannion, and Dickon Pinner, A blueprint for scaling voluntary carbon markets to meet the climate challenge
- Application of the European Union Emission Trading Directive Analysis of national responses under Article 21 of the EU ETS Directive
- GoG (2014), Social-economic Development Strategy of Georgia: GEORGIA 2020, Government of Georgia, Tbilisi,
- https://policy.asiapacificenergy.org/sites/default/files/ Georgia%202020_ENG.pdf.
- IEA (2017), World Energy Balances of non-OECD Countries 2015, OECD Publishing, Paris, www.iea.org/statistics/statisticssearch/report/?country=Georgia&product=balances.
- IEA (2015), Energy Policies Beyond IEA Countries: Caspian and Black Sea Regions 2015, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264228719-en.
- IFC (2017), "IFC, Amundi to create world's largest green-bond fund dedicated to emerging markets", Press Release, 21 April 2017, International Finance Corporation, Washington, DC, https://ifcextapps.ifc.org/IFCExt/pressroom/IFCPressRoom.
- nsf/0/2CC3EDA1AE8B9B558525810900546887
- Kochladz, M. et al. (2015), Georgia and European Energy Community – The Challenges of EU Integration, Green Alternative, Tbilisi, https://greenalt.org/wp-content/uploads/2015/06/Georgia_and_European_Energy_Community.pdf.
- McNicoll, L. and R. Jachnik (2017), The "Investor Perspective" for Estimating Publicly mobilised Private Finance for Climate Action: Methodological Proposal and Case Studies, Researchers Collaborative, OECD Publishing, Paris, www.oecd.org/env/researchcollaborative.
- Ecosystem Marketplace, Producing-and-Selling-a-Voluntary-Carbon-Offset
- ENERGY | ELECTRIC POWER | ENERGY TRANSITION | OIL, Insight Blog, Silvia Favasuli Vandana Sebastian
- Climate smart agriculture practices in the context of Georgia's climate mitigation efforts, Thomas Day, Pablo Lopez Legarreta, Tessa Schiefer
- International Bank for Reconstruction and Development / The World Bank, Partnership for Market Readiness
- Decarbonisation scenarios for the transport sector in Georgia, Thomas Day, Sofia Gonzales Zuñiga, Swithin Lui, 2021

- Pillai, Madhavi M.; Golub, Elena Strukova; Lokshin,Michael M.; Rakovych, Oksana; Ha,Thanh Phuong. Ukraine - Building Climate Resilience in Agriculture and Forestry.
- SPECIAL REPORT | CARBON FARMING: EUROPE'S NEW TREND? | EURACTIV
- Abulashvili, G. (2013). Building Energy Efficiency Project HOA ' s in Tbilisi City George Abulashvili ESIB Local Coordinator in Georgia Background and Overview of Demonstration Project in Tbilisi. http://www.inogate.org/documents/20140215 ESIB - GA Innogate.pdf
- ADB. (2017). Unlocking the potential of railways: a railway strategy for CAREC, 2017-2030. https://www.adb.org/sites/default/files/institutional-document/227176/carec-railway-strategy-2017-2030.pdf
- ADB. (2018). Sustainable Transport Solutions. https://www.adb.org/sites/default/files/publication/468921/sustainable-transport-solutions-peoples-republic-china.pdf
- Addis Ababa Road and Transport Bureau. (2018). Addis Ababa Non-Motorized Transport Strategy. https://globaldesigningcities.org/wp-content/uploads/2020/08/NMT-Strategy-181109.pdf
- Ahmed, J., Almeida, E., Aminetzah, D., Denis, N., Henderson, K., Katz, J., Kitchel, H., & Mannion, P. (2020). Agriculture and climate change. McKinsey & Company. https://www.mckinsey.com/~/media/McKinsey/Industries/Agriculture/Our Insights/Reducing agriculture emissions through improved farming practices/Agriculture-and-climate-change.pdf
- Amir, J. (2020). Thai government announces EV roadmap. IHS Markit. https://ihsmarkit.com/research- analysis/thai-government-announces-ev-roadmap.html
- Benmaamar, M., Keou, O., & Saslavsky, D. (2015). Georgia' Transport and Logistics Strategy. documents1.worldbank.org/curated/en/623591468191346382/pdf/96577-REVISED-WP-PUBLIC-Georgia-Box391464B-Final-Jan2015.pdf
- Bnamericas. (2019). Colombia launches National Strategy for Electric and Sustainable Mobility.
- Bnamericas. https://www.bnamericas.com/en/news/colombia-launches-national-strategy-for-electric-and-sustainable-mobility
- Bnamericas. (2020). Mexican railway sector expects investments of over US$590mn. Bnamericas. https://www.bnamericas.com/en/interviews/mexican-railway-sector-expects-investments-over- us590mn
- Cembureau. (2018). Co-processing of waste in EU cement plants: status and prospects. European Circular Economy Knowledge Hub. https://circulareconomy.europa.eu/platform/en/good- practices/co-processing-waste-eu-cement-plants-status-and-prospects
- Cembureau. (2020). Cementing the European Green Deal - Reaching climate neutrality along the cement and concrete value chain by 2050. https://cembureau.eu/media/1948/cembureau-2050-roadmap_final-version_web.pdf [accessed on 13 July 2020]
- Climate Action Tracker. (2020). Paris Agreement Compatible Sectoral Benchmarks: Elaborating the decarbonisation roadmap. Climate Action Tracker (Climate Analytics, NewClimate Institute). https://climateactiontracker.org/documents/753/CAT_2020-07-10_ParisAgreementBenchmarks_FullReport.pdf
- Day, T., Gonzales-Zuñiga, S., Nascimento, L., Höhne, N., Fekete, H., Sterl, S., Hans, F., Warembourg, A., Anica, A., & Van Breevoort, P. (2018). Climate Opportunity: More Jobs; Better Health; Liveable Cities.
- EBRD-GEFF. (n.d.). IQ Energy – the launch of a new financing facility for Ukraine.
- Ecos. (2020). Breaking down barriers to lower-carbon cements. https://ecostandard.org/breaking-down- barriers-to-lower-carbon-cements-ecos-brings-solutions-to-concrete-problems/
- ECRA. (2017). CSI/ECRA-Technology Papers 2017 Development of State of the Art Techniques in Cement Manufacturing: Trying to Look Ahead. www.ecra-online.org
- European Commission. (2020). Industrial Emissions Directive. https://ec.europa.eu/environment/industry/stationary/ied/legislation.htm
- Forbes.ge. (2020). Back on Track. Forbes Georgia. https://forbes.ge/back-on-track/
- GCF Documentation. (2016). FP010: De-risking and scaling-up investment in energy efficient building retrofits in Armenia.
- Climate-smart agriculture [Електронний ресурс] – Режимдоступу: http://climate-adapt.eea.europa.eu/metadata/publications/climate-smart-agriculture
- Gert-Jan Nabuurs, Philippe Delacote, David Ellison, Marc Hanewinkel, Marcus Lindner, Martin Nesbit, Markku Ollikainen and Annalisa Savaresi. 2015. A new role for forests and the forest sector in the EU post-2020 climate targets. From Science to Policy 2. European Forest Institute.
- IPCC, 2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp.
- IPCC, 2014: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and
- Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L.White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1132 pp.
- IPCC, 2014: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Barros, V.R., C.B. Field, D.J. Dokken, M.D. Mastrandrea, K.J. Mach, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L.White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 688.
- IPCC, 2014: Climate Change 2014: Mitigation of Climate Change. Contribution of Working

- Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change
- Mart-Jan Schelhaas, Martin Cerny, Igor Buksha et. all., 2004. Scenarios on Forest Management in the Czech Republic, Hungary, Poland and Ukraine. European Forest Institute Research Reports
- Ukraine's Greenhouse Gas Inventory 1990-2019, Ministry of Environmental Protection and Natural Resources of Ukraine
- Securing Climate Benefit: A Guide to Using Carbon Offsets, Derik Broekhoff, Michael Gillenwater, Tani Colbert-Sangree, Patrick Cage
- Christian Nissen (Öko-Institut), Johanna Cludius (Öko-Institut), Verena Graichen (Öko-Institut), Jakob Graichen (Öko-Institut), Sabine Gores (Öko-Institut), ETC/CME Eionet Report | 9/2021
- Trends and projections in the EU ETS in 2021
- DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union, Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and Regulation (EU) 2015/757
- COWI, Ecologic Institute and IEEP (2021) *Technical Guidance Handbook - setting up and implementing result-based carbon farming mechanisms in the EU* Report to the European Commission, DG Climate Action, under Contract No. CLIMA/C.3/ETU/2018/007. COWI, Kongens Lyngby.
- Dale VH. The Relationship Between Land-Use Change and Climate Change. Ecol Appl. 1997;7(3):753-769. doi:10.1890/1051-0761(1997)007[0753:TRBLUC]2. 0.CO2
- Couwenberg J. Emissions from drained peatlands in Europe. & Martin, N. (in press) Organic soils in national inventory submissions of EU countries. Proceedings of the Greifswald Mire Centre.
- Bossio DA, Cook-Patton SC, Ellis PW, et al. The role of soil carbon in natural climate solutions. Nat Sustain. 2020;3(5):391-398. doi:10.1038/s41893-020- 0491-z
- Dupeux B. EEB Pathway for a Net-Zero Agriculture and Agriculture-Related Land Emission.; 2021.
- Aertsens, J., De Nocker, L., Gobin, A. (2013): Valuing the carbon sequestration potential for European agriculture. Land Use Policy 31, 584–594.
- Albrecht, A., and Kandji, S. T. (2003): Carbon sequestration in tropical agroforestry systems. Agriculture, Ecosystems and Environment, 99(1–3) 15–27
- Alliance Environnement, European Commission. Directorate General for Agriculture and Rural Development (2019): Evaluation study of the impact of the CAP on climate change and greenhouse gas emissions: final report. Publications Office, LU.
- Amundson, R. and Biardeau, L. (2018): Opinion: Soil carbon sequestration is an elusive climate mitigation tool. Proceedings of the National Academy of Sciences of the United States of America, vol. 115, no. 46, pp. 11652–11656
- Barbero M., Leip A. (2020): Economic assessment of GHG mitigation policy options for EU agriculture: A closer look at mitigation options and regional mitigation costs EcAMPA 3 European Commission. Joint Research Centre. Publications Office, Luxembourg, 2020, ISBN 978-92-76-17854-5, doi:10.2760/4668, JRC120355
- Badgley, G., Freeman, J., Hamman, J. J.,Haya, B., Trugman, A. T., Anderegg, W. R. L., & Cullenward, D. (2021): Systematic over-crediting in California's forest carbon offsets program.Global Change Biology, 00, 1– 13
- Design principles of a Carbon Farming Scheme in support of the Farm2Fork & FitFor55 objectives Pierre-Marie Aubert (IDDRI), Claudine Foucherot (I4CE), Johannes Svensson (IDDRI)
- EC (2021). *Sustainable Carbon Cycles*. Brussels, Communication from the Commission to the European Parliament and the Council – COM(2021) 800.
- EC (2020). *Farm to Fork Strategy. For a fair, healthy and environmentally-friendly food system. Brussels,* Communication from the Commission to the European Parliament and the Council
- Technical Guidance Handbook – setting up and implementing result-based carbon farming mechanisms in the EU
- Policy Department for Economic, Scientific and Quality of Life Policies Directorate-General for Internal Policies Authors: Hugh McDonald, Ana Frelih-Larsen, Anna Lóránt, Laurens Duin, Sarah Pyndt Andersen, Giulia Costa, and Harriet Bradley PE 695.482, Carbon farming, Making agriculture fit for 2030
- COWI, Ecologic Institute and IEEP (2021a): *Technical Guidance Handbook - setting up and implementing result-based carbon farming mechanisms in the EU Report to the European Commission*, DG Climate Action, under Contract No. CLIMA/C.3/ETU/2018/007. COWI, Kongens Lyngby
- EEA (2020): Changes in GHG emission trends and projections under the scope of the Effort Sharing Decision in the EU, 2005-2018, 2018-2030
- European Parliament (2021c): Legislative resolution of 23 November 2021 on the proposal for a regulation of the European Parliament and of the Council establishing rules on support for strategic plans to be drawn up by Member States under the Common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulation (EU) No 1305/2013 of the European Parliament and of the Council and Regulation (EU) No 1307/2013 of the European Parliament and of the Council (COM(2018)0392 – C8-0248/2018 – 2018/0216(COD))
- A GUIDE TO LINKING EMISSIONS TRADING SYSTEMS, Marissa Santikarn, Lina Li, Stephanie La Hoz Theuer, Constanze Haug
- Christi Electris, et al., "The Impact of Equity Engagement: Evaluating the Impact of Shareholder Engagement in Public Equity Investing," Croatan Institute, November 2014.
- See David Easley and Jon Kleinberg, Networks, Crowds, and Markets: Reasoning about a Highly Connected World (New York: Cambridge University Press, 2010); and Electris, et al., "The Impact of Equity Engagement."
- "What Do the UN Sustainable Development Goals Mean for Investors?" Principles for Responsible Investment, 2016; and Mila Ivanova and Frances Joanne Mountford, "Transforming Our World," ShareAction, March 2016.

- Pete Smith, et al., "Agriculture," in *Climate Change 2007: Mitigation,* Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (Cambridge and New York: Cambridge University Press, 2007), p. 499.
- Mark Gregory, "Financing Land Grabs and Deforestation: The Role of EU Banks and Investors," Fern, July 2016; Jeff Conant, "Are Your Invested in Exploitation?" Briefing Paper, Friends of the Earth, July 2016; Joshua Humphreys, Ann Solomon, and Emmanuel Tumusiime, "US Investment in Large-Scale Land Acquisitions in Low- and Middle-Income Countries," Research Backgrounder, Oxfam America, 2013; "Pension Funds and the Financing of Land Grabs," Briefing Paper, Friends of the Earth, September 2012; Shepard Daniel, "Situating Private Equity Capital in the Land Grab Debate," *The Journal of Peasant Studies* 39, nos. 3-4 (2012): 703-29; and Daniel, with Anuradha Mittal, "(Mis)Investment in Agriculture: The Role of the International Finance Corporation in Global Land Grabs," Oakland Institute, 2010.
- See ICCR, Guidelines for Responsible Investing in Food Commodities, 2012; and Ivo Knoepfel and David Impert, "The Responsible Investor's Guide to Commodities: An Overview of Best Practices across Commodity-exposed Asset Classes," Principles for Responsible Investment, 2011. More generally, see "Commodities as an Asset Class: Appropriate for Responsible Investors?" Initiative for Responsible Investment, Harvard University, 2011; and Knoepfel, "Responsible Investment in Commodities: The Issues at Stake and a Potential Role for Institutional Investors," Zurich: onValues, January 2011.
- Business Partnership for Market Readiness (B-PMR), The International Emissions Trading Association (IETA)
- Allen B., K. Hart, G. Radley, G. Tucker, C. Keenleyside *et al.* (2014) *Biodiversity protection through results based remuneration of ecological achievement*. Report to the European Commission, DG Environment on Contract ENV.B.2/ETU/2013/0046, Institute for European Environmental Policy, London.
- Boatman N., C. Short, J. Elliott, Y. Cao, P. Gaskell, C. Hallam, R. Laybourn, J. Breyer, N. Jones (2014) *Agreement scale monitoring of Environmental Stewardship 2013-4 - assessing the impact of advice and support on the environmental outcomes of HLS agreements*. Food and Environment Research Agency, final report to Natural England on Contract no. LM0432.
- Byrne D., Astrain Massa C., Beaufoy G., Berastegi Garciandia A., Bleasdale A.,Campion D., Andy; Copland A., Dunford B., Edge R., Finney K., Iragui Yoldi U., Jones G., Lopez Rodriguez F., Maher C., Moran J., McLoughlin D. and O'Donoghue B.,(2018). *Non-technical Summary: Results-based Agri-environment Pilot Schemes in Ireland and Spain.* Report prepared for the European Union, Agreement No.07.027722/2014/697042/SUB/B2. https://rbaps.eu/documents/guidance-documents/
- Chaplin, S., V. Robinson, A. LePage, H. Keep, J. Le Cocq, D. Ward, D. Hicks, E. Scholz (2019) *Pilot Results-Based Payment Approaches for Agri-environment schemes in arable and upland grassland systems in England.* Final Report to the European
- European Commission (2017) *Technical handbook on the monitoring and evaluation framework of the Common Agricultural Policy 2014 – 2020*. Directorate-General for Agriculture and Rural Development.
- European Commission (2018) EU budget: the Common Agricultural Policy beyond 2020. Press release issued on 01.08.2020, Commission of the European Communities, Reference: IP/18/3985.

#EU4CLIMATE