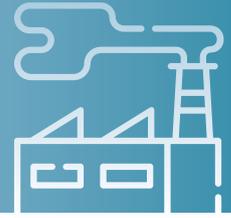
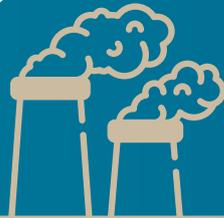


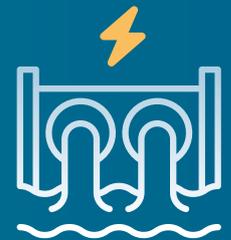
GEORGIA'S LONG-TERM LOW EMISSION DEVELOPMENT STRATEGY



Non-technical Summary



2023





**Funded by
the European Union**



This publication has been produced with the assistance of the European Union (EU) and the United Nations Development Programme (UNDP). Its contents are the sole responsibility of the Georgian Government and do not necessarily reflect the views of the EU and UNDP.

Introduction

After joining the Paris Agreement,¹ Georgia made significant commitments to develop its climate change policy and reduce Greenhouse Gas (GHG) emissions. Georgia submitted its Nationally Determined Contribution (NDC)² to the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) in 2021, unconditionally committed to limiting its domestic total GHG emissions to 35% below the 1990 level by 2030 and 50-57% in case of international support. Succeeding this, the Georgian Government adopted the Climate Change Strategy 2030 and the Climate Action Plan (CAP 2021-2023) the same year. As the promising process towards climate change mitigation had started, Georgia also prepared and adopted the **Long-Term Low Emission Development Strategy (further LT LEDES) in April 2023³. Georgia has an aim to become a "green" country by mid-century. It plans to implement robust climate measures and fundamental technological changes by 2050 to achieve its ultimate goal – carbon neutrality.**

LT LEDES is a framework document defining Georgia's long-term vision of low-emission development. It shapes and formulates a GHG emissions reduction vision and principles for the carbon-neutral development of the country by 2050. LT LEDES defines a range of estimated national (GHG) emissions and removals from the following sectors - energy⁴, industrial processes, product use (IPPU), agriculture, land use, land-use change, and forestry (LULUCF), and waste.

Mandate

The TL LEDES is a national policy document approved by the Government of Georgia. It was prepared in accordance with Resolution No. 629 of the Government of Georgia on "Approval of the Rules for the Development, Monitoring, and Evaluation of Policy Documents (December 20, 2019)."

The development of the LT LEDES is mandated, and it is aligned with the Paris Agreement (Article 4, Paragraph 19) adopted at the UNFCCC Conference of Parties (COP21) in December 2015, the EU-Georgia Association Agreement signed in 2014⁵, and the Regulation on the Governance of the

1 The Paris Agreement, adopted at COP21 in December 2015, stipulates its objective to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels and for this purpose achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases (worldwide carbon neutrality) in the second half of this century

2 Approved according to Resolution No. 167 of the Government of Georgia "On the approval of the Updated Nationally Determined Contribution (NDC) of Georgia, the 2030 Climate Change Strategy of Georgia and the 2021-2023 Action Plan" provided by the Paris Agreement (UNFCCC), 18 April 2021

3 The Resolution No. 160 of the Government of Georgia "On the Approval of the Long Term Low Emission Development Concept of Georgia," April 24, 2023

4 The energy sector considers GHG emissions from fuel combustion which includes the power industry (electricity generation and transmission), energy consumption from stationary sources (buildings) and mobile sources (transportation), and fugitive emissions from fuels

5 In June 2014, the EU and Georgia signed an Association Agreement, which entered into force on July 1, 2016

Energy Union and Climate Action (the Governance Regulation)⁶ of the Energy Community. It also follows the UN 2030 Agenda on Sustainable Development Goals and other commitments as part of Georgia's international obligations.

LT LEDS will be followed by ten-year low-emission development strategies, along with Georgia's updating NDC and corresponding short-term action plans. The LT LEDS will also serve as a framework for planning and developing sectorial policy documents linked to climate change. However, LT LEDS may become a subject of further review and update as suggested by changing international circumstances and commitments.

The implementation of the LT LEDS will be overseen and coordinated by the inter-governmental agency - Climate Change Council, the consultative body established by the Government of Georgia in January 2020⁷ to coordinate the effective implementation of the national climate policy, the Paris Agreement, and Georgia's other international commitments.

Scope and methodology

The elaboration of LT LEDS began in September 2020. Many stakeholders were involved in drafting the document, including representatives from the public, sectoral governmental agencies, scientific and civil organizations, and experts. As part of this engagement, various events, such as interviews, stakeholder meetings, and public consultations, were held to discuss the document and consider proposed comments in the preparation process. The methodology and approach for the document were elaborated in consultation with relevant stakeholders and presented at the inception workshop.

As part of the LT LEDS preparation methodology, the data collection and policy analysis have been conducted for each sector, and proper drivers, e.g., population size, the gross domestic product, and other economic and demographic factors, etc., have been selected and used to elaborate baseline scenarios. Furthermore, various sector-relevant methods and models of GHG emission projection, e.g., TIMES-Georgia, Ex-Ante Carbon-balance Tool (EX-ACT), IPCC Waste Model, etc., were applied for building long-term low-emission development scenarios of the LT LEDS.

Two baseline scenarios - pessimistic and optimistic, and WoM (Without Measures), WeM (With Existing Measures), and WaM (With Additional Measures) scenarios have been elaborated, showing the tentative range of GHG emissions up to 2050. By analyzing the projected emission trends for each scenario, the possibility of carbon neutrality has been additionally discussed, and the areas for additional mitigation potential have been identified. Furthermore, additional calculations revealed the conditions and measures (extent of additional efforts) sufficient for achieving Georgia's carbon neutrality by 2050.

6 Regulation (EU) 2018/1999 of the European Parliament and of the Council of December 11, 2018, on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council, Decision 2021/13/MC-EnC passed by the Council of Ministers on November 30, 2021

7 Resolution No. 54 of the Government of Georgia on the Establishment of the Climate Change Council, 23 January 2020

Content

The preparation of the LT LEDS is based on the overview of the current situation and climate change impacts in the country, entailing the need to elaborate a long-term low-emission development strategy. This initial part of the LT LEDS, among others, describes the emission sources and the GHG emissions trends in the sectors and analysis GHG emissions in individual sectors. Generally, each sector-specific section contains detailed information about the sector, including its description, current situation, and historical GHG emissions.

For the mid-century low-emission vision, the LT LEDS analyzes tentative ranges and targets between pessimistic and optimistic development paths for each climate-relevant sector to reduce GHG emissions. It also identifies corresponding sets of mitigation actions. It envisages mitigation activities to be implemented in the correlated economic sectors to be reflected in the respective strategy and action plans following the LT LEDS.

Consideration of gender aspects plays a significant role in LT LEDS development and its entire operation process. The section on gender identifies the gender-related element and provides recommendations that should be adequately reflected in the LT LEDS implementation process. LT LEDS takes a promising step to promote women's professional development and proper integration into the entire LEDS operation according to equity principles.

Georgia's LT LEDS pays critical attention to the technological transformation and modernization of economic sectors, exceptionally energy-efficient technologies and renewables, as the basis for low-emissions development. Innovative technologies, in general, and among them climate technologies, are the keys to economic development and decarbonization by 2050. Georgia plans to combine low-emission development and economic growth by introducing innovative approaches and technologies that reduce GHG emissions.

From the financial and practical point of view, the climate finance vision as part of the LT LEDS Climate Finance Strategy (CFS) considers the factors needed to raise public, private, and international funds to implement the LT LEDS successfully. The climate finance scheme includes mobilizing local, national, and international finances supporting climate mitigation, adaptation, and low-carbon development. It is crucial to develop funding policies and procedures that align with Georgia's LT LEDS and fulfill the investment requirements to achieve its main objectives. This issue is significant because, like other developing countries, Georgia is characterized by high capital costs that are a considerable barrier to attracting funds and the development process in general.

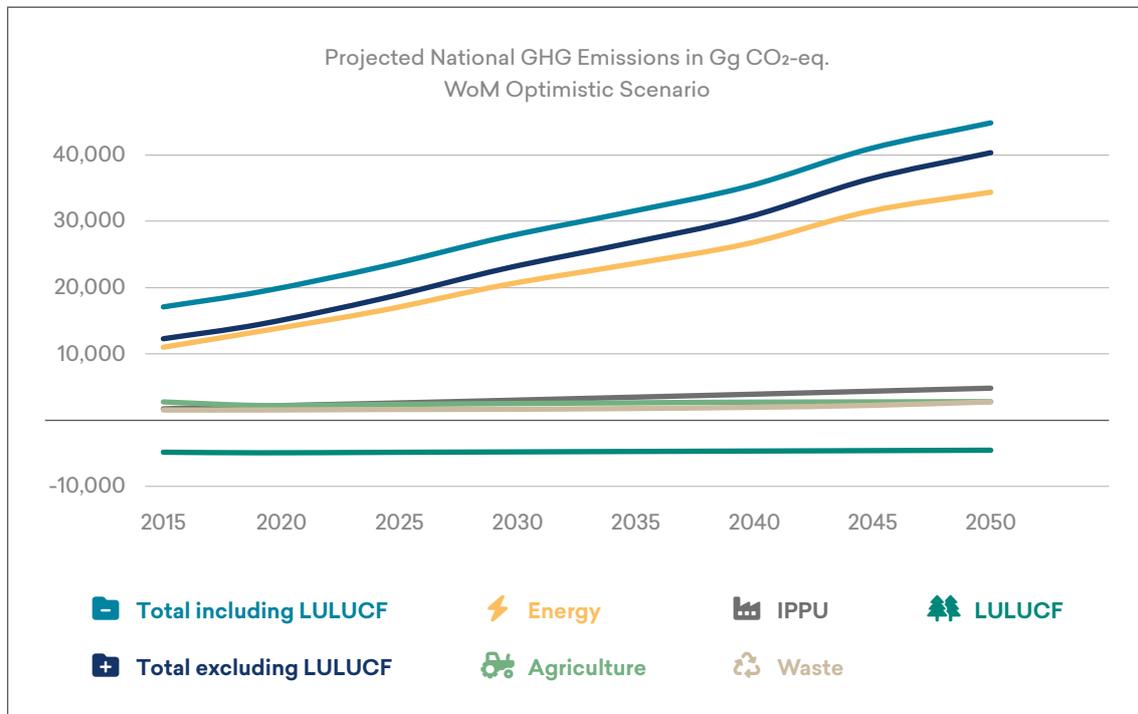
Key conclusions

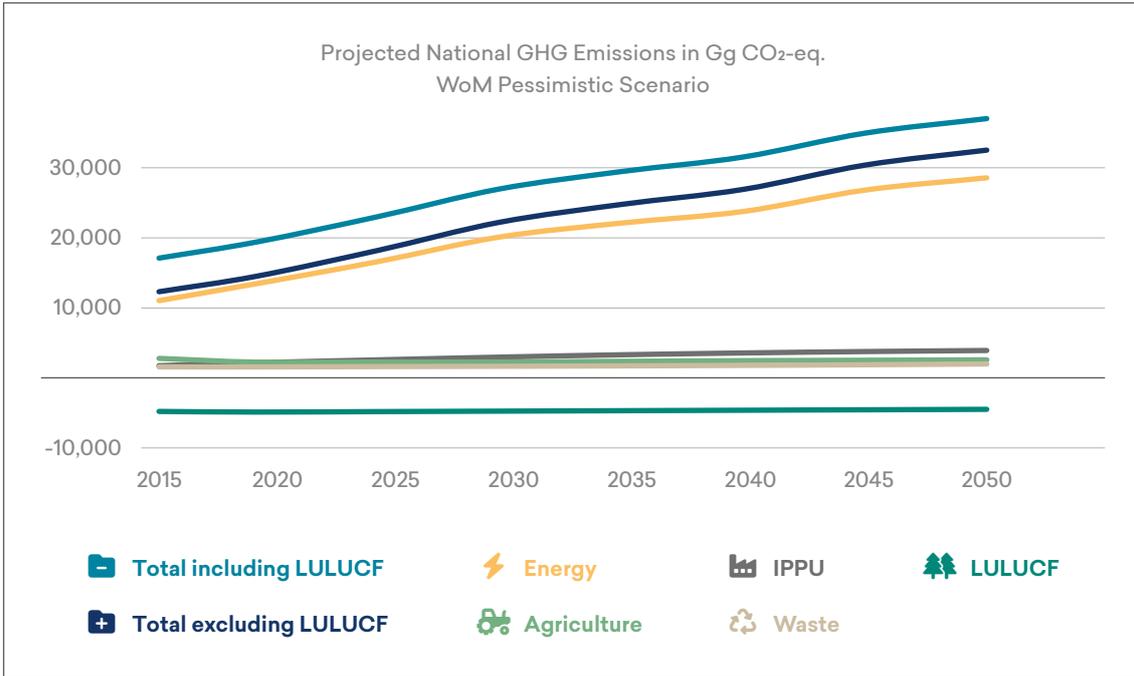
Overall, LT LEDS defines the range of projected GHG emissions by 2050 between optimistic and pessimistic development and proposes trajectories for three emission reduction scenarios for Georgia. Based on these analyses, these key conclusions are driven as follows:

WoM Scenario (the baseline scenario)

In the case of the baseline scenario (WoM) and optimistic development, the projected national GHG emissions (including LULUCF) by 2050 will reach 40,313 Gg CO₂-eq and 32,499 Gg CO₂-eq in the case of the WoM pessimistic scenarios. Similarly, GHG emissions (excluding LULUCF) by 2050 will reach 44,808 Gg CO₂-eq in the case of the WoM optimistic and 36,995 Gg CO₂-eq in the case of the WoM pessimistic scenarios.

Projected GHG Emissions in Gg CO₂-eq. WoM Optimistic and WoM Pessimistic Scenarios





As for sectors, the share of GHG emissions in national GHG emissions is presented in Table 1.

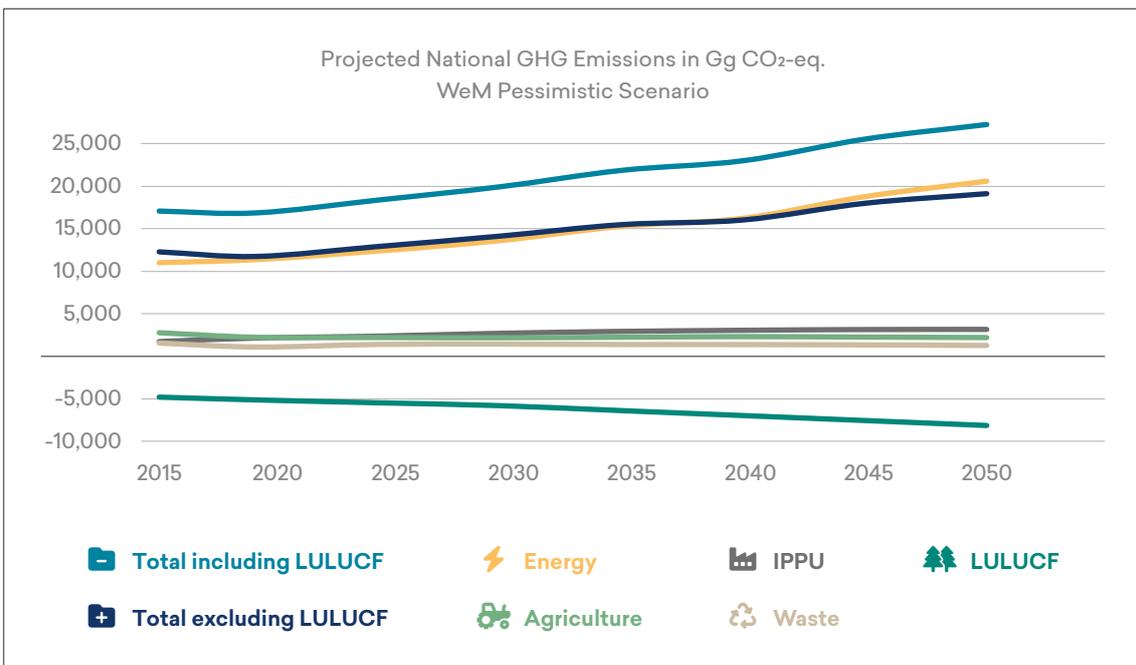
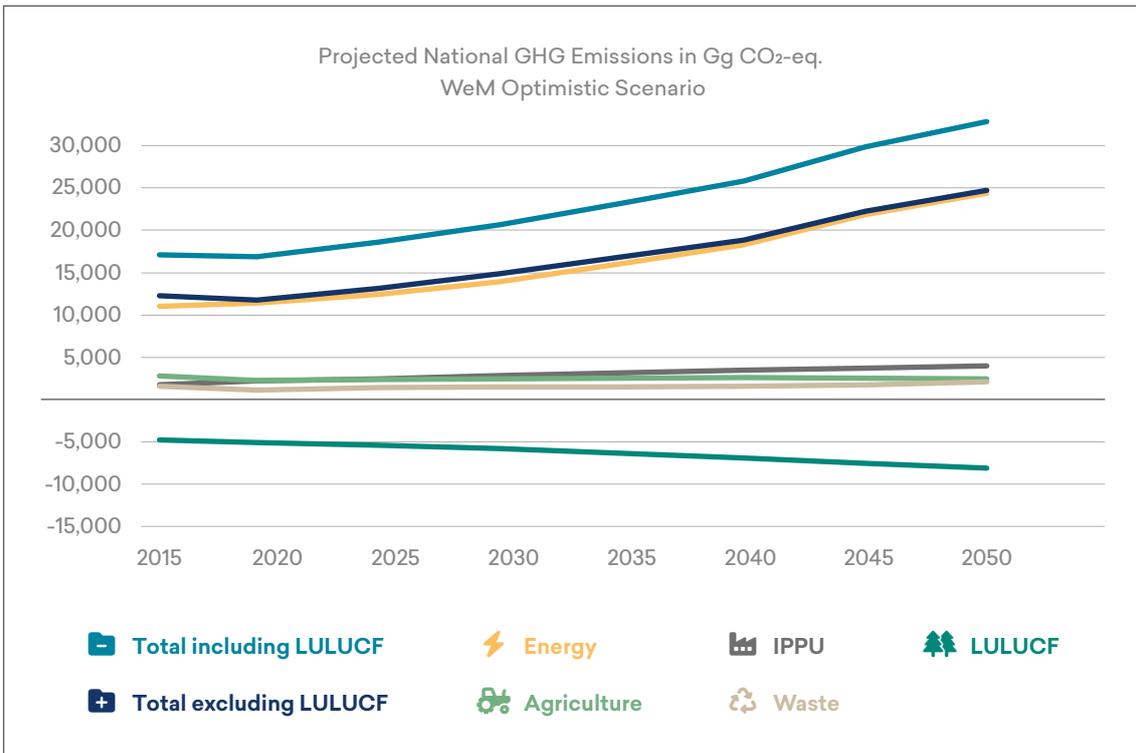
TABLE 1. Share of Sectoral GHG Emissions in National GHG Emissions

Sector	✓ WoM Optimistic scenario				✗ WoM Pessimistic scenario			
	2020	2030	2040	2050	2020	2030	2040	2050
	⚡ Energy	69%	74%	76%	77%	69%	75%	76%
🏭 IPPU	11%	11%	11%	11%	11%	11%	11%	11%
🚜 Agriculture	12%	9%	8%	6%	12%	8%	8%	7%
♻️ Waste	8%	6%	6%	6%	8%	6%	6%	5%
📦 Total excluding LULUCF	100%	100%	100%	100%	100%	100%	100%	100%
🌳 LULUCF	-25%	-17%	-13%	-10%	-25%	-18%	-15%	-12%
📦 Total including LULUCF	75%	83%	87%	90%	75%	82%	85%	88%

WeM Scenario (with Existing and Planned Measures)

Expected GHG emissions (including LULUCF) by 2050 will be 24,736 Gg CO₂-eq in the case of the WeM optimistic and 19,134 Gg CO₂-eq in the case of the WeM pessimistic scenarios and GHG emissions (excluding LULUCF) by 2050 will be 32,868 Gg CO₂-eq in the case of the WeM optimistic and 27,267 Gg CO₂-eq in the case of the WeM pessimistic scenarios.

Projected GHG Emissions in Gg CO₂-eq. WeM Optimistic and WeM Pessimistic Scenarios



As for sectors, the share of GHG emissions in national GHG emissions is presented in Table 2.

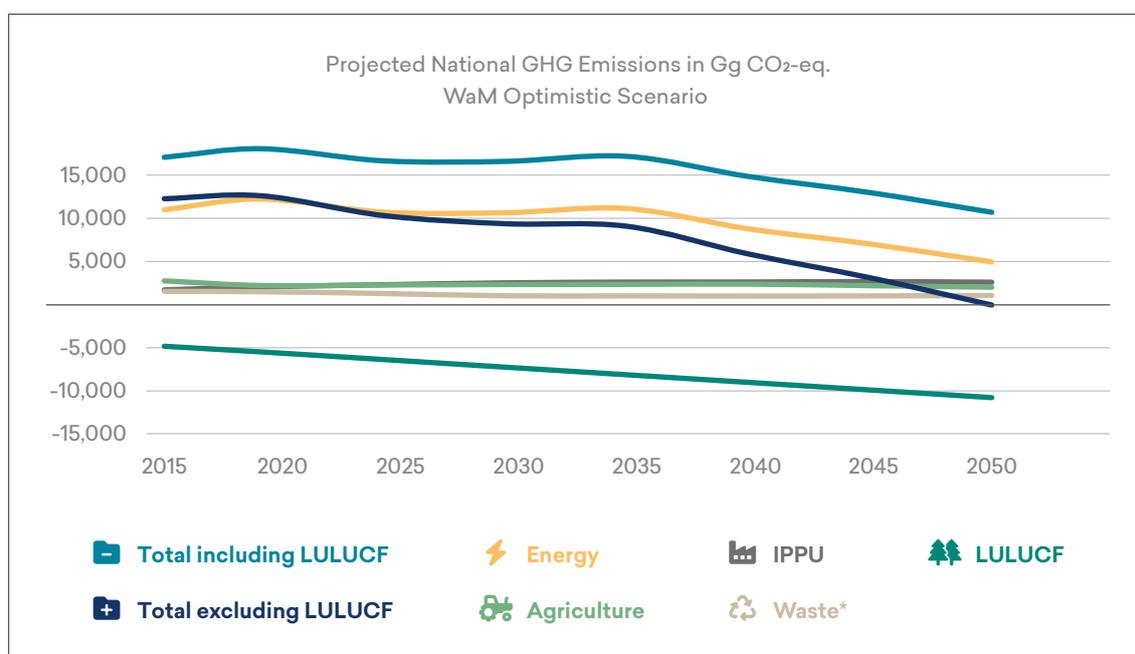
TABLE 2. Share of Sectoral GHG Emissions in National GHG Emissions

Sector	WeM Optimistic scenario				WeM Pessimistic scenario			
	2020	2030	2040	2050	2020	2030	2040	2050
⚡ Energy	68%	67%	71%	74%	66%	69%	70%	74%
🏭 IPPU	13%	14%	13%	12%	13%	14%	13%	12%
🚜 Agriculture	13%	12%	10%	7%	13%	11%	10%	8%
♻️ Waste	7%	7%	6%	6%	7%	7%	6%	5%
📦 Total excluding LULUCF	100%	100%	100%	100%	100%	100%	100%	100%
🌳 LULUCF	-30%	-28%	-27%	-25%	-30%	-29%	-30%	-29%
⊕ Total including LULUCF	70%	72%	73%	75%	70%	71%	70%	71%

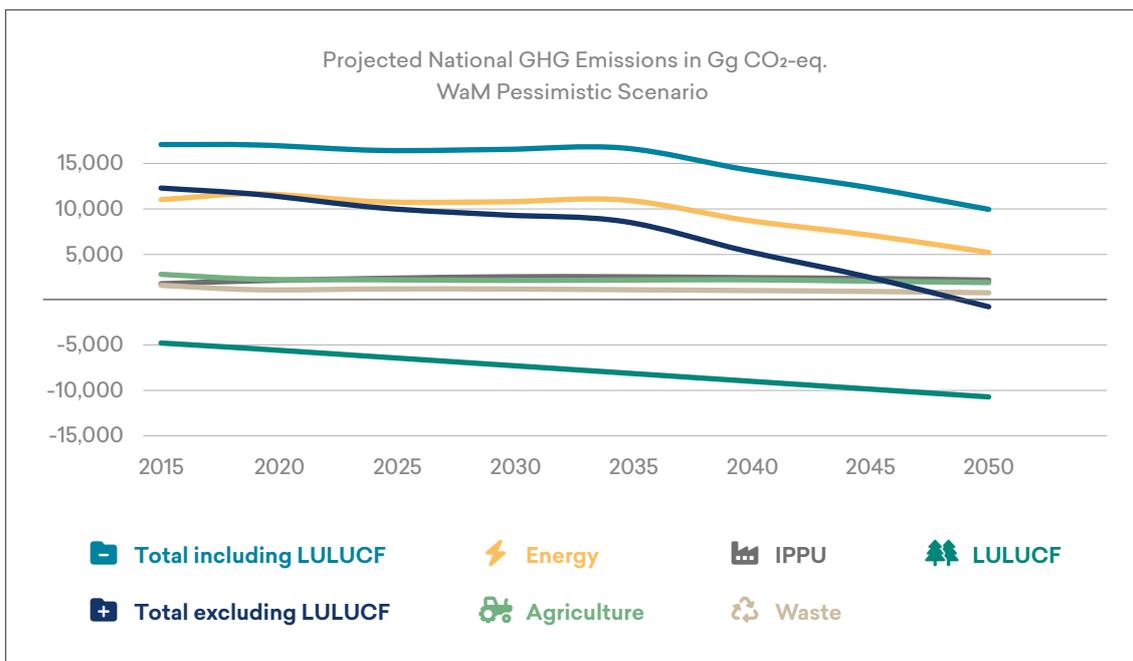
WaM scenario (with additional measures)

Expected GHG emissions (including LULUCF) by 2050 will be -20 Gg CO₂-eq in the case of the WaM optimistic and -801 Gg CO₂-eq in the case of the WaM pessimistic scenarios and GHG emissions (excluding LULUCF) by 2050 will be 10,720 Gg CO₂-eq in the case of the WaM optimistic and 9,939 Gg CO₂-eq in the case of the WaM pessimistic scenarios.

Projected GHG Emissions in Gg CO₂-eq. WaM Optimistic and WaM Pessimistic Scenarios



* Additional CH₄ recovery potential has been accounted for.



As for sectors, the share of GHG emissions in national GHG emissions is presented in Table 3.

TABLE 3. Share of Sectoral GHG Emissions in National GHG Emissions. WaM Optimistic and WaM Pessimistic Scenarios

Sector	WaM Optimistic scenario				WaM Pessimistic scenario			
	2020	2030	2040	2050	2020	2030	2040	2050
⚡ Energy	68%	64%	59%	46%	67%	66%	61%	50%
🏭 IPPU	12%	15%	18%	25%	12%	15%	17%	21%
🚜 Agriculture	12%	14%	16%	19%	13%	13%	15%	18%
♻️ Waste	8%	6%	7%	10%	6%	7%	7%	6%
📦 Total excluding LULUCF	100%	100%	100%	100%	100%	100%	100%	100%
🌳 LULUCF	-30%	-44%	-61%	-101%	-31%	-44%	-63%	-105%
📦 Total including LULUCF	70%	57%	40%	-1%	69%	56%	37%	-5%

Carbon neutrality by mid-century will be the ultimate goal for Georgia's long-term low-emissions development. However, achieving this with the baseline – the WoM scenario and with the existing measures – the WeM scenarios seems impossible. Instead, it can only be reached in the case of additional measures – the WaM scenario.

Thus, by 2050, Georgia will be able to become carbon-neutral in the case of both the pessimistic and the optimistic WaM scenarios.

LT LEDS demonstrates the crucial importance of introducing an innovative policy and new technologies requiring outer (international) technical, technological, and financial assistance to realize the ultimate goal – carbon neutrality by the mid-century.

Besides, the climate change mitigation policy should be implemented in compliance with the principles of social justice and the just transition principles. The measures implemented within the climate change mitigation policy framework provide opportunities for creating new decent jobs, which, along with the reduction of GHG emissions, contribute to the development of the regional and national economy. Therefore, low-emission development is turning into a tool not only for reducing GHG emissions but also for achieving social welfare goals.

Paradigm shift toward carbon-neutral development pathways

Social-economic impact - key messages⁸

Implementing the LT LEDS will create opportunities for new investments and technological innovations that can benefit the overall economic prospect of the country. This process will promote technological development, create additional jobs, and increase national revenues. However, implementing climate action, especially long-term, is hard work and requires considerable technical, human, and financial resources for Georgia to achieve the desired goal.

Georgia will need \$78 bn more *capital expenditure* for implementing the scenario with climate measures (WaM) compared to a scenario without climate measures (WoM). However, setting up infrastructure for climate measures will save approximately \$56 bn in *operational expenditure*, meaning that between now and 2050, Georgia will need to mobilize about \$22 bn in extra finances to achieve carbon neutrality. From 2022 to 2050, implementing climate measures will require an average additional expenditure of around USD 760M per year, equivalent to 1.9% of GDP, compared to a 'business as usual' scenario. Investment in infrastructure for climate measures is crucial, and financial resources are necessary to make it happen. This includes long-term energy storage, hydrogen infrastructure, EV charging infrastructure, and electricity grid upgrades and expansion.

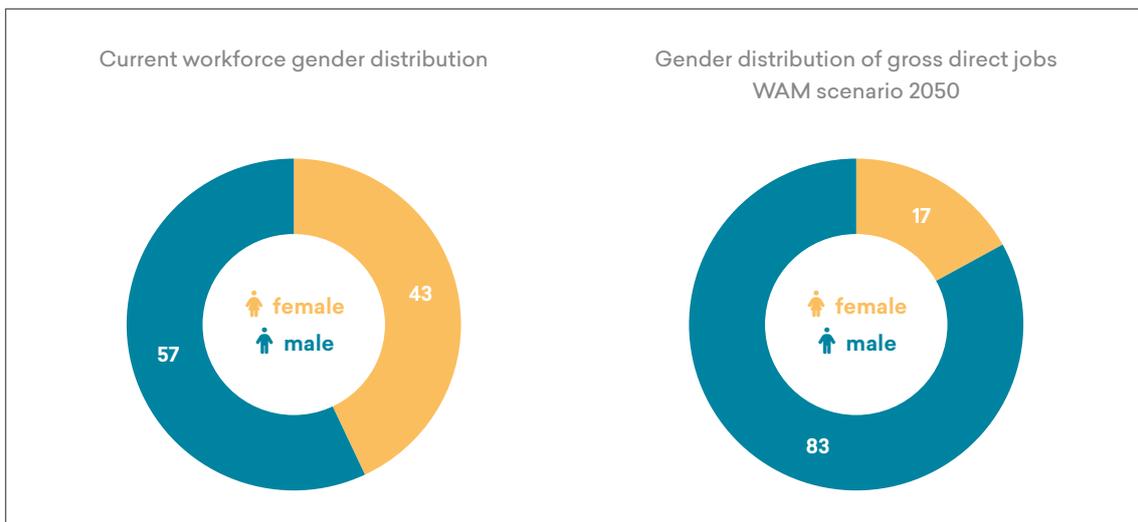
However, the investment to support climate measures is expected to increase GDP and employment compared to a scenario with no climate measures and sustain a long-term economic outlook for Georgia. By investing in climate measures, Georgia can create a more resilient system that relies less on imports, especially for energy sources. As a result of reducing energy consumption for heating and transportation in businesses and households, new opportunities for investing in innovative

⁸ This part of the Non-technical Summary summarizes the key messages of the Socio-Economic Impacts of Georgia's Decarbonization Pathway conducted by McKinsey & Company, Inc in January 2023 with support of the NDC Partnership. The study is based on comparing WoM and WaM scenarios of Georgia's LT LEDS.

technologies will arise. Over time, Georgia will be able to recoup the initial capital investment made toward climate measures.

In addition, implementing climate measures is projected to result in an extra \$1 bn of Gross Value Added (GVA) and the creation of 200,000 more jobs by 2050 compared to a scenario without climate measures. It is anticipated that roughly 80% of the total GVA generated by investments in the WaM scenario will come from low-carbon technologies.

In the WAM scenario, employment consistently remains higher compared to the WOM scenario. Furthermore, it has been estimated that low-carbon technologies will support 90% of the total jobs in the WaM scenario. As for the sectors, from WaM investments, the transport sector will generate 30% of employment, while the industry, power, and building sectors will each support roughly 15% of jobs by 2050. New jobs will create demand for mid and low-skill workers with a technical background, leaving potential occupational gaps for skilled agricultural and craft workers. However, this gap creates new opportunities for educational institutions in Georgia to enhance professional education in these directions to sustain professional demand. Nevertheless, it is essential to note that the transition will impact female workers. An increase in jobs for this transition will be seen in sectors traditionally dominated by men, posing a challenge to inclusive growth.



Finally, Georgia can benefit from the transition by exploring new areas of low-carbon development and leveraging strategic opportunities in the global technology market; one example is liquid hydrogen technology, which is expected to reach a \$50 billion global market annually by 2027.

It needs to be admitted that Georgia's goal to become carbon-neutral will boost opportunities for new and innovative low-carbon technologies and require transformative changes in the country's economic and social systems in compliance with just transition principles. Although this transformation will require significant financial investments with well-managed processes and robust climate measures, it will sustain a long-term positive impact on the country.

