



TBC CAPITAL

CLIMATE CHANGE

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What is climate change?

Climate change, with its borderless impacts, is under the scrutiny of numerous organizations and intergovernmental bodies. The universal threat it poses necessitates unified global efforts to address and mitigate its effects.

Today, climate change refers to short-term effects and long-term alterations in the planet's average weather patterns. These include rising global temperatures, shifts in precipitation, changing wind patterns, and an increasing frequency of extreme weather events, such as summer heatwaves and unseasonably warm winter days.

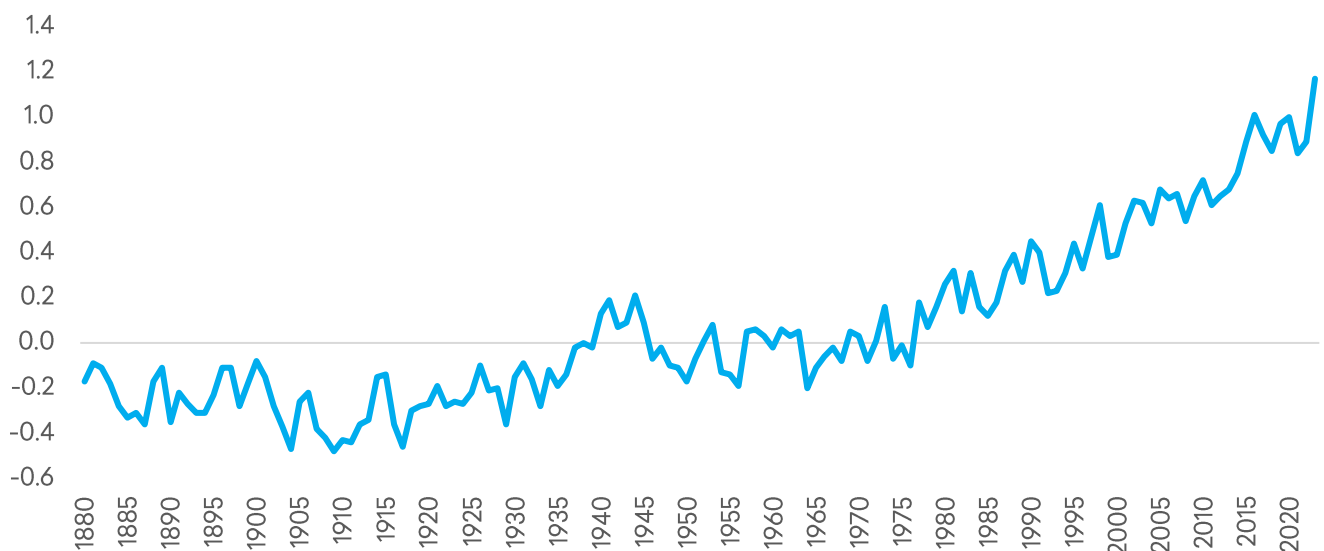
Human activities since the Industrial Revolution have significantly accelerated climate change. Anthropogenic actions, particularly the burning of fossil fuels, deforestation, and industrial processes, release greenhouse gases (GHGs) into the

atmosphere. These gases trap heat radiating from Earth's surface, creating a greenhouse effect that warms the lower atmosphere.

Key contributors to global warming include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated gases. While greenhouse gases vary in their heat-trapping potency, carbon dioxide is the primary driver of climate change due its sheer volume of emissions, accounting more than half of the emissions worldwide.

The increasing concentration of GHGs in the atmosphere is a major driver of global warming. To counter this trend, **intergovernmental organizations have established agreements such as the Kyoto Protocol and the Paris Agreement, which aim to align policies and coordinate global action against climate change.**

Figure 1. Changes in global surface temperature relative to 1951-80 (°C)



Source: NASA/GISS

Paris agreement and Georgia's obligations

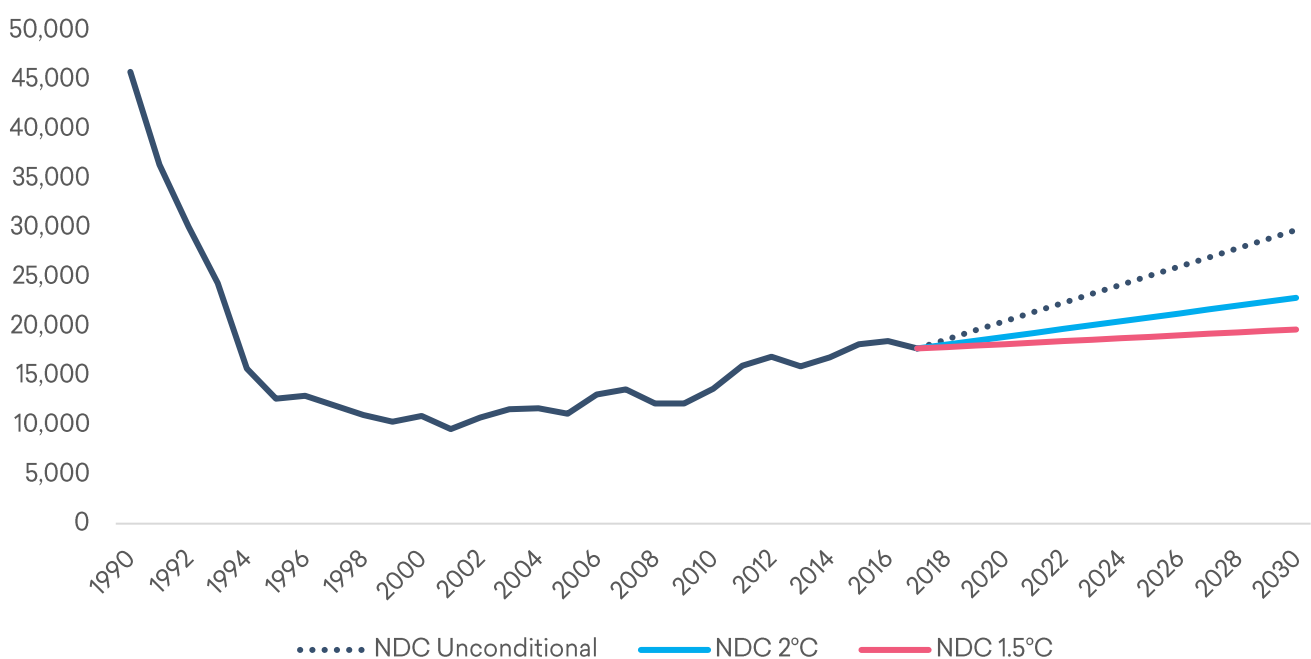
In 2015, during the 21st Conference of the Parties (COP21), the Paris Agreement, an international treaty, was adopted by nearly 200 countries. The Agreement seeks to limit the rise in global average temperature to well below 2°C above pre-industrial levels, while striving to restrict the increase to 1.5°C.

Each signatory country establishes its own targets, outlined in their Nationally Determined Contributions (NDCs). NDCs reflect each country's commitment to addressing climate change, tailored to their unique circumstances and priorities. These contributions detail national efforts to reduce greenhouse gas emissions and strategies to adapt to the impacts of climate change. Signatory countries are required to update their NDCs every five years.

Georgia joined the Paris Agreement in 2017 and submitted its updated NDC in 2021. According to the document, Georgia has committed to reducing its domestic GHG emissions by 35% below 1990 levels by 2030. **With international support, Georgia aims for a 50% reduction under a global 2°C scenario and a 57% reduction under a 1.5°C scenario by 2030.**

The Fourth National Communication of Georgia highlights significant climate trends. Between 1986 and 2015, compared to the baseline period of 1956–1985, the average mean air temperature increased by 0.47°C. During the same period, annual precipitation patterns shifted: western Georgia experienced increased precipitation, while eastern Georgia saw a decline.

Figure 2. Nationally determined contribution targets for Georgia, Gg CO₂eq



Source: Georgia's Updated Nationally Determined Contribution (NDC)

Climate change and its importance for businesses

The impact of climate change is felt across many industries and businesses around the world, either directly or indirectly, affecting their business models and growth potential.

Acute physical risks from climate change are immediate threats to businesses. Fluvial or pluvial flooding, droughts, hurricanes, wildfires, heatwaves and other natural hazards do physically damage people and affect their productivity, property, transport and energy infrastructure; supply chains are disrupted.

Agriculture, for example, is exposed to almost every physical climate risks. Heavy rainfalls can stimulate plants' diseases and attract pests, delay planting and harvesting works, flood fields and eventually lead to crop failure, damage the livestock and promote waterborne diseases among them.

Extreme heat may reduce crop yields and quality, affecting the revenues for the businesses and households; reduced soil moisture and therefore increased water demand puts additional pressure on the irrigation system. Regions dominated by the same crops planted over large areas are especially vulnerable during heatwaves. These crops typically have similar water requirements and demand irrigation at the same time. This simultaneous demand intensifies pressure on local water resources, often exceeding their capacity, which can lead to water

shortages and hinder effective irrigation. Adopting new technologies, such as drip- and pivot-irrigation systems, can improve efficiency. Additional technologies for microclimate control, precipitation forecasting, and pest management can further help. Collecting excess rainwater for dry periods and building windbreaks, which protect against soil erosion and enhance irrigation effectiveness, can alleviate pressure on water resources.

Tourism is also affected by climate change, and countries like Georgia may be heavily affected. Georgia offers its visitors both summer and winter attractions and climate change has its impact on both. Some of the ski resorts are already investing funds into climate adaptation measures like artificial snowmaking to extend the average season for skiing industry. On the other hand, summer resorts may experience unpredictable weather patterns like heavy rainfalls or even storms, discouraging tourists from visiting beach destinations. In addition, coastal resorts are already facing the problems with damaged infrastructure due to extreme weathers.

Heavy rainfalls, landslides and avalanches damage the **critical infrastructure** such as roads and transmission lines and in addition, also damage the resort facilities. Due to expected frequent extreme weathers, insurance premiums may go up, imposing higher costs for tourism services.

Climate change and its importance for businesses

The industrial sector is significantly affected by climate change, particularly in areas where workers are directly exposed to ambient temperatures. Workers in construction, mining, and agriculture face extreme heat and cold, reducing productivity, posing health risks, and potentially deterring workers. Prolonged exposure can lead to health issues, delaying output and deferring revenues. These challenges may also increase operational costs as industries adopt protective measures or adjust work schedules.

Energy sector, especially hydropower, is highly vulnerable to global warming due to its dependence on water availability and flow patterns. Changes in precipitation, including prolonged droughts and intense rainfalls, can disrupt hydropower generation, particularly for plants without reservoirs. Glacial retreat and diminishing snowpacks further jeopardize future hydropower potential, threatening energy security in regions reliant on this renewable resource. The impact of climate change on hydropower is not evenly distributed globally but poses significant risks to areas where rivers are glacier-fed. For example, in Georgia, global warming has led to a nearly 30% reduction in glacier-covered areas over the last 50 years, according to the Fourth National Communication of Georgia.

According to the scenario outlined in Georgia's Fourth National Communication, thermal power plants are expected to be adversely affected by the rising mean temperatures at their locations, leading to reduced efficiency; Additionally, power transmission losses are expected to increase, particularly in lowland areas, due to higher average air temperatures. These factors are likely to contribute to increased charges for final consumers.

Due to changing weather patterns, businesses occupying office spaces are increasingly investing in advanced heating and cooling systems to maintain an ideal working environment. These decisions involve significant upfront costs, which vary depending on the size and complexity of the buildings. After the initial investment, businesses must also budget for ongoing operational and maintenance expenses, which can escalate with further climate-related shifts. Additionally, these adaptations may include upgrading insulation, installing energy-efficient windows, or integrating smart climate control systems, all of which contribute to long-term financial and environmental implications.

Climate change mitigation

Combating climate change requires both mitigation and adaptation measures and cannot be achieved without global and local cooperation. The Paris Agreement serves as a prime example of the international commitment needed to tackle this challenge collectively.

The core objective of mitigating climate change is to reduce greenhouse gas (GHG) emissions from human activities. With the largest share of emissions originating from the burning of fossil fuels, transitioning to renewable energy sources is a critical step. Technologies like solar, wind, hydropower, and other renewable energy systems significantly lower the carbon footprint compared to traditional energy sources. According to National Energy and Climate Plan (NECP), Georgia aims to achieve a 27.4% share of renewable energy in its final energy consumption by 2030 from its 18.8% share in 2019.

Energy efficiency plays a pivotal role in mitigation efforts. Enhancing energy efficiency not only reduces GHG emissions but also lowers energy bills for consumers and businesses. Retrofitting buildings with better insulation to reduce energy demand for heating and cooling, Improving energy performance in household appliances, industrial machinery, and manufacturing processes has benefits both for environment and the consumer. Electrifying sectors such as road transport reduces reliance on fossil fuels, but the environmental benefits hinge on the degree to which renewable energy sources power electricity generation. Georgia's inherently clean

power system, combined with its net-metering program, can play a pivotal role in the energy transition, particularly by fostering the adoption of solar rooftop systems, which are already financially viable, even at smaller scales.

The 2024-2025 Action Plan of Georgia's 2030 Climate Strategy outlines the measures and actions required across all sectors responsible for greenhouse gas emissions to achieve the country's climate goals by 2030. Georgia already has a high share of renewable energy in its electricity mix; however, this share is expected to increase to 87% by 2030, compared to 78% in 2018. In the transport sector, Georgia aims to raise the share of electric vehicles (EVs) in the national automotive fleet to 5% and hybrid vehicles to 20% by 2030. In the building sector, all newly constructed buildings are already required to meet energy efficiency standards. The country also plans to curb emissions from the industrial sector by adopting climate-smart technologies, targeting a 5% reduction in emissions compared to the baseline scenario by 2030. For the waste management sector, Georgia is focusing on the closure or upgrading of waste disposal sites and implementing advanced waste management technologies.

In addition to emission reduction efforts, Georgia intends to strengthen the forestry sector's capacity to capture GHGs through reforestation activities and improved forest management practices.

Green financing in Georgia

Efforts to tackle climate change indeed require significant financing. In Georgia, the financial sector is predominantly composed of commercial banks, holding approximately 91% of the total assets in the financial sector. In addition, various international financial institutions (IFIs) have been providing green loans to support the Georgian economy.

In 2023, Georgian banks issued GEL 843 million in green loans,* reflecting a remarkable annual growth of 73%, excluding the exchange rate effect. These loans signify the growing commitment of the financial sector to support environmentally sustainable projects.

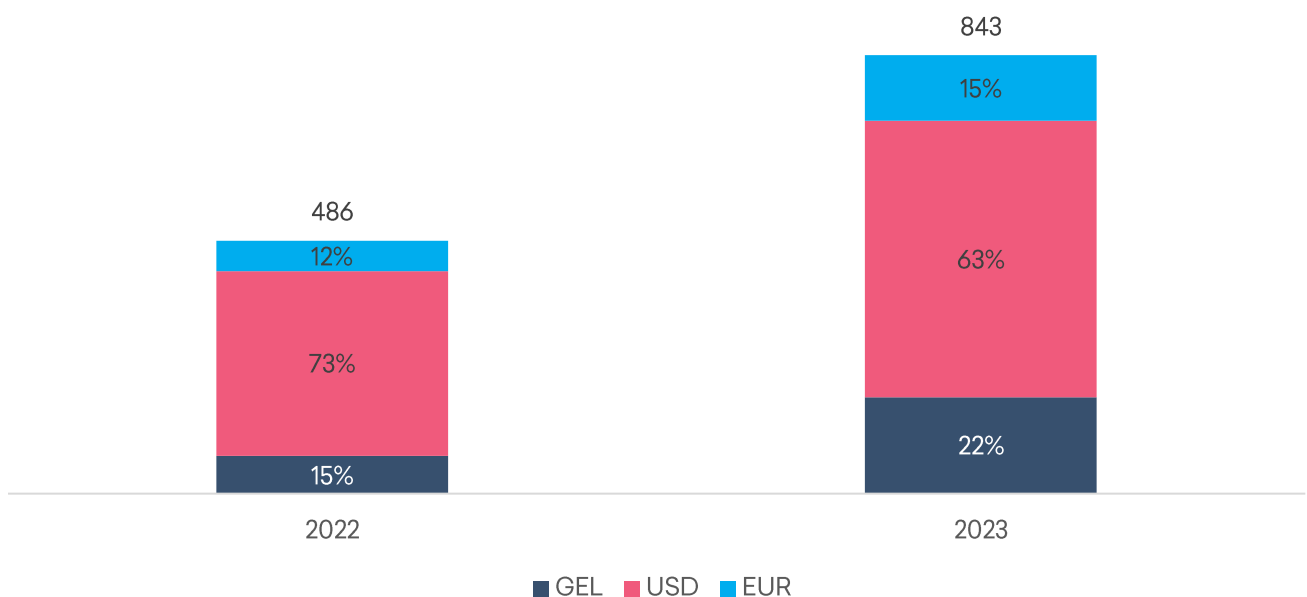
A substantial portion of these loans, 63%, were denominated in USD, while GEL-denominated green loans accounted for nearly GEL 185 million or

22% of the total. This currency distribution highlights the reliance on foreign currency in financing green initiatives.

As of 2023, the total amount of green loans outstanding stood at GEL 1.9 billion, marking an annual growth of 30%. This consistent increase illustrates the expanding scope and adoption of green financing in the country.

Green loans in Georgia have been utilized to support eight key economic sectors. Among these, 65% of the outstanding loans were directed toward the renewable energy sector, emphasizing its priority in the green financing landscape. Additionally, 14% of the loans were allocated to the sustainable buildings and construction sector, contributing to the development of environmentally friendly infrastructure.

Figure 3. Total green loans issued, excl. EX effect



Source: National Bank of Georgia

Note: * - According to the taxonomy provided by National Bank of Georgia

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