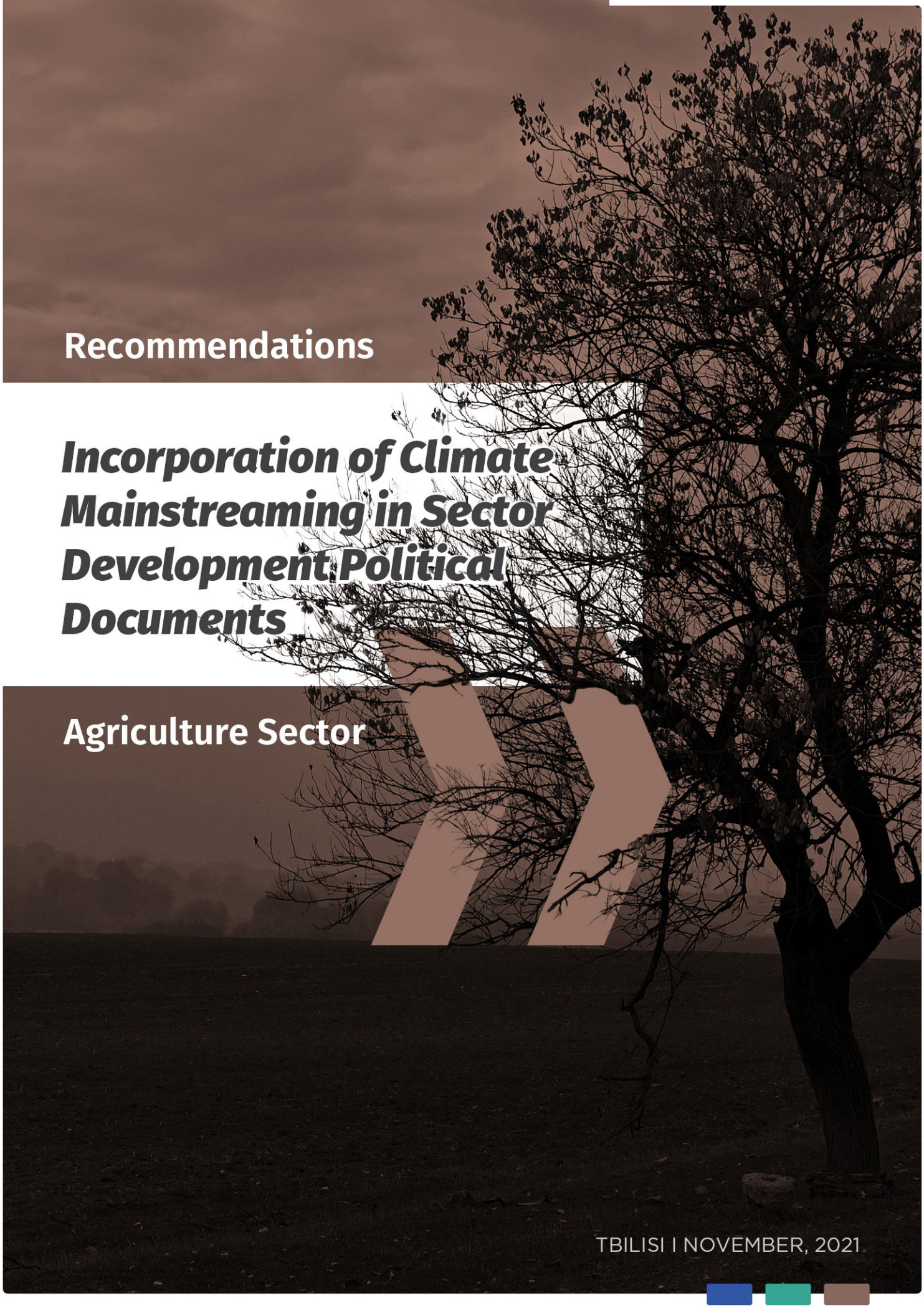
#EU4Climate

Recommendations

Incorporation of Climate Mainstreaming in Sector Development Political Documents

Agriculture Sector



TBILISI I NOVEMBER, 2021

ევროკავშირი საქართველოსთვის

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Incorporation of Climate Mainstreaming Recommendations in Sector Development Political Documents

Agriculture Sector

Tbilisi
2021, November

Content

Foreword

This document was prepared by the NGO Environment and Development under the EU-4Climate initiative funded by the European Union (EU) and implemented by the United Nations Development Programme (UNDP). It supports countries in implementing the Paris Climate Agreement and improving climate policies and legislation. Its ambition is to limit the effects of climate change and make local communities more resilient. It will assist the Eastern Partnership countries to integrate low carbon and climate resilient development objectives into policies and plans, to improve the implementation of the Paris Agreement and support legislative alignment.

The project is a sub-component of the EU4Climate initiative and aims to assist the UNDP and the Ministry of Environmental Protection and Agriculture of Georgia in identifying priority directions in the energy, agriculture and health sectors by mainstreaming climate change issues and developing specific sectoral recommendations and guidelines for addressing climate change issues based on these identified and agreed priorities.

One of the main tasks of the project is to review and analyze national policy documents, strategies, programs, development plans and legislative and regulatory framework documents and identify priority directions in the agriculture sector for developing recommendations vis-à-vis addressing climate change issues in the sectoral planning process.

Overall Background

01 Overall Background

Georgia has a rich agricultural tradition which is an integral part of its history, mentality and cultural heritage. Agriculture played an important role in formation of the Georgian statehood and significantly contributed to its economic development.

A total of 43.4% (more than 3 million hectares) of the whole territory of Georgia is designated as agricultural land which also includes pastures and meadows. A total of 43% of the remaining area is covered by forest. Georgia, as a mountainous country, is characterized by altitudinal zonality where only 39% of arable land is located at an elevation of 500 meters above sea level, 29%- 500-1,000 meters above sea level, 21% - 1,000-1,500 meters above sea level and 11% is located at elevations over 1,500 meters above sea level.

Georgia has favorable soil and climatic conditions conducive to the development of agriculture which is determined by the existence of 12 different climatic zones and 20 types of soils. Many endemic species create a perfect source for the development of plant growing and cattle breeding. Diverse soil-climatic conditions support the growth of temperate climate and sub-tropical crops. These crops include cereals, early and late season vegetables, melons and gourds, potatoes, technical crops, grapes, sub-tropical crops, fruit varieties, etc. However, Georgian agriculture and food production has been lagging well behind other sectors of the economy in the past decades.

As a result of the census of October 1, 2014, 642.2 thousand farms were registered in the country, including 640.0 thousand households and 2.2 thousand legal entities (Geostat, 2016). In total, 787.7 thousand hectares of agricultural land are used by farms. Among them, 86.5% (681.1 thousand ha) are used by households and 13.5% (106.6 thousand ha) are used by legal entities. Most of the farms are small in size. In particular, more than

43.4%

of the whole territory of Georgia is designated as agricultural land which also includes pastures and meadows

three-quarters (77.1%) of farms own less than one hectare of agricultural land.

A total of 44.6% of the land used for annual crops is sown with maize, 18.6% with wheat, 9.2% for vegetables and 9.2% is sown with barley. The area of perennial plants grown on farms is 109.6 thousand hectares. The average area for the perennials grown by farms is 0.4 hectares. A total of 93.5% of farms have less than one hectare of perennials. A total of 17.6 thousand farms have and one hectare or more for perennials and 1.7 thousand have three hectares or more. A total of 54.2% of perennials are orchards, 30.1%- vineyards, 6.7%- citrus plantations and 4.2%- tea plantations.

As of October 1, 2014, the number of cattle owned by farms amounted to 1,005.0 thousand heads, sheep and goats - 989.3 thousand, pigs- 213.1 thousand and the number of poultry- 8,216.0 thousand.

According to data from Geostat Agricultural Census of 2014, the total area of pastures and hay meadows amounts to 1,940,400 ha (i.e., approximately 64% of the total agricultural land). Of this, 1,796,000 ha (i.e., 92% or 59% of the total agricultural land) falls under pasturelands. The majority of Georgian pastures is either used as common pastures or is owned by the state. State-owned pastures are either rented out with short-term leases or used informally.

Many of these pastures show only modest animal performance and provide low incomes for the farmers using them. Moreover, inadequate pasture use, particularly the overuse of erosion exposed pastures, can contribute to exposing people, property and infrastructure to the natural risk of landslides and inundation.

Work Performed and Results

02 Work Performed and Results

An active communication with the responsible agencies / experts in the field of agriculture was carried out in order to develop relevant recommendations for climate change mainstreaming.

National policy documents, strategies, programs and legislative and regulatory framework documents in the agricultural sector were analyzed using desk research, interviews and online surveys.

The mainstreaming / strengthening of climate change issues in the priority areas of the agricultural sector is considered through the development of relevant recommendations based on the country's international commitments as well as high-level documents (policies, strategies, programs) in addition to the existing legal and institutional framework.

A detailed stakeholder analysis comprised an important aspect of the work on this document. To this end, the existing strategic, policy and regulatory documents in the field of climate change were evaluated in order to identify stakeholders in accordance with the pre-designed approaches. The responsible structures and parties involved at different stages / levels were also identified.

Additionally, information was collected about individuals who are actively involved in climate change decision-making and implementation during initial interviews with stakeholders.

In order to analyze the impact and interest of stakeholders, the identified parties were assessed in terms of attitudes towards the agricultural sector and climate change issues which are detailed below in the relevant sub-section of this document.

2.1. Agriculture Risk Profile Assessment

Climate and any change in it directly affects agriculture. Georgia's diverse soil and climatic conditions determine the multiplicity of the country's agricultural production. The agricultural sector has traditionally occupied an important place in the Georgian economy. Although its market share was 7.4% of the gross domestic product in 2019, more than 38% of the employed population works in agriculture (Geostat, 2019). The low income of the agricultural sector is due to many factors in relation to the number of people employed in it but it is also negatively affected by climate change, especially its extreme manifestations such as prolonged and severe droughts, sharp temperature changes, strong winds and rain, hail, etc. It should be noted that in addition to employment, a well-developed agricultural sector ensures a country's food security and is the basis of its sovereignty. It is vital for agriculture to be a priority for every country.

Climate change threats to Georgia's agricultural sector are:

- Increasing the area of drought regions, increasing the moisture deficit at the expense of evaporation and loss of yield;
- Strengthening soil salinization processes (in Eastern Georgia);
- Decreased soil fertility;
- Intensive reproduction of diseases and pests of agricultural crops;
- Enhancement of soil erosion processes;
- Increased risk of floods and hail;
- Changes in agro-climatic zones;
- Increased demand for irrigation water in the face of the declining freshwater resources.

Taking the expected threats into consideration, the sector will not be ready to cope with the challenges posed by future scenarios and its vulnerability to climate change will increase even more due to the absence of appropriate mitigation and adaptation measures to climate change and legislative gaps in strategic documents and relevant action plans.

Gender issues should also be included in the strategy papers as the threats posed by climate change affect women and men differently. At the same time, the involvement of women and men in agriculture is different in Georgia and is often associated with gender stereotypes.

Until now, the main focus in agricultural development in relation to climate change was to find measures for adaptation and nearly no action was taken in order to implement a mitigation strategy in the agricultural production system. Consequently, practically no mitigation measures were considered or adopted at the farm level which is conditioned by various factors, including a lack of knowledge and financial resources and no legal requirements.

the involvement of women and men in agriculture is different in Georgia and is often associated with gender stereotypes

2.2. Key Findings

Based on the analysis of the current situation, the following main conclusions can be drawn:

- The vulnerability of the agricultural sector to climate change is high. The importance of climate change and the need to take effective steps in this direction are highlighted in the policy documents, action plans and legislation discussed above. At the same time, however, it should be noted that strategies and specific action plans only weakly address specific ways in which to increase the resilience of the agricultural sector to climate change. This may increase the existing risks and the vulnerabilities in the sector;
- It is recommended to clearly state the specific goals and objectives in the Agriculture and Rural Development Strategy 2021-2027 document which will be aimed at the introduction / dissemination of mitigation measures which include reducing greenhouse gas emissions and promoting carbon sequestration in soil and plant biomass as well as the implementation of adaptation measures;
- In addition, it is important to fill the existing legislative gaps that will help increase the resilience of the agricultural sector to climate change. The possibility of filling these gaps is real because:
  - A draft law on windbreaks (field protection) has been prepared;
  - A draft law has been prepared in order to unify and update two existing laws on soil protection;
  - An amendment to Government Resolution #424 has been prepared which provides for the introduction of additional control mechanisms in order to protect soil from physical degradation;
  - There are plans to develop a national pasture management policy and create an appropriate legal framework for 2022 (within the Achieving Land Degradation Neutrality Targets of Georgia through the Restoration and Sustainable Management of Degraded Pasturelands project launched with the support of the Global Environment Facility [GEF]);
  - A practical guide on good agricultural practice to reduce ammonia emissions from the agricultural sector has been prepared which is planned to be established in the form of a code.

Based on the analysis of the reviewed documents, the main errors and gaps were identified which are part of the policy documents and legislative framework related to the agricultural sector. In particular:

- Climate change mitigation and adaptation measures in the agricultural development strategy documents are of a general nature and less reflected in specific plans;
- The agricultural development strategy documents practically do not reflect plans to reduce greenhouse gas emission from the agricultural sector which will help mitigate climate change;
- No law / normative document defining the sustainable use of common pastures and establishing a legislative regulation mechanism has been adopted. The existing legislation contains only general records which is insufficient for bringing the process within the legislative framework;
- A law on windbreaks (field protection) has not been adopted which is of particular importance in terms of climate change mitigation. It should be noted that the relevant draft law has already been prepared and is in the discussion stage;
- No resolution has been adopted on the approval of the National Indicators of Land Degradation and the methodology for determining them which has been prepared and

its implementation will assist with the establishment of land degradation monitoring and the coordinated and effective work of the agencies involved in this direction;

- No resolution has been adopted on the approval of the technical regulation on soil pollution quality. An updated version of the resolution has already been prepared;
- The norms for the use of agrochemicals (fertilizers, ameliorators, plant protection products) used in the agricultural sector are not regulated; therefore, there are no mechanisms to control them;
- No normative acts have been developed in order to protect the soil from physical, chemical and biological degradation. In this regard, the updated draft law on soil protection and the planned change in the technical regulations on the removal, storage, use and recultivation of the fertile soil layer are noteworthy;
- No Code of Good Agricultural Practice has been developed covering all areas of agriculture and aimed at reducing emissions (from barns, manure storage and application, inappropriate animal nutrition practices, synthetic fertilizer use, organic waste burning) and increasing the stock of organic carbon in the soil (applying organic fertilizers, green manure, low tillage practices, etc.);
- Gender issues are left out of the focus of the strategy and other policy documents. However, proper gender mainstreaming is essential given the urgency of the issue: the dangers posed by climate change affect women and men differently. At the same time, the involvement of women and men in agriculture is different in Georgia which is often associated with gender stereotypes.

2.3. Recommendations

1. Table 2 presents detailed recommendations for climate change mainstreaming for the selected strategic documents – Agriculture and Rural Development Strategy of Georgia, 2021-2027 and in the relevant Action Plan 2021-2023 of the Agriculture and Rural Development Strategy of Georgia, 2021-2027;

2. Strengthen the capacity of advisory services in the agricultural sector in terms of climate mitigation and climate adaptation measures;

3. Study the impacts of climate change in all areas of the agricultural sector which will provide a full picture of the existing risks involved. It is also desirable to focus on the issue of gender, risk assessment in terms of gender (e.g., the vulnerability to climate change of male and female farmers involved in different sectors of agriculture);

4. Facilitate the renewal of the meteorological observation network and increase the coverage area to create a complete climate picture and improve forecasting;

5. Promoting the dissemination of water-saving irrigation methods (drip, rain) and fertigation;

6. Replacement of a fixed tariff for irrigation water with a volumetric or a mixed tariff;

7. Fill in the existing legislative gaps and develop mechanisms to facilitate the implementation of the regulations imposed within them.

The detailed recommendations vis-à-vis the changes to be made in the selected strategic documents for climate mainstreaming - Agriculture and Rural Development Strategy of Georgia, 2021-2027 and in the relevant Action Plan 2021-2023 of the Agriculture and Rural Development Strategy of Georgia, 2021-2027 to present issues related to climate change and to facilitate their further practical implementation are presented in the **table 1.**

Document	Inconsistent Context	Specific Recommendations
Agriculture and Rural Development Strategy of Georgia, 2021-2027	Strategy Goal 2: "Sustainable use of natural resources, conservation of ecosystem, climate change adaptation" – does not include climate change mitigation.	The goal of Strategy 2 should be formulated as follows: "Sustainable use of natural resources, conservation of ecosystems, climate change adaption and climate change mitigation."
Agriculture and Rural Development Strategy of Georgia, 2021-2027	Dissemination of environmentally adapted, climate-smart agricultural practices and promoting the development of bio / organic production.	Add climate change mitigation measures: 1) Reduce greenhouse gas emission by introducing good agricultural practices Through proper management of animal and plant organic waste generated during the agricultural production process, including changing the practice of waste incineration in the open field. By integrating organic waste into the soil, by anaerobic processing of organic waste using biogas plants and by spreading aerobic composting of agricultural and household waste; Providing minimal plant cover for the soil; Minimal soil tillage; Through improving livestock food rations and stall care; 2) Promoting atmospheric carbon sequestration by converting it to the organic carbon in the soil Implementing soil protection and soil improvement measures; Installation of field protection strips; Proper management of pastures; Restoration of degraded lands; 3) Promoting climate neutrality of the complete food production and supply chain- from farm to consumer;

Table 1:

Recommendations

Agriculture and Rural Development Strategy of Georgia, 2021-2027	The mechanism for carrying out the following tasks is not discussed: 1) Dissemination of environmentally-friendly and climate-smart agricultural practices and promoting development of bio / organic production; 2) Promotion of energy-efficient and renewable energy technologies; 3) Preservation of agro-biodiversity.	Must be added: 1) Dissemination of environmentally-friendly and climate-smart agricultural practices. In addition, the introduction of energy-efficient and renewable energy technologies and practices should be defined as one of the main preconditions to participate in programs implemented and funded by the NNLE Rural Development Agency. Define highly effective measures in accordance with the specifics of the field which will be promoted within the aforementioned programs; 2) To promote the development of bio / organic production, create a separate program that will be implemented NNLE Rural Development Agency; 3) Maintaining agro-biodiversity and promoting the adoption of new high-yielding and better-adapted varieties / hybrids; 4) Measures should be taken to ensure equal involvement of women and men.
Agriculture and Rural Development Strategy of Georgia, 2021-2027; 2021-2023 Action Plan of the Agriculture and Rural Development Strategy of Georgia for 2021-2027	Achieving the second goal of the strategy will be difficult due to the lack of awareness of farmers / entrepreneurs. Goal 1- Competitive agricultural and non-agricultural sectors; Task 1: Ensure the knowledge / awareness of farmers and entrepreneurs.	Task 1 is formulated as follows: 1) "Ensuring knowledge / awareness of best agricultural practices in the context of climate change for farmers and entrepreneurs;" 2) Strengthening extension services to transfer knowledge about climate-smart agricultural technologies to farmers; 3) Climate change mainstreaming in agriculture professional educational programs taking into account the specifics of the field; 4) Promoting the equal participation of women and men in awareness raising activities.
2021-2023 Action Plan of the Agriculture and Rural Development Strategy of Georgia for 2021-2027	Activity: 1.1.1. Provision of effective extension services for farmers.	The activity is formulated as follows: 1.1.1. Provision of effective extension services for farmers on best agricultural practices and climate-smart technologies.

2021-2023 Action Plan of the Agriculture and Rural Development Strategy of Georgia for 2021-2027	Activity: 1.2.1. Develop criteria supporting bottom-up principle initiatives.	Define the advantage of the proposed initiative as the main criterion for supporting bottom-up principle initiatives in terms of climate change mitigation and / or climate change adaptation.
2021-2023 Action Plan of the Agriculture and Rural Development Strategy of Georgia for 2021-2027	Activity: 1.2.2. Equipping agricultural cooperatives with processing machines.	Develop infrastructure for agricultural cooperatives using the best climate-smart technologies in the field.
2021-2023 Action Plan of the Agriculture and Rural Development Strategy of Georgia for 2021-2027	The following programs do not address or only partially address climate change issues: 1.2.3. Promoting the cultivation of modern orchards. The program: "Plant the Future." 1.2.4. Promoting Georgian tea production. The program: "Georgian Tea." 1.2.7. Co-financing the purchase of harvesting equipment for farmers. Harvesting Equipment Co-financing Project; 1.2.8. Establishment / co-financing of storing and processing enterprises. 1.2.12. Organizing a greenhouse cluster. "Imereti Agrozone."	Precondition for receiving financial support in these programs should be defined as climate mitigation and climate adaptation measures which take into account the specifics of the program / project. It is also important to increase access to financial resources for women farmers.
2021-2023 Action Plan of the Agriculture and Rural Development Strategy of Georgia for 2021-2027	The action plan does not envisage accounting for irrigation water consumption and changing the tariff scheme.	Change of fixed tariff for irrigation water with a volumetric or a mixed tariff.
2021-2023 Action Plan of the Agriculture and Rural Development Strategy of Georgia for 2021-2027	Does not take into consideration defining climate change mitigation opportunities: 2.1.1. Identifying and promoting opportunities for climate change adaptation.	The activity is formulated as follows: 2.1.1. Identifying and promoting opportunities for climate change adaptation and mitigation.
2021-2023 Action Plan of the Agriculture and Rural Development Strategy of Georgia for 2021-2027	Does not envisage the creation / improvement of new species / hybrids of climate-adapted animals and plants: 2.5.1. Conducting research on local species and populations of Georgian fauna; 2.5.2. Conducting research on annual and perennial crops.	It is necessary to promote research on the creation of new species / hybrids of animals and plants adapted to the climate and to expand scientific activities in this direction and encouraging the equal participation of women and men in research.

A detailed description of the recommendation, along with the expected results and specific actions to be taken, is given in **Table 2.**

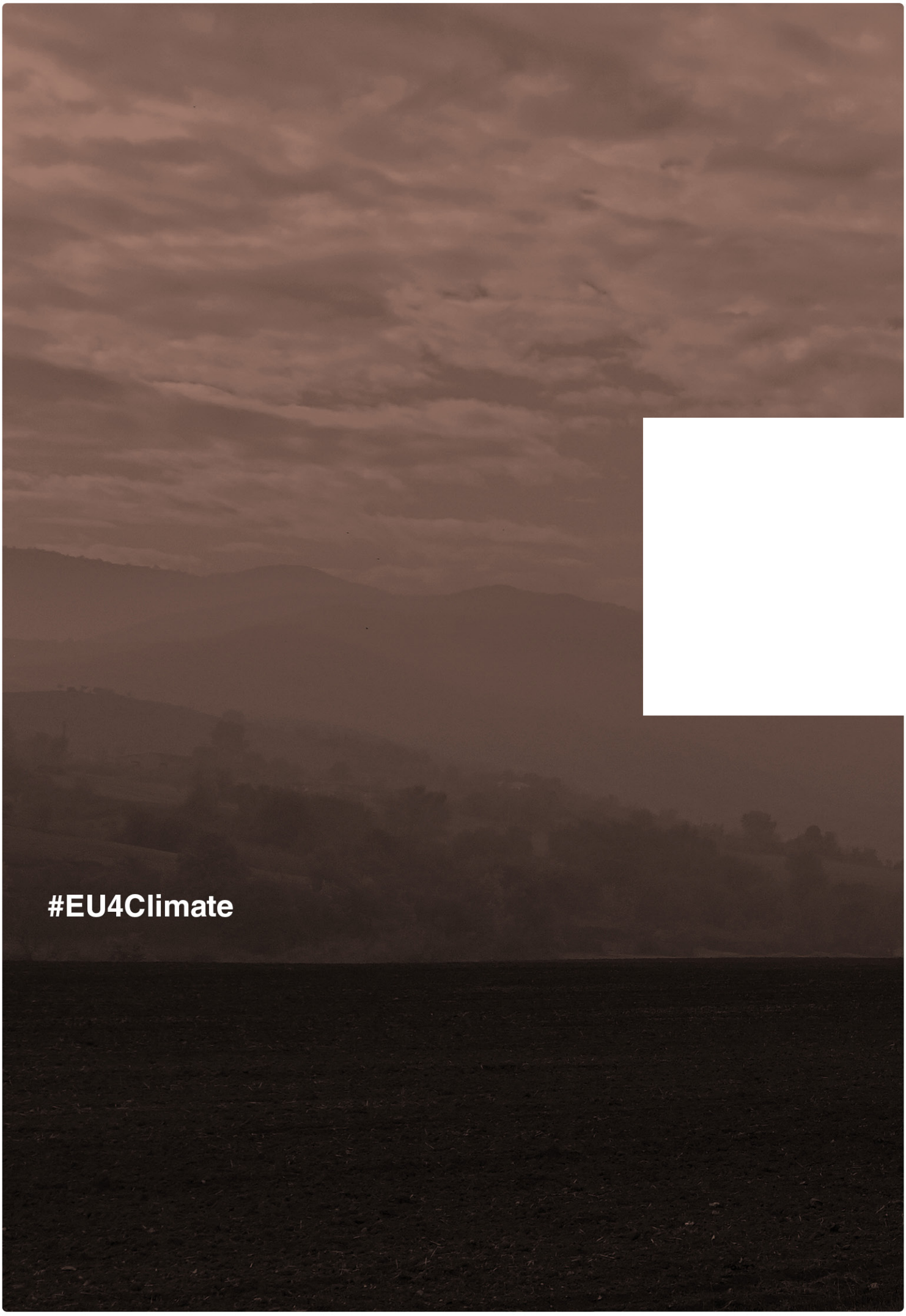
Recommendation	Possible Outcome of Implementation (Problem-oriented)	Specific Actions / Measures	Responsible Structure	Risks / Assumption
Goal 2 of the Strategy should be formulated as follows: «Sustainable use of natural resources, conservation of ecosystems, climate change adaption and mitigation.»	Dissemination of specific climate mitigation measures / technologies in the agricultural sector and reducing greenhouse gas emissions from the sector.	Relevant tasks should be written in order to identify / research climate change mitigation opportunities.	Ministry of Environmental Protection and Agriculture and its subordinate sector agencies.	Lack of incentive mechanisms.
Climate change mitigation measures should be added to Goal 2 of the Strategy: 1) Reducing greenhouse gas emissions by promoting the dissemination of sound agricultural practices through the proper management of animal and vegetable organic waste originating in the process of agricultural production; among others, changing the practice of burning waste in the open field; Ensuring minimal cover soil cover with minimal processing of soil and through improving cattle feeding and stalls. 2) Promoting the sequestration of carbon in the atmosphere by converting it into organic carbon in the soil through implementing soil protection and soil improvement measures: through the creation of windbreaks, improving pasture management and the restoration of degraded land. 3) Promoting climate neutrality from farm to consumer- the complete food production and supply chain.	Disseminating specific climate mitigation measures / technologies in the agricultural sector and reducing greenhouse gas emissions from the sector.	Recommended measures should be reflected in the tasks of Goal 2.	Ministry of Environmental Protection and Agriculture and its subordinate sector agencies.	Lack of incentive mechanisms.

Mechanisms for implementing climate change adaptation tasks should be added to the Strategy.	Practical implementation of climate change adaptation measures in accordance with the following tasks: Promoting environmentally-friendly, climate-smart agricultural practices and promoting the development of bio / organic production; 2) Promoting the introduction of energy-efficient and renewable energy technologies and practices; 3) Preservation of agro-biodiversity.	The objectives of the given tasks should become prerequisite for the implementation of relevant thematic programs, sub-programs and projects.	Ministry of Environmental Protection and Agriculture and its subordinate sector agencies.	Lack of relevant programs / sub-programs and / or scope.
Climate change and the actualization of related issues should be emphasized in the first task of Strategy's first goal.	Awareness of farmers / entrepreneurs on adaptation to climate change and climate change mitigation.	The first task of Strategy's first goal should be formulated as follows: «Ensuring the knowledge / awareness of farmers and entrepreneurs in the direction of adaptation to climate change and climate change mitigation.»	Ministry of Environmental Protection and Agriculture and its subordinate sector agencies.	Low interest from farmers / entrepreneurs.
Provision of information / knowledge on best agricultural practices and climate-smart technologies should be reflected in "Activity 1.1.1. Provision of effective extension services to farmers."	Creating / enhancing supply / training opportunities for climate change practices and technologies related to climate change by extension services.	Activity 1.1.1 of the 2021-2023 Action Plan of the Agriculture and Rural Development Strategy of Georgia for 2021-2027 to be formulated as follows: "The provision of information / knowledge on best agricultural practices and climate-smart technologies should be reflected in providing effective extension services to farmers	Ministry of Environmental Protection and Agriculture and its subordinate sector agencies.	Insufficient human resources, insufficient involvement of farmers / entrepreneurs.

The key criterion for supporting bottom-up initiatives is to define the advantages of the proposed initiative in terms of climate change mitigation and / or adaptation to climate change.	Stimulating and implementing outstanding initiatives in terms of climate change mitigation and /or adaptation.	Reflecting Activity 1.2.1 ("Developing bottom-up criterion for supporting initiatives") of the Action Plan 2021-2023 of the Agriculture and Rural Development Strategy of Georgia 2021-2027 as a mandatory criterion for mitigating climate change and / or adapting to climate change.	Ministry of Environmental Protection and Agriculture and its subordinate sector agencies.	Insufficient financial resources.
Infrastructure of agricultural cooperatives should be developed by using the best climate-reasonable technologies in the field.	Creation / distribution of climate-smart infrastructure and technologies in agricultural cooperatives.	While implementing Activity 1.2.2 ("Equipping agricultural cooperatives with processing equipment ") of the Action Plan 2021-2023 of the Agriculture and Rural Development Strategy of Georgia 2021-2027 climate-friendly infrastructure and technologies should be selected	Ministry of Environmental Protection and Agriculture and its subordinate sector agencies.	Low activity on the part of cooperatives.
Climate mitigation and climate adaptation measures should be defined as a precondition for receiving financial support in state support programs for farmers, taking into account the specifics of the program / project.	Disseminate climate mitigation and climate adaptation measures and agricultural practices to beneficiaries of state support programs for farmers.	In accordance with the 2021-2027 Action Plan of the Agriculture and Rural Development Strategy of Georgia for 2021-2023 in the state programs for farmers support: 1.2.3. Promoting the cultivation of modern orchards. «Plant the Future» program; 1.2.4 Promoting Georgian tea production. "Georgian Tea" program; 1.2.7. Co-financing the purchase of harvesting equipment for farmers. "Harvesting Equipment Co-financing" project;	Ministry of Environmental Protection and Agriculture and its subordinate sector agencies.	Lack or and / or narrow nature of relevant programs.

		1.2.8. Establishment / co-financing of saving and processing enterprises. 1.2.12. Establishing a greenhouse cluster. "Imereti Agrozone;" Defining climate mitigation and mandatory adaptation measures as a mandatory criterion taking into account industry specifics.		
Registration of irrigation water consumption and change of tariff scheme according to the volume of consumed water or the introduction of a mixed tariff.	Reducing water losses and inappropriate spending.	Reflection of relevant activities for the implementation of irrigation water accounting and effective tariff policy in the Action Plan 2021-2023 of the Agriculture and Rural Development Strategy of Georgia for 2021-2027.	Ministry of Environmental Protection and Agriculture; Georgian Land Reclamation Ltd.	Insufficient financial resources and relatively difficult administration at the initial stage.
Adding identification of opportunities for climate change mitigation in the Action Plan.	Defining opportunities for climate change mitigation for the agricultural sector.	Activity 2.1.1 in the Action Plan should be formulated as follows: "Identification and promotion of opportunities for adaptation to climate change and climate change mitigation."	Ministry of Environmental Protection and Agriculture and its subordinate sector agencies.	Insufficient financial resources for large-scale research.
Promotion of research into the development of new species / hybrids of adapted animals and plants and expand scientific activities in this area.	Creation / testing and propagation of new species and hybrids of climate-adapted animals and plants on farms.	Promoting scientific research facility and develop / testing of climate-adapted, including local, highly productive species / hybrids and plants, to expand selection work.	Ministry of Environmental Protection and Agriculture; Agricultural Research Center.	Time required to obtain varieties / hybrids.

Table 2: *Recommendations and Specific Implementation Actions*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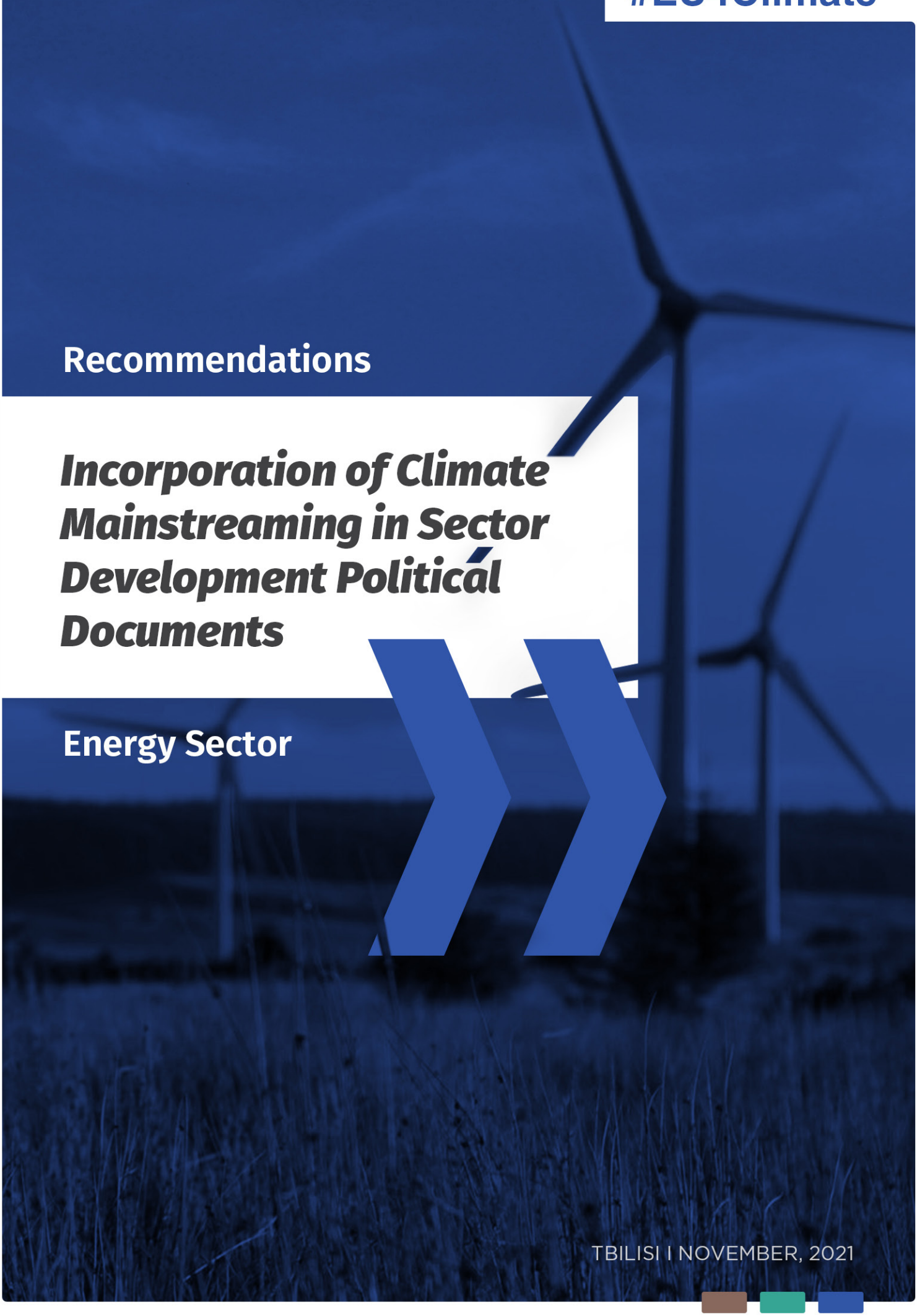

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One of the main tasks of the project is to review and analyze national policy documents, strategies, programs, development plans and legislative and regulatory framework documents and identify priority directions in the energy sector for developing recommendations vis-à-vis addressing climate change issues in the sectoral planning process.

Overall Background

01 Overall Background

Based on the data for 2019,[1,2] the total primary energy supply (TPES) in Georgia was fuel at 45% based on natural gas, 26% on oil products, 15% on hydro, 5% on coal, 5% on biofuel and waste, 2% on electricity, 1% on crude oil and 1% on other renewables (wind, solar, etc.). For the reviewed period, the share of the import in the energy supply of Georgia was 77% (See Diagram 1).

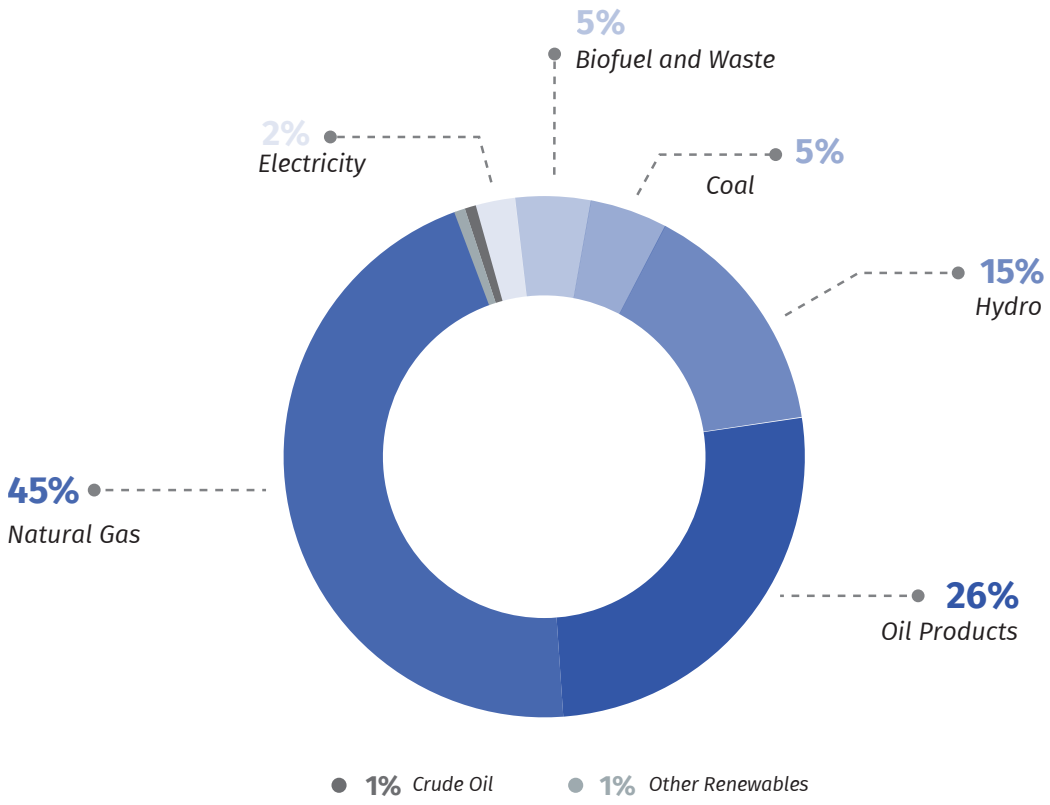


Diagram 1: *Total Primary Energy Supply (TPES) by Fuel, 2019*

1 National Statistics Office of Georgia – Aggregated Energy Balance of Georgia 2019 https://geostat.ge/media/35433/1.-Aggregated-Energy-Balance.xlsx.

2 Due to the COVID-19 pandemic, a review of 2020 data was not considered appropriate.

As for the consumption of the energy in Georgia in 2019, the biggest sector was transport – 31%, the second largest consumer was the residential sector – 28% and the third largest consumer was the industry sector – 16% (see diagram below for more details).

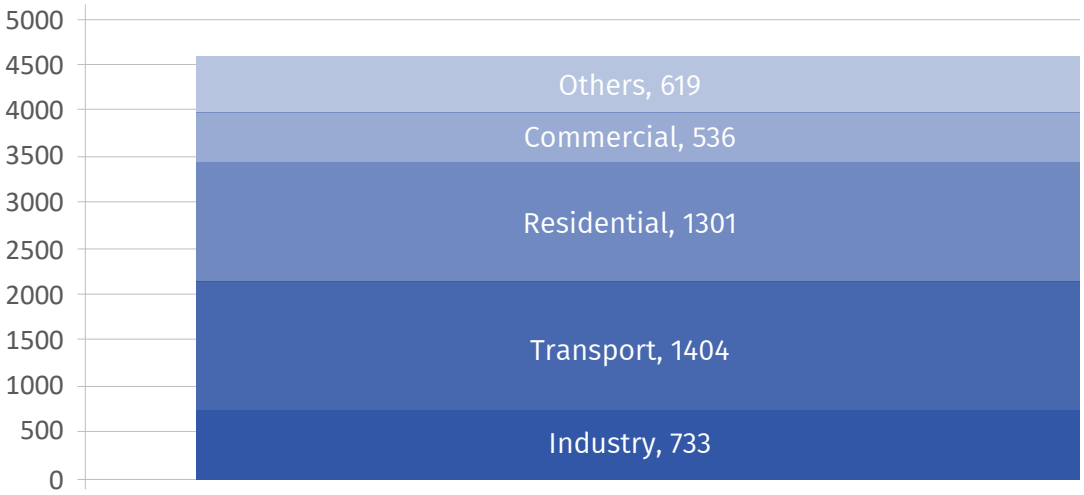


Diagram 2: *Total Final Energy Consumption by Sector (TFEC), 2019 (Thousand Tons of Oil Equivalent)*

The domestic demand for electricity is primarily met by the production of electricity from local hydropower plants: the 3,300 MW[3] of installed capacity generated electricity is sufficient to cover around 67% of the demand (2019)[4]. The share of other renewable sources in the electricity supply is less than 1% and is ensured by the only wind power plant in Georgia with an installed capacity of 20.7 MW. The rest of the supply of electricity is backed up by imports: the share of direct electricity import was around 12% while the thermal power plants (five units with an 925 MW installed capacity[5]) that operate on imported natural gas generated 21% of the total supply. This means that the electricity supply in the network in 2019 was 33% dependent on imports.

Energy is the largest contributor of greenhouse gas emissions in Georgia and at the same time is the most critical for ensuring the functioning of society. Georgia's total greenhouse gas emissions in 2017 were approximately 17,766 gigagrams (gg) of CO^2 equivalent where the share of the energy sector in this amount was 60% (including the transport

the 3,300 MW of installed capacity generated electricity is sufficient to cover around 67% of the demand

3 Georgian State Electro System: Ten-Year Network Development Plan 2020-2030.

4 Electricity System Commercial Operator (ESCO) 2019 – Actual Energy Balance of Georgia https://esco.ge/files/data/Balance/energobalans_2019_eng.pdf.

5 Based on the review of 2019's data, no information is provided here on the 230 MW combined cycle thermal power plant commissioned in 2020.

6 Fourth National Communication.

sector).[6] Taking the aforementioned circumstances into account, renewed national level contribution targets have been developed where one of the main targets is the reduction of the greenhouse gas emission rate by 35% by 2030 as compared to the rate recorded in 1990. For this purpose, sectoral targets in terms of greenhouse gas limitations have been identified. For the energy sector, this primarily envisages a 15% reduction in greenhouse gas emissions in the energy generation and transmission sector by 2030 relative to the forecasts under the baseline scenario.[7]

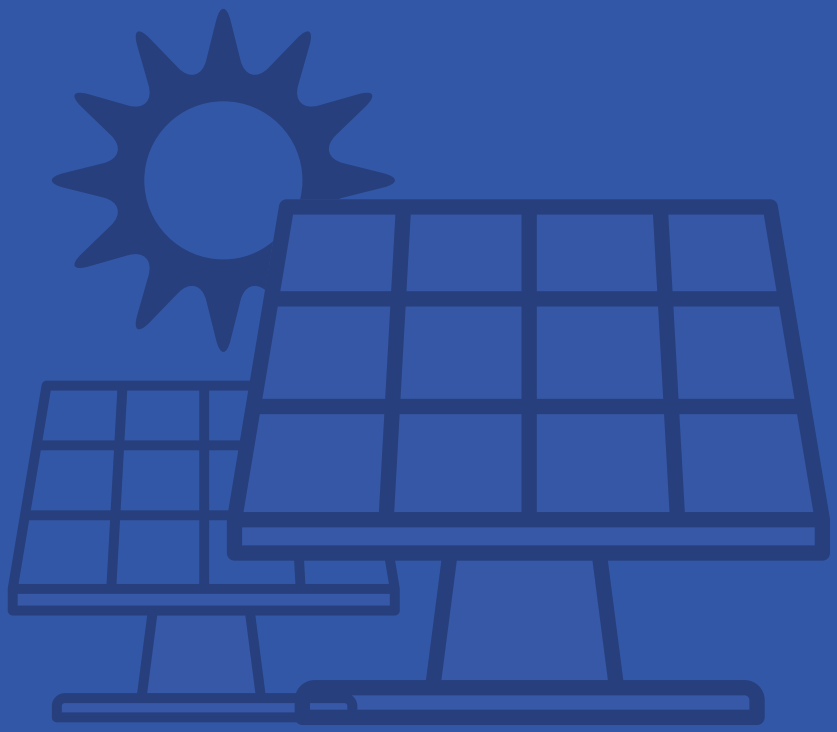
Given that:

- The share of renewable resources in Georgia's energy balance is less than 30% (while by 2030 Georgia wants to increase this share to 35%);
- A total of 77% of the entire energy supply depends on mineral resources;
- A significant share of local renewable energy resources is not utilized.

To achieve climate mainstreaming aspects, specific measures need to be identified and implemented in the energy sector in order to help reduce greenhouse gas emissions while improving the country's energy independence and ensuring low operating costs in the energy sector.

7 Georgia's Updated Nationally Determined Contribution (Final Draft) http://www.eiec.gov.ge/getattachment/5a00f7a6-ecc0-4d4d-8411-e0ad522e2402/Final-Draft-NDC_Georgia_ENG.pdf.aspx.

Key Findings



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02 Key Findings

In order to study the energy sector, initial consultations were conducted with stakeholders in accordance with the pre-designed research methodology. As part of these consultations, priority was given to communication with energy and climate change policy-makers; in particular, the Ministry of Economy and Sustainable Development (Department of Energy Reform and International Relations) and the Ministry of Environmental Protection and Agriculture (Climate Change Division). Meetings with these agencies were held in the form of individual semi-structured interviews (virtual). As a result of these consultations, key policy, strategy and action plan documents were identified and a further qualitative content analysis of these documents was performed.

In the next phase of the study, desk research was conducted to identify key studies and reports whose analysis was deemed appropriate in order to determine the risk profile in the energy sector and identify possible measures for climate mainstreaming.

Additionally, an important component of the research was the comments and recommendations of researchers and other stakeholders in the field on the basis of which the research presented herein was refined.

A comprehensive qualitative analysis of the reviewed literature supported the identification of the current gaps and challenges for the energy sector which are summarized below:

- The energy sector, being in an active reform process, makes the overall evaluation of the current state challenging as the legal framework is actively changing;
- Despite the approval of the all of the major laws in the energy sector, there is an urgency to develop secondary legislation that will be in line with the new legislation and international obligations as soon as possible;
- Work is ongoing on two major policy documents in the sector – the National Energy Policy and the National Energy and Climate Plan (NECP). Consequently, a complete review of these documents is currently impossible. However, an analysis of the NECP working document took place within the preparation of this report;
- Work on updating an energy policy document is at an early stage while action plan and strategy documents have either already been approved or are in the final stages of development. This means that these documents were developed without a relevant long-term vision for the sector;
- Detailed steps for achieving the targets for energy efficiency and renewable energy under the action plans need to be introduced together with a monitoring system that will help the evaluation of the achievements;
- Energy efficiency measures and clean development mechanisms require significant financial sources. Considering the current state budget, the mainstreaming of the cli-

mate change mitigation and adaptation measure in the energy sector may be hindered in the short-term period;

- As of now, the action plans focus on the activities to be financed by the private sector and international donors while the state budget does not prioritize climate change spending;
- For the successful and timely completion of the reform process within the sector, sufficient human resources are needed which represents a big challenge for now;
- Regarding climate change and with the exception of mitigation measures, it is necessary to identify adaptation measures in the energy sector and reflect them in action plans.

In the framework of this study aiming to mainstream climate change issues in the energy sector, it was considered expedient to pay special attention to the analysis of those documents which are in the process of elaboration:

- **Energy Policy Document;**
- **Integrated National Plan for Energy and Climate.**

Both documents define the main policies of the sector and, therefore, it would be appropriate to focus on these two documents in order to actualize climate change issues, including within the format of consultative workshops.

As of May 2021, Georgia's Energy Policy and National Integrated Energy and Climate Plan documents are still being developed. According to the latest data, the estimated deadline for the approval of these documents has been postponed until 2022. As these two documents are not yet publicly available, the following four approved policy documents were reviewed instead:

- Climate Change Strategy of Georgia, 2030;
- Climate Change Action Plan of Georgia, 2021-2023;
- Georgian National Renewable Energy Action Plan;
- Georgian National Energy Efficiency Action Plan of Georgia, 2019-2020.

Based on an analysis of these documents, recommendations for climate change mitigation and adaptation measures were prepared for the energy generation and transmission sub-sector.

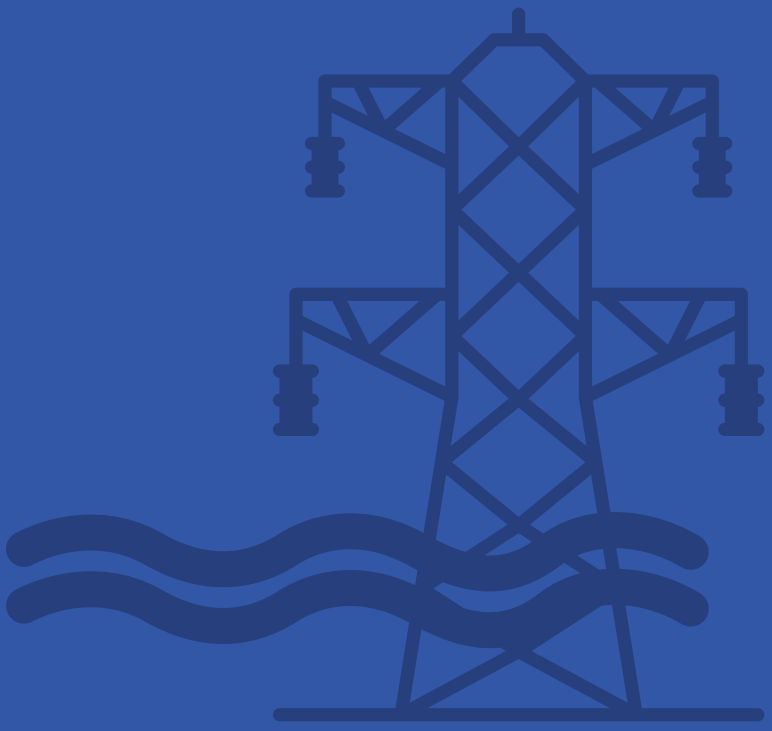
To clarify the recommendations presented below, an analysis of the existing working version of the NECP was conducted. As a result, it was determined which issues are expected to be addressed in the Integrated National Energy and Climate Plan and what additional issues need to be addressed.

The analysis of the selected documents in terms of international obligations and national legislation is given below:

Document	Compliance with International Obligations	Compliance with National Legislation	Executive / Implementing Structure
Climate Change Strategy	United Nations Framework Convention on Climate Change Paris Agreement	Georgia›s Updated Nationally Determined Contribution (NDC) Document; Resolution of the Government of Georgia #629 (20.10.19).	Ministry of Environmental Protection and Agriculture
Climate Change Action Plan	United Nations Framework Convention on Climate Change Paris Agreement	Resolution of the Government of Georgia # (20.10.19).	Ministry of Environmental Protection and Agriculture
National Renewable Energy Action Plan (NREAP)	Directive 2009/28 / EC of 23 April 2009 on the promotion of the use of energy from renewable energy sources	Law on the Encouragement of Production and Use of Energy from Renewable Sources; Resolution of the Parliament of Georgia on the main directions of state policy in the field of energy of Georgia.	Ministry of Economy and Sustainable Development
Energy Efficiency Action Plan	EU Energy Efficiency Directive EED - 2012/27 / EU	Georgia›s Updated Nationally Determined Contribution (NDC) Document.	Ministry of Economy and Sustainable Development
Energy Policy Document	Energy Union founding agreement	Resolution of the Government of Georgia #629 (20.10.19); Law on Energy and Water Supply.	Ministry of Economy and Sustainable Development
Integrated National Energy and Climate Plan	Energy Union founding agreement	Resolution of the Government of Georgia #629 (20.10.19); Resolution of the Government of Georgia #75 (06.02.20); Law on Energy and Water Supply.	Ministry of Economy and Sustainable Development/ Ministry of Environmental Protection and Agriculture

Incorporation of Climate Mainstreaming Recommendations
in Sector Development Political Documents

Recommendations for Climate Change Mainstreaming



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03 Recommendations for Climate Change Mainstreaming

3.1. The essence of climate change mainstreaming in terms of the goals of this report

Based on the Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC), Georgia has undertaken an obligation to reduce its GHG emissions. To achieve this goal, Georgia has approved a Nationally Determined Contribution (NDC) Document. The Climate Change Strategy 2030 and the Action Plan for 2021-2023 defined the goals, objectives and activities to be implemented in order to mitigate climate change in Georgia.

Georgia's Updated Nationally Determined Contribution (NDC) Document is based on an analysis of seven sectors of the country's economy. These include transport, buildings, energy production and transmission, agriculture, industry, waste management and the forestry sector. Our main focus will be on energy production and transmission in this report. Georgia plans to reduce greenhouse gas emissions by 15% by 2030 in line with the baseline forecasts in the energy generation and transmission sector.

Responding to the project's objective to provide recommendations for mainstreaming climate change in the energy sector, a desk study was conducted in order to identify possible mitigation and adaptation measures.

The Climate Change Strategy and Action Plan already envisage mitigation measures in the energy generation and transmission sub-sector which are aimed at reducing the causes of greenhouse gas emissions and their impact.

An interest in adaptation measures was identified during consultations with stakeholders. As this report focuses on the energy generation and transmission sub-sector, the following is a list of possible adaptation measures within this sub-sector based on good international practices in this direction.

The International Energy Agency (IEA) notes that climate resilience should become a central part of policy and system planning. The interconnectedness of extreme weather cases emphasizes the need for sustainable energy system planning. According to recent studies, only nine of the 38 members of the IEA / associated countries have identified specific activities / measures for climate change adaptation and resilience in each segment of

the power system.[8]

In order to properly select climate change mitigation and adaptation measures for the energy sector, it is first and foremost recommended to conduct energy security research ensuring the equal involvement of women and men therein. The aim of this research should be to study the availability of all energy resources for Georgia which in turn will identify the challenges and opportunities in the sector. This is necessary to determine the right directions vis-à-vis the country's energy policy. Consequently, conducting energy security research is a prerequisite for the development of a sustainable energy policy document and an integrated energy and climate national plan.

It is recommended that the adaptation measures identified here be analyzed and subsequently selected as measures reflected in the relevant policy documents (Climate Change Strategy and Action Plan, Integrated National Energy and Climate Plan [NECP]). The abovementioned analysis should be conducted within the framework of developing the National Energy and Climate Plan. It is recommended that this task should be implemented by the Ministry of Economy and Sustainable Development in close cooperation with the Ministry of Environmental Protection and Agriculture.

Possible adaptation measures to climate change in the case of hydropower plants:[9]

Impact	Potential Threats	Examples of Adaptation Measures
Precipitation variability	Changes in access to water resources, depending on flow conditions, will increase or decrease access to electricity.	o Increasing the volume of reservoirs; o Optimizing water use schedule to increase generation.
Seasonal and annual changes in precipitation variability	The high variability of precipitation causes large fluctuations in water flow that can alter seasonal and annual generation; High peak flows may cause flood and losses regarding generation volume.	o Short-term water flow forecasting must be improved; o Improving water management strategy; o Increasing the volumes of reservoirs; o Increasing turbine efficiency.
Cases of extremely high rainfall	Dams and turbines can be damaged due to the mobilization of debris in the upper reaches of the river due to floods; Flood causes the reduction in generation as water spills occur through bypass canals.	o Increasing the volumes of reservoirs; o Improving the protective mechanisms of dams and turbines; o Improving water management in order to reserve volumes in reservoirs for excess water; o Organizing cleaning of debris.
Precipitation reduction / high temperature	Both cases reduce the volume of swamped water.	o Increasing the volume of reservoirs in order to allow more water to dam during periods of high flow.
Extremely cold conditions	Ice can damage dam and block turbine door (entrance).	o Developing a strategy in order to reduce flow and create ice cover.

8 IEA (2020), Power Systems in Transition, IEA, Paris https://www.iea.org/reports/power-systems-in-transition.

9 IEA (2020), Power Systems in Transition, IEA, Paris https://www.iea.org/reports/power-systems-in-transition.

Possible adaptation measures to climate change in the case of wind farms:[10]

Impact	Potential Threats	Examples of Adaptation Measures
Wind variability (wind force density)	Windiness determines the density of wind force and any variability can change wind resource,	◦ Improving resource valuation and location selection through taking into account changing conditions.
Annual, seasonal and daily variability	Variability determines the availability of capacity.	◦ Considering variability in energy system planning; ◦ Construction and maintenance of backup capacities.
Change in precipitation, thermal regime and moisture near the surface	These changes can affect the freezing rate which can lead to operating problems and reduce output.	◦ Considering frost in wing design; ◦ Installation of wing heating.
Low density of air due to high air temperature	Low density of air causes generation reduction.	◦ There is no adaptation measure.
Drier air causes wind to scatter dust	Dry air and wind cause dust to settle on the wings which reduces generation.	◦ Modification of turbine design and wing coverage; ◦ Increasing the frequency of wing cleaning and service.
Variability of wave activity and wind wave connection	Wind, sea flows, waves and sea ice can damage offshore foundations and towers.	◦ Modification of the design and adjustment of the construction scheme to the wave and wind forecast conditions.
Extreme wind speed (sudden change of directions, flow and movement)	Extreme wind increases structural load and endangers structural integrity of wind turbines which can damage turbine parts and reduce generation as a result.	◦ Improvement of turbine design and construction of wind support structures; ◦ Installation of protective devices.
Extremely high and low temperatures	Extreme changes in temperature can cause changes in materials and fluids (expansion and compression).	◦ Considering extreme temperature ranking when selecting turbine material and lubricants.
Lightning frequency variability	Lightning can damage the wings, mechanical and electrical parts.	◦ Use enhanced lightning protection and grounding.

10 International Atomic Energy Agency (2019): Adapting Energy Sector to Climate Change.

Possible adaptation measures to climate change in the case of solar power plants:[11]

Impact	Potential Threats	Examples of Adaptation Measures
Higher average temperature	On average, higher temperatures improve the efficiency of solar heaters (especially in colder regions) but reduce the conversion efficiency of photovoltaic modules; Thermal and cooling efficiency are reduced in water-cooled solar concentrated power (CSP) systems; The efficiency in solar photovoltaic modules decreases by about 0.5% / ° C while in crystalline silicon and thin film modules it increases; Prolonged exposure to high temperatures causes wear of the materials.	o Installation of cooling facilities to reduce efficiency losses based on the ratio of electricity losses and alternative cooling options.
Variable cloudiness	Increasing cloudiness reduces the output of all solar technologies, hence the solar collector of the evacuated tube is relatively less affected as they can use scattered insolation; Solar concentrated power (CSP) systems are more vulnerable because they cannot use scattered insolation; Reducing cloudiness has a positive effect on generation.	o Covering the photovoltaic panels with a rough surface so that they can better use the scattered light; o Changing the fixed tilt angle to improve the use of scattered light; o Installation of systems to optimize the angle of inclination according to the state of scattered light; o Increasing the backup capacity of concentrated solar energy systems.
Extreme heat	Extremely high temperatures cause the damage of photovoltaic panels and reduces generation in photovoltaic and solar concentrated stations.	o Installation of passive cooling for active photovoltaic panels or use of active cooling by means of air blowing or liquid cooling.
Extreme cold	Extreme cold conditions reduce the performance of solar heaters due to heat loss in glazed collectors.	o Installation of heat exchange and use of antifreeze chemicals.
Storm	Strong winds can cause material damage to all solar technologies; Waste brought by the wind can cause pollution of the collector surface.	o Strengthening inclination and support structures; o Reinforcement of the sensitive surface of the collectors.

11 International Atomic Energy Agency (2019): Adapting Energy Sector to Climate Change.

Wind and sand storm	The storm can place dust and sand on the collector surface that will reduce generation; High humidity will make this impact worse.	o Installation of panel rotation system to protect from wind; o Cleaning the collector surface; o Use of elastometric insulator devices instead of glass; o To rotate mirrors or rotating them against the wind in concentrated solar energy systems and to continue thermal reserve to operate during a sandstorm; o Cleaning the glass after a storm.
Hail	Hail can damage photovoltaic materials and crack the surface of a glass plate.	o Using reinforced glass in flat plate collectors to increase hail resistance; o Strengthening the surface of the solar collector of the evacuated tube; o Raising the protection systems in all solar devices to the existing standard.
Lightning	Lightning can damage the inverter in photovoltaic panels.	o Improved protection from lighting of the area and panels.

Possible climate change adaptation measures in the electricity transmission and supply system:[12]

Impact	Potential Threats	Examples of Adaptation Measures
Strong wind, storm	Extreme wind speeds can damage overground transmission towers, lines and poles; Moving cables due to wind can cause a short circuit; Wind-blown trees and flying debris can cause mechanical damage to power lines and cause short circuits.	o Matching wind load standards to expected future conditions; o Moving power lines in open space and / or along the road; o Regularly cutting nearby vegetation to a safe distance; o Investment in better hurricane prediction systems; o Considering the possibility of placing cables underground.
Lightning	Increased lightning can frequency cause short circuits.	o Adding grounding to live conductors and sub-stations; o Installation of spark discharge and overload protection.
Extreme heat	Hot air will further increase transmission losses; The short circuit resulting from the extension of the cables can ignite the trees below; Power lines and transformers can be overheated and disconnected.	o Strengthen system capabilities to offset losses; o Increasing line tension against deceleration; o Investment in better hurricane forecasting systems; o Considering the possibility of placing power lines underground.

12 International Atomic Energy Agency (2019): Adapting Energy Sector to Climate Change.

Extreme cold	Accumulation of ice on insulators, switchgears, and transformers can cause short circuits.	◦ Improvement of the design of the insulator.
More frequent and intensive rain	Heavy rain can cause short circuits in high voltage insulators and circuit breakers.	◦ Improving the design of the insulator; ◦ Improving the service of components at risk.
Cold, wind, rain or snow and frost at the same time	This combination can cause ice and snow cover to form, while wind can damage transmission towers and overground transmission lines; The formation of ice and snow cover on the trees can cause damage to the supply lines under them.	◦ Considering stronger frost and wind conditions in the design standards; ◦ Moving lines to a more protected area; ◦ Improving frost and storm forecasting in vulnerable regions.
Floods caused by heavy rain or waves	Floods can damage ground or surface equipment (sub-stations, transformers).	◦ Placement of surface installations away from danger zones; ◦ Improvement of the insulation design.
Landslide or avalanche caused by heavy rain or snow	Landslides and avalanches can damage overground power lines, underground power lines, sub-stations and other components.	◦ Placement of surface installations away from hazard zones; ◦ Construction of avalanche protection facilities; ◦ Development of a network's net-like configuration in endangered regions.
Forest fires caused by drought	Fires can damage overground transmission lines and wooden poles; Smoke and combustion particles can cause a short circuit.	◦ Consideration of risks when routing transmission lines; ◦ Increasing green cover control in the vicinity of transmission and supply lines.

3.2. Specific Recommendations for Each Selected Document

3.2.1. Climate Change Strategy of Georgia

The Climate Change Strategy of Georgia considers four tasks in the field of electricity generation and transmission:

Task 1.1.
Promoting the production of renewable energy;

Task 1.2.
Improving the average efficiency of thermal power plants;

Task 1.3.
Strengthening the integration possibilities of renewable energy in the Georgian transmission network;

Task 1.4.
Development of new policy documents and legislation in the field of energy.

In other future priority areas of Georgia's Climate Change Strategy 2030, Section 4.1.2., it is recommended to add a study on the availability of groundwater and surface water resources in the context of climate change. The NECP document in the field of research provides a separate dimension of study, innovation and competitiveness within which it will be appropriate to write this measure.

> Georgia's Nationally Defined Contribution (NDC) Document specified that Georgia plans to assess the effects of climate change on the availability of groundwater and surface water resources for their sustainable use in agriculture (irrigation systems), energy production and household purposes in the long term. However, this activity, which can be uniquely assessed as a climate change adaptation measure, is not presented in either the Climate Change Strategy or the Climate Change Action Plan.

The second inconsistency is related to alternative renewable energy sources such as wind, solar and geothermal water. According to the Georgian Climate Change Strategy, the study of alternative renewable energy opportunities is identified as future priority areas. Given that the period of validity of the strategy is calculated until 2030 and the promotion of the production of renewable energy is one of the aims within the framework of the strategy's Task 1.1., it turns out that the measures

in the field of alternative energy, which are set for the period 2021-2023, precede the research on the availability of these sources. It is recommended that this measure of Georgian Climate Change Strategy 2030's Section 4.1.2 be removed from other future priorities and instead become an integral part of Objective 1.1. Adding alternative energy research to climate change measures will be a new adaptation measure that Georgia can implement in the near future. This will facilitate the production of renewable energy from alternative energy sources which, in turn, is a mitigation measure. This should also be reflected in the NECP document within the dimensions of research, innovation and competitiveness.

3.2.2. Climate Change Action Plan of Georgia 2021-2023

For 2021-2023, the Climate Change Action Plan of Georgia outlines a total of six activities based on the Climate Change Strategy document. Three of these activities are planned within Task 1.1. renewable energy (wind, solar, hydro, biomass) production support.

Task 1.1. Renewable energy (wind, solar, hydro, biomass) production support.

Task 1.1. considers increasing the share of renewable energy (wind, solar, hydro) in the production of electricity in Georgia by 2030 to 87% (according to the baseline data for 2018, this figure was 78% [hydro and wind]).

- **1.1.1. Technical and procedural support work for the generation of electricity from wind energy.**

This activity envisages the construction of nine wind farms with a total capacity of 373.6 MW of installed capacity by 2024. The budget for these activities is GEL 2.178 billion with 100% of the funding coming from organizations (private sector). It is noteworthy that the Climate Change Strategy document envisages the construction of nine wind farms by 2030, although their installed capacity is a total of 611 MW. Comparing the projects in the two documents made it clear that the data from the nine projects reviewed did not match the four projects.

It is necessary to review the list of projects outlined in the documents and bring them together so that further information on the planned wind farms can be properly reflected in the integrated national energy and climate plan.

It is also important to present the basis on which the projects of these particular wind farms were identified in these documents so that the process of reviewing strategic documents in the future can be carried out sustainably. The source of confirmation of this activity is the ten-year transmission network development plan of Georgia which includes a list of projects planned until 2030, although this document does not specify the deadlines for the implementation of these projects. Accordingly, it is necessary to either identify the source on the basis of which the wind farm projects are determined or amend the document of the ten-year development plan of the Georgian transmission network and reflect the planned deadlines for the implementation of the projects.

It should be noted that the data on wind farms presented in the climate change strategy documents and the ten-year development plan of the Georgian transmission network do not coincide. The strategy document, as mentioned above, includes nine projects of 373 MW while the ten-year development plan for the same period envisages 18 projects with an installed capacity of 1,331 MW.

Additionally, these activities do not describe what specific measures will be implemented directly by the state. This will complicate the process of monitoring this activity and assessing the effectiveness of the steps taken by the state towards climate change as a whole.

This activity / measure should be reflected in the NECP decarbonisation dimension; in

particular, within the renewable energy direction, after envisaging all of the abovementioned recommendations.

o 1.1.2. Technical and procedural support work for the generation of electricity from solar energy.

Within this activity, it is planned to implement a project of seven solar power plants by 2024 with a total installed capacity of 117 MW. The budget of this activity is GEL 209.88 million where 100% of the source of funding is organizations (private sector).

It is noteworthy that the strategy document includes the project of six solar power plants with a total installed capacity of 116 MW. Georgia's ten-year transmission network development plan for 2030 envisages a project of 12 solar power plants with a total installed capacity of 520 megawatts.

It is necessary to review the list of projects reflected in the documents and bring them together so that the information about the planned solar power plants can be properly reflected afterwards in the integrated energy and climate plan. Like wind power plant projects, the source of solar power plants has to be defined. If the source is the document of the ten-year development plan of the Georgian transmission network, then the planned deadlines for the implementation of the projects should be reflected there.

In the case of solar power plants, the specific measures which will be taken directly by the state are not described. This will complicate the process of monitoring this activity and assessing the effectiveness of the steps taken by the state in the direction of climate change as a whole.

This activity / measure should be reflected in the NECP decarbonisation dimension; in particular, within the renewable energy direction after envisaging all of the abovementioned recommendations.

o 1.1.3. Technical and procedural support work for solar power plants.

Unlike the wind and solar power projects, the strategy document only represents projects with a capacity of more than 13 megawatts planned for 2023.

Firstly, it is necessary to clarify why projects with a capacity of more than 13 MW are excluded. If this is a consequence of the definition of a small power plant established by the Energy and Natural Gas Law, then this needs to be adjusted in accordance with the Energy and Water Supply Law adopted in 2019 where power plants with a capacity of less than 15 MW were defined as small power plants.

The Climate Change Strategy document envisages a total of nine hydropower projects with a total installed capacity of 326.79 MW. The same projects are reflected in the Action Plan.

It should be emphasized that some of the projects listed above are similar in name and installed capacity to the following projects that have been put into operation in the recent past: Kirnati HPP - 27.47 MW (2018), Mestiachala 1- 20 MW (2019) and Old Energy - 21.39 MW which is close to the Stori 1 HPP project data (2018).

The ten-year development plan of the Georgian transmission network focuses in detail on the hydropower plant projects. Unlike the solar and wind power plants, the hydropower projects have an estimated date of implementation. Additionally, hydropower projects have a category which determines their status: Category 1- projects under construction, Category 2 - projects at the licensing stage and Category 3 - future projects. Georgia's ten-year transmission network development plan for 2020 envisages 109 hydropower plants with an installed capacity of 3,545 MW of which 88 HPP projects are planned to be put into operation by the end of 2023.

It is necessary that the Climate Change Strategy document, unlike the Climate Change Action Plan, includes the projects of all hydropower plants planned for 2030, regardless of their installed capacity. It is also important that the Action Plan reflects all of the projects envisaged in the ten-year development plan of the Georgian transmission network by 2023. It is also desirable that, like hydropower projects, alternative energy projects (solar, wind, biomass) be given a category and the estimated dates of their initiation be defined.

This activity / measure should be reflected in the NECP decarbonisation dimension; in particular, within the renewable energy direction after envisaging all of the above-mentioned recommendations.

Task 1.2. Improving the average efficiency of thermal power plants.

Georgia's ten-year transmission network development plan envisages the construction of a 250-megawatt combined cycle thermal power plant in 2023. This project is reflected in the Climate Change Strategy document and is also presented as an activity in the Climate Change Action Plan. Within Activity 1.2.1, the JSC Georgian Oil and Gas Corporation is mentioned as a partner agency and is also presented as the main source of funding - GEL 332 million (62.5% of the total task budget).

It should also be noted that Activity 1.2.1 also envisages: improving the average efficiency of existing thermal power plants by more than 50%, the implementation of technical upgrades on thermal power plants, strengthening the infrastructure of national transmission systems and equipping new combined cycle thermal power plants with new technologies to double their energy efficiency.

Currently, the JSC Georgian Oil and Gas Corporation owns two combined cycle thermal power plants- Gardabani (231.2 MW installed power plant put into operation in 2015 with an efficiency rate of over 50%)[13] and Gardabani 2 (commissioned in 2020 and also with an efficiency rate exceeding 50%).[14] Therefore, there is no need to increase efficiency measures until 2030 at the thermal power plants currently owned by JSC Georgian Oil and Gas Corporation and to be built by them in the near future (where the project expects a 57% efficiency rate).[15]

The task also includes the implementation of technical work on thermal power plants and the strengthening of the infrastructure of national transmission systems. Both of these activities are not described in detail and the strategy does not contain information on how these actions relate to the issue of climate change within this particular activity. In particular, strengthening the infrastructure of national transmission systems is not in essence directly related to the goals of Task 1.2. It is closer to Task 1.3 - to the goals of strengthening the capacity for the integration of renewable energy into the Georgian transmission network.

Georgia's ten-year transmission network development plan also envisages the construction of another 250-megawatt combined cycle thermal power plant in 2025. This project is not reflected in the Climate Change Strategy. It would be appropriate for it to be presented therein because the strategy envisages all measures up to and including 2030.

In addition to the thermal power plants owned by the JSC Georgian Oil and Gas Corporation, there are currently three other thermal power plants operating in Georgia: the 300-megawatt Gardabani 9th power unit (Mtkvari Energy Ltd), the 270 MW Tbilsress (Georgian International Energy Corporation Ltd.) and the 110 MW Air Turbine (Giffower Ltd). Each of them is privately owned. Based on the electricity balance data, it is clear that the average efficiency is systematically lower than 50% in the case of two of the thermal power plants. The companies owning these three thermal power plants are not represented in the Action Plan as partner agencies. Therefore, it can be assumed that these three companies and the thermal power plants owned by them do not have the planned activities envisaged through Task 1.2.

It should also be noted that according to the definition of energy efficiency measures in thermal power plants, the existing working document of the NECP envisages the construction of two new thermal power plants (a total of 500 megawatts of installed capacity). Additionally as part of this activity, it is planned to decommission the old thermal power plants or not to give them priority during dispatching (the plan states that Gardabani 3-4 was decommissioned in 2020 and Mtkvari will be decommissioned in 2025). Consequently, energy efficiency measures do not envisage defining any kind of energy efficiency measures in old thermal power plants and energy efficiency targets will be achieved with the development of combined cycle thermal power plants with new technology which will provide more electricity with the same volume of gas than old thermal power plants.

It should be noted that the 2018 version of

13 Ltd. Gardabani Thermal Power Plant- Monthly report on the activity of the enterprise-http://www.gtpp.ge/?view=accounts.

14 Electricity balance 2020.

15 Scoping report of 272 MW Combined Cycle Thermal Power Plant (CCTPP) construction and operation project- https://mepa.gov.ge/Ge/Files/Download/38815.

the ten-year network development plan envisaged the decommissioning of the Gardabani 3-4 thermal power plants in 2019 and the decommissioning of Mtkvari Energy (Gardabani 9) in 2021. However, the updated versions of this plan (from 2020) do not provide the exact dates of the decommissioning of the old thermal power plants.
In order to achieve the targets planned under Task 1.2, it is recommended to split the activities into two in the Action Plan: Activity 1.2.1 should be corrected and replaced by the decommissioning of inefficient and obsolete thermal power plants. Further, Activity 1.2.2 should be added which will separately consider the construction of a new combined cycle thermal power plant. This will facilitate a clearer formulation of the objectives of Task 1.2 as well as identify relevant partner agencies and plan and implement the results of this activity.
Like Activity 1.1, it is recommended that the Climate Change Strategy document reflect the performance of Activity 1.2 on how it will reduce greenhouse gas emissions. It is also important for monitoring the implementation of the updated nationally determined contribution of Georgia. As of now, Annex #5 of the Climate Change Strategy - Impact of Key Strategy Interventions on Emissions Reduction by 2030- envisages the effect of the direct reduction of intervention in the direction of thermal power plants at 423 kT CO2 eq. by volume.

Task 1.3. Strengthening the possibilities of renewable energy integration in the Georgian transmission network.

Connecting regional power systems is also one of the tools to increase network flexibility. Georgia's ten-year power network plan envisages strengthening the grid connecting all neighboring countries. This is also reflected in the NECP energy security dimension. As for the demand management, it is still a new tool to be mastered and the NECP security dimension envisages activities / measures in this direction. The objectives set out in Task 1.3 and the relevant activities of the Climate Change Action Plan are clearly described as the objective as well as the indicators of the outcome of the activity, the partner agency and the sources of funding.
It is recommended that the Climate Change Strategy document reflect the impact of this task on reducing greenhouse gas emissions as the sectoral priority of the renewed national level of Georgia is energy generation and transmission.

However, the ten-year power network plan[16] considers a separate sub-section on future visions and challenges, listing the obstacles that climate change poses to the energy system. It focuses on the energy generation component and consumption growth forecasts. Furthermore, the direct risks posed by climate change, which may have a direct impact on electricity transmission infrastructure, are not addressed. The Georgian State Electricity System needs to conduct a complex study of network climate resilience to identify potential challenges to electricity transmission infrastructure and identify adaptation measures that can reduce the impact of climate change on network operation. These measures, in turn, should be reflected in the relevant subsections of the NECP- mainly in the energy security dimension.

16 Georgian State Electric System: Ten-Year Transmission Network Development Plan (2021-2031).

Task 1.4. Developing new policy documents and legislation in the field of energy.

The Climate Change Strategy document mentions the Integrated National Energy and Climate Plan (NECP) as a strategic vision for the energy sector for 2020-2030. The climate change strategy paper also states that the Integrated National Energy and Climate Plan will be in line with the Nationally Determined Contributions document and the Climate Strategy and Action Plan.
In the Action Plan, the activity of this task is selected as an indicator of the outcome of 1.4.1. However, it is not mentioned in the Integrated National Plan for Energy and Climate. This may lead to the expectation that the energy sector strategy document should be developed separately which, in turn, is incorrect as the Integrated National Energy and Climate Plan is a strategic document in the energy sector as recommended by the Council of Ministers of the Energy Community. As a result, it is recommended that the activity of the Climate Change Action Plan be determined by the approval of the Integrated National Energy and Climate Plan as an indicator of the outcome of 1.4.1.

3.2.3. National Renewable Energy Action Plan of Georgia

The National Renewable Energy Action Plan of Georgia describes all the documents of the incentive policy for the use of renewable energy and provides an overview of the relevant measures. The activities within the measure are divided into the following directions:

- Review of all documents and measures of the renewable energy incentive policy;
- Specific measures necessary to comply with the requirements of Articles 13, 14, 16 and 17 of European Commission Directive 2009/28;
- Promoting the introduction of adapted schemes for the use of renewable energy in electricity;
- Facilitate the introduction of adapted renewable energy schemes in the heating and cooling systems by an EU member state or group of member states;
- Facilitate the introduction of adapted renewable energy schemes in the transport sector by an EU member state or group of member states;
- Promoting specific measures to obtain energy from biomass;
- Planned use of statistical data transmission between member states and planned participation in joint projects with other member states or third countries.

Like the other policy documents reviewed in this report, the analysis of the National Renewable Energy Action Plan was based on Georgia's Nationally Determined Contribution (NDC) document. Accordingly, the measures that are directly related to the energy generation and transmission sub-sector will be reviewed. Given that the Action Plan was approved in 2019, and at the end of 2019 the legislative framework of the energy sector was significantly changed (five laws and relevant by-laws came into force), it is necessary to review the overall Action Plan and prepare draft amendments which should be properly reflected in the direction of decarbonization of the Integrated National Energy and Climate Plan; in particular, in the renewable energy sub-sections.
Due to the fact that the drafting of the NECP document is regulated by the requirements of the European Union, Georgia, as a member of the Energy Community, is obliged to take these requirements into account. A working version of Georgia's Integrated National Energy and Climate Plan was available during the development of this report and further analysis of the future structure of this document is possible based on NECP documents adopted by EU member states. As mentioned

above, the National Renewable Energy Action Plan will not be updated, although the issues envisaged by the existing National Renewable Energy Action Plan will become an integral part of the NECP. Accordingly, the recommendations presented in this sub-section may be directly incorporated into the NECP drafting process.

Review of all renewable energy consumption incentive policy documents and measures

The current working version of the NECP document does not currently include specific and detailed incentive activities / measures. It is possible that these measures will be specified at a later stage in the development of the plan.

Section 3.1 of the National Renewable Energy Action Plan presents an analysis of the policy and legislative framework. Given that the Action Plan was approved in 2019, and by the end of 2019 the legislative framework of the energy sector was significantly changed (five laws and relevant by-laws came into force), it is necessary to review the entire subsection and reflect the relevant changes. In addition to the legislative acts that have already entered into force, it is appropriate to describe in this sub-section the by-laws that are currently being drafted and / or planned within the framework of the international obligations undertaken by Georgia. This is an essential part of policy development and will also help monitor compliance with international obligations and planned changes under the law. In addition, it will become the basis for the development and coordination of short-term action plans. Under this change, the Climate Change Action Plan Task 1.4 should be adjusted and its implementation monitored.

The development of heating and cooling infrastructure is also discussed in the same sub-section. The existing Action Plan states that an feasibility study is needed to explore the potential for the use of renewable energy sources in this direction. However, no specific measures have been taken. The current working version of the NECP envisages only incentives for the use of solar energy in the field of heating.

During consultations with stakeholders and experts, the potential for heating capabilities was highlighted which will help increase the share of renewable energy in final use energy as well as the replacement of imported fossil fuels. It was noted during the consultation that biomass has significant potential in this direction and there are a number of studies in this area:

- Research on forest and agricultural residual biomass energy potential in Georgia;[17]
- Detailed study of the advisability of biomass production and utilization (technical-economic evaluation) for Tbilisi Municipality;[18]
- Creation of a biomass chain for Telavi Municipality;[19]
- Cost-benefit analysis of the practice of incineration of agricultural waste for Dedoplistskaro Municipality;[20]
- etc.

Since the Renewable Energy Chapter of NECP includes heating and cooling issues, it is advisable to add a detailed study on the feasibility of using local renewable energy sourc-

17 World Experience for Georgia (2014): "Assessment of Wood and Agricultural Residue Biomass Energy Potential in Georgia."

18 Center for New Technologies (2014): "Detailed Study on the Expediency of Biomass Production and Utilization (Feasibility Study) For Tbilisi Municipality."

19 Irakli Kobulia (2019): "On the Establishment of a Biomass Chain for Telavi Municipality."

20 Vanja Westerberg, Luis Costa and Giorgi Ghambashidze (2016): "Cost Benefit Analysis of Agricultural Burning Practices in the Dedoplistskaro Municipality, Georgia."

es for heating and cooling infrastructure development under the heating and cooling infrastructure development sub-list. Furthermore, based on existing studies, a list of possible measures must be prepared that can be implemented in the context of the development of heating and cooling infrastructure and be reflected in the integrated energy and climate plan.

Facilitating the introduction of adapted schemes for the use of renewable energy in electricity

In the section on the introduction of adapted schemes in the National Renewable Energy Action Plan, Section 3.3 emphasizes that these renewable energy promotion measures have not been used in Georgia during the approval of this plan.

This sub-section needs to be edited taking into account the fact that at the end of 2019, a law was adopted on incentives for the production and use of energy from renewable sources. This law considers the creation of a legal basis for the promotion and the encouragement and use of energy from renewable sources. Additionally, the purpose of this law is to determine the mandatory national total target indicators of the total share of energy received from renewable sources in the total final energy consumption and consumption by energy transport. The transitional provisions of Article 21 of this law include a list of by-laws to be drafted as well as the deadlines for their approval. The Law on Encouraging the Production and Use of Energy from Renewable Sources is an important tool for mainstreaming climate change issues in the energy sector.

> ***Section 4.1 of the National Renewable Energy Action Plan provides a list of renewable energy policy support measures for the period 2018-2020, their estimated cost and benefits. The total list includes ten actions. These include the measures envisaged in Climate Change Action Plan according to task 1.1:***

Support for the production of hydropower plants;

Support for electricity generation with wind power;

Support for electricity generation with solar power.

Accordingly, the recommendations set out in section of Climate Change Task 1.1 are in line with this part of the National Renewable Energy Action Plan.

As for the other measures envisaged in the National Renewable Energy Action Plan, there is also an incentive measure for micro power plants (up to 500 kW) working on renewable energy sources. The regulatory framework for this measure is defined by the Georgian National Energy and Water Regulatory Commission and they have made changes in the relevant legislation. This, in turn, means that this support measure needs to be adjusted in line with changes in legislation and also be-

come part of other related policy documents; in particular - Task 1.1 of the Climate Change Action Plan has to be added and the NECP renewable energy policy and measures have to be reflected in sub-section 3.1.2.

Under this plan, another measure is to raise awareness about renewable energy sources and increase the potential of technical staff. For the successful implementation of this measure, it is necessary to specify its objectives and write an action plan accordingly for the period. This should also be reflected in the NECP's research, innovation and competitiveness dimension.

3.2.4. Georgian National Energy Efficiency Action Plan 2019-2020

The measures in the National Energy Efficiency Action Plan are divided into seven areas:

- Horizontal measures;
- Energy efficient measures in buildings;
- Energy efficiency measures in state public institutions;
- Energy efficiency measures in industry;
- Energy efficiency measures in the transport sector;
- Promoting the introduction of energy efficient heating and cooling systems;
- Regulation of energy conversion, transmission, distribution and demand.

Due to the fact that this report follows the objectives of the renewed Nationally Determined Contribution (NDC) document of Georgia, the main focus was on energy production and the transmission sub-sector. Accordingly, the analysis of the National Energy Efficiency Action Plan is also presented in this context.

- **Measure E-1 - Natural Gas Saving - Replacement of Old Thermal Power Plants with New Technologies**

The most important energy transformation process in Georgia takes place in thermal power plants where natural gas is converted into electricity. Within the framework of this measure, the JSC Georgian Oil and Gas Corporation has been established as the implementing body. This measure is consistent with the Climate Change Action Plan envisaged under Task 1.2. Accordingly, the recommendation outlined in the Climate Change Action Plan sub-section regarding this measure is also valid.

In particular, within the framework of the NECP energy efficiency dimension, the timing of decommissioning of old thermal power plants and the action plan for the development of new combined cycle thermal power plants should be specified.

- **Measure E-2 - Rehabilitation and investment of hydropower plants**

Measure E-2 deals with the rehabilitation and investment of hydropower plants. Only the second part of this issue- investments- is presented in the Climate Change Strategy and Action Plan. The hydropower rehabilitation measure is also not an integral part of the existing working version of the NECP document. As for the rehabilitation part of existing hydropower plants, this is a significant mitigation measure that can increase the share of energy from renewable sources. This, in turn, is the goal of the NDC in the energy generation and transmission sub-sector. In order for this measure to be fully implemented, it is necessary to develop a ten-year strategy to address this issue which primarily envisages research in the context of increasing the share of renewable energy through the rehabilitation of existing hydropower plants. This study will also help the policy-making body to examine the issue of the budget required for rehabilitation. Given that most of the hydropower plants are privately owned, it is important to involve these companies in the research and to understand their willingness to participate in the implementation of this measure.

Only after this research is it appropriate to prepare a detailed list of the hydropower plants where the rehabilitation will take

place. The plan should take into account the extent to which power plant efficiency will be improved and the extent to which this will reduce the share of greenhouse gas emissions in the energy generation and transmission sub-sector. Rehabilitation research should be reflected in both the NECP document and it should be an integral part of the climate change strategy. It is by nature a measure of greater adaptation. However, the hydropower plan developed based on this study is another mitigation measure in the policy documents.

Measure E-3 - Optimization of capacity reserves and seasonal regimes

Measure E-3 power reserves and seasonal mode optimization is another mitigation measure that can increase the share of renewable energy in final energy consumption. It should be emphasized that these content measures are covered by the NECP Security Dimension. Power reserves and seasonal modes are issues that directly affect the power system dispatcher. The ten-year power grid development plan includes measures for the sustainable operation of the system. In order for hydropower plants to increase system flexibility, it is necessary to calculate the required level of reserves and properly manage generation. Solar energy and other energy-saving stations (hydraulic storage stations) can also contribute to the integration of solar and wind energy.

The Ministry of Economy and Sustainable Development may consider this issue in the context of the topic of the Electricity Generation Plan. This, in turn, implies the development of relevant technologies over a ten-year period. If additional generation facilities are required within these measures, this should be properly reflected in the policy documents.

Measure E-4 - Expansion of the transmission network, integration of new generating capacities into the network and reduction of losses

Measure E-4 envisages the expansion of the power transmission network, the integration of new generation capacities in the network and a reduction of losses. Transmission network issues are also presented in the Climate Change Strategy and Action Plan. The recommendation given in Task 1.3 of the Climate Action Plan for a complex study of network climate resilience is also relevant here. These activities / measures should in turn be reflected in the NECP security dimension.

It should be noted that the National Energy Efficiency Action Plan did not include measures to be implemented in the natural gas transmission network. Measures in this direction need to be identified and reflected in the NECP energy efficiency dimension.

Measure E-5 and E-6 - Normative requirements for rules for calculating electricity and gas normative losses in pipelines - Investment stability

In particular, measures E-5 and E-6 refer to the rules for calculating normative losses in the electricity and natural gas sub-sectors. Normalizing and regulating losses is an important measure of energy efficiency in terms of reducing greenhouse gas emissions. This issue was within the competence of the Energy and Water Regulatory Commission of Georgia even before the adoption of the law on energy and water supply. In the case of electricity, the regulatory framework for regulatory losses was last revised in 2017 while it was revised in 2015 in the case of natural gas. In 2019, losses in the transportation system were 0.7% in the natural gas sector while they were 1.2% in the distribution network. In the same year, losses in the power network decreased by 8%, although increased by 11% in the distribution network.

Therefore, it is necessary to encourage investments in this sector in order to increase the level of energy efficiency in the distribution network. This event should be written as a separate paragraph in the action plans where, based on the short-term plans prepared by the distribution companies, two-year specific activities will be written with A planned budget. The period for updating the action plans should also include updating this data and reflecting it appropriately in the new document. It is noteworthy that this issue is part of the current working version of the

NECP within the energy efficiency dimension. Therefore, it needs to be clarified taking into account the recommendations presented above.

The table below summarizes the Inconsistencies identified due to the analysis of key policy, strategy and action plan documents. In order to mainstream the issues of climate change in the energy sector, specific recommendations are presented in this regard.

Inconsistencies and recommendations identified in the policy, strategy and action plan documents:

Document	Context of Inconsistency	Specific Recommendation
Climate Change Strategy	The study on access to groundwater and surface water resources envisaged in the updated Nationally Determined Contribution (NDC) Document of Georgia is not presented in the strategy document.	Climate Change Strategy, Section 4.1.2.- Conduct research on access to groundwater and surface water resources in other future priority directions. In the dimension of NECP research, innovation and competitiveness should be reflected the implementation of this research.
Climate Change Strategy	Renewable energy production promotion activities precede studies on access to the same energy sources.	Remove climate change strategy section from 4.1.2 and add to Task 1.1 of the same strategy. In the dimension of NECP research, innovation and competitiveness should be reflected the implementation of this research.
Climate Change Action Plan	There is irrelevant data about renewable power plants in the documents of the Climate Change Strategy, the Climate Change Action Plan and the Ten-Year Development Plan of the Electricity Transmission Network.	Strategy Objective 4.1 Correction and aligning of data on projects written within climate change Task 1.1. The list of updated projects should be reflected in the NECP decarbonization dimension.
Climate Change Action Plan / National Energy Efficiency Action Plan	Mitigation measures for energy efficiency activities in thermal power plants are not defined accordingly. There is irrelevant data about thermal power plant projects in the Climate Change Strategy and Ten-Year Development Plan documents for the electricity transmission network.	The activity under Task 1.2 of the Climate Change Action Plan must be divided into two and presented as follows: Activity 1.2.1- Decommissioning of thermal power plants operating on inefficient and outdated technologies; Activity 1.2.2- Construction of a new combined cycle thermal power plant.
Climate Change Action Plan	The direct risks posed by climate change, which may have a direct impact on electricity transmission infrastructure, are not considered.	Add an event to conduct a complex study of network climate resilience. These measures should be reflected in the relevant subsections of the NECP- mainly in the part of the energy security dimension.

Climate Change Action Plan	The Climate Change Strategy Paper does not contain a forecast for the reduction of greenhouse gas emissions as a result of activities to be undertaken in the energy transfer sub-sector which is essential to monitor the performance of NDC targets.	The Climate Change Strategy document should reflect the impact of this task on reducing greenhouse gas emissions. Annex II of the NECP, where each activity / measure is described in detail, provides a forecast for reducing greenhouse gas emissions.
Climate Change Action Plan	Based on the Climate Change Strategy and the Action Plan, it is needed to clarify the outcome of the defined indicator.	Approval of the Energy and Integrated Climate National Plan must be defined as an indicator of Activity 1.4.1's result.
National Renewable Energy Action Plan	The National Renewable Energy Action Plan is not in line with the new legislative framework.	Adjusting the review of all renewable energy consumption incentive policy documents and measures.
National Renewable Energy Action Plan	The National Renewable Energy Action Plan is not in line with the new legislative framework.	Correction of measures to facilitate the introduction of adapted schemes for the use of renewable energy in electricity.
National Renewable Energy Action Plan	The measure is not described in detail which will hinder the successful implementation of this adaptation measure.	Raising awareness of renewable energy sources and specifying measures to increase the potential of technical staff and reflect in the NECP research, innovation and competitiveness dimension.
National Renewable Energy Action Plan	Non-existence of measures to promote the use of local renewable energy sources for the development of heating and cooling infrastructure.	The feasibility study on the use of local renewable energy sources for heating and cooling infrastructure development should be added in the NECP document under the Heating and Cooling Infrastructure Development subsection; Based on existing studies, specific possible measures should be developed for the development of heating and cooling infrastructure.
National Energy Efficiency Action Plan	The hydropower rehabilitation plan is not detailed which will prevent this mitigation measure from being taken.	This activity must be written within Activity 1.1.3 of the Climate Change Action Plan in the following way: 1.1.3.1- Research on the possibility of rehabilitation of hydropower plants; 1.1.3.2 – Rehabilitation of existing hydropower plants.
National Energy Efficiency Action Plan	The existing policy documents do not envisage energy efficiency activities in distribution networks.	An item should be added in the energy efficiency sub-section of the NECP document: Implementation of energy efficiency measures in electricity and natural gas distribution networks.

3.3. Ways to implement the proposed recommendations

An energy policy document and an integrated energy and climate national plan have been selected to address climate change issues in the energy sector. Firstly, a national energy security study should be prepared which should be a pre-condition for the development of an energy policy document and an integrated energy and climate plan. The above recommendations should first be reflected in the working version of the Integrated National Energy and Climate Plan. In parallel, a project of changes to the Climate Change Strategy and the Climate Change Action Plan should be prepared. According to the procedures defined by the legislation, the Energy Policy document and the Integrated National Plan for Energy and Climate must be approved by the Parliament of Georgia. In turn, the Climate Change Strategy and the Climate Change Action Plan are approved by the Government of Georgia.

The recommendations for the National Renewable Energy Action Plan and the Energy Efficiency Action Plan should be directly reflected in the Integrated National Energy and Climate Plan as these two documents will form part of the NECP and will not be updated separately.

The analysis of the selected documents did not include a gender assessment which was not the purpose of the assignment; however, the recommendations below address gender issues.

The main recommendation on how to address gender-sensitive issues in energy and climate change policy documents is based on the equal participation of women and men in activities such as conducting research, implementing various energy efficiency measures and equal involvement in rehabilitation work.

3.4. A step-by-step guide to how specific recommendations should be reflected in existing documents

Recommendation	Possible Outcome of the Implementation (Problem-oriented)	Specific Actions/ Measures	Responsible Structure	Risks / Assumptions
Climate Change Strategy, Section 4.1.2- Research on access to groundwater and surface water resources should be conducted in other future priority directions.	It will facilitate the use of renewable energy sources which will have a positive impact on reducing greenhouse gas emissions.	Conducting and publishing research on access to groundwater and surface water resources and support equal involvement of women and men in the research.	Ministry of Environmental Protection and Agriculture Ministry of Economy and Sustainable Development	Research on renewable energy sources will help attract investment in the energy generation sub-sector.
Task 1.1 of the same strategy should be added to Climate Change Strategy. Conduct research on the availability of renewable energy sources.	Will facilitate the use of renewable energy sources which will have a positive impact on reducing greenhouse gas emissions.	Conducting research on access to renewable energy sources and support equal involvement of women and men in the research.	Ministry of Environmental Protection and Agriculture Ministry of Economy and Sustainable Development	Research on renewable energy sources will help attract investment in the energy generation sub-sector.

Strategy Task 4.1., Correction and adjustment of project data written within climate change Task 1.1	It will promote the integrity of strategic documents and accountability within international commitments.	Conformation of policy documents.	Ministry of Environmental Protection and Agriculture Ministry of Economy and Sustainable Development	Production of incorrect accounting which will hinder the correct calculation of the performance of the target indicators.
Dividing the activity under Task 1.2 into two in the Climate Change Action Plan Activity 1.2.1- Decommissioning of thermal power plants operating on inefficient and outdated technologies; Activity 1.2.2- Construction of a new combined cycle thermal power plant.	It will promote more efficient use of natural gas for energy generation purposes which, in turn, will reduce greenhouse gas emissions.	Decommissioning of old and inefficient thermal power plants; Construction of a new combined cycle thermal power plant; Promoting equal involvement of women and men is desirable in both activities.	Ministry of Environmental Protection and Agriculture Ministry of Economy and Sustainable Development	Production of incorrect accounting which will hinder the correct calculation of the performance of the target indicators; Will help attract investment in the energy generation sub-sector.
Complex study of climate resilience conduction of the electricity grid should be added to Task 1.3 of the Climate Change Action Plan.	It will facilitate the functioning of the network, which will lead to the improvement of energy security.	Conducting network climate resilience complex research and identifying adaptation measures that can reduce the impact of climate change on network functioning.	Ministry of Economy and Sustainable Development Georgian State Electrosystem Ministry of Environmental Protection and Agriculture	Conducting a complex study of network climate resilience will help the network function sustainably.
Calculation of the greenhouse gas emission reduction forecast as a result of activities in the energy transfer sub-sector in the Climate Change Strategy document.	Greenhouse gas emission reduction forecast will help to monitor NDC target performance.	Calculation of greenhouse gas emission reduction forecast for energy transfer sub-sector.	Ministry of Environmental Protection and Agriculture Ministry of Economy and Sustainable Development	Production of incorrect accounting which will hinder the calculation of the performance of the target indicators.

This activity should be written within the framework of Activity 1.1.3 of the Climate Change Action Plan as follows: 1.1.3.1- Research on the possibility of the rehabilitation of hydropower plants; 1.1.3.2- Rehabilitation of existing hydropower plants.	It will help to increase energy efficiency in existing hydropower plants and, as a result, the use of renewable energy sources, which will have a positive impact on reducing greenhouse gas emissions.	Research on the possibility of the rehabilitation of hydropower plants; Rehabilitation of existing hydropower plants; Promoting equal involvement of women and men is desirable in both activities.	Ministry of Environmental Protection and Agriculture Ministry of Economy and Sustainable Development	Research on the possibility of rehabilitating existing hydropower plants will help attract investment in the renewable energy generation sub-sector.
An item should be added in the energy efficiency sub-section of the NECP document: Implementation of energy efficiency measures in electricity and natural gas distribution networks.	Implementing energy efficiency measures in distribution networks will reduce losses and have a positive impact on greenhouse gas emissions.	Implementation of energy efficiency measures in electricity distribution networks; Promoting equal involvement of women and men in energy efficiency measures.	Ministry of Economy and Sustainable Development Georgian National Energy and Water Supply Regulatory Commission	Attracting investment in the energy transmission sector.
A study on the advisability of using local renewable energy sources for the development of heating and cooling infrastructure should be added to the list of measures under the Heating and Cooling Infrastructure Development of the NECP document and possible specific measures should be developed for the development of heating and cooling infrastructure based on existing studies.	It will reduce dependence on imported fossil fuels (natural gas) and will also facilitate the use of renewable energy sources which will have a positive impact on reducing greenhouse gas emissions.	Conducting a feasibility study on the use of local renewable energy sources for the development of heating and cooling infrastructure. Ensuring equal involvement of women and men.	Ministry of Economy and Sustainable Development Ministry of Environmental Protection and Agriculture	Research on renewable energy sources will help attract investment in the energy sector.


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Recommendations

Incorporation of Climate Mainstreaming in Sector Development Political Documents

Health Sector

TBILISI I NOVEMBER, 2021

ევროკავშირი საქართველოსთვის

Project funded by the European Union

#EU4Climate

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Incorporation of Climate Mainstreaming Recommendations in Sector Development Political Documents

Health Sector

Tbilisi
2021, November

Content

Foreword

This document was prepared by the NGO Environment and Development under the EU-4Climate initiative funded by the European Union (EU) and implemented by the United Nations Development Programme (UNDP). It supports countries in implementing the Paris Climate Agreement and improving climate policies and legislation. Its ambition is to limit the effects of climate change and make local communities more resilient. It will assist the Eastern Partnership countries to integrate low carbon and climate resilient development objectives into policies and plans, to improve the implementation of the Paris Agreement and support legislative alignment.

The project is a sub-component of the EU-4Climate project and aims to assist the UNDP and the Ministry of Environmental Protection and Agriculture of Georgia in identifying priority directions in the energy, agriculture and health sectors by mainstreaming climate change issues and developing specific sectoral recommendations and guidelines for addressing climate change issues based on these identified and agreed priorities.

One of the main tasks of the project is to review and analyze national policy documents, strategies, programs, development plans and legislative and regulatory framework documents and identify priority directions in the health sector for developing recommendations vis-à-vis addressing climate change issues in the sectoral planning process.

Introduction and Key Findings

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01 Introduction and Key Findings

Climate change has a negative impact on human health; however, the factors causing this impact are mainly beyond the health sector and fall under the direct responsibility of sectors such as energy, agriculture, infrastructure and transport, etc. Consequently, in order for the policies pursued in these sectors to be in line with human health interests, it is important that the connection between health and climate change and the state measures to respond to it are clearly set out in state policy – the National Health Care Strategy. This document currently is in the process of development.

Moreover, in order to provide better information and leadership to high-level health care professionals, it is important to expand their capabilities.

> ***In the process of adaptation to climate change, a number of measures should be implemented in the health sector:***
>
> 1. Management of diseases related to climate change;
> 2. Responding to natural disasters related to climate change and extreme meteorological changes in terms of human health protection;
> 3. Improving the qualification of medical service providers (staff);
> 4. Improving the readiness of medical service providers (institutions) and the system;
> 5. Monitoring health status and risk factors related to climate change and creating scientific evidence
> 6. Reducing the share of climate change on the part of the medical sector.

It should be noted that the development and implementation of state policy in these areas require both strategic leadership (which is reflected in the National Health Strategy) and the allocation of relevant resources, including financial resources. The allocation of resources for the implementation of the policy set by the state is reflected in the medium-term planning document and it is important that this document also prioritizes measures related to climate change in the health sector.

Women and men have different sensitivities to climate change risks. Accordingly, the integration of gender issues should be considered in policy documents and a number of measures.

Detailed Analysis of Selected Documents

02 Detailed Analysis of Selected Documents

A number of target documents were selected within the work process in order to raise the issue of climate change in the health sector, in particular:

- A national health strategy that is in the process of development and reflects the priorities within the sector as well as the state priorities in this area;
- The National Environment and Health Action Plan (NEHAP) which is currently in force and expires in 2022. The document is in line with international policy declarations in the field and outlines measures on climate change;
- The Country's Basic Data and Directions Document (BDD), which is approved annually, and its development is ensured by the executive branch under the leadership of the Ministry of Finance within the state budget cycle. The document outlines the program priorities and defines the ways to implement them. The document is the basis for allocating program funding from the state budget once submitted.

The table below shows the assessment of these documents in terms of international and national obligations / legislation and identifies the responsible structure.

Document	Compliance with International Obligations	Compliance with National Legislation	Executing / Implementing Structure
National Health Strategy (in the process of development)	Document is in the process of development.	Document is in the process of development.	Ministry of Internally Displaced Persons from the Occupied Territories, Labor, Health and Social Affairs of Georgia
National Environment and Health Action Plan (NEHAP)	Document is in line with international policy declarations.	Document is in line with local legislation; however, it is important that the necessary human and financial forces are mobilized for the implementation of the measures envisaged by the document.	National Centre for Disease Control
Country's Basic Data and Directions Document (BDD) The same as the medium-term planning document	Georgia has not taken any specific financial obligations.	The document does not reflect the relevant financial obligations.	Ministry of Internally Displaced Persons from the Occupied Territories, Labor, Health and Social Affairs of Georgia and Ministry of Finance of Georgia

Incorporation of Climate Mainstreaming Recommendations
in Sector Development Political Documents

Recommendations for Climate Change Mainstreaming

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03 Recommendations for Climate Change Mainstreaming

As a result of reviewing the documents and consulting with experts, several priority issues were identified to address the issue of climate change in the health sector and the kinds of changes to be implemented in these documents were determined. In particular, these issues include:

- Reflection of the issue of climate change in the national health strategy which is under development;
- Finding financial resources for climate change adaptation measures in health care and
- Finding financial resources from the state budget for the implementation of measures envisaged by the NEHAP.

Document	Context of Inconsistency	Specific Recommendation
1. National Health Strategy	The document does not exist.	The document is in the process of development.
2. Country's Basic Data and Directions Document (BDD)	Defined and planned activities related to climate change are not reflected in the health sector at this stage (e.g., NEHAP activities)	Defining as a program priority and allocating appropriate funding.
3. NEHAP	Unfavorable pace of implementation of the measures defined by the NEHAP. After the expiration of the action period of the existing plan, it is unclear how this direction will be defined and continue to work.	Mobilization of resources for the implementation of the activities envisaged in the action plan.

Detailed Description of Recommendations and Action Plan / Actions for Their Implementation

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04 Detailed Description of Recommendations and Action Plan / Actions for Their Implementation

Six recommendations have been developed for the climate mainstreaming process. In particular:

1. Prioritization of the climate change issue in the process of developing a health sector strategy;
2. Improvement of the supervising of diseases and risk factors related to climate change and collecting scientific evidence on the impact of climate change on human health;
3. Increasing readiness for a timely response;
4. Increasing the qualifications and resources of medical staff;
5. Increasing the capacity of high-level representatives of the health sector;
6. Creating relevant (economic) evidence for resource mobilization and investment.

The aforementioned recommendations should address the gender issues which mainly includes the equal participation of women and men in activities, their equal involvement in capacity-building activities and their equal access to the use of mobilized resources. It is desirable to take into account gender specificities (climate change impact and disease manifestation characteristics in women and men) in the process of creating health surveillance and scientific evidence so that gender inequalities related to climate change are better reflected in future activities.

The actions required and the expected results for the implementation of each of the recommendations are outlined in the table below. Additionally, it also identifies the responsible structure and key risks and assumptions.

#	რეკომენდაცია	შესაძლო შედეგი (პრობლემაზე ორიენტირებული)	რისკები / დაშვებები	კონკრეტული ქმედებები / ღონისძიებები	პასუხის-მგებელი სტრუქტურა
1.	Climate change should be prioritized in the process of developing a health sector strategy; Working draft of the strategy includes climate change as one of the key challenges for public health; And High-level representatives of the health sector can advocate for the interests of the health sector in other sectoral policy documents.	High-level strategic / policy prioritization of climate change ensures: 1. Proper reflection of the impact of climate change on public health in various sectoral documents; 2. Planning specific measures needed in the field of health in the direction of climate change and mobilization of relevant resources; Top management in health care has the relevant information and qualifications to address health and climate change issues in a variety of sectoral policies.	Assumption: The National Health Strategy, based on regional and global practices and health priorities, will envisage climate change issues as one of the key public health challenges and include actions to respond to the challenge; Assumption / Risk: Low participation in information meetings; High work flow levels in high-ranking individuals and public servants. Low level of attention to the issues related to climate change from the health sector policy-making given other competing priorities and obligations.	Collaborate with the National Health Strategy working group on drafting sections of the document on climate change; Organize information meetings / workshops with the involvement of international organizations and experts for health sector policy-makers.	Government of Georgia Ministry of Internally Displaced Persons from the Occupied Territories, Labor, Health and Social Affairs of Georgia
2.	Improve surveillance and risk factor monitoring for climate change related health conditions And Collect / generate evidence on the impact of climate change on human health; And Define respective obligations in the statute of the NCDC.	Routine disease surveillance and risk factor monitoring systems integrate monitoring of health conditions and risk factors related to climate change; Knowledge and evidence will increase.	Low priority of activities; Scarce funding.	Develop methodology and maintain a monitoring system; Assure routine reporting of surveillance and monitoring data on the impact of climate change on human health; Define climate change as one of the priorities for scientific / operational research priorities; Implement / finance relevant research projects and ensure equal participation of women and men.	NCDC

3	Increase readiness for timely response; Increase the qualifications and capabilities of medical staff on climate change and its impact on human health.	Readiness and capabilities to respond in a timely and appropriate manner to reduce harm to human health, including among primary care physicians, is increased.	Low interest.	Develop protocols for identifying and responding to emergencies and emergency medical services for the dangers posed by climate change such as: sharp rise in temperature, sharp drop in temperature, natural disasters caused by excessive rainfall and others (considering the specifics of the impact of climate change on women and men).	NCDC Ministry of Internally Displaced Persons from the Occupied Territories, Labor, Health and Social Affairs of Georgia
4	Create relevant (economic) evidence for resource mobilization and investment; No such assessment / research has been conducted in Georgia; Medium Term Planning Document (BDD).	Resources (including financial) are mobilized in climate change direction in order to fund and implement priority issues in the health sector.	One-quarter of global deaths are related to environmental factors, including changes that occur under the influence of climate change; Consequently, an investment that reduces or better explores these risks is often justified; The basic assumption is that the information needed to make such an assessment will be available; The main risk is that the implementation of the research will be delayed due to a lack of financial resources and a lack of relevant qualifications.	Study to assess the economic impact of climate change on human health integrating the gender component (taking into account the different impacts of climate change on women and men); Within the study, it is important to determine the burden of morbidity and mortality due to climate change and make an economic assessment of this burden.	Ministry of Internally Displaced Persons from the Occupied Territories, Labor, Health and Social Affairs of Georgia

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