Concept Note

Project/Programme Title:	**Green Hub – Waste to Energy (Biofuel production in Georgia)**	
Country(ies):	**Georgia**	
National Designated Authority(ies) (NDA):	**Ministry of Environmental Protection and Agricultura (MEPA)**	impo
Accredited Entity(ies) (AE):	**Ltd "Biodiesel Georgia" (project-specific accreditation)**	
Date of first submission/ version number:	*[YYYY-MM-DD] [V.0]*	
Date of current submission/ version number	*[YYYY-MM-DD] [V.0]*	

GREEN CLIMATE FUND

Please submit the completed form to **fundingproposal@gcfund.org**, using the following name convention in the subject line and file name:
"CN-[Accredited Entity or Country]-YYYYMMDD"

Notes

- The maximum number of pages should **not exceed 12 pages**, excluding annexes. Proposals exceeding the prescribed length will not be assessed within the indicative service standard time of 30 days.
- As per the Information Disclosure Policy, the concept note, and additional documents provided to the Secretariat can be disclosed unless marked by the Accredited Entity(ies) (or NDAs) as confidential.
- The relevant National Designated Authority(ies) will be informed by the Secretariat of the concept note upon receipt.
- NDA can also submit the concept note directly with or without an identified accredited entity at this stage. In this case, they can leave blank the section related to the accredited entity. The Secretariat will inform the accredited entity(ies) nominated by the NDA, if any.
- Accredited Entities and/or NDAs are encouraged to submit a Concept Note before making a request for project preparation support from the Project Preparation Facility (PPF).
- Further information on GCF concept note preparation can be found on GCF website Funding Projects Fine Print.

A. Project/Programme Summary (max. 1 page)			
A.1. Project or programme	☒ Project ☐ Programme	**A.2. Public or private sector**	☐ Public sector ☒ Private sector
A.3. Is the CN submitted in response to an RFP?	Yes ☐ No ☒ If yes, specify the RFP: _____	**A.4. Confidentiality[1]**	☒ Confidential ☐ Not confidential
A.5. Indicate the result areas for the project/programme	Mitigation: Reduced emissions from: ☒ Energy access and power generation ☒ Low emission transport ☒ Buildings, cities and industries and appliances ☐ Forestry and land use Adaptation: Increased resilience of: ☐ Most vulnerable people and communities ☒ Health and well-being, and food and water security ☐ Infrastructure and built environment. ☐ Ecosystem and ecosystem services		
A.6. Estimated mitigation impact (tCO2eq over lifespan)	1.2 million tCO2eq (only from biodiesel production scale up. Solar power generation and biogas is not taken into consideration at this stage)	**A.7. Estimated adaptation impact (number of direct beneficiaries and % of population)**	N/A
A.8. Indicative total project cost (GCF + co-finance)	Amount: USD 10 million	**A.9. Indicative GCF funding requested**	Amount: USD 8.5 million
A.10. Mark the type of financial instrument requested for the GCF funding	☒ Grant ☐ Reimbursable grant ☐ Guarantees ☐ Equity ☒ Subordinated loan ☐ Senior Loan ☐ Other: specify_____		
A.11. Estimated duration of project/ programme:	a) disbursement period: 3 years b) repayment period, if applicable: 10 years	**A.12. Estimated project/ Programme lifespan**	20 years
A.13. Is funding from the Project Preparation Facility requested?[2]	Yes ☒ No ☐ Other support received ☐ If so, by who:	**A.14. ESS category[3]**	☐ A or I-1 ☐ B or I-2 ☒ C or I-3
A.15. Is the CN aligned with your accreditation standard?	Yes ☒ No ☐	**A.16. Has the CN been shared with the NDA?**	Yes ☒ No ☐
A.17. AMA signed (if submitted by AE)	Yes ☐ No ☒ If no, specify the status of AMA negotiations and expected date of signing: This is private sector which is interested to get the project specific accreditation	**A.18. Is the CN included in the Entity Work Programme?**	Yes ☒ No ☐
A.19. Project/Programme rationale, objectives and approach of programme/project (max 100 words)	Brief summary of the problem statement and climate rationale, objective and selected implementation approach, including the executing entity(ies) and other implementing partners. This CN considers scaling up biofuel production from food and agricultural waste. LLC "Biodiesel Georgia"[4], established in 2018 in the same year, started production of		

[1] Concept notes (or sections of) not marked as confidential may be published in accordance with the Information Disclosure Policy (Decision B.12/35) and the Review of the Initial Proposal Approval Process (Decision B.17/18).
[2] See here for access to project preparation support request template and guidelines
[3] Refer to the Fund's environmental and social safeguards (Decision B.07/02)
[4] www.biodiesel.ge

	biodiesel from used cooking oil (UCO). Currently, the company produces 1,000 t of biodiesel annually. “Biodiesel Georgia” plans to scale up this business to 35,000 t/a by 2030 and pilot biogas production from livestock manure and food waste in case it gets support in conducting feasibility studies for the biogas production and establishing zero emission “Green Hub- Waste to Energy” with the potential to reach in nearest future regional level of its activities. In addition to producing biofuel, “Biodiesel Georgia” claims and plans to be a zero-emission private business producing and using only carbon-free energy. “Biodiesel Georgia” for producing biodiesel has close cooperation and partnership with local farmers producing grains (wheat, maize, etc.) throughout Georgia contributing with this to sustainable management agricultural arable lands helping farmers in growing/producing rapeseeds for biodiesel oil production. “Biodiesel Georgia” provides to farmers technical expertise and make with them wholesale contracts. Seeding rapeseeds in years when the land should be restored from grain cultures negative impact could improve the land quality and contributes to the GHGs reduction.

B. Project/Programme Information (max. 8 pages)

B.1. Context and baseline (max. 2 pages)

Describe the climate vulnerabilities and impacts, GHG emissions profile, and mitigation and adaptation needs that the prospective intervention is envisaged to address.
Please indicate how the project fits in with the country's national priorities and its full ownership of the concept. Is the project/programme directly contributing to the country's INDC/NDC or national climate strategies or other plans such as NAMAs, NAPs or equivalent? If so, please describe which priorities identified in these documents the proposed project is aiming to address and/or improve.

According to the latest official national GHG inventory of 2017, transport sector emissions had the highest (23%) share in the country's total emissions. And by 2030, without taking measures to reduce emissions, a significant increase in emissions from this sector is expected; however, in case of taking measures, this sector has the highest potential for reducing greenhouse gases. According to the Georgian Climate Change Strategy 2030 and Action Plan 2021-2023 (CSAP) and the National Integrated Energy and Climate Plan (NECP) of Georgia, 41% of the total emission reductions come from this sector.

The purpose of increasing the scale of biofuel (biodiesel, biogas) production technologies is to reduce GHG emissions from transport and household waste sectors in Georgia, and thereby contribute to the fulfilment of the country's commitments under international agreements. Pursuant to the decision of the United Nations Framework Convention on Climate Change (UNFCCC), Georgia submitted its NDC document to the UNFCCC, according to which the country plans to reduce GHG emissions in the transport sector by 15% compared to baseline projections by 2030, and to promote low-emission development of the waste sector by introducing modern climate-friendly technologies in the sector.

Georgia's 2030 Climate Strategy and 2021-2023 Action Plan include the production and sale of biodiesel by gradually increasing the proportion of biodiesel in the blends: in particular, the gradual increase in the use and sale of B5, i.e. 5% biodiesel and 95% petrodiesel blend and B7, i.e. 7% biodiesel and 93% petrodiesel blend.

According to this plan, if the measure is implemented, the direct effect of mitigation will be the reduction of GHG emissions by 39 GgCO2-eq by 2030.

The National Integrated Energy and Climate Plan of Georgia talks directly about B10 fuel, with 10% proportion of biodiesel. According to the plan, the share of biodiesel in the total consumption of diesel-powered transport should be 4% by 2030 and 12% by 2050.

In reality, Biodiesel Georgia LLC started its production in 2018 and was selling B3 blend at first, then B5, and finally the B10 blend. This took place before the COVID-19 pandemic. Since the spring of 2020, due to some flaws in the Georgian legislation which imposed double taxation on the private sector, Biodiesel LLC started exporting its products to Europe. Currently, almost the entire amount of production, about 1,000 t per year, goes to Europe, and a very small amount of B100 biodiesel (100% undiluted (pure) biodiesel) remains in Georgia. Thus, very minor emissions are saved currently in Georgia through biodiesel production.

As for biogas production from household livestock waste, with the 2030 Climate Action Plan, emissions in this sector should be less than 1,850 GgCO2-eq. Of this, less than 840 GgCO2-eq from landfills. No specific commitment expressed in percentages has been included for this sector, as no relevant technologies have been introduced in the country and the potential has not been studied.

In the National Integrated Energy and Climate Plan of Georgia, reduction commitments are distributed among the closed old landfills, which must be closed by 2024, and the new landfills, which must be operated with low emissions.

These biofuel technologies are related to the Georgia-EU Association Agreement, which includes supporting the implementation of Directive 2009/28/EC (encouraging the use of renewable energy). This direction is in line with the Sustainable Development Goals: SDG 3 (health and well-being), SDG 7 (affordable and clean energy) and SDG 11 (safe and sustainable cities and settlements).

Describe the main root causes and barriers (social, gender, fiscal, regulatory, technological, financial, ecological, institutional, etc.) that need to be addressed.

In the process of ensuring increase of biofuel production, it is important to consider and address the following barriers:
Legal and Regulatory
- Unfavourable tax approach, because - adding biodiesel as a 10% additive to mineral diesel is considered as fuel production for tax purposes and subject to re-taxation
- The existing legislation prohibits the secondary use of used food oils as food, including in livestock and poultry farming, however, this law cannot be properly enforced in Georgia, and therefore livestock-poultry production violates the law and competes with biodiesel production.
- According to the legislation of Georgia, it is prohibited to import UCO into Georgia, which prevents the growth of biodiesel production.
- Biodiesel production requires additional research for product certification and quality assurance, which does not allow the private sector to rapidly expand production, making initial capital more expensive and operating costs due to high risks.
- Technical-economic feasibility of biogas production technology has not been studied in Georgia. The production of such large-scale research imposes an additional cost on the private sector, making it more expensive for business and initial investment.
- There are no investors/financial institutions in the country that can provide favourable/promoting investments for biogas production (e.g. cheap loans, free or discounted consulting services, etc.)
Institutional and organizational capabilities.

Gender aspect of the CN. Solid biomass is still widely used in Georgia for cooking, which is heavily female task in Georgia as in themost of the world, and so are the negative impacts of burning biomass in traditional cook stoves, such as respiratory diseases and death. The gender dimension exists not only on the use side but also in how the biomass is produced. Women spanning generations are largely responsible for collecting and supplying their households with biomass used for cooking. These women and girls deserve a robust effort to improve their quality of life, offering them healthier option, which may be biofuel.
The CN considers women not only active end-users of biofuel, but also giving opportunities for female smallholders to participate in such innovations, capturing greater added value which can enable them to diversify activities, gain skills and confidence and understand the value chain better. Thus, capacity building support is likely to be needed to achieve women's participation and empowerment. Equipped with knowledge on new technologies and thus – empowered women will participate in 'green hub' activities, in laboratory work and definitely in the biogas production process, which are the ultimate components of the CN. New job opportunities will result in higher income and financial independence of women.

Where relevant, and particularly for private sector project/programme, please describe the key characteristics and dynamics of the sector or market in which the project/programme will operate.
This is only biodiesel producer in Georgia and in the region. Annual Import of biodiesel is increasing and in 2022 it was 500,000 t. Recent production of 1,000 t biodiesel/annually corresponds to 0.2% this imported in 2022 diesel. The project target value of production is 35,000t which is about 7% of 2022 import of mineral diesel. Georgia doesn't have an import of biodiesel.

B.2. Project/Programme description (max. 3 pages)

Describe the expected set of components/outputs and subcomponents/activities to address the above barriers identified that will lead to the expected outcomes.
This concept note consists of three components focused on removing barriers identified to Increasing the Biofuel (biodiesel and biogas) Production in Georgia:
Component 1. Biodiesel Georgia LLC has established a waste processing "Green Hub", where biodiesel is produced from UCO and rapeseed plants from current 1,000 t to increased 35,000 t per year, by providing the import of UCO from neighbouring countries.
Two outputs considered within this component are: 1.1. The regulatory environment necessary for the import, purchase, processing and sale of biofuel (biodiesel, biogas) raw materials and the development of this field in general is established and 1.2 "Green Hub" waste processing "Green Hub" has been established by "Biodiesel" LLC and the production of biodiesel from UCO and rapeseed has increased from the current 1,000 t to 35,000 t per year.
Activities for achieving the output 1.1 (Creation of legal and regulatory environment for biofuel production in Georgia) are:
1.1.1. Actively work with legislative and executive structures regarding double taxation of biodiesel production to create a favourable/encouraging legislative environment for biofuel production.
1.1.2. Consideration of the possibility of importing used oil and other types of household waste from other countries of the region for the purpose of biofuel production and granting a permit by the state under certain regulations, taking into account the full responsibility of the producer.
1.1.3. Effective implementation of monitoring on the regulation of used oils.
Activities for achieving the output 1.2 (Increasing the capacities of the Green Hub) are:
Activity 1.2.1 Construction and arrangement of the Green Hub building
Activity 1.2.2 Assembling a new biodiesel production line

Activity 1.2.3. Installation of a 1.5 MW solar photovoltaic system on the roof of the hub
Activity 1.2.4. Promotion/expansion of rapeseed production in Georgia
Activity 1.2.5. Piloting the process of collecting UCO from the population"

Component 2. In order to ensure the quality of biofuel, a corresponding high-quality laboratory has been established and accredited, and electronic vehicle distribution/collection park is created
Output considered within this component is 2.1 "Green Hub" is provided with a high-quality certified laboratory to ensure fuel quality and a fleet of e-cars
Activities for achieving the output 2.1 (Ensuring the quality of fuel and electricity, vehicles) are:
Activity 2.1. Setting up and accrediting the laboratory necessary for ensuring the quality and certification of biofuel
Activity 2.2. E-vehicel fleet purchase for own needs (for collecting used oils and other waste.)

Component 3. Production of biogas from organic waste and cattle manure is operating in Georgia. Biogass is used in Biodiesel Georgia's vehicles and production facility.
Outputs considered within this component are 3.1 The technical-economic feasibility of biogas production in Georgia has been studied and 10-20 kW. Biogas production piloted and 3.2 The capacity of the biogas plant has been increased to 50-100 kW and information campaigns are being conducted by "Biodiesel Georgia" to increase the demand for biofuel.

Activities for achieving the output 3.1 (Piloting of biogas production technology) are:
Activity 3.1.1. Studying the feasibility of setting up a biogas plant
Activity 3.1.2. Piloting a small biogas plant (10-20 kW) based on the results of technical and economic feasibility
Activities for achieving the output 3.2 (Starting biogas production and ensuring readiness of the biofuel market) are:
3.2.1. Establishing the necessary regulations for biogas production in the process of technical and economic study and ensuring the process with the necessary regulations
3.2.2. Start of 50-100 kW biogas production (this component depends on activity 3.1.2)
3.2.3 Conducting an information campaign for broad sections of society about the advantages of biofuel (biodiesel, biogas)

In terms of rationale, please describe the theory of change and provide information on how it serves to shift the development pathway toward a more low-emissions and/or climate resilient direction, in line with the Fund's goals and objectives.
If the private sector producing biofuels has access to preferential finance and technical assistance, which will eliminate financial, professional and market-related barriers, and at the same time the biofuel production sector is provided with a sound legislative and regulatory environment conducive to private business for the production of biofuels (biodiesel, biogas), then the greenhouse gas emissions will be significantly reduced. Gas emissions from the consumption of carbon-containing fuels and at the same time will reduce the country's energy dependence on fossil fuels in the transport sector. (see Logframe)

Describe how activities in the proposal are consistent with national regulatory and legal framework, if applicable.
There are some regulatory barriers hindering the scale up of the business and its contribution to the reduction of GHGs from the transportation sector though the private sector and government are in close partnership to remove these barriers to reduction of GHGs and support local business.

Describe in what way the Accredited Entity(ies) is well placed to undertake the planned activities and what will be the implementation arrangements with the executing entity(ies) and implementing partners.
LLC "Biodiesel Georgia" is ready to apply for the project-specific accreditation. This entity independently started up this biodiesel production business, which was initially piloted at Illia State University (in Georgia) with the support of the USAID programme (technology experts also got on-job training in the US through the USAID programme). The target of this potential AE is to the maximum realization of Waste2Energy concept and demonstration in the region of zero-emission private business.
Please provide a brief overview of the key financial and operational risks and any mitigation measures identified at this stage.

Selected Risk Factor 1: Availability of Raw Materials (supply risk)		
Category	Probability	Impact
Operational	High	Medium
Description		
There are several factors that can lead to a failure to ensure biofuel production with the planed amount of primary raw material in Georgia, specifically focusing on biodiesel from used cooking oil and rapeseed or other crops, as well as biogas:		

Insufficient Collection Infrastructure: Inadequate collection infrastructure for used cooking oil and crop residues including rapeseed can pose a significant challenge in ensuring the planned amount of primary raw material for biofuel production. If there is a lack of efficient and organized systems for collecting used cooking oil and crop residues from various sources, such as households, restaurants, and agricultural fields (rapeseeds), it can result in a limited supply of feedstock for biodiesel and accordingly limited biogas production.

Limited Availability of Used Cooking Oil: The availability of used cooking oil as a feedstock for biodiesel production depends on cooking oil consumption in households, food service establishments, and other sources. Factors such as changing dietary habits, cooking practices, or improper disposal of used cooking oil can impact its availability. If there is a shortage of used cooking oil due to reduced consumption or improper collection/disposal methods, it can lead to a failure in ensuring the planned amount of primary raw material for biodiesel production.

Crop Yield Fluctuations: The production of biodiesel from crops, such as oilseeds, requires a consistent and sufficient supply of feedstock. Fluctuations in crop yields due to factors like unfavorable weather conditions, pests and diseases can lead to a shortage of primary raw materials. Insufficient crop yields can disrupt the steady supply of feedstock for biodiesel production, impacting the overall production capacity.

Mitigation Measure(s)

Addressing these challenges requires a multi-faceted approach involving collaborations among stakeholders, supportive policies and regulations, investments in collection infrastructure, awareness campaigns for used cooking oil disposal, and promoting sustainable feedstock cultivation practices. It is important to create an enabling business management environment that ensures a consistent and sufficient supply of primary raw materials for biodiesel and biogas production in Georgia.
To address these issues Activity 1.2.4. Promotion/expansion of rapeseed production in Georgia and Activity 1.2.5. Piloting the process of collecting UCO from the population are planned.

Selected Risk Factor 2: Increasing Cost of Raw Material

Category	Probability	Impact
Financial	Medium	Medium

Description

An increase in the price of raw material for biofuel production, specifically biodiesel from used cooking oil and rapeseed or other crops, can pose several risks for a company in Georgia. These risks include:

Cost Inflation: If the price of raw materials, such as used cooking oil or crops, experiences a significant increase, it can result in cost inflation for the biofuel production company. Higher raw material cost has direct impact on the production costs, potentially reducing profit margins and making the biofuel less competitive in the market.

Reduced Profitability: Increasing raw material prices without a corresponding increase in the selling price of biofuels can lead to reduced profitability for the company. If the production costs rise substantially while the market price remains relatively stable, the company may struggle to maintain profitability or experience decreased profit margins.
Uncertain Market Conditions: A sudden increase in raw material prices can create uncertainty in the biofuel market. Companies may face challenges in forecasting and planning due to volatile pricing. Fluctuating prices can make it difficult to secure long-term contracts or establish stable pricing agreements with customers, leading to market instability and potential financial risks.
Supply Chain Disruptions: Higher raw material prices can disrupt the supply chain for biofuel production. Suppliers may struggle to meet the increased demand or adjust their pricing, leading to potential shortages or delays in raw material delivery. This can affect the company's production capacity and ability to fulfill customer orders, impacting its reputation and market position.

Reduced Competitiveness: If the cost of raw materials for biofuel production rises significantly, the final product may become less competitive compared to conventional fossil fuels or alternative renewable energy sources. If the price of biofuel surpasses the price of traditional fuels, it may deter potential customers from adopting biofuels, affecting market demand and the company's market share.
Reliance on Imported Raw Materials: In the case of a reliance on imported raw materials for biofuel production, an increase in global raw material prices can further compound the risks. Currency fluctuations, trade restrictions, or supply disruptions in the global market can significantly impact the availability and cost of imported raw materials, potentially hindering production and increasing the company's vulnerability to external factors.

Mitigation Measure(s)

Mitigating these risks requires proactive measures, including:

Diversifying the raw material sources: The company can explore alternative feedstocks or establish partnerships with multiple suppliers to reduce dependence on a single source and mitigate the impact of price fluctuations.
Investing in research and development: The company can focus on improving production efficiency and exploring innovative technologies to reduce the raw material requirements or identify more cost-effective feedstocks.
Hedging strategies: Implementing risk management strategies such as futures contracts or hedging mechanisms can help mitigate the impact of price volatility by locking in raw material prices at more favorable rates.
Long-term supply agreements: Establishing long-term contracts with suppliers can provide stability and ensure a consistent supply of raw materials at predictable prices, reducing the vulnerability to short-term price fluctuations.
Government support: Engaging with relevant government bodies to advocate for supportive policies and incentives that promote sustainable feedstock cultivation and stabilize raw material prices can help mitigate risks and provide a conducive environment for biofuel production.
It is important to closely monitor market trends, stay updated on raw material pricing, and develop comprehensive risk management strategies to navigate potential challenges associated with an increase in raw material prices.

Selected Risk Factor 3: Regulatory Environment		
Category	Probability	Impact
Regulatory	Medium	Medium
Description		
This risk is related to the existing regulatory barriers detailed within the CN: double taxation of biodiesel production due to blending process considered as new business activity; weak implementation enforcement (monitoring) of low restricting the use of used cooking oil in poultry/livestock feeding process; and existing restriction on waste import in Georgia.		
Mitigation Measure(s)		
"Biodiesel Georgia" (potential AE, EE) is in active consultations with the responsible governmental structures to make existing regulations more flexible and supportive to this important for GHGs reduction activity and development of local small and medium business in green energy sector.		

B.3. Expected project results aligned with the GCF investment criteria (max. 3 pages)

The GCF is directed to make a significant and ambitious contribution to the global efforts towards attaining the goals set by the international community to combat climate change, and promoting the paradigm shift towards low-emission and climate-resilient development pathways by limiting or reducing greenhouse gas emissions and adapting to the impacts of climate change.
Provide an estimate of the expected impacts aligned with the GCF investment criteria: impact potential, paradigm shift, sustainable development, needs of recipients, country ownership, and efficiency and effectiveness.

Impact Potential

From the perspective of GHGs reduction, the estimated reduction for the project lifespan is 1,246,080 tCO2eq (1t biodiesel saves 2.64 tCO2eq.). It should be highlighted that GHGs reduction due to 1.5 MW photovoltaics and biogas production and consumption is not calculated at this CN stage.

Recent production of 1,000 t biodiesel/annually corresponds to 0.2% of average annual consumption of diesel fuel (500,000 t/a in 2022). The project target value of production is 35,000t biodiesel annually which is about 7% of consumption in 2022 but this couldn't be achieved by 2030. In most desirable scenario assuming that the project starts in 2024, maximum 15,000 t biodiesel will be available in 2030 which is 0.3% of 2022 consumption. According to the planned activities the first 35,000 t/a could be achieved in 2033 and it will be 7% of 2022 consumption. Of course, consumption in 2033 will be different/higher but it could be assumed with high probability that for 2030 a 35,000 t biodiesel will be about 4% of total consumption of diesel fuel.
The impact potential directly depends on the project starting date. Impact potential of the CN should be considered significant as it has potential to reduce by 30.5% transport sector emission level (4,143 Gg) in 2017.

Sustainable Development

This private sector committed to make its business near zero-emission green business consuming self-generated renewable energy and continue to explore new options for waste to energy solutions.
Successful implementation of project will directly contribute to the achievement of the following SDGs:
- SDG 3: Target 3.9 **By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination** - reduced impact of air pollution from diesel consumption; reduction of air, water and soil pollution and contamination by disposal of used cooking oil.
- SDG 7. Target 7.2 **By 2030, increase substantially the share of renewable energy in the global energy mix** – Renewable energy will be one of the major outputs of the project – biodiesel. In addition, the project will provide increased used renewable energy by utilizing solar energy for power generation for production uses.

- SDG 8. Target 8.3 **Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services** – The project will provide small business development and creation of 50 jobs in the sector of waste collection, logistics, production and distribution and value chain development, which will contribute to economic growth in locations of waste generation.
- SDG 9: Target 9.3 **Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets** – The project will enable Biodiesel Georgia LLC to gain access to affordable finances and achieve increased integration into value chains.
- Target 9.4 - **By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities** – The Project will enable waste recycling industry to gain sustainability, use renewable energy for production and increase resource-use efficiency by recovery of sources (diesel) from waste.
- Target 9.5 – **Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending** – Establishing an innovative laboratory will upgrade the technological capabilities of recycling in the industrial sector.
- Target 9.b- **Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities** – The laboratory for biofuels will provide support for research and development of waste to energy solutions in the country.
- SDG 12: Target 12.4 - **By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment** – Project involves recycling of waste materials (used cooking oil, used mineral oil) that otherwise would be released into air, water and soil through disposal or contaminates the atmosphere by inefficient combustion.
- Target 12.5 - **By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse** – Project will provide recycling of 36 000 t/a of UCO.

Needs of the recipient

The financial capacities of both the public and private sectors of Georgia are ineffective and the terms and conditions they offer are insufficient to lay the foundation and support the Waste Recycling Hub "Waste to Energy", despite the declared waste management being one of the priorities of the Government of Georgia.

High interest on local bank loans in Georgia and risks perceived by these banks for such businesses are very high and they create a financial barrier to a successful implementation of waste recycling business.

Another barrier to launching waste to energy business is that there are no suitable laboratory services available locally, which hinders production of high-quality biofuels and their certification.

The regulations of the country related to production and realization of biofuels, namely biodiesel, should be adjusted to the country needs and get harmonized with the regulations of the EU, with which Georgia has signed an association agreement.

Country Ownership

This concept note was developed within Georgia's Technology Needs Assessment (TNA) Project, financed by GCF through UNEP (AE) and CTCN and implemented through local partner "Sustainable Development Center - Remissia".

Waste sector: Over the years, the waste sector in Georgia has experienced a slow but steady growth and it is expected to continue this trend in the future. According to the National Waste Management Strategy and Action Plan, moving towards reducing and recycling is Georgia's long-term vision for the waste sector. Georgia's legislation introduces a five-step hierarchy system: a) waste prevention; b) preparation for reusing; c) recycling; d) other types of recovery; and e) disposal. Recycling is the basis of the concept note. In recent years, adequate waste management has become one of the country's priorities. In 2016 Georgia adopted the Waste Management National Strategy and its Action Plan in compliance with the Waste Management Code and relevant directives envisaged under the EU-Georgia Association Agreement.

One of the national mitigation priorities reported in the *GCF Country Programme (2021)* in the result area - "Buildings, cities and appliances" is "Sustainable waste management and waste-to-energy approaches". This concept note "Green Recycling Hub Waste2Energy" is directly aligned with these priority areas as it provides waste-to-energy solution. Activity 5.2.2 of the GCF country programme plans to "Develop cost-benefit analysis and feasibility study to identify best options in which manure management systems can be implemented". Feasibility study for manure management and for generating biogas from this waste is a part of this CN. Waste management and waste to energy activities are also prioritized in the National Energy and Climate Integrated Action Plan (NECP) as well as conducting of feasibility study to identify the best way for management of this energy source.

The waste sector and manure management in agriculture sector are also priority areas for the following policies and strategies of the country: Georgia´s 2030 Climate Change Strategy and action plan and Georgia´s Long-Term Low Emission Development Strategy.
Transport sector: According to NDC by 2030, Georgia plans to mitigate the GHG emissions from the transport sector by 15% from the reference level. Production of biodiesel (from UCO and rapeseeds oil) and biogas (from manure) could significantly contribute to fulfilment of this commitment. In accordance with the „Georgia's Energy and Climate Integrated Plan (2023 Draft)", activity RE-6: commits that by 2030, 4% should be the biodiesel share in total diesel consumption in Georgia and this share should reach 12% by 2050. The "Climate Change Strategy of 2030 and 2021-2023 action plan also confirms these targets which should be reached in a phase approach starting from B5 blend, followed by B7 blend, though it should be reported here that "Biodiesel Georgia" already produces B10 blend.
Good evidence of country ownership of this project is involvement into the project initiation of local scientists (in development of production processes) and local business. The two leading universities of Georgia Ilia State University[5] and Tbilisi State University[6] provide scientific support to Biodiesel Georgia LLC. The scientists of these universities work on quality assurance and technology development of biodiesel produced on the plant of Biodiesel Georgia LLC. The students from these universities get practical training and do their research under the guidance of the university professors. The CEO and the Scientific advisor of Biodiesel Georgia LLC have been working with the parliament of Georgia to develop the relevant regulations related to the production of alternative renewable biofuels in Georgia.

Efficiency and Effectiveness. The project is expected to deliver about 1.7 MtCO2eq of GHG emission reductions over a 15-year period. The efficiency metrics that will be delivered by this project intervention were estimated as follows:

(a) Total project financing = USD 10.0 million;

(b) Requested GCF amount = USD 8.5 million;

(c) Expected lifetime emission reductions = 1.2 MtCO2eq;

(d) Estimated cost per tonne of carbon dioxide

equivalent (tCO2eq) ((d) = (a)/(c)) = USD 8.3 /tCO2eq;

(e) Estimated GCF cost per tCO2eq removed ((e) = (b)/(c)) = USD 7.08/tCO2eq. GCF total; GCF costs based on grant amount USD 1.6/tCO2eq.

Effect of this CN anticipated to be particularly high in waste management sector, implementing in Georgia food and agricultural waste recycling technologies.
The FP leverages 15% of total project costs from the private sector to start up the new business producing biogas.

B.4. Engagement among the NDA, AE, and/or other relevant stakeholders in the country (max ½ page)

Please describe how engagement among the NDA, AE and/or other relevant stakeholders in the country has taken place and what further engagement will be undertaken as the concept is developed into a funding proposal.

The Ministry of Environment Protection and Agriculture (MEPA) is the GCF DNA in Georgia. The key decision making body on Climate Change issues established in Georgia in 2020 is the Climate Change Council (CCC) which is chaired by the prime Minister of Georgia. The Secretary to the Council is the Department of Environment and Climate Change. Almost 3 years, since 2020, „Biodiesel Georgia" has been involved in close partnership with the NDA. The concept note was developed within the TNA process.
„Biodiesel Georgia" LLC was established in 2018 as pioneer of biodiesel production in Georgia and the whole region of the South Caucasus: company implemented innovative technology, launched a biodiesel plant, and started the production of clean, renewable, environmentally friendly fuel – biodiesel.
Since then the plant has been operating successfully, constantly increasing production. Company is ready to get the project specific accreditation for implementation of this project. The same company will be EE for the project implementation.
Stakeholder involvement in preparation of this CN was very broad including representatives of NDA and other decision making structures, representatives of universities, farmers and other private sectors. Monitoring of the results will be carried out by the AE itself based on the monitoring plan agreed with the secretariat.

C. Indicative Financing/Cost Information (max. 3 pages)

C.1. Financing by components (max ½ page)

Please provide an estimate of the total cost per component/output and disaggregate by source of financing.

	Indicative cost	GCF financing	Co-financing

[5] https://iliauni.edu.ge/en/
[6] https://www.tsu.ge/en

Component/Output	(USD)	Amount (USD)	Financial Instrument	Amount (USD)	Financial Instrument	Name of Institutions
Component 1	6.5 million	6.5 million	loan			
Component 2	1.0 million	1.0 million	grant			
Component 3	2.5 million	1.0 million	grant	1.5 million	Co-investment	Ltd "Biodiesel Georgia"
Indicative total cost (USD)	10 million	8.5 million		1.5 million		

For private sector proposal, provide an overview (diagram) of the proposed financing structure.

C.2. Justification of GCF funding request (max. 1 page)

Explain why the Project/ Programme requires GCF funding, i.e. explaining why this is not financed by the public and/ or private sector(s) of the country.

Activity described in the CN is production/transfer/distribution of innovative, waste recycling, low-emission fuel production technologies offered by private sector. Such high-risk activity usually could be financed through following financial options: investments provided by the local banking sector as commercial loan, provided by international donors/programmes as concessional targeted investment, provided by the government as concessional targeted loan (e.g. to contribute to the fulfilment of commitments, small-grants for capacity building, or other type of programmes from the government targeting specifically similar activities, or private/own money of entrepreneur.

Describe alternative funding options for the same activities being proposed in the Concept Note, including an analysis of the barriers for the potential beneficiaries to access to finance and the constraints of public and private sources of funding.

Three scenarios are considered in cost-benefit analysis (CBA) of the project:

- **Baseline scenario**. Under this scenario the private sector doesn't have access to concession loans or grants, and it invests its own capital in financing all activities considered by the CN. The CBA result of this scenario is negative NPV (-3.2 million GEL) for 15 years CBA period. This situation is not comparable to the biofuel import business which have 910,000 GEL annual profit and 13.3 million GEL annual profit if the initial capital assumes 5 million GEL.
- **For the same scenario** and period, the project IRR =10.2%, while WACC =12.35%. The project IRR should be higher than 12.35% for getting any profit, while the project IRR in baseline scenario equals to 10.2%.
- Commercial loan was considered as an alternative to baseline scenario with interest rate 14.85% in GEL. For the same 15-year period the project IRR is the same 10.2%, while the WACC =15.37% and NPV equals -7.3 mln GEL. Losses are doubled due to the commercial loan rate paid by the project.
- **Third scenario** considers concessional loan with 5% rate in GEL and 5 mln GEL grant for activities not having direct income and having high risks (establishment of laboratory for ensuring the quality of biofuel, conducting feasibility studies and piloting biogas generation process). For this scenario the project IRR=12.7%, and 9.6 years required for the loan payback and NPV eauls 12.2 mln GEL for the 15 years, which is significantly low than alternative business of import.

Alternative option. As the alternative business opportunity to production of biofuel from waste the CN considers importing biodiesel, as Georgia is traditionally fuel importer country. Simplified calculations are presented here for assessment of the pros and cons of import against local production. If these 35,000 tons of biodiesel will be imported per year with minimum net profit 10 USD per ton, that makes 350 000 USD profit per year and for 15 years profit will be 5,100,000 USD (13,3 mln GEL).

Justify the rationale and level of concessionality of the GCF financial instrument(s) as well as how this will be passed on to the end-users and beneficiaries. Justify why this is the minimum required to make the investment viable and most efficient considering the incremental cost or risk premium of the Project/ Programme (refer to Decisions B.12/17; B.10/03; and B.09/04 for more details). The justification for grants and reimbursable grants is mandatory.

Concessionality to final beneficiaries is ??.

In the case of private sector proposal, concessional terms should be minimized and justified as per the Guiding principles applicable to the private sector operations (Decision B.05/07).

C.3. Sustainability and replicability of the project (exit strategy) (max. 1 page)

Please explain how the project/programme sustainability will be ensured in the long run and how this will be monitored, after the project/programme is implemented with support from the GCF and other sources.

Sustainability of the project will be achieved though economic feasibility and profit-oriented operation of the biodiesel production and market trends in Georgian energy (incl. fuel) markets: increasing prices of fossil fuels, growing demand for energy, country-wide consensus on maximum reduction of dependence on imported energy. Considering these trends high demand of biodiesel and other products produced by the Hub expected to be increased which should ensure long-term sustainability of the Hub operation.
It is important to take into consideration high demand for biofuel from neighboring countries including the EU markets. Sustainability also will be supported by the country's commitment to reducing GHGs emissions (Paris Agreement, climate action plan that includes biodiesel production and consumption).
The AE and EE will take full responsibility on monitoring and evaluating the achieved results as well as reporting through assessment of production and sales reports of the company, survey of consumers, etc. A detailed monitoring plan will be developed for the full proposal.

For non-grant instruments, explain how the capital invested will be repaid and over what duration of time.

Concessional loan asked by the AE will be paid back according to the conditions and requirements/schedule agreed with the GCF Secretariat. CBA is calculated for 10 years for loan repayment.

D. Supporting documents submitted (OPTIONAL)

- ☐ Map indicating the location of the project/programme
- ☒ Diagram of the theory of change
- ☒ Economic and financial model with key assumptions and potential stressed scenarios
- ☐ Pre-feasibility study
- ☐ Evaluation report of previous project
- ☐ Results of environmental and social risk screening

Self-awareness check boxes

Are you aware that the full Funding Proposal and Annexes will require these documents? Yes ☒ No ☐

- Feasibility Study
- Environmental and social impact assessment or environmental and social management framework
- Stakeholder consultations at national and project level implementation including with indigenous people if relevant
- Gender assessment and action plan
- Operations and maintenance plan if relevant
- Loan or grant operation manual as appropriate
- Co-financing commitment letters

Are you aware that a funding proposal from an accredited entity without a signed AMA will be reviewed but not sent to the Board for consideration? Yes ☒ No ☐

Theory of Change