UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

SUSTAINABLE DEVELOPMENT GOALS

Project Implementation Report

(1 July 2022 – 30 June 2023)

Project Title:	*Sustainable use of biomass to assist the development of Türkiye's economy towards green growth*
GEF ID:	*9218*
UNIDO ID:	*140325*
GEF Replenishment Cycle:	*GEF-6*
Country(ies):	*Türkiye*
Region:	*ECA - Europe and Central Asia*
GEF Focal Area:	*Climate Change Mitigation (CCM)*
Integrated Approach Pilot (IAP) Programs[1]:	*N/A*
Stand-alone / Child Project:	*Stand alone*
Implementing Department/Division:	*ENE / ESI*
Co-Implementing Agency:	*N/A*
Executing Agency(ies):	*UNIDO, Ministry of Agriculture and Forestry MoAF/TAGEM)*
Project Type:	*Full-Sized Project (FSP)*
Project Duration:	*60 months*
Extension(s):	*1*
GEF Project Financing:	*4,416,210 USD*
Agency Fee:	*419,540 USD*
Co-financing Amount:	*29,598,880 USD*
Date of CEO Endorsement/Approval:	1/3/2018
UNIDO Approval Date:	1/25/2017
Actual Implementation Start:	3/6/2018
Cumulative disbursement as of 30 June 2023:	*3,163,369.44 USD*

[1] Only for **GEF-6 projects**, if applicable

Mid-term Review (MTR) Date:	6/1/2021
Original Project Completion Date:	3/6/2023
Project Completion Date as reported in FY22:	6/30/2024
Current SAP Completion Date:	3/6/2024
Expected Project Completion Date:	6/30/2024
Expected Terminal Evaluation (TE) Date:	5/31/2024
Expected Financial Closure Date:	6/30/2025
UNIDO Project Manager[2]:	*Marco Matteini*

I. Brief description of project and status overview

Project Objective

The project objective is to trigger sectoral transformation through application of modern bio-energy technologies to improve overall energetic performance, increase competitiveness and reduce greenhouse gas emissions in agro-industry.

Project core indicators	*Expected at Endorsement / Approval Stage*
CO_2 emission reduced (tons of CO_{2eq}) due to new bioenergy projects	*4,280,000 metric tons (440,000 direct and 3,840,000 indirect)*
Energy generated from bioenergy technologies supported or promoted by project (in MWth)	*10 MW_{th}*
No. of new bioenergy projects	*5 bio-energy supply chains and 5 biomass energy technology applications*

Baseline

Currently Türkiye's energy consumption is increasing every year, and the country imports approximately 60% of its energy demands. To decrease its dependency on imported petroleum and natural gas, the country encourages electricity generation from renewable sources, which includes biomass (incl. landfill gas), hydropower, wind-power, geothermal and solar. By end of the 2022, There are 11,427 active power plants in Tükiye, and the total installed power is 103,809 megawatts (MW). Turkiye's total electricity installed capacity is expected to reach approximately 189,700 MW by the end of 2035 according to 2020-2035 Energy Scenario of T.C. Energy and Natural Sources Ministry. The installed capacity of biomass-waste value is only 1.9% of the total installed power. Agricultural waste forms the highest share (of 51%) of available biomass resources, with crop types like wheat, barley, tobacco, cotton, and rice. According to government studies, the theoretical potential for available agricultural waste (based on cultivated areas and remaining residues post-harvest) is at least theoretically more than 50 million tons per year (BEPA,2019), which is often burnt in open fields or are abandoned to decay. Detailed techno-economic

[2] Person responsible for report content

potentials of bio-energy per region and agro-industrial subsector are currently lacking. The theoretical potentials are known per region and the project (and PPG) will refine these data, using the opportunity of this project to drive economic development in less industrialized regions.

The project will build on the existing legal and regulatory framework in Türkiye which has been presenting several policies and measures for the fight against climate change particularly in development plans and also national plans, programs and strategy documents, especially in energy, agriculture, forestry, transportation, industry and waste sectors. Türkiye's main goal in the fight against climate change is the mitigation of GHG emissions. According to 2021 figures of GHG emissions, the energy sector ranks first among sectors emitting greenhouse gases (at 71%). Türkiye's strategy and policy is focused on providing energy security of supply through diversification in energy resources. An enhanced use of domestic and renewable energy resources is key to achieve this goal.

The project will strengthen the existing incentives, which the Government of Tükiye has been preparing and implementing, in order to accelerate the use of biomass resources with modern technology application.

Please refer to the explanatory note at the end of the document and select corresponding ratings for the current reporting period, i.e. FY23. Please also provide a short justification for the selected ratings for FY23.

In view of the GEF Secretariat's intent to start following the ability of projects to adopt the concept of adaptive management[3], Agencies are expected to closely monitor changes that occur from year to year and demonstrate that they are not simply implementing plans but modifying them in response to developments and circumstances or understanding. In order to facilitate with this assessment, please introduce the ratings as reported in the previous reporting cycle, i.e. FY22, in the last column.

Overall Ratings[4]	**FY23**	**FY22**
Global Environmental Objectives **(GEOs)** / Development Objectives **(DOs)** Rating	*Satisfactory (S)*	*Satisfactory (S)*
Mid-term review (MTR) from mid-2021 states that "The effectiveness of the project is reflected by its achievement at output and outcome levels (in terms of support provided for supply chain management of agricultural residues, bioenergy plants installations, and awareness-raising activities); so, it is clearly seen that all the activities identified in the project documents will be completed by the end of the project"		
Implementation Progress **(IP)** Rating	*Satisfactory (S)*	*Satisfactory (S)*
MTR reported that even though restricted working conditions during the Covid-19 outbreak, most of the project activities have been implemented as is planned, additionally training programs and promotional activities, were completed through online systems resulted in higher participations.		
Overall **Risk** Rating	*Low Risk (L)*	*Low Risk (L)*

[3] Adaptive management in the context of an intentional approach to decision-making and adjustments in response to new available information, evidence gathered from monitoring, evaluation or research, and experience acquired from implementation, to ensure that the goals of the activity are being reached efficiently

[4] Please refer to the explanatory note at the end of the document and assure that the indicated ratings correspond to the narrative of the report

Based on the evaluation findings risk identification and assesment has been done for project performance and progress towards results, management of project implementation and other cross cutting issues. Based on this evaluation overall project risk rating classified as low (source: MTR 2021).		

II. Targeted results and progress to-date

Please describe the progress made in achieving the outputs against key performance indicator's targets in the project's **M&E Plan/Log-Frame at the time of CEO Endorsement/Approval**. Please expand the table as needed.

Please fill in the below table or make a reference to any supporting documents that may be submitted as annexes to this report.

Project Strategy	KPIs/Indicators	Baseline	Target level	Progress to-date
Component 1 – Demonstration of modern bio-energy technologies and energy efficiency measures in the agro-industrial sector Outcome 1: Modern bio-energy technologies demonstrated and ready for scale-up				
Output 1.1.1: Modern bio-energy technologies demonstrated and ready for scale-up	No. of project ideas submitted for supply chain development No. of farmers/project investors interested in developing supply chain projects	N/A	30-50 applications expected by year 1. Out of these, 20 applications fitting to the criteria (incl. social and gender mainstreaming impact) most will be supported with business plan preparation by year 1 Participation from or by women in the project teams will be given extra points in the evaluation	The second call for proposals has been lunch, the received applications are evaluated based on the technical criteria and shortlisted. The result of this evaluation is decided to be announced on August 2022 at the project website www.surdurulebilirbiyokutle.org. The project is providing technical support to the most suitable projects. For the 2nd nationwide Call for proposals for biomass Supply chain projects, the following applications are received and their applications were approved: • Arıkan Mensucat San. Tic. A.Ş. /Kahramanmaraş , • Biowatt Geri Kazanım Enerji Üretim Sanayi ve Tic. A.Ş. Merkezefendi/Denizli , • Gate Sürdürülebilir Enerji A.Ş. Akhisar/Manisa, • H29 Solar Enerji Üretim Sanayi ve Ticaret Anonim Şirketi Salihli/Manisa, • Ulubey Elektrik Üretim ve Enerji Yatırımları A.Ş. Çine/Aydın,

				• İçelli İnş. Taah. San. Tic. Ltd. Şti./ Kahramanmaraş These companies' feasibility reports are currently being prepared. After the evaluation is completed by independent Experts, TAGEM and UNIDO, it will be officially decided on the companies which will be supported. National Technical Expert's has been contracted. The expert is developing feasibility studies, verification visits and conducting monitoring the companies.
Output 1.1.2: Modern bio-energy (and energy efficiency) technology applications in selected SME subsectors are prepared, with focus on process heat applications	No. of project ideas submitted for bio-energy project development No. of project investors interested in developing bio-energy projects	N/A	100-150 applications expected by year 1. Out of these, 50 applications to be supported with TA (special assessment with focus on thermal energy demand – by Q2, year 2.Out of the 50, 25 applications to be selected for further support (preparation of detailed feasibility study) – by end year 2	The evaluation by indepent the Independent Experts, TAGEM and UNIDO experts based on the technical criteria are ongoing. As a result of the evaluation, it will be officially decided which companies will be supported by the projects. National Technical Expert together with TAGEM experts have conducted site visits and stakeholders' interviews and collected energetic, environmental and financial data to assess the feasibility of the projects
Output 1.1.3: Linkage with existing financing instruments established for an accelerated scale-up across agro-industrial subsectors	No. of projects qualifying against the call criteria and becoming eligible for TA support provided	N/A	10 biomass supply chain projects to receive further technical, financial and business development support (by Q2, year 3)12 bio-energy technology projects to be made bankable (by Q2, year 3	Financial expert and TAGEM served technical, financial and business development support for all applicant demonstration projects for the 2nd call companies will be implemented in 3rd and 4th quarter of 2023. It will be implemented as done for the 1st call. The financial expert will contact the national and international financial banks, investment and leasing firms to discuss about the indicators for the bankability of bioenergy projects, received further information on the special deals for renewable energies and green investments
Output 1.1.4: Five sustainable bio-energy supply chains and five innovative and highly replicable technology applications with an estimated total capacity of 10 MWth are realized and monitored for economic and energetic performance	No. of projects qualifying against the call criteria and becoming eligible for TA support provided	N/A		The project has assisted biomass supply chain project (Yapılcanlar). As a result, of the site visits grant support of 200.000 USD is approved. Payment processing in progress The project has already supported the following pilot plants so far. The continuous monitoring of these pilot plants are conducted:

				Mimsan –Supply Cain Company; 190.000.00 USD grant support completed. Monitoring process is in progress. TRE- Supply Chain Company; 200.000.00 USD grant support completed. Monitoring process is in progress. BGB-Supply Chain Company; 272.788.35 USD grant support completed. Monitoring process is in progress. BGB –biomass Energy Company; 434.400.00 USD grant support completed. Monitoring process is in progress Mey- Energy Company; Equipment purchases of the company are monitored. Dinar- Energy Company; The first part of the company's grant support was completed (50.000 USD). Second tranche grant support is in progress. Biyomek- Energy Company; The first part of the grant support was completed (90.000USD). The second part of the support is evaluated as the company has made their purchases.
Component 2 – Refined policy and regulatory framework to enable transformation across sub-sectors				
Outcome 2: Policy and regulatory environment is fine-tined to enable scale-up of bio-energy plants				
Output 2.1.1: Sectoral policies, plans, programs, associate legislative and regulatory instruments are analysed and tailored recommendations for improvement are developed	Appropriate policy and regulatory framework for bio-energy development developed and enforced. Guidelines for sustainable crop management are developed OPTIONAL: Support mechanism for biomass supply chains put in place	Missing policy, guidelines for sustainable crop management (amount of residues to remain in fields)	Guidelines for sustainable crop management regulations and policies(amount of residues to remain in fields)Developing sustainable crop management guidelines materials (handbook, brochure) for farmers Support mechanism for development of biomass supply chains developed and adopted (by end year 5) by cooperating with MoFAL (higher support for the projects with higher social and gender mainstreaming impact)	For the first package of activities on the development and improvement of the legislative infrastructure, studies and negotiations were conducted to carry out a legal gap analysis at international standards and to prepare the work to be done in partnership with the private sector, public, and university. A legal Gap analysis was prepared. A draft regulation related to biomass has been prepared. This draft regulation contains revising the definition of biological wastes versus resources/residues (based on agricultural residues), update of a set of sustainability indicators and recommendations concerning the amount of residues that should be left on the fields, development of a monitoring system at a local level to measure the sustainability of biomass extraction, and monitoring of any adverse environmental effects. Meetings were held with financial sector stakeholders and a draft regulation has been formed.

Output 2.1.2: Policies and programs to integrate heat from biomass	Guidelines, policy and regulatory framework for thermal utilization including district heating and cooling of biomass developed and adopted.	Policy and regulatory framework for the thermal component of bio-energy systems (including district heating and cooling) developed and adopted (by Q3 year 3	Policy and regulatory framework for the thermal component of bio-energy systems (including district heating and cooling) developed and adopted (by Q3 year 3)	Output 2.1.2: Policies and programs to integrate heat from biomass and 2.1.3: Incentive programs and financing schemes for bioenergy promotion have already been completed by MENR before start of the project implementation. Thus, budget allocated for Output 2.1.2 and 2.1.3 were shifted to Mini Biogas project implemented by TEMSAN, MENR. The Mini Biogas Unit Project, carried out by the Ministry of Energy and Natural Resources with the task assigned to Türkiye Electromechanical Industry Inc. (TEMSAN), started in January 2019. The aim of the project is to develop a system that will enable people dealing with cattle farming in rural areas to produce biogas with the manure and use the produced biogas for cooking and hot water supply. For this purpose, TEMSAN has developed a Mini Biogas Unit with a volume of 1 m3, suitable for individual use that can be used by farmers having 1-3 cattle. It has been also planned to use the digestate as fertilizer which is an end product after anaerobic digestion process. The Mini Biogas Unit is tested by TEMSAN at General Directorate Campus. The effect of parameters such as temperature, type of waste, amount of organic matter in the waste, etc. on biogas production is examined; in addition to 14 pilot applications in Ankara and some villages. The cooperation with UNIDO initiated in December 2020 and two technical experts have been contracted by UNIDO in order to provide technical support to TEMSAN on the improvement of the biogas unit. The technical support completed in December 2022. Introductory video and animation film was made for Mini Biogas Unit project and it is displayed in social media and MoENR and TEMSAN websites as well. The outcomes of Mini Biogas Unit Project could provide valuable know-how to the Ministry of Agriculture and Forestry as it serves to create a new resource (manure) for energy production, to reduce GHG emissions through production of biogas from manure and utilization of this biogas for basic needs. Furthermore, under this component **Biomass Energy Potential Atlas (BEPA)**
Output 2.1.3. Incentive programs and financing schemes for bio-energy promotion	Bioenergy financing mechanism developed	Financial mechanism (incl. social and gender sensitive grant support, financial guarantee or ESCO) to replicate biomass energy projects in the future explored and developed (by end year 5	Financial mechanism (incl. social and gender sensitive grant support, financial guarantee or ESCO) to replicate biomass energy projects in the future explored and developed (by end year 5)	

				https://bepa.enerji.gov.tr/ web portal which is being operated by MoENR will be improved. . BEPA is a GIS application that shows the bioenergy potential in different regions of Türkiye, to produce how much electricity and how much biofuel from which biomass source with graphic and numerical expressions on the map. Biomass energy potential analysis can be performed on both provincial and district bases. However, BEPA needs to be strengthened to be more dynamic in line with the latest technology advancements and capable of responding to future technologies and more investment focused such as; - obtaining and calculating data through online current data web services up to parcel level - user interface with freely calculation tools - freely add new GIS tools to interface - shortest route analyses - calculations with area drawing - to be able to produce and download reports - strengthened with machine learning and artificial intelligence applications and features - image processing (it will also be used in product detection studies) - survey studies - the web portal needs to be user-friendly allowing potential investors to obtain data and produce easily, accurately and effectively - energy potential of each biomass (average value will be provided) - providing accurate energy potential (technical and economic) besides the theoretical energy potential (required energy related information will be provided) -see Box I below. Additional data from Ministry of Agriculture will be fed into the BEPA to enhanced the real-life accuracy of the biomass energy potential data.[5] The new dynamic portal will be operated by MoENR. In the improved version of BEPA, dynamic daily data will be used and it will ease to have more accurate and dynamic data for bioenergy potential in different regions of Türkiye.
Component 3 – Capacity base strengthened and awareness raising increased				
Output 3.1.1: Awareness on biomass technologies increased through the	Website hits and social media activities. Number of training	There are some technical universities and	A project website developed and social media platforms	Project website and social media accounts are being used actively. Unique posts are being prepared

[5] Manual of BEPA : https://bepa.enerji.gov.tr/KullanimKilavuzu.aspx

development of tailored knowledge products to facilitate technology transfer in the agro-industry	programs developed and organized Number of trained people at academic level Number of master and PhD thesis and academic papers Training course implemented Replication strategy developed	academic R&D institutions across the country, which focus on renewable energy technologies or agricultural resources research. However, specialized know-how for the development of specific business models on supply chain development and technical know-how on O&M, financing and implementation of bio-energy projects is lacking.	integrated (e.g. Facebook, Twitter) – by Q2 year 1)Energy monitoring concept (by year 1) and analysis report developed (by year 5)Five master students (50% female) and 2 PhD (50% female) candidates accompanied in developing theses on bio-energy resources related topics (by end year 3)Publications of 5 papers (50% by female researchers) and participation in 5 relevant conferences and symposia on project related topics (by end year 4)Implementation of 1 training course (50% female participants) at academic level during at least 2 semesters (by end year 5)Developing of a replication strategy (by end year 5)Organizing 2 national symposia (50% female participants)	based on the activities held. For instance, TUYAP, Konya Fair was participated and shared on Instagram account and Bursa and Erzurum Training Programs are shared on official website of the project, participation to CoEEE symposium in Sweden and Low Carbon Hero Award are shared on social media accounts. Posts will be continued on other social media accounts of the project. Energy monitoring concept has been started and other facilities are on progress. Formal letters have been sent to relevant universities prepared to choose 5 master students and 2 PhD candidates through co-financing from national stakeholders in the development of their theses about bio-energy potential from agricultural residues, supply chain development, heat integration into industrial processes, sustainable crop management, etc. Criteria is prepared for evaluations of the applications, applications are evaluated by 4 TAGEM experts, meetings were held to listen to the applicants and their projects in details. The 5 masters and 2 PhDs are selected for support, and their support is provided. Preparation for the 5th Bioenergy Studies Symposium has been going on. It will be held on January 2024.
Output 3.1.2: Capacity and knowledge of 50 decision makers in government and private sector are improved through 5 tailored workshops	Number of public and private sector stakeholders participating in trainings Number of trainings organized Number of specific awareness materials disseminated	At present there is less awareness, confidence and linkages among various stakeholders for bio-energy development and its benefits. There are no funding/legal commitments for bio-energy projects so far.	Information package (gender-sensitive) on bio-energy development and benefits for awareness creation and basic training developed (by Q2, year 1)5 x 2 days of decision makers awareness workshops (40% female participants delivered across the country (by end year 1)	Development of information package initiated for awareness creation and basic training is partially finished, and the rest is in progress. 3 decision-makers trainings were held during 2020 through tailored workshops and the tailored course materials were published in the project website to public access. No further activity in 2022-2023.
Output 3.1.3. Capacity building mechanism for O&M, technical and service roles is established to develop and retain skilled workforce for innovative bio-energy technologies in industry through training of 20 trainers and 550 engineers, technicians, governmental and financial stakeholders, in cooperation with technical partners through 15 workshops	Number of trained engineers and technical staff Number of trained government staff to remove regulatory/implementation barriers Number of trained financial sector stakeholders and executive officers Number of farmers participating in roadshows	N/A	Training of 20 trainers (2x3 days) (40% female participants) An on-site training for trainers to gain knowledge and exposure to international best practice (3 days) (40% female participants) Training of 450 engineers, technical staff at SME/industries (9 workshops x 2 days) across the country on O&M and design/operational issues concerning bio-	The training program of 450 technical staff is in progress. The program was decided to be held in 9 different cities with 50 participants. 5 workshops have been completed. The First Training was held in Konya on 24-25 June 2022 with the participation of 59 participants (12 female-47 male). The Second Training was held in Manisa on 16-17 December 2022 with the participation of 82 participants (27 female- 55 male). The Third Training was held in Ankara on 2-3 February 2023 with the participation of 58 participants (20 female- 38 male). The Fourth

			energy plants. (30% female participants) Training of 50 government staff (2x2 days) on bio-energy utilization and regulatory aspects/barrier removal. (50% female participants) Training for 50 financial sector stakeholders and executing officers from industry (2x2 days) on risk assessment and financial support (50% female participants)Active participation of over 50 farmers trade shows, targeting over 5000 farmers. (25% female participants)	Training was held in Bursa with 53 participants (10 female-43 male). The Fifth Training was held in Erzurum with 74 participants (22 female-52 male) The total number of participants reached 326 (91 female).
Component 4- Project Monitoring and Evaluation (M&E)				
Output 4.1.1: A monitoring and evaluation plan will be prepared and carried out.	List of all progress reports prepared Mid-term and terminal evaluation conducted Number of project and steering committee meetings Number of dissemination materials	N/A	M&E Plan ready within 3 months of project start Mid-term evaluation completed by project mid-term Terminal evaluation completed by end of project closing time Project terminal report completed by end of project Dissemination materials ready by the end of project	TAGEM has submitted execution Progress Report
Output 4.1.2.: Technical performance of demonstration projects will be monitored and publicized	Monitoring reports of successfully implemented projects Report on lessons learnt	N/A	10 monitoring reports documenting successful project implementation of demonstrations Lessons learnt from the project drafted by Q2, year 5	Mid-term Review report has been finalized by Lead Evaluation Expert and Evaluation Expert recruited by UNIDO. The MTR was completed on December 2021.

III. Project Risk Management

1. Please indicate the overall project-level risks and the related risk management measures: (i) as identified in the CEO Endorsement document, and (ii) progress to-date. Please expand the table as needed.

	(i) Risks at CEO stage	**(i) Risk level FY 21**	**(i) Risk level FY 22**	**(i) Mitigation measures**	**(ii) Progress to-date**	**New defined risk[6]**

[6] New risk added in reporting period. Check only if applicable.

1	Regulatory framework risk: uncertainty in the application of legislation that incent renewable energy production	Moderate risk (M)	Moderate risk (M)	The incentive given for the energy to be obtained through biomass use is applied for ten years for those having production license subject to the Renewable Energy Law (REL) Support Mechanism that have commenced or will commence operation until 31/12/2015. However, in line with other developments, particularly the supply security, the amount, price and periods to be applied under this Law are determined by the Cabinet in a way to not exceed the prices in the Chart for production facilities with REL Certificate that will commence operation after 31/12/2015.	The mitigation measures situation is now as follows in the country: The incentive given for the energy to be obtained through biomass use is applied for ten years for those having production license subject to the Renewable Energy Law (REL) Support Mechanism that commenced until 31/12/2020. Update: This support mechanism was not extended by the government unfortunately The project is working on developing guidelines on using agricultural residues for energy production.	☐
2	No demonstrated projects in the country for bio-energy applications to produce heating/cooling for industrial energy users	Moderate risk (M)	Moderate risk (M)	Biomass technologies are state-of-the-art in many developing countries and energy produced from agricultural residues in the form of electricity, heating and cooling is a major contribution to sustainable development and lowering the country's energy imports in the long term. Technology know-how and successful business models will be used while implementing the project.	Still there is no demonstrated projects in the country for bio-energy applications to produce heating/cooling for industrial energy users. However, in the pre evaluation of the energy plants submissions, two candidates applied for heating process which are grant process. Update: The project supported several pilot projects on bioenergy applications and widespread knowledge on know-how among stakeholders	☐
3	Some bio-energy technologies and applications may not be technically/economically viable for energy generation.	Low risk (L)	Low risk (L)	The project focuses mainly on locally available resources and their use as a bio-energy fuel source within SME and industrial facilities. Assessments made during the PPG showed that the production of thermal energy would provide a major benefit for the predominantly fossil-fuel based industries, while additional income opportunities for local farmers utilizing their available residues would be generated.	The call for proposal guidelines indicates that the proposed projects must use locally available feedstock Update: The project decided to focus on viable bioenergy technologies such as biogas production through anaerobic digestion, biomass combustion and biomass gasification.	☐
4	Low awareness on biomass energy technologies may hinder the project development.	Low risk (L)	Low risk (L)	Building capacity and awareness raising among stakeholders on bio-energy technologies and their application has been already started during the PPG and will be further carried out as a special component (Component 3) during project implementation.	The risk is still valid. However, project team had chance to raise awareness among stakeholders on bio energy technologies in the awareness meetings that were held in 7 different cities in Türkiye. The awareness raising studies will continue in the following years as well.	☐

					Update: The project has conducted many capacity building and awareness raising activities in many different parts of the country.	
5	Entrepreneurs' lack of interest	Moderate risk (M)	Moderate risk (M)	Key stakeholders are currently not aware and do not have sufficient knowledge on the commercial use of biomass-to-energy. The competence of entrepreneurs as well as farmers and SME managers on bio-energy production and use will be enhanced by providing tailored awareness initiatives to strengthen the capacities. Entrepreneurs will be provided with technical assistance in the project development and assessing technical, economical feasibilities and develop bankable projects.	The competence of entrepreneurs as well as farmers and SME managers on bio-energy production and use has started to enhance by providing tailored awareness initiatives to strengthen the capacities by awareness raising meetings and one to one meetings. Entrepreneurs will be provided with technical assistance in the project development and assessing technical, economical feasibilities and develop bankable projects in the following years.	☐
6	Technology providers' lack of interest	Low risk (L)	Low risk (L)	Considering the targeted actors in the supply chain and hence biomass producers, it is seen that the lack of technical information concerning technological biomass practices is one of the barriers to the starting of technological investments. This project seeks to facilitate and promote private sector participation and new technologies for bio-energy thermal utilization and thus create new economic opportunities for the agro-industry as well as local technology providers. Hence, their interest to participate within demonstration projects shall be ensured (e.g. via the already practiced premium grant in case local technologies are used).	The risk is still valid due to worsening economic situation in the countr. Due to the unstable economic conditions in Türkiye, the targeted actors still have the lack of technical information concerning technological biomass practices is one of the barriers to the starting of technological investments.	☐
7	Financial/credit constraints and high capital cost that prevent the private sector from investing in bio-energy projects	Low risk (L)	Low risk (L)	The project focuses on productive uses where bio-energy use (mainly heating/cooling, in addition to electricity production) can demonstrate real economic benefits and new value chains to encourage private sector participation. Selected business cases and demonstration projects will provide technical assistance to properly design, finance, and bio-energy applications that will contribute to increased confidence in the technical reliability of the technologies. Creation of a	The risk is still valid due to worsening economic situation in the country. However, a financial expert and TAGEM served technical, financial and business development support for all applicant demonstration projects being 12 supply chain and 9 energy plant (14 different firms in total, as some has applied for both for supply chain and energy plant support). The financial expert has contacted the national and international financial banks, investment and leasing firms to discuss about the indicators for the bankability of bioenergy projects, received	☐

				linkage with relevant financing schemes currently existing in the country will be ensured throughout the project by organizing financing roundtables with relevant stakeholders from the banking sector, private entrepreneurs and government.	further information on the special deals for renewable energies and green investments. Prepared a general guideline for any bioenergy firm to benefit while applying for credits and loans for their investments; delivered tailored presentations and feedback to each demonstration applicant in separate meetings.	
8	Insufficiency of available financial mechanisms	Modest risk (M)		It is very difficult for project sponsors to secure supply of biomass on long term basis with contracts, while this is a requirement for financing. The project will develop standard contracts to enable the setup of a market for biomass and promote to supply biomass to the local industry through matchmaking activities UNIDO's best practice suggests that a limited triggering financing support (for instance as grant), combined with tailored technical assistance typically yields the best results. Loan Guarantee mechanism is going to be discussed under a dedicated Guarantee Facility as well as feasibility and advice to be developed under the project.	Project contacted with banks, possible local foundation sources and is now working to increase the available financial mechanisms. Moreover, under project a general guideline for any bioenergy firm to benefit while applying for credits and loans for their investments prepared; tailored presentations and feedback to each demonstration applicant in separate meetings delivered.	☐
9	The risk of raw material supply	Modest risk (M)	Modest risk (M)	Considering the large potential in existing biomass resources from agro-industrial waste streams, the partial use of these resources is not expected to have any impact on food production. Nevertheless, the biomass supply chain is so far in developing stage in the country and needs special focus and support mechanisms to enable farmers and agricultural companies to build up a local biomass fuel market. The project will promote the use of post-harvest agricultural wastes and byproducts and biomass residues generated in production processes in the agro-industry.	Project aimed to raise the awareness within the farmers about the large potential of existing biomass resources. In the pre evaluation phase of the potential projects, it is considered that there are potential projects for the use of post-harvest agricultural wastes and byproducts and biomass residues generated in production processes in agro-industry.	☐
10	Competition between agricultural production and energy use	Low risk (L)	Low risk (L)	Sustainable use of modern biomass and development of a set of sustainability indicators and recommendations concerning the amount of residues that should be left on the fields will be developed as part of	Within the project and calls for the energy plant and raw materials, sustainable use of modern biomass and development of a set of sustainability indicators and recommendations concerning the amount of residues that	☐

				the project, with reference to the Global Bioenergy Partnership; relevant standards and certification schemes will be applied in line with best international practice where necessary. Agricultural products for human consumption or animal feed will not be included in the project to ensure food supply safety. The targeted biomass sources are agricultural residues which are not utilized for any consumption, such as harvest or pruning leftovers.	should be left on the fields is promoted. Update: this risk remains very low since the project does not and will not support any energy crops business model.	
11	There could be a risk of resistance against, or lack of interest in, the project activities from stakeholders, especially with regard to the active promotion of gender equality; or low participation rates of suitable female candidates due to lack of interest, inadequate project activity or missing qualified female population within engineering sector.	Low risk (L)	Low risk (L)	To mitigate this risk the project will pursue thorough and gender responsive communication and ensure stakeholder involvement at all levels, with special regard to involving women and men, as well as CSOs and NGOs promoting sustainable agriculture practices and energy use, and a gender expert. This shall mitigate social and gender related risks, promote gender equality, create a culture of mutual acceptance, and maximize the potential contribution of the project to improving gender equality in the energy field.	As foreseen, within the project, social and gender related risks are mitigated, gender equality, create a culture of mutual acceptance is promoted, and potential contribution of the project to improving gender equality in the energy field is maximized with the involvement of NGOs, women cooperatives, gender balanced partners, stakeholders.	
12	Climate change could affect Türkiye's agricultural production	Low risk (L)	Low risk (L)	Increased drought periods (for instance in 2014) may affect the availability of biomass resources, both agriculture residues and livestock manure. During the project preparation phase, an assessment of the availability of resources based on different scenarios was carried out. As a result, it seems that the amount of untapped agricultural biomass potential available in the country is enormous and will not adversely affect the project implementation.	Since the amount of untapped agricultural biomass potential available in the country is enormous and currently will not expected to affect the project implementation. Update: As demonstrated during the prolonged heat waves in the summer of 2023 in Mediterranea and ever increasing global temperatures records, this climate risk remains valid as ever.	
13	Timely and full participation of governmental stakeholders may be limited from time to time due to frequently	Modest risk (M)	Modest risk (M) ,	TAGEM project team completely changed in January 2023. The project needed to allocate more resources to build	Timely and full participation of all government partners (local authorities, district departments of agriculture and	YES

	changing of project team members, shift of focus during national and local elections and other instable political issues.			connections with new senior and junior officials that are assigned. Internal knowledge transferred was limited.	education, etc.) will be ensured through active engagement at all stages of the project implementation, and careful planning of activities. In order to keep the momentum alive, Steering Committee will be used as a platform to bring all relevant stakeholders and partners together. If team members would be changed in time due to the elections, the connections will be rebuilt as soon as possible. The project will focus more on stakeholder partnerships to build connections with newly assigning senior official rotating in. Continuing with soft support and informal capacity building approach amongst various government entities and agencies will be needed.	
14	Private sector postpones and/or slows down some of the pipeline investments due to the worsening economic situation and financial landscape in Türkiye.			International and national economic recession, economic impact of the earthquakes and ongoing USD/Turkish Lira currency fluctuations effected private sector investments. In addition, an earthquake of 7.7 magnitude with the epicenter in the south-east of the country, struck Türkiye on 6 February 2023,	The project team will collaborate and continuously exchange knowledge and updates with the financial sector, bioenergy association, local development agencies and risk management experts where required to assess the most suitable customized strategies for mitigating financial risks associated with economic volatility and currency	YES

				followed by 3,858 aftershocks. Another earthquake of 7.6 magnitude occurred in the afternoon. The earthquakes came at the peak of winter and are considered as one of the largest earthquakes for centuries in the region. Before the earthquake, **13,5** million people (nearly **16** per cent of the total population) were living within impacted 10 provinces (Adana, Adıyaman, Diyarbakır, Gaziantep, Hatay, Kahramanmaraş, Kilis, Malatya, Osmaniye, Şanlıurfa). Lots of business, companies, industrial activities damaged. In Malatya, there was one of the pilot plants (MIMSAN) is affected from the earthquake as well.	fluctuations in technology demonstration projects. The project technical experts will extensively evaluate and incorporate financial risks due to worsening economic situation in feasibility studies as much as possible. The project will monitor potential risks and implications of the global economy as it may have significant effects through increased fuel costs and disrupted global supply chains. The international economic recession might also reduce the potential market size for some export commodities.	

2. If the project received a sub-optimal risk rating (H, S) in the previous reporting period, please state the actions taken since then to mitigate the relevant risks and improve the related risk rating. Please also elaborate on reasons that may have impeded any of the sub-optimal risk ratings from improving in the current reporting cycle; please indicate actions planned for the next reporting cycle to remediate this.

In the previous reporting period only low and medium level risks were reported and the level of the risks did not increase within this reporting period.

3. Please indicate any implication of the **COVID-19** pandemic on the progress of the project.

Covid-19 pandemic has caused enterprises of all sizes to cease business, at least temporarily, due to recommended or required workplace closures, or has reduced the level of business, with severe impacts on incomes and jobs. The economic impact of the crisis will cause these problems to linger on into the future.

A brief informal assessment has been conducted within the supply chain and energy plant project owners. They have been asked how they positioned, and their needs while and after pandemic. Only one of the 20 projects was withdrawn due to the pandemic. The other projects have responded as they have managed

their business in the COVID-19 crisis. The progress on project activities especially on technology investments are expected to delay due to COVID-19's economic impact on the businesses.

Some meetings with enterprises are conducted online or hybrid to mitigate the risk of transmission during pandemic but in July 2022-June2023 period all meetings are held face to face or hybrid.

4. Please clarify if the project is facing delays and is expected to request an **extension**.

Due to the COVID19 precautions, project management staff change for 6 times during the implementation and Türkiye's economic situation (USD/TRY currency fluctuation) caused delays in the implementation. Regarding these causes, executing agency TAGEM would like to extend the project until mid-2024.
Moreover, in the MTR recommendations it is mentioned as: "Even though capacity-building activities like training, workshops, support of academic research, etc, and energy-related regulatory studies have been completed as is planned the selection of the energy and supply chain plants was delayed due to the pandemic conditions. This also caused a delay in transferring allocated financial supports and consequently taking these plants into full operation. For that reason, the extension of the project will ensure to reach a reasonable conclusion on the impact and sustainability of the project by monitoring the performance and other influences of the installed plants." The PSC will discuss in the next PSC in Q4 2023, a potential need to extend the project.

5. Please provide the **main findings and recommendations of completed MTR**, and elaborate on any actions taken towards the recommendations included in the report.

The action towards the recommendations provided by the MTR are given in the table below in summary:

Project component/result	**Mid-term Review Recommendation**	**Proposed action**	**Responsibility**	**Priority**	**Progress**
Project activities	Revision of project activities to reflect the actual implementation of the project	Addition of the activities planned/realized to support Mini Biogas project Output 1.1.5	UNIDO+TAGEM *(Proposed Indicator: Number of pilot applications)*	1	Minor revisions of project activities are reflected on the PSC minutes (e.g., Mini biogas project, TA to BEPA atlas) and TAGEM progress reports. However, the project document itself is not revised as per GEF guidelines.
Outcome 2	Establishment of MoAF and MENR cooperation	Update of BEPA (Output 2.1.2)	TAGEM+MENR *(Proposed Indicator: Number of technical meetings to*	1	The project team ensured close collaboration between TAGEM and TEMSAN to work towards mutual goals

			ensure data exchange)		under the mini-biogas project. The entities assigned communication focal points.
Outcome 2	Estimation of biomass potential based on real agricultural production data	Development or design of a database for biomass by product and region (Output 2.1.3)	TAGEM *(Proposed Indicator: 1. Database for biomass potential by region and product* *2. List of Coefficients for biomass potential by product type)*	2	The project is providing technical assistance to enhance the capacities of Bioenery Atlas (BEPA) to provide more accurate biomass energy potential. All pilot companies have their own data tracking systems. Project Monitoring Team has prepared a monitoring excel table and monitoring team is requesting data from the companies quarterly. Moreover, monitoring visits are being done every 6 months.
Outcome 2	Clarification of the actions to be taken to complete guidelines for sustainable agricultural land and crop management	Establishment of a working group for preparation of guidelines for sustainable agricultural land and crop management	TAGEM	1	TAGEM is revising the guidelines based on the recommendation of MTR. It will be finished by September 2023.

Outcome 2	Inclusion of the project in the investment program implemented by SSB	Improved coordination and communication between MoAF and SSB	TAGEM + SSB	2	being negotiated between the parties.
Outcome 3	To strengthen partnership of the key stakeholders and improve their engagement	Regular updates on project activities through sharing project documents and create opportunities for collaboration. Inclusion of representatives of agricultural holdings and their associations in the project activities.	TAGEM+UNIDO *(Proposed Indicator: 1. Number of participants from agricultural holdings* 2. *Number of booklets and guidelines on biomass targeting agricultural holdings)*	1	Regular updates are being shared with stakeholders in the trainings. The project team has conducted several awareness raising activities to promote the project activities in particular trainings under Component 3 through social media and official communication channels.
Outcome 4	Development of a monitoring plan to track project implementation	A template for continuous monitoring of the activities will be prepared	UNIDO	1	An online document is being prepared and shared with all project team. This implementation plan is being discussed in weekly meetings.
Outcome 4	Consideration of time requirement for analysis of data in the final evaluation of the project	Preparatory phase of the final evaluation will start before the end of the project	UNIDO	2	Adequate time will be allowed for final evaluation.

IV. Environmental and Social Safeguards (ESS)

1. As part of the requirements for **projects from GEF-6 onwards**, and based on the screening as per the UNIDO Environmental and Social Safeguards Policies and Procedures (ESSPP), which category is the project?

☐ Category A project

☒ Category B project

☐ Category C project

(By selecting Category C, I confirm that the E&S risks of the project have not escalated to Category A or B).

Notes on new risks:

- *If new risks have been identified during implementation due to changes in, i.e. project design or context, these should also be listed in (ii) below.*
- *If these new/additional risks are related to Operational Safeguards # 2, 3, 5, 6, or 8, please consult with UNIDO GEF Coordination to discuss next steps.*
- *Please refer to the UNIDO Environmental and Social Safeguards Policies and Procedures (ESSPP) on how to report on E&S issues.*

Please expand the table as needed.

	E&S risk	**Mitigation measures undertaken during the reporting period**	**Monitoring methods and procedures used in the reporting period**
(i) Risks identified in ESMP at time of CEO Endorsement	Competition between agricultural production and energy use	Sustainable use of modern biomass and development of a set of sustainability indicators and recommendations concerning the amount of residues that should be left on the fields is being developed as part of the project, with reference to the Global Bioenergy Partnership; relevant standards and certification schemes will be applied in line with best international practice where necessary. TAGEM formed up a technical working group on this issue	Sustainable crop management – Regulations concerning the use of agricultural resources developed
	Involvement of additional agricultural activity The expansion of lands cultivated for energy agriculture into forest areas may contribute to soil erosion or ecological damage.	The expansion of surrounding agricultural lands monitored according to national regulations on forest, protected areas and any violations will be informed to authorities	Monitoring report to measure the sustainability of biomass extraction
	Effluent leakages and solid wastes during operation	The project evaluated the environmental management measures in the pilots plants several solutions to manage the effluents such as impermeable layers, tanks and pipes as well as constant underground water monitoring. The coolant will be evaporated. The flue gas washing water will be analyzed and	Site visits and monitoring of technology demonstration plants, Sampling where required

		discharged to the sewer line after treated to reach the regulatory limits. Recyclable waste will be separated to be sent to recycling bins. Other wastes will be disposed in such a way that they will not pollute the environment due to appearance, odor, dust, leaks or any other factors. The ashes of the combustion will be automatically collected in the ash collection silos as they are non-hazardous wastes. Silo-filled ash will be sent to cement factories as raw material.	
	Air emissions from combustion process during operation	The project team made sure that the pilot plants comply with the national air emissions standards	Site visits and monitoring of technology demonstration plants, Sampling where required
	Environmental impacts to the surroundings during construction (These impacts of air, soil, surface water and noise pollution caused by the construction equipment, machinery, soil excavation, and the large amounts of water and electricity usage are expected to be limited to the construction time and have only short term impacts on environment.)	The project team made sure that the pilot plants comply with the national environmental regulations	Monitoring of solid wastes and wastewater by technicians Noise measurement
	Major industrial accidents	Precaution measures will be taken against occupational safety (especially against fire) from the beginning of construction/ equipment purchasing phase. The pilot plants use protection equipment will be used	Report of emergency management plans, trainings, emergency drills
(ii) New risks identified during project implementation (if not applicable, please insert 'NA' in each box)			

V. Stakeholder Engagement

1. Using the previous reporting period as a basis, please provide information on **progress, challenges and outcomes** regarding engagement of stakeholders in the project (based on the Stakeholder Engagement Plan or equivalent document submitted at CEO Endorsement/Approval).

4th Steering committee meeting was held on 14 December with the participation of all stakeholders, UNIDO project staff and TAGEM colleagues. It was carried out online within the scope of COVID-19 Precautions.

TAGEM, continues to be the main executing partner of the project. The project team is conducting weekly meetings and has direct, efficient communication in place. Regarding their activities, TAGEM submitted the 11th and 12th progress reports during 1 July 2022 – 30 June 2023.

Within the project Biomass Energy Potential Atlas (BEPA) https://bepa.enerji.gov.tr/ web portal which is being operated by MoENR will be improved. BEPA is a GIS application that shows the bioenergy potential in different regions of Türkiye, to produce how much electricity and how much biofuel from which biomass source with graphic and numerical expressions on the map. Biomass energy potential analysis can be performed on both provincial and district bases. Data from Ministry of Agriculture and Foresty will be feed into the BEPA to enhanced the real-life accuracy of the biomass energy potential data. The new dynamic portal will be operated jointly by MoENR and TAGEM/Ministry of Agriculture and Forestry (MoAF). In the improved version of BEPA, dynamic daily data will be used and it will ease to have more accurate and dynamic data for bioenergy potential in different regions of Türkiye.

Private sector engagement ;

Progress and Outcome: The project is in continuous engagement with the selected agro-industrial enterprises and provide technical support and guidance on the investment. Project team is in close cooperation between both supply chain and energy plant sector experts.

*T*Verification of the machinery/equipment purchases by the project grant have begun. Details can be found below;

COMPANY	**GEF GRANT SUPPORT**	**STATUS**
Mimsan -Supply	$ 190.000.00	Completed
Yapılcanlar- Supply	$ 200.000.00	Grant support is approved. Payment processing in progress.
TRE- Supply	$ 200.000.00	Completed.
BGB Supply	$ 272.788.35	Completed, Monitoring has been initiated.
BGB Energy	$ 434.400.00	Completed, Monitoring has been initiated.
Mey Energy	$ 70.000.00	Equipment purchases of the company are being monitored and supported.
Dinar Energy	$ 70.000.00	The first part of the company's grant support is completed. Second part is pending

Biyomek Energy	$ 200.000.00	The first part of the company's grant support payment was completed. The second part of the support is evaluated as the company has made their purchases.

Moreover, During the support call, technical visits were conducted between September and November 2022 to firms whose applications were accepted. These visits aimed to assess their current situation and were documented in the previous report. Meetings were held with the firms during this period, and developments following the technical visits were monitored. Technical information necessary for the preliminary report was collected, evaluated by the teams from TAGEM and UNIDO, and preliminary evaluation reports were prepared for all the applying companies. Evaluation criteria were determined for the companies to be included in the support program, focusing on Energy and Supply, and scoring was carried out separately by the TAGEM and UNIDO teams. Two independent experts were selected to evaluate the Supply and Energy companies. Completed preliminary reports and company applications will be shared with the designated experts for scoring according to the established evaluation criteria. Feasibility studies for energy companies and business plans for supply companies are prepared. Here is the list of companies which are approved for technical support;

Shortlisted Energy Companies	Shortlisted Supply Companies
T.C. Çay İşletmeleri Genel Müdürlüğü/ Rize	*Arıkan Mensucat San. Tic. A.Ş. /Kahramanmaraş*
Mersin Elektrik Üretim Ve Enerji Yatırımları A.Ş. Ezine Biyokütle Enerji Santrali Ezine/Çanakkale	*Biowatt Geri Kazanım Enerji Üretim Sanayi ve Tic. A.Ş. Merkezefendi/Denizli*
İsmail Çakır İpsala/Edirne	*Gate Sürdürülebilir Enerji A.Ş. Akhisar/Manisa*
Altın Tarım Hayvancılık Soğuk Depo San. ve Tic. Ltd. Şti. /Çanakkale	*H29 Solar Enerji Üretim Sanayi ve Ticaret Anonim Şirketi Salihli/Manisa*
H29 Solar Enerji Üretim Sanayi ve Ticaret Anonim Şirketi Salihli/Manisa	*Ulubey Elektrik Üretim ve Enerji Yatırımları A.Ş. Çine/Aydın*
	İçelli İnş. Taah. San. Tic. Ltd. Şti./ Kahramanmaraş

2. Please provide any feedback submitted by national counterparts, GEF OFP, co-financiers, and other partners/stakeholders of the project (e.g. private sector, CSOs, NGOs, etc.).

General Directorate of Foreign Relations of the European Union of MoAF evaluated all the international funded projects under the Ministry and as a result Sustainable use of biomass to assist the development of Türkiye's economy towards green growth project ranked with highest evolution points. Team received good feedback from General Directorate of Foreign Relations of the European Union in 4th Steering Committee.

Moreover, as the project aims to reduce greenhouse gas emissions while increasing energy performance and competitiveness by triggering sectoral transformation with the applications of modern bioenergy technologies in the agricultural industry, Within the scope of the VIII Istanbul Carbon Summit, organized in collaboration with the Ministry of Environment, Urbanization and Climate Change, Istanbul Technical University, and the Sustainable Production and Consumption Association (SUT-D), the project received the

Low Carbon Hero Award on May 2, 2023.

3. Please provide any **relevant stakeholder consultation** documents.

- *9218_4th PSC Minutes*
- *9218_12th Progress Report (of TAGEM)*

VI. Gender Mainstreaming

1. Using the previous reporting period as a basis, please report on the **progress** achieved **on implementing gender-responsive measures** and **using gender-sensitive indicators,** as documented at CEO Endorsement/Approval (in the project results framework, gender action plan or equivalent),.

Gender-issue has been considered and thus equality between men and women was ensured within the project team as much as possible. However at the project level, it was more male-oriented and all the project coordinators were men. During implementation of project activities gender equality has also been applied. For example, around %30 of the trainers, moderators and participants were women at the trainings and symposiums held within the scope of the project. The number of female participants is being encouraged as well. Moreover, in the evaluation process of the companies applying for financial support, gender-issue was specified as a selection criterion, and therefore, the companies adopted equality policies became advantageous and received high scores.

"Risk and Financing in Biomass" Workshops and The Biomass Energy Journey Workshops started with the presentation of Ms. Ayşen Toksöz Ünalan and Olcay Işın titled "Gender Equality in the Energy Sector." and "Climate Change of Sustainable Biomass Project- Goals on Renewable Energy Axis and Gender Equality on the Path of Sectoral Development". In these presentations, both Experts talked about gender inequality in the social and energy sectors. Ms. Ayşen Toksöz Ünalan mentioned in her presentation that gender equality strengthens the industry and economy, and as a result, it reduces poverty and increases general welfare. Olcay Işın explained the goals of UNIDO and objectives, project activities, and carbon emissions reduced by project components and emphasized the importance that the project attaches to gender equality among its sustainable development goals. In particular, gender equality, which is the 5th article, and the 9th Sustainable Development Goal, establishing industry, innovation, and infrastructures, supporting inclusive and sustainable industrialization, and strengthening innovation were mentioned. Some programs are proposed to attract women to the energy sector.

Within the scope of the project, workshops on bioenergy efficiency and how to remove the legislative restrictions in bioenergy was held for 50 public officials, and gender equality was emphasized in this workshop and around 50% of female participants participated in each workshop.

Tagem also prepared a Gender Equality Pathway document with 30 volunteered staff and requested UNIDO to support them technically for further implementation of the Gender Equality Pathway within the scope of the project. UNIDO is now preparing a TOR for Gender Expert for further technical support to TAGEM.

Furthermore, the Mini Biogas introductory video and animation film has been made via taking into the account of gender equality norms. For example, both women and men were animated in the video and the video is vocalized by a woman vocalist.

VII. Knowledge Management

1. Using the previous reporting period as a basis, please elaborate on any **knowledge management activities / products**, as documented at CEO Endorsement / Approval.

CASE STUDY: Bolu Guc Birligi (https://www.industrialenergyaccelerator.org/turkey/case-study-bolu-guc-birligi/) Please find it attached.

Earlier CASE STUDY: Goknur Gida, The zero-waste fruit juice company reaping the benefits of biogas (https://www.industrialenergyaccelerator.org/turkey/the-zero-waste-fruit-juice-company-reaping-the-benefits-of-biogas/)

2023 International Conference on Renewable Energy and Environmental Engineering, Malmö, SWEDEN

Project Coordinators Dr. Şerafettin ÇAKAL, Suat YILMAZ, and Project Experts Muhammed GÖKALP and Özlem HAKYEMEZ from TAGEM participated in the "2023 International Conference on Renewable Energy and Environmental Engineering," held in Sweden through a collaboration between Shanghai Jiao Tong University in China and Malmö University. The symposium, which included participants from various countries, provided an opportunity for exchanging information and experiences among the participating countries and benefiting from the expertise of professionals in these fields. It was a productive program aimed at promoting the project. The project was introduced, and discussions were held with the participating countries to explore potential collaborations in the future.

Vienna Biogas Week- Vienna, AUSTRIA

"Vienna Biogas Week" was organized by UNIDO at the Vienna International Centre from June 12th to 15th, 2023, with the participation of 30 attendees from Tuürkiye, Germany, Brazil, Kenya, Zanzibar, and South Africa. Representing the project, the event was attended by UNIDO Türkiye Representative Süleyman YILMAZ, UNIDO Vienna Expert Önay GEYLAN, Director of Black Sea Research Institute Assoc. Prof. Dr. Kibar AK, Project Expert Berrak MEMİŞ, and Yavuz EKİNCİ from BGB Inc., one of the companies we support. Private Sector Representative Yavuz EKİNCİ from BGB made a presentation and discussed the chicken sector in Türkiye. Project Expert Berrak Memiş presented the project titled "Sustainable Use of Biomass to Assist the Development of Türkiye's Economy Towards Green Growth Project " introducing the ongoing project on an international platform. The presentation covered completed activities in the project so far and outlined the planned future steps. In addition to listening to other projects supported by UNIDO, there were exchanges of information regarding the necessary topics for the development of the biogas sector.

Academic Paper- "Biofuels in Türkiye and the Future"

The article titled " Biofuels in Türkiye and the Future " written with the contributions of TAGEM Project Expert Mustafa Acar from the Black Sea Research Institute and Ondokuz Mayıs University Faculty of Agriculture and Black Sea Agricultural Research Institute Samsun, has been prepared for publication in the Bioenergy Studies journal and is awaiting publication approval.

TUYAP-Konya Agriculture Fair

From March 5th to 9th, 2024, the 20th edition of the Konya Agriculture Fair, aimed at raising awareness about the project, was held. Project experts Kadir TERZİOĞLU, İhsan ÇETİN, and Ödül BEĞEN participated in the fair for two days.

The event took place in a total exhibition area of 90,000 square meters, with 66,000 square meters allocated for indoor exhibits and 24,000 square meters for outdoor exhibits. A total of 474 companies and representatives from 20 countries participated in the fair, which lasted for five days. There were 235,195

visitors from 90 countries and all 81 provinces of Türkiye

The Ministry of Agriculture and Forestry had a large booth at the fair. Within this booth, written and visual materials were placed by the project experts for the promotion of the project. Presentations on biomass and its applications were given to visitors, and their questions were answered. Additionally, companies related to the subject matter had booths at the fair and were visited. Meetings were held with the owners of firms that produce machines for processing forest and field waste to provide them with information about the project.

VIII Istanbul Carbon Summit- Low Carbon Hero Award

As the project aims to reduce greenhouse gas emissions while increasing energy performance and competitiveness by triggering sectoral transformation with the applications of modern bioenergy technologies in the agricultural industry, Within the scope of the VIII Istanbul Carbon Summit, organized in collaboration with the Ministry of Environment, Urbanization and Climate Change, Istanbul Technical University, and the Sustainable Production and Consumption Association (SUT-D), the project received the Low Carbon Hero Award on May 2, 2023.

IRENEC 2023-13th International Renewable Energy Conference-İSTANBUL

TAGEM Project Experts Siyami İlhan KÖKDEN, Ödül BEĞEN and Elif SİDAN participated in the 13th International Renewable Energy Conference (IRENEC 2023), held at Beykent University in İstanbul from May 4th-6th. They contributed to raising awareness by promoting the project during the conference, which served as a platform for presenting current activities in the field of renewable energy.

Sustainable Crop Management Report

Agricultural waste includes residues from farming, such as crop leftovers, animal manure, and other side products. Improper management leads to increased greenhouse gas emissions and environmental pollution. Crop residues can be converted into renewable energy sources or valuable fertilizers through biogas production or composting. Effective waste management is crucial for reducing environmental impacts and utilizing their potential. Under project component 2, "Sustainable Crop Management Report" has been prepared based on Türkiye's soil quality with agricultural residues and potential waste management methods emphasizes negative effects of crop burning.

Sustainable Crop Management Regulation Draft

The project aims to develop and update sustainability indicators and recommendations for the optimal management of agricultural residues in Türkiye. These indicators and recommendations will be adapted to different regions, crops, and climates within the country, while taking into consideration local regulations and guidelines. The project draws inspiration from the sustainability indicators published by the Global Bioenergy Partnership, which focus on bioenergy use. One of the key aspects of the project involves revising the definition of biological wastes versus resources/residues, specifically emphasizing agricultural residues. Under the second component of the project, a Daft Regulation has been prepared based on the sustainable crop management report, which will contribute to the project's development of environmental policies and specifications. By establishing clear percentage values and guidelines, the report aims to promote sustainable practices in residue management, reduce environmental impacts, and align with global sustainability standards. Ultimately, the report seeks to foster an understanding of agricultural residues as valuable resources contributing to a more sustainable and resource-efficient agricultural sector in Türkiye.

Sustainable Crop Management Booklet

Sustainable Crop Management Report has been compiled into a booklet to be used as a guideline in the agricultural sector. The booklet, which aims to provide guidance on sustainable bioenergy practices.

Sustainable Crop Management Leaflet

Sustainable Crop Management Report has been compiled into a leaflet to be used as a guideline for farmers. The Leaflet, which aims to provide general information for crop management on fields.

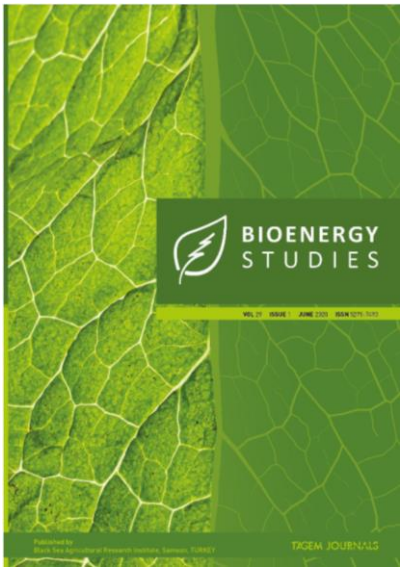
2. Please list any **relevant knowledge management mechanisms / tools** that the project has generated.

Project Website: www.surdurulebilirbiyokutle.org

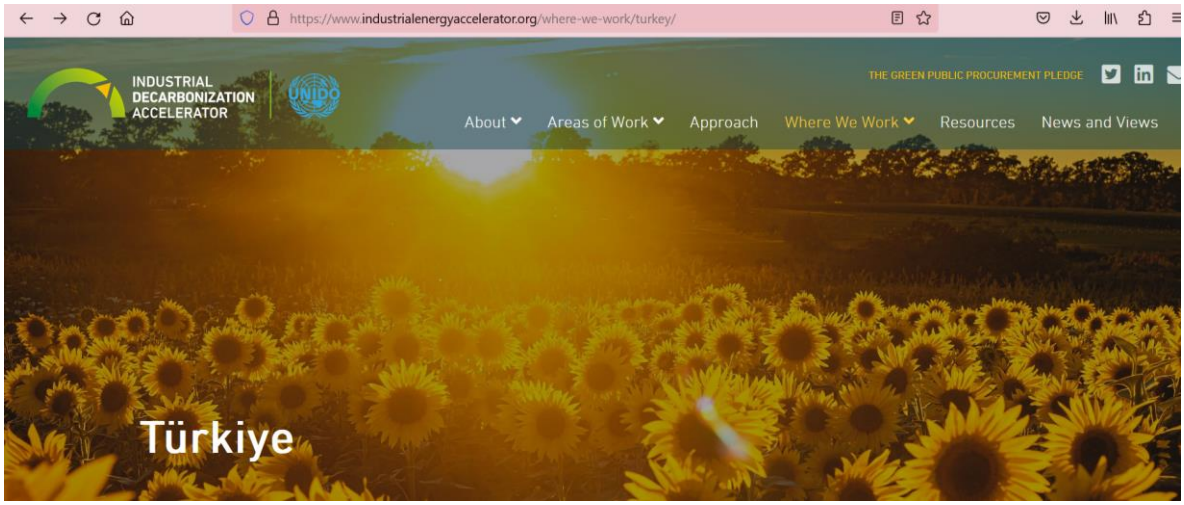
An academic journal on Bionergy Studies Journal (http://www.bioenergystudies.org/)is created within the project activities. After the project finishes, TAGEM will manage the journal activities.

"Bioenergy Studies" is an international refereed academic journal that is published biannually (July & December) by Black Sea Agricultural Research Institute. Bioenergy Studies is an online open-access journal free of charge which aims to address research and needs of studies within the area of bioenergy.

The journal publishes original research articles, critical review articles, short communications, and technical notes on applied and scientific research. Articles submitted to this journal must be in English and it shouldn't have been published previously. The full texts of research articles with only abstracts published as a part of a congress, symposium, meetings, etc., are welcomed.



Industrial Energy Accelerator Türkiye Werbsite; https://www.industrialenergyaccelerator.org/where-we-work/turkey/



VIII. Implementation progres

1. Using the previous reporting period as a basis, please provide information on **progress, challenges and outcomes achieved/observed** with regards to project implementation.

Progress: Significant progress made on project activities especially under the technology demonstration component;

Continuous guidance is being provided to industry on bioenergy investments.

Verification of the machinery/equipment purchases have been in progress.

The Mini Biogas Unit is being tested by TEMSAN at General Directorate Campus. The effect of parameters such as temperature, type of waste, amount of organic matter in the waste, etc. on biogas production is examined; in addition to 14 pilot applications in Ankara and some villages. The cooperation with UNIDO initiated and two technical experts have been contracted by UNIDO in order to provide technical support to TEMSAN on the improvement of the biogas unit. Introductory video is made for Mini Biogas Unit project and it is displayed in social media and MoENR and TEMSAN websites as well.

The outcomes of Mini Biogas Unit Project could provide valuable know-how to the Ministry of Agriculture and Forestry as it serves to create a new resource (manure) for energy production, to reduce GHG emissions through production of biogas from manure and utilization of this biogas for basic needs.

Biomass Energy Potential Atlas (BEPA) https://bepa.enerji.gov.tr/ web portal which is being operated by MoENR will be improved.

Preparation for the 5th Bioenergy Studies Symposium has been going on. It will be held on January 2024.

Second call was held for further technical assistance as energy assessment study for energy plants and supply chain plants. Within the scope of 2nd call, 5 more Energy Company and 6 more supply chain company has been selected for technical support.

Site visits for feasibility studies on biomass supply chains and energy plants are conducted.

Awareness raising activities continued to be conducted through project website, project social media, online meetings and dissemination material.

The training program of 550 technical staff is in progress. The program was decided to be held in 9 different cities with 50 participants. 5 workshops have been completed. The First Training was held in Konya on 24-25 June 2022 with the participation of 59 participants (12 female-47 male). The Second Training was held in Manisa on 16-17 December 2022 with the participation of 82 participants (27 female-55 male). The Third Training was held in Ankara on 2-3 February 2023 with the participation of 58 participants (20 female- 38 male). The Fourth Training was held in Bursa with 53 participants (10 female-43 male). The Fifth Training was held in Erzurum with 74 participants (22 female-52 male) The total number of participants reached 326 (91 female).

Challenges: Due to the COVID19 precautions, project management staff change for 6 times during the implementation and Türkiye's economic situation (USD/TRY currency fluctuation) caused delays in the implementation.

Outcomes:

- *4 energy plants and 4 supply chain projects are selected and feasibility reposts are prepared for 11 companies for further investment. 3 energy plant, 3 supply chain firms investments are concluded and others are in progress and their investments will be completed in 2023.*
- *Awareness on biomass technologies increased through the development of tailored*

knowledge products to facilitate technology transfer in the agro-industry *Please kindly find the following Progress Reports from TAGEM and annexes further detailed information in the attachment.* *Progress Report 11* *Progress Report 12*

2. Please briefly elaborate on any **minor amendments**[7] to the approved project that may have been introduced during the implementation period or indicate as not applicable (NA).

Please tick each category for which a change has occurred and provide a description of the change in the related textbox. You may attach supporting documentation, as appropriate.

☐	Results Framework	
☐	Components and Cost	
☐	Institutional and Implementation Arrangements	
☐	Financial Management	
☐	Implementation Schedule	
☐	Executing Entity	
☐	Executing Entity Category	
☐	Minor Project Objective Change	
☐	Safeguards	
☐	Risk Analysis	
☐	Increase of GEF Project Financing Up to 5%	
☐	Co-Financing	
☐	Location of Project Activities	
☐	Others	

3. Please provide progress related to the **financial implementation** of the project.

[7] As described in Annex 9 of the *GEF Project and Program Cycle Policy Guidelines*, **minor amendments** are changes to the project design or implementation that do not have significant impact on the project objectives or scope, or an increase of the GEF project financing up to 5%.

GRANT DELIVERY REPORT

		Grant:	2000003845	**Grant Status:**	Authority to implement	**Grant Validity:**	06.03.2018 - 06.03.2024
		Sponsor:	400150 - GEF - Global Environment Facility	**Currency:**	USD	**Reporting Period:**	06.03.2018 - 10 08 2023
		Other Reference:	9218-U3-PJ-FS-GR-01	**Fund:**	GF	**Prepared on:**	10.08.2023

Project	Project Description	Country	Region	Project Manager	Project Validity
140325	SUSTAINABLE USE OF BIOMASS TO ASSIST THE DEVELOPMENT OF TURKEYS ECONOMY TOWARDS A LOW-CARBON DEVELOPMENT PATH	Türkiye	Europe	Marco Matteini	20.06.2016 - 06.03.2024

	Description	Released Budget Current Year (a)	Obligations Current Year (b)	Disbursements Current Year (c)	Expenditures Current Year (d=b+c)	Total Agreement Budget (e)	Released Budget (f)	Obligations + Disbursements (g)	Funds Available* (h=f-g)	Support Cost (i)	Total Expenditures (j=g+i)
140325											
140325-1-02-01	**Technology Demonstration**	USD	USD	USD	USD	USD	USD	USD	USD	USD	USD
1100	Staff & Intern Consultants	409,713.82	16,283.91	18,342.49	34,626.40	(10,000.00)	(10,000.00)	36,498.21	(46,498.21)	0.00	36,498.21
1500	Local Travel	995.67	380.85	5,015.86	5,396.71	6,000.00	6,000.00	8,995.84	(2,995.84)	0.00	8,995.84
1700	Nat.Consult./Staff	278,182.17	24,503.63	29,452.46	53,956.09	0.00	0.00	84,773.92	(84,773.92)	0.00	84,773.92
2100	Contractual Services	170,468.06	(5,500.00)	58,054.85	52,554.85	2,000,000.00	2,000,000.00	1,307,032.74	692,967.26	0.00	1,307,032.74
3000	Train/Fellowship/Study	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4300	Premises	3,225.53	0.00	0.00	0.00	4,000.00	4,000.00	0.00	4,000.00	0.00	0.00
4500	Equipment	389,723.68	0.00	74.71	74.71	(2,000,000.00)	(2,000,000.00)	7,141.03	(2,007,141.03)	0.00	7,141.03
5100	Other Direct Costs	4,922.77	0.00	1,626.16	1,626.16	0.00	0.00	2,873.42	(2,873.42)	0.00	2,873.42
9300	Support Cost IDC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	137,489.68	137,489.68
140325-1-02-01	**Total**	**1,262,231.70**	**35,668.39**	**112,566.53**	**148,234.92**	**0.00**	**0.00**	**1,447,315.16**	**(1,447,315.16)**	**137,489.68**	**1,584,804.84**
140325-1-02-02	**Policy and regulatory framework**	USD	USD	USD	USD	USD	USD	USD	USD	USD	USD
1100	Staff & Intern Consultants	48,776.28	0.01	2,124.80	2,124.81	(130,000.00)	(130,000.00)	13,696.53	(143,696.53)	0.00	13,696.53
1500	Local Travel	3,812.20	30.79	672.40	703.19	0.00	0.00	1,256.49	(1,256.49)	0.00	1,256.49
1700	Nat.Consult./Staff	36,554.01	(29.98)	9,891.14	9,861.16	0.00	0.00	80,657.15	(80,657.15)	0.00	80,657.15
2100	Contractual Services	(100,553.73)	(105,008.80)	104,842.05	(166.75)	130,000.00	130,000.00	140,893.48	(10,893.48)	0.00	140,893.48
3000	Train/Fellowship/Study	27,750.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3500	International Meetings	0.00	1,180.68	1,314.35	2,495.03	0.00	0.00	2,495.03	(2,495.03)	0.00	2,495.03
4500	Equipment	0.00	0.00	0.00	0.00	42.36	42.36	0.00	42.36	0.00	0.00
5100	Other Direct Costs	14,473.72	0.00	276.17	276.17	(42.36)	(42.36)	3,323.23	(3,365.59)	0.00	3,323.23
9300	Support Cost IDC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23,020.58	23,020.58
140325-1-02-02	**Total**	**30,812.48**	**(103,827.30)**	**119,120.91**	**15,293.61**	**0.00**	**0.00**	**242,323.91**	**(242,323.91)**	**23,020.58**	**265,344.49**

* Does not include Unapproved Obligations

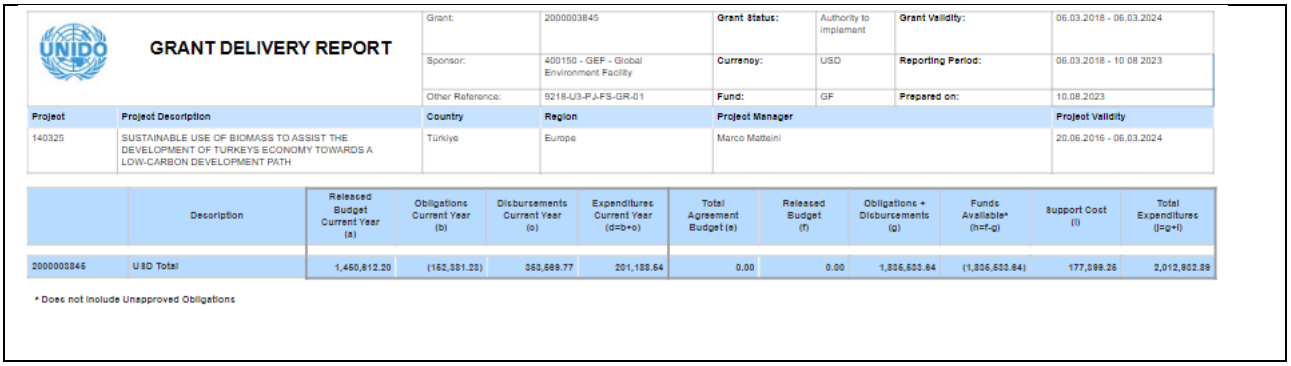
GRANT DELIVERY REPORT

		Grant:	2000003845	**Grant Status:**	Authority to implement	**Grant Validity:**	06.03.2018 - 06.03.2024
		Sponsor:	400150 - GEF - Global Environment Facility	**Currency:**	USD	**Reporting Period:**	06.03.2018 - 10 08 2023
		Other Reference:	9218-U3-PJ-FS-GR-01	**Fund:**	GF	**Prepared on:**	10.08.2023

Project	Project Description	Country	Region	Project Manager	Project Validity
140325	SUSTAINABLE USE OF BIOMASS TO ASSIST THE DEVELOPMENT OF TURKEYS ECONOMY TOWARDS A LOW-CARBON DEVELOPMENT PATH	Türkiye	Europe	Marco Matteini	20.06.2016 - 06.03.2024

	Description	Released Budget Current Year (a)	Obligations Current Year (b)	Disbursements Current Year (c)	Expenditures Current Year (d=b+c)	Total Agreement Budget (e)	Released Budget (f)	Obligations + Disbursements (g)	Funds Available* (h=f-g)	Support Cost (i)	Total Expenditures (j=g+i)
140325-1-02-03	**Capacity building**	USD	USD	USD	USD	USD	USD	USD	USD	USD	USD
1100	Staff & Intern Consultants	7,825.45	0.00	0.00	0.00	(65,000.00)	(65,000.00)	1,127.87	(66,127.87)	0.00	1,127.87
1500	Local Travel	4,608.07	15.40	324.27	339.67	(25,000.00)	(25,000.00)	742.60	(25,742.60)	0.00	742.60
1700	Nat.Consult./Staff	13,052.74	(14.99)	4,864.99	4,850.00	(180,000.00)	(180,000.00)	13,797.26	(193,797.26)	0.00	13,797.26
2100	Contractual Services	542.78	(90,328.80)	90,030.76	(298.04)	426,000.00	426,000.00	(351.61)	426,351.61	0.00	(351.61)
3000	Train/Fellowship/Study	3,500.00	0.00	0.00	0.00	(146,000.00)	(146,000.00)	0.00	(146,000.00)	0.00	0.00
3500	International Meetings	3,555.86	0.00	0.00	0.00	(10,000.00)	(10,000.00)	(221.65)	(9,778.35)	0.00	(221.65)
5100	Other Direct Costs	2,375.81	0.00	(8.98)	(8.98)	0.00	0.00	393.36	(393.36)	0.00	393.36
9300	Support Cost IDC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,697.07	1,697.07
140325-1-02-03	**Total**	**35,460.71**	**(90,328.39)**	**95,211.04**	**4,882.65**	**0.00**	**0.00**	**15,487.83**	**(15,487.83)**	**1,697.07**	**17,184.90**
140325-1-51-01	**Monitoring and Management**	USD	USD	USD	USD	USD	USD	USD	USD	USD	USD
1100	Staff & Intern Consultants	3,519.02	0.02	1,416.55	1,416.57	65,000.00	65,000.00	27,133.05	37,866.95	0.00	27,133.05
1500	Local Travel	6,182.25	133.99	730.94	864.93	0.00	0.00	943.12	(943.12)	0.00	943.12
1700	Nat.Consult./Staff	43,158.55	4,459.41	20,771.92	25,231.33	(80,000.00)	(80,000.00)	52,416.46	(132,416.46)	0.00	52,416.46
3500	International Meetings	8,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4500	Equipment	960.26	0.00	0.00	0.00	2,000.00	2,000.00	(3,798.00)	5,798.00	0.00	(3,798.00)
5100	Other Direct Costs	(132.08)	1,512.65	2,229.64	3,742.29	13,000.00	13,000.00	12,609.18	390.82	0.00	12,609.18
9300	Support Cost IDC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11,287.20	11,287.20
140325-1-51-01	**Total**	**61,688.00**	**6,106.07**	**25,149.05**	**31,255.12**	**0.00**	**0.00**	**89,303.81**	**(89,303.81)**	**11,287.20**	**100,591.01**
140325-1-53-01	**Monitoring and evaluation**	USD	USD	USD	USD	USD	USD	USD	USD	USD	USD
1100	Staff & Intern Consultants	38,270.35	0.00	1,416.55	1,416.55	0.00	0.00	16,346.20	(16,346.20)	0.00	16,346.20
1500	Local Travel	6,314.99	0.00	0.00	0.00	(1,000.00)	(1,000.00)	185.01	(1,185.01)	0.00	185.01
1700	Nat.Consult./Staff	15,515.80	0.00	0.00	0.00	0.00	0.00	22,884.20	(22,884.20)	0.00	22,884.20
5100	Other Direct Costs	318.17	0.00	105.69	105.69	1,000.00	1,000.00	1,687.52	(687.52)	0.00	1,687.52
9300	Support Cost IDC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,904.72	3,904.72
140325-1-53-01	**Total**	**60,419.31**	**0.00**	**1,522.24**	**1,522.24**	**0.00**	**0.00**	**41,102.93**	**(41,102.93)**	**3,904.72**	**45,007.65**
140325	**Total**	**1,450,612.20**	**(152,331.23)**	**353,569.77**	**201,188.54**	**0.00**	**0.00**	**1,836,533.64**	**(1,836,533.64)**	**177,399.25**	**2,012,932.89**

* Does not include Unapproved Obligations



GRANT DELIVERY REPORT

Grant:	2000003845	Grant Status:	Authority to implement	Grant Validity:	06.03.2018 - 06.03.2024
Sponsor:	400150 - GEF - Global Environment Facility	Currency:	USD	Reporting Period:	06.03.2018 - 10 08 2023
Other Reference:	9218-U3-PJ-FS-GR-01	Fund:	GF	Prepared on:	10.08.2023

Project	Project Description	Country	Region	Project Manager	Project Validity
140325	SUSTAINABLE USE OF BIOMASS TO ASSIST THE DEVELOPMENT OF TURKEYS ECONOMY TOWARDS A LOW-CARBON DEVELOPMENT PATH	Türkiye	Europe	Marco Matteini	20.06.2016 - 06.03.2024

	Description	Released Budget Current Year (a)	Obligations Current Year (b)	Disbursements Current Year (c)	Expenditures Current Year (d=b+c)	Total Agreement Budget (e)	Released Budget (f)	Obligations + Disbursements (g)	Funds Available* (h=f-g)	Support Cost (i)	Total Expenditures (j=g+i)
2000003845	USD Total	1,460,612.20	(152,381.23)	353,689.77	201,188.54	0.00	0.00	1,336,533.84	(1,336,533.84)	177,399.25	2,012,932.89

* Does not include Unapproved Obligations

IX. Work Plan and Budget

1. Please provide **an updated project work plan and budget** for the remaining duration of the project, as per last approved project extension. Please expand/modify the table as needed.

Outputs by Project Component	Year 1				Year 2				Year 3				GEF Grant Budget Available (US$)
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Component 1 – Demonstration of modern bio-energy technologies and energy efficiency measures in the agro-industrial sector Outcome 1: Modern bio-energy technologies demonstrated and ready for scale-up													
Output 1.1: Twenty business plans for sustainable supply chain management of agricultural residues prepared based on a call for applications and supported pre-assessment	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Output 1.2: Twenty-five feasibility studies for modern bio-energy technology applications with focus on process heat applications are prepared based on a call for projects and supported pre-assessment	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Output 1.3: Ten supply chain and twelve bio-energy technology projects made bankable and linked with existing financing instruments for	☐	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	

an accelerated scale-up across agro-industrial subsectors													
Output 1.4: Five sustainable bio-energy supply chains and five innovative and highly replicable technology applications with an estimated total capacity of 10 MWth are realized and monitored for economic and energetic performance	☒	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Component 2 – Refined policy and regulatory framework to enable transformation across sub-sectors Outcome 2: Policy and regulatory environment is fine-tined to enable scale-up of bio-energy plants													
Output 2.1: Sustainable crop management – Regulations concerning the use of agricultural resources	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Output 2.2: Policies and programs to integrate heat from biomass	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Output 2.3: Incentive programs and financing schemes for bio-energy promotion	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Component 3 – Capacity base strengthened and awareness raising increased Outcome 3: Capacities of key players strengthened and information made available to market enablers and major stakeholders													
Output 3.1: Awareness on biomass technologies increased through development of tailored knowledge products to facilitate technology transfer in the agro-industry	☒	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Output 3.2: Capacity and knowledge of 50 decision makers in government and private sector are improved through 5 tailored workshops	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Output 3.3: Capacity building mechanism for O&M, technical and service roles is established to develop and retain skilled workforce for innovative bio-energy technologies	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	

in industry through training of 20 trainers and 550 engineers, technicians, governmental and financial stakeholders, in cooperation with technical partners through 15 workshops													
Component 4 – Monitoring and evaluation													
Outcome 4: Project's progress towards objectives continuously monitored and evaluated													
Output 4.1: A monitoring and evaluation plan will be prepared and carried out.	☒	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Output 4.2: Technical performance of demonstration projects will be monitored and publicized	☒	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	

X. Synergies

1. **Synergies** achieved:

The project aims to reduce greenhouse gas emissions while increasing energy performance and competitiveness by triggering sectoral transformation with the applications of modern bioenergy technologies in the agricultural industry, Within the scope of the VIII Istanbul Carbon Summit, organized in collaboration with the Ministry of Environment, Urbanization and Climate Change, Istanbul Technical University, and the Sustainable Production and Consumption Association (SUT-D), the project received the Low Carbon Hero Award on May 2, 2023.

As part of Industrial Energy Accelerator (https://www.industrialenergyaccelerator.org/where-we-work/turkey/) Türkiye page has been established. Two case studies have been published as fallows;

CASE STUDY: Goknur Gida, The zero-waste fruit juice company reaping the benefits of biogas (https://www.industrialenergyaccelerator.org/turkey/the-zero-waste-fruit-juice-company-reaping-the-benefits-of-biogas/)

By investing in biogas, Turkish fruit juice manufacturer Göknur Gida has established a fully sustainable, low-carbon production cycle. Now with UNIDO's support on thermal energy management, this cycle has become even more robust.

CASE STUDY: Bolu Guc Birligi (https://www.industrialenergyaccelerator.org/turkey/case-study-bolu-guc-birligi/) Please find it attached.

Bolu, in north-western Türkiye, has a thriving poultry industry. Around one-quarter of all national broiler chicken production (chicken bred and raised for meat) comes from the area. As broiler farms are abundant here, the sheer scale of production makes poultry waste a significant environmental problem and a public health risk. To address this issue, farm owners and local businesses have come together to form Bolu Güç Birliği (BGB), a bioenergy company that turns broiler litter (a mix of chicken bedding, chicken droppings,

spilled feed and feathers) into renewable energy.

3. Stories to be shared (Optional)

CASE STUDY: Bolu Guc Birligi (https://www.industrialenergyaccelerator.org/turkey/case-study-bolu-guc-birligi/) Please find it attached as well.

Bioenergy – using organic materials from plants, animals and domestic waste to generate electricity and thermal energy – is emerging as a key sustainable energy source in Türkiye. Currently, the country is highly dependent on fossil fuels. Two-thirds of the energy generated is fuelled by gas imported from other countries, including Russia, and coal. After YEKDEM intensive period, the renewable energy transition significantly increases in Türkiye. By the end of 2022, the share of renewable energy in electricity generation has reached the point of approximately 50% (installed power). On the other hand, other energy production and consumption methods continue to be heavily dependent on fossil resources. and the rate of change in electricity production and consumption cannot be seen in these areas. The biomass energy sector could be the key to this transformation.

Bioenergy/biomass sector has mainly focused on biogas to energy and the use of biomass (materials from plants, solid agricultural residues over animal manure, sludge or domestic waste) to incinerate to generate electricity in Türkiye. The biomass energy sector is newly shaped and it is a sector that is struggling with certain technical and economic challenges. Installed power is extremely low despite its potential. Therefore, investors need to be supported both financially and technically.

The Project, one of the most important contributions of the project is to strengthen the biomass sector technical and economic aspects. Another important contribution of the project is that it will accelerate the heat decarbonization process in the energy sector by drawing attention to the usage areas of thermal energy in biomass energy conversion methods. Concordantly, the business plans of Biotrend Company which is one of the bioenergy investors, on the use of thermal energy in biomass investments fit in with the project objectives.

Biotrend's plant in Aydin, a city in the Aegean region, was chosen for the project. The plant generates electricity using corn and cotton stalks, tree roots, bark and forest residue, and is located in the Cine industrial zone. With UNIDO's support, a high-efficiency combustion boiler, steam generator and supporting system will be installed to supply steam to five enterprises in the industrial zone; mainly food manufacturers producing cheese, olives, canned goods and pickles. For this reason, Biotrend was selected to be one of the pilots in the use of a thermal energy system that would enable it to become a steam supplier.

The installation of the steam generation biomass boiler is completed in October 2022 and pipelines will be completed in August 2023. Alongside some financial support, UNIDO has contributed tailored technical support in the form of a feasibility study, plus capacity building on installation, operation and maintenance. UNIDO will also monitor the project for a year after installation, and the knowledge gained will be shared to inform similar projects. The collected data will provide nationally-generated, evidence-based information, which is much needed to encourage potential investors to replicate similar projects. Lessons-learned on environmental, social and economic benefits are also expected to be fed into national policies and development plans.

Once fully operational, the boiler will run on around 6,000 tons of biomass a year, to generate 26,476,000 kWh of thermal energy. This thermal energy will produce 2 tons of steam an hour, saving 20,240 tonnes in annual carbon emissions, equivalent to removing 4,432 cars from the roads every year. It will also stop hazardous gases like nitrous oxides, which coal emits when burnt, from polluting the air.

XI. GEO LOCATION INFORMATION

The Location Name, Latitude and Longitude are required fields insofar as an Agency chooses to enter a project location under the set format. The Geo Name ID is required in instances where the location is not exact, such as in the case of a city, as opposed to the exact site of a physical infrastructure. The Location & Activity Description fields are optional. Project longitude and latitude must follow the Decimal Degrees WGS84 format and Agencies are encouraged to use at least four decimal points for greater accuracy. Users may add as many locations as appropriate.

Web mapping applications such as OpenStreetMap or GeoNames use this format. Consider using a conversion tool as needed, such as: https://coordinates-converter.com

Please see the Geocoding User Guide by clicking here

Location Name	Latitude	Longitude	Geo Name ID	Location and Activity Description
ANKARA TAGEM	39.906369	32.750397	323786	

Please provide any further geo-referenced information and map where the project interventions is taking place as appropriate.

EXPLANATORY NOTE

1. **Timing & duration:** Each report covers a twelve-month period, i.e. 1 July 2022 – 30 June 2023.

2. **Responsibility:** The responsibility for preparing the report lies with the project manager in consultation with the Division Chief and Director.

3. **Evaluation:** For the report to be used effectively as a tool for annual self-evaluation, project counterparts need to be fully involved. The (main) counterpart can provide any additional information considered essential, including a simple rating of project progress.

4. **Results-based management**: The annual project/programme progress reports are required by the RBM programme component focal points to obtain information on outcomes observed.

Global Environmental Objectives (GEOs) / Development Objectives (DOs) ratings	
Highly Satisfactory (HS)	Project is expected to achieve or exceed all its major global environmental objectives, and yield substantial global environmental benefits, without major shortcomings. The project can be presented as "good practice".
Satisfactory (S)	Project is expected to achieve most of its major global environmental objectives, and yields satisfactory global environmental benefits, with only minor shortcomings.
Moderately Satisfactory (MS)	Project is expected to achieve most of its major relevant objectives but with either significant shortcomings or modes overall relevance. Project is expected not to achieve some of its major global environmental objectives or yield some of the expected global environmental benefits.
Moderately Unsatisfactory (MU)	Project is expected to achieve some of its major global environmental objectives with major shortcomings or is expected to achieve only some of its major global environmental objectives.
Unsatisfactory (U)	Project is expected not to achieve most of its major global environmental objectives or to yield any satisfactory global environmental benefits.
Highly Unsatisfactory (HU)	The project has failed to achieve, and is not expected to achieve, any of its major global environmental objectives with no worthwhile benefits.

Implementation Progress (IP)	
Highly Satisfactory (HS)	Implementation of all components is in substantial compliance with the original/formally revised implementation plan for the project. The project can be presented as "good practice".
Satisfactory (S)	Implementation of most components is in substantial compliance with the original/formally revised plan except for only few that are subject to remedial action.
Moderately Satisfactory (MS)	Implementation of some components is in substantial compliance with the original/formally revised plan with some components requiring remedial action.
Moderately Unsatisfactory (MU)	Implementation of some components is not in substantial compliance with the original/formally revised plan with most components requiring remedial action.
Unsatisfactory (U)	Implementation of most components in not in substantial compliance with the original/formally revised plan.
Highly Unsatisfactory (HU)	Implementation of none of the components is in substantial compliance with the original/formally revised plan.

Risk ratings	
Risk ratings will access the overall risk of factors internal or external to the project which may affect implementation or prospects for achieving project objectives. Risk of projects should be rated on the following scale:	
High Risk (H)	There is a probability of greater than **75%** that assumptions may fail to hold or materialize, and/or the project may face high risks.
Substantial Risk (S)	There is a probability of between **51%** and **75%** that assumptions may fail to hold or materialize, and/or the project may face substantial risks.
Moderate Risk (M)	There is a probability of between **26%** and **50%** that assumptions may fail to hold or materialize, and/or the project may face only moderate risk.
Low Risk (L)	There is a probability of up to **25%** that assumptions may fail to hold or materialize, and/or the project may face only low risks.