

Concept Note

Project of energy recovery from olive waste in Fez-Meknès Region

Morocco | Agency for Agricultural Development - Morocco (ADA-Morocco)

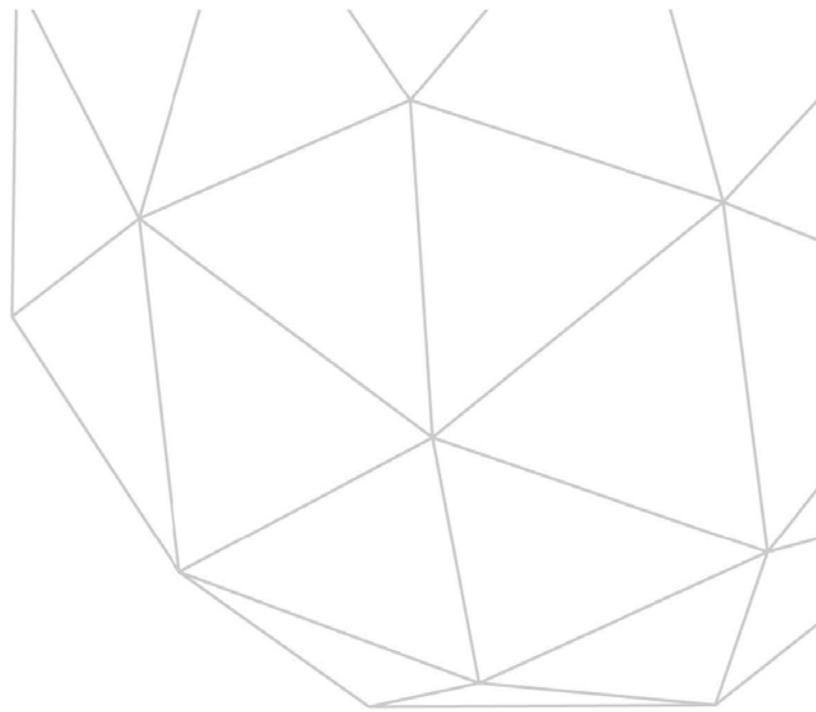
25 April 2017



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Concept Note

The Green Climate Fund (GCF) is seeking high-quality projects or programmes.

Accredited entities may choose to submit a concept note, in consultation with the relevant national designated authority, to present the proposed project or programme idea in order to receive early feedback and recommendation.

Project/Program Title: *Project of energy recovery from olive waste in Fez-Meknès Region*

Country/Region: Meknès-Fès Region

Accredited Entity: Agency for Agricultural Development - Morocco _____

National Designated Authority: *Secretariat of State to the Ministry of Energy, Mines and Sustainable Development, responsible for sustainable development*

Please submit the completed form to fundingproposal@gcfund.org¹

A. Project / Program Information	
A.1. Project / program title	<i>Project of energy recovery from olive waste in Fez-Meknès Region</i>
A.2. Project or program	Project
A.3. Country (ies) / region	Fès-Meknes Region
A.4. National designated authority(ies)	Secretariat of State to the Ministry of Energy, Mines and Sustainable Development, responsible for sustainable development.
A.5. Accredited entity	Agency for Agricultural Development – Morocco
A.6. Executing entity / beneficiary	Executing Entity : DRA de Fès-Meknes Beneficiary: GIE, Producers of the olive-producing area of the Meknes-Fez region, private sector.
A.7. Access modality	Direct <input checked="" type="checkbox"/> International <input type="checkbox"/>
A.8. Project size category (total investment, million USD)	Micro (≤ 10) <input type="checkbox"/> Small ($10 < x \leq 50$) <input checked="" type="checkbox"/> Medium ($50 < x \leq 250$) <input type="checkbox"/> Large (> 250) <input type="checkbox"/>
A.9. Mitigation / adaptation focus	Mitigation <input checked="" type="checkbox"/> Adaptation <input type="checkbox"/> Cross-cutting <input type="checkbox"/>
A.10. Public or private	public
A.11. Results areas (mark all that apply)	<i>Which of the following targeted results areas does the proposed project/program address?</i>
	<p>Reduced emissions from:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Energy access and power generation (E.g. on-grid, micro-grid or off-grid solar, wind, geothermal, etc.) <input type="checkbox"/> Low emission transport (E.g. high-speed rail, rapid bus system, etc.) <input type="checkbox"/> Buildings, cities, industries and appliances (E.g. new and retrofitted energy-efficient buildings, energy-efficient equipment for companies and supply chain management, etc.) <input type="checkbox"/> Forestry and land use (E.g. forest conservation and management, agroforestry, agricultural irrigation, water treatment and management, etc.) <p>Increased resilience of:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Most vulnerable people and communities (E.g. mitigation of operational risk associated with climate change – diversification of supply sources and supply chain management, relocation of manufacturing facilities and warehouses, etc.) <input type="checkbox"/> Health and well-being, and food and water security (E.g. climate-resilient crops, efficient irrigation systems, etc.) <input type="checkbox"/> Infrastructure and built environment (E.g. sea walls, resilient road networks, etc.) <input type="checkbox"/> Ecosystems and ecosystem services (E.g. ecosystem conservation and management, ecotourism, etc.)
A.12. Project / program life span	Benefit stream : 15 years Project implementation lifespan : 4 years
A.13. Estimated implementation start and end date	Start: January 2018 End: November 2022

¹ Please use the following naming convention for the file name: “[CN]-[Agency short name]-[Date]-[Serial number]” (e.g. CN-ABC-20150101-1).

B. Project/Program Details

The Fund requires the following preliminary information in order to promptly assess the eligibility of project/program investment. These requirements may vary depending on the nature of the project/program.

B.1. Project /
program
description
(including
objectives)

The Morocco Green Plan has given particular importance to the olive-growing sector, particularly in terms of upstream agricultural development and the development of a modern upgrading infrastructure.

Currently, the olive-growing area in Morocco is 1 million hectares (9% of the Utilizable Agriculture Area- UAA excluding fallow land), 780 000 of which are in oats, olive growing accounts for more than 55% of the national arboreal forests. By 2020, the olive-growing area will increase to 1.3 million hectares.

The Fes-Meknes region totals about 340 000 hectares, or 34% of the total olive-growing area in Morocco and will reach 443 000 hectares in 2020.

In terms of olive production, the total area produces about 1 million tons of olives. The Fès-Meknès region produces 324 000 tons of olive, or 26% of the national production.

Region	Olivier (Ha)	%
Fès-Meknès	340 128,60	34%
Marrakech-Safi	209 832,60	21%
Tanger-Tetouan-Al Hoceima	152 201,60	15%
Oriental	115 618,50	11%
Béni Mellal-Khénifra	73 498,00	7%
Rabat-Salé-Kénitra	61 231,00	6%
Souss-Massa	25 863,70	3%
Grand Casablanca-Settat	13 590,60	1%
Drâa-Tafilalet	12 988,90	1%
Guelmim-Oued Noun	2 137,30	0%
Laayoune-Sakia El Hamra	0	0%
Eddakhla-Oued Eddahab	0	0%
TOTAL	1 007 090,80	100%

The Morocco Green Plan enabled the organization of the sector and the setting up of the inter-professional olive-growing organization (INTERPROLIVE) and put a specific program contract in the sector within the framework of the regional agricultural plans.

In terms of organization: since 2010, 94 olive trituration units have been installed throughout the national territory under Pillar II of the Morocco Green Plan and the MCA program. The region of Fès-Meknes totals 14 units installed among the 34 planned within the framework of the PMV.

Unités de trituration installées dans le cadre du PMV

Region	Objectives PMV	Number of installed units
DRAA-TAFILALET	37	34
FÈS-MEKNES	34	14
TANGER-TETOUAN-ALHOUCEIMA	22	11
MARRAKECH SAFI	18	8
SOUSS-MASSA	14	9
BÉNI MELLAL KHENIFRA	12	8
ORIENTAL	10	8
RABAT-SALE-KENITRA	6	1
GUELMIM OUED NOUN	3	1
CASABLANCA SETTAT	1	-
Total	157	94

This dynamic, particularly in the Fes Meknes region, prompts, as detailed below, measures to preserve the environment, particularly with regard to the treatment of pulping waste.

In terms of adaptation to climate change, the olive tree, by its products and their secular uses, as well as its multiple functions of erosion control, valorization of agricultural lands and fixing populations in mountain areas, constitutes the main fruit speculation cultivated in Morocco. This sector supplies a very important downstream sector around the olive and olive oil cannery.

In term of economic and social point of view: The olive sector contributes 5% to the formation of agricultural GDP at the upstream level and 15% to national agro-food exports. The olive sector produces close to 15 million working days per year, equivalent to 70,000 permanent jobs, and in economic terms, the olive sector covers 18% of the country's needs in edible vegetable oils, Production of 60 000 tons / year. It also supplies olive canneries producing an average of 120,000 tons / year, of which more than half is exported.

In terms of biomass energy deposit : the data presented below and related to industrial downstream in the Fez-Meknes region shows that the capacity of trituration of the olives reaches 393 Tons per day, in approximately 370 000 Tons annually.

Capacity of trituration of olives in the region of Fez Meknes

Olive oil basin	Modern crushing units			
	Nb UT-M	Caped UT-M (T/j)	Caped UT-M (T/an)	UT-M
AKNOUL	6	6	3 240	
GHAFAI	18	32	51 750	
KARIA	6	20	10 710	
OUED AMLIL	5	11	4 950	
TAHALA	4	13	4 500	
TAINASTE	6	3	1 620	
TAOUNATE	15	57	76 770	
TAZA	13	17	19 350	
TISSA	12	13	13 770	
ELORJANE-OUTAT LHAJ	2	6	1 080	
FRITISSA	2	6	1 080	
KSABI	1	2	135	
MISSOUR	2	6	1 080	
SEKKOURA	2	6	1 080	
TISSAF	1	2	198	
WIZEGHT	1	2	198	
RAS TABOUDA	17	4	6 120	
IGHEZRANE	18	7	11 340	
AZZABA	15	4	5 400	
FES-MY YACOUB	50	135	78 750	
MY DRISS ZARHOUNE	30	13,6	36 740	
DKHISSA-MHAYA	19	13,6	23 269	
ELHAJEB-ISSOUAL	13	14	16 380	
Total	258	393	369 510	

In terms of biomass energy: The olive trituration process allows production of margins of 206 000 m³ / year and a quantity of 187 000 tons annually in crude residue produced in the Fes-Meknes region. The quantities of solid and liquid discharges (pomace and margins) from crushing plants are summarized in the table below.

Estimated quantities of liquid and solid discharges per olive-growing basin

Olive oil basin	Margins produced	Grignons Bruts produits
	1000 m ³ /an	1000 T/an
AKNOUL	5	4,5
AZZABA	6,3	5,7
DKHISSA-MHAYA	18,8	17
ELHAJEB-ISSOUAL	12,2	12
ELORJANE-OUTAT LHAJ	0,6	0,5
FES-MY YACOUB	25,7	23,2
FRITISSA	0,9	0,8
GHAFAI	24,6	22,2
IGHEZRANE	7,4	6,7
KARIA	10	9
KSABI	0,3	0,3
MISSOUR	0	0
MY DRISS ZARHOUNE	11	9,9
OUED AMLIL	8,7	7,9
RAS TABOUDA	6,9	6,2
SEKKOURA	0,9	0,8
TAHALA	4,2	3,8
TAINASTE	7,5	6,8
TAOUNATE	30,6	27,6
TAZA	10	9
TISSA	14	12,6
TISSAF	0,4	0,4
WIZEGHT	0,2	0,2
Total	206,2	187,1

Faced with this favorable economic situation for the olive sector, its impact on the environment remains at least favorable according to the current BAU and risks slowing down its development. This unfavorable situation linked to the negative impact on the environment is explained by the impact of margins and olive residues on the environment.

On the other hand, the rejection of crushing has a negative impact on the environment. Indeed, the development of the olive-growing industry at national level is increasingly producing olive trituration residues, in particular olive-pomace and margins, which represent a high risk of environmental pollution from phytotoxic and antimicrobial substances (Phenols, fatty acids and organic acids) they contain.



Most of the liquid discharges are concentrated in the Taounate Province (80,000 m³ annually), affecting the quality of surface water, ground water and accelerated soil degradation.



On the one hand, Climatic change, coupled with productivity losses due to the application of sometimes inadequate farming techniques, make the olive oil industry in Morocco much less developed than the olive oil industry in neighboring countries around the Mediterranean.

In order to remedy this, the treatment of this waste through the adoption of new ways of recovery is a vital necessity. Indeed, energy recovery of olive waste as an innovative, sustainable and structural solution as far as waste will be inputs for energy recovery. In addition, upgrading is helping to meet the growing demand for energy, thus contributing to the achievement of Morocco's objective to reduce its greenhouse gas emissions, but also in the energy mix from renewable energies.

The project to recover olive-pomace in the Fes-Meknes area allows:

- The valorization of products - waste from the olive tree,
- Biomass energy production;
- Contribution to the sustainable acceleration of the olive oil program in Morocco
- Environmental protection.
- The sequestration of carbon by the valorization of the energy of the biomass coming from the olive pomace.

The project is based on three components to achieve the objective of energy recovery of olive-pomace in the production area of the Fes-Meknes region.

Component 1: Installation of olive pomace and margin Collect units. This component aims to ensure the supply of raw material for the upgrading unit through the installation of the

	<p>collect units of margins and olive-pomace in the ten basins around the recovery unit in the region. The installation of the tanks makes it possible to combine the raw material resulting from the trituration and then convey it to the recovery unit. This component is split into three activities:</p> <ul style="list-style-type: none"> - Activity 1.1. : Installations of collects centers (10 reservoirs of accumulations of margins and olive-pomace of average capacity of 40 000 m3). - Activity 1.2. : contractualisation of GIEs for the recovery of olive oil. - Activity 1.3. : Equipment and equipment purchases of collect units. <p>Component 2: Establishment of the biomass recovery unit Energy from olive waste</p> <ul style="list-style-type: none"> - Activity 2.1. : Technical studies and choice of technology; - Activity 2.2. : Construction of the biomass energy recovery unit - Activity 2.3. : Intentional Arrangements and Connection to the Electric System - Activity 2.4. : Purchase of means of transport <p>Component 3: Project Technical Assistance</p> <ul style="list-style-type: none"> - Activity 3.1. : Technical assistance to follow up on the establishment of the unit; - Activity 3.2. : Technical assistance to beneficiaries; - Activity 3.3. : Institutional capacity building
<p>B.2. Background information on project/program sponsor</p>	<p><i>Describe project/program sponsor's operating experience in the host country or other developing countries.</i></p> <p>The ADA staff is more than 100 engineers and managers on five business directions (Projects engineering, management aggregation and partnership, Projects Management, Commercialization of local products and Financial and Administrative Directions.</p> <p>ADA's team are responsible on the projects management and they have a portfolio of 1,451 projects started between 2009-2015 of which 835 projects of efficient agriculture (Pillar I PMV) for 1.5 billion USD and 616 projects of sustainable and inclusive agriculture mobilizing 860 million USD. ADA's budget of projects funded by donors and who are registered amounts to US \$ 180.5 million for the period 2011- 2018 (13% grants and 87% loans) or about \$ 30 million annually managed by the ADA budget. Other budget not included in the ADA's budget amounts to 164.5 US \$ Million for the period 2010-2018 (81% grants and 19% in loans).</p>
<p>B.3. Market overview</p>	<p>Describe the market for the product(s) or services including the historical data and forecasts.</p> <ul style="list-style-type: none"> - <u>Production of olive pomace</u> <p>At the national level, the production of olive residue is estimated at around 500,000 tons / year, which gives the possibility of production of coconut oil in the order of 5,000-5,500 tons / year. An estimated 20-25% is used in the brickyards as a fuel, resulting in a loss of coconut oil in the order of 1000 to 1500 tons / year. The rest of the production is processed by about 5 units mainly located in the region of Fez and Meknes with an extraction capacity of about 400,000 tons. While collection difficulties and prolonged storage at the crushing plants currently produce only 1500 to 2500 tons which can be refined and used in human food. The remainder of the oil of pomace, having a strong acidity, is generally destined for the soap factory.</p> <p>The depleted loam, amounting to 40,000 to 45,000 tons / year, is used as fuel in factory boiler rooms and in brick kilns. The margins are currently evacuated to the receiving media without any prior treatment.</p> <p><u>Capacity of valorization of the pomace on the scale of the region</u></p>

At the level of the Fes-Meknes region, the absence of units for the recovery and treatment of wet pellets is reported.

The formation of by-products depends on the extraction system used, which influences the nature and characteristics of the discharges. The estimated average production rates of margins and olive residues are as follows:

Characteristics of discards of modern, semi-modern and traditional UT

Quantity produced	UT traditionnal & Semi-Modern	UT Modern	
		Centrifugation with 3 phases	Centrifugation with 2 phases
Margins produced (Taux en m ³ /tonne d'olives)	0.5	1.0	0.1
Olive-pomace produced (Taux en T/tonne d'olives)	0.4	0.55	0.75

Given the average production rates of margins and olive-residues, and the typology of UTs, we can estimate the levels of regional production of margins and olives at 68.8 thousand m³ and 63.2 thousand tons per year (estimated On the basis of an annual production of olives for crushing during the 2011/12 reference year).

Potential for biomass recovery Energy in the area :

In terms of agricultural biomass potential in the Fes-Meknes region, it is estimated at 716,852 MWh / year. Much of the agricultural biomass at this region level comes from the waste from the arboriculture. The province of Taounate, by virtue of its agricultural vocation, contributes 37% to the agricultural biomass potential of the region.

Morocco: Importing country of Electricity:

The power generation market remains a buoyant market because the country consumes a lot of fossil energy, of which more than 93.5% has to be imported. Most imports are represented by petroleum products with 5.8 million tons crude oil in 2013 coming from Saudi Arabia (45%), Iraq (33%) and Russia (20%).

This dependence and the energy bill weighs heavily on economic and financial balances. The energy bill for 2012 reached 104.3 MAD billion for imports of crude oil and petroleum products (88.5%), coal (5.7%), natural gas (3.2%), Imported electricity (2.7%).

Most electricity is produced by the ONEE and major self-producers, including Maroc Phosphore, SAMIR, Cellulose of Morocco, Lafarge Tétouan and Indusaha, which have an additional installed capacity of 336 MW. In 2014, net electricity production in Morocco amounted to 28,000 GWh.

Energy Strategy of Morocco:

Morocco's energy strategy has started and aims to reach a capacity of 24,800 MW with 52% from renewable energies (wind, solar and hydro) by 2030.

Electricity generation capacity in Morocco will increase from 8,129 MW in 2015 to 15,946 MW in 2020 to reach 24,800 MW by 2030.

Electricity demand in constant growth

The development of national primary energy demand is linked to economic growth: Energy demand has increased on average by nearly 5.3% in recent years, driven by growth in electricity consumption, which has increased by an average of 6 , 5% per year (2009-2015). With an annual consumption of 0.54 toe per inhabitant Morocco is below the world average.

	<p><i>Provide pricing structures, price controls, subsidies available and government involvement (if any).</i></p> <p>The electricity tariffs applied by the ONEE vary according to the categories of customers. Typically, tariffs for large and medium voltage customers are comprised of a fixed annual premium and a unit price (per kWh consumed) that varies per hour. Low-voltage tariffs for the residential sector or low-consumption professionals and local authorities are unit prices that vary according to the monthly consumption band. For domestic use, for example, prices are dynamic according to the consumption periods per month: for the first 100 kWh, the price is set at MAD 0.9010 per kWh, whereas after the 500th kWh consumed per month, Additional kWh costs 1.5420 MAD.</p>
<p>B.4. Regulation, taxation and insurance</p>	<p>Provide details of government licenses, or permits required for implementing and operating the project/program, the issuing authority, and the date of issue or expected date of issue.</p> <p>Describe applicable taxes and foreign exchange regulations.</p> <p><u>Energy Component:</u></p> <p>Recently, Morocco adopted Law 13-09 on Energy to reduce its dependence on imported energy but also to be able to reach its goal of 52% of energy from renewable energies.</p> <ul style="list-style-type: none"> • Law 13-09 on renewable energies: which transcribes the commitments entered into by the public authorities with regard to, inter alia, the promotion of the production of energy from renewable sources, its marketing and its export by public entities or Private; • Law No. 58-15 promulgated by Dahir No. 1-16-3 of January 12, 2016: which amends and supplements Law No. 13-09 and aims to overcome the shortcomings of Law 13-09 And to facilitate its application, in particular with a view to supporting the development of the sector, adapting it to future technological developments and encouraging private initiatives; • Decree No. 2-10-578 of 7 jomada I 1432 (April 11, 2011) issued for the application of Law No. 13-09 on renewable energies; • Decree No. 2-15-772 on access to the national grid of medium voltage; <p><u>Environment Component:</u></p> <ul style="list-style-type: none"> - Law No. 11-03 on the Protection and Development of the Environment. The purpose of this Act is to lay down the basic rules and general principles of national policy in the field of environmental protection and enhancement in order to: <ul style="list-style-type: none"> ▪ protecting the environment from all forms of pollution and degradation, whatever their origin; ▪ improving the human environment and living conditions; ▪ define the basic orientations of the legislative, technical and financial framework for the protection and management of the environment; ▪ Establish a specific liability regime to ensure compensation for damage to the environment and compensation to victims. - Law No. 28-00 on waste management and disposal, which lays down the basic rules and principles relating to waste management and disposal. It provides, inter alia, for the possibility of marketing and re-use by municipalities of products of recovered waste. <p><u>Agriculture Component:</u></p> <p>The Waste Management and Disposal Act 28-00 refers to it. These include:</p> <ul style="list-style-type: none"> • Article 2, which defines agricultural waste as: any organic waste generated by farming or gardening activities; • Article 10 which states: "Within five years from the date of publication of this Law, the territory of each region shall be covered by a regional master plan for the management of industrial waste, Non-hazardous pharmaceuticals, ultimate, agricultural and inert waste. "

	<ul style="list-style-type: none"> • Article 24, which requires that: Subject to the provisions of Article 28 below, inert waste, residual waste, agricultural waste and non-hazardous industrial waste shall be deposited by their generators or authorized persons To manage the premises and disposal facilities designated for this purpose by the Regional Master Plan under the control of the municipalities or their associations concerned and the officials authorized to do so " • Article 25, which provides that: "The municipal management responsible for the management of municipal solid waste and, where applicable, eligible persons may receive and manage inert, agricultural, residual and non-hazardous industrial waste with A fee for services. The rate of this fee shall be determined by the municipal council, in accordance with Law No. 78-00 concerning the municipal charter, Article 69. In addition, the council will determine the itinerary, the pace and the timetable for this type of collection garbage " ; • Article 26 which provides that: "Agricultural waste and non-hazardous industrial waste can not be treated as household waste on the basis of an analysis report, if necessary, by the municipality and carried out by a laboratory Accredited. In this case, the waste may be transported and deposited separately in landfills of controlled municipal sites'; • Article 28, which allows biodegradable agricultural waste to be recycled or disposed of on the farms that produce it;
<p>B.5. Implementation arrangements</p>	<p><u>Describe construction and supervision methodology with key contractual agreements.</u></p> <p>The logic of intervention for the valorization of olive pomace passes through three stages namely:</p> <ul style="list-style-type: none"> • The installation of olive-pomace collection centers at the scale of crushing units in the region. This involves the construction of ten collection centers. • Transport of margins and pomace to the recovery unit. At this stage, the transport of the olive-pomace will be carried out by transporting the crushing units to the recovery unit. To ensure this transport, the project envisages the purchase of means for transporting the products resulting from crushing. In addition, the institutionnel arrangements plans for the setting up of an exclusive contract for the sale of olive-pomace oil to the recovery unit in order to ensure its operation. • The construction of the upgrading unit will first pass through a technical design study, the purchase of valorization technology. <p>At the same time, the implementing entity will ensure the establishment of a contract for the sale of the electricity produced for the region by injecting the energy produced into the ONEE network or directly into the network The Autonomous Water and Electricity Board.</p> <p>Implementation of the project will involve intentional arrangements and contracts with the various key players, namely:</p> <ul style="list-style-type: none"> • The DRA of Fes-Meknes will be the implementing entity responsible for the implementation of component 1. The ADA as an accredited entity will have the role of supervising and monitoring the implementation of component 1. Through the Directorate of Project Management at the ADA Seine. • ONCA: it will be responsible for the support at the level of the territory on the implementation and the contact with the beneficiaries. • INERPROLIVE: the interprofession will be in relation with the DRA and ONCA to coordinate with the GIEs and the beneficiaries on the mobilization of the land, the adhesion to the project and the signing of a convention for the supply of olive pomace and for the valuation unit. • The Fes-Meknes Region: Has the role to facilitate the establishment of the olive-pomace collection centers and the recovery unit. The region will also facilitate the setting up of a convention for the injection of electricity produced on the city's network. • ONEE Branch Electricity: Will have the role of facilitating the implementation of the connection of the Energy production unit and the injection of the Electricity produced in the national network. <p>For institutional arrangements:</p> <ul style="list-style-type: none"> - An agreement will be signed between the Implementing Entity, ONCA and GIEs producing olives for supply;

- An agreement will be signed between the executing agency, ONEE Electricity Branch, Fes-Meknes Region and a Private Operator for the production of Electricity and injection into the ONEE network.
- From the second year onwards, the executing entity will issue a call of interest to designate the manager of the recovery unit in order to prepare its operationalization by means of a precise specification.

For the implementation of the project. The implementing entity set up the following monitoring and enforcement committees;

- Project Management Unit - PMU: It will be responsible for planning the project activities and will be composed of a PMU Director and a multidisciplinary team to facilitate the implementation of the project according to the required standards.
- Steering committee: The steering committee will be composed of the various partner institutions in the project (ADA, DRA, Region, ONCA, ONEE, Ministry of Energy, Ministry of Agriculture, etc.). The steering committee will have the role of validating the project planning on an annual basis and periodically monitoring the progress of the activities. The Committee shall meet quarterly and if necessary at the request of the Entity of Implementation or the Accredited Entity.
- Project Follow-up Technical Committee: this committee is composed of representatives of entities locally in addition to ONCA, INTERPROLIVE, GIE, ONEE. It is responsible for monitoring the implementation of the project at the local level. In addition to the companies and firms selected for the implementation of the project components. This committee meets monthly and if necessary at the request of its members or the request of the steering committee.

Describe operational arrangements with key contractual agreements following the completion of construction.

For the implementation of project activities, different contracts will be established, namely:

- Contract of consultant for the technical assistance of the project: a call for tender will be launched to select a firm specialized in the technical assistance of the project and the setting up of the unit of energy recovery. An international call for tender will be launched to select the firm that has similar references in terms of study and monitoring of the work of the energy recovery unit.
- Contract with a partner design office and architect's office for: design studies of the collect unit, technical feasibility of the project, choice of technology.
- Contract with construction company for the installation of the collection basins provided for in component 1
- Contract with the construction company for the installation of the energy recovery unit. An international call for tender will be launched for the selection of the company specializing in the construction and installation of energy production units from olive pomace.
- Contract for the purchase of the adapted equipment and technology: a call for tender will be launched after having carried out the studies for the choice of the technology and the supplier of the production equipment of the Energy.
- Contract for the purchase of rolling stock and transport: an invitation to tender will be issued for the purchase of rolling stock and spare parts for the collection of olive-pomace.

A timetable showing major scheduled achievements and completion for each of the major components of the project/program.

Component /activities	Year 1				Year 2				Year 3				Year 4			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Component 1: Installation of olive pomace and margine Collect units																
Activity 1.1. : Installations of collects centers																
Activity 1.2. : contractualisation of GIEs for the recovery of olive oil																
Activity 1.3. : Equipment and equipment purchases of collect units																
Component 2: Establishment of the biomass recovery unit Energy from olive waste																
Activity 2.1. : Technical studies of the biomass recovery unit																
Activity 2.2. : Construction and equipment of the biomass energy recovery unit																
Activity 2.3. : Intentional Arrangements and Connection to the Electric System																
Activity 2.4. : Purchase of means of transport																
Component 3: Project Technical Assistance																
Activity 3.1. : Technical assistance to follow up on the establishment of the unit																
Activity 3.2. : Technical assistance to beneficiaries																
Activity 3.3. : Institutional capacity building																

The project will consist of an integrated management of the by-products, with a reduction of the environmental impacts. It is proposed to set up a unit for the treatment of waste from the trituration of olives, with a view to producing biofuels, biomass, bio-food and electrical energy. Perfectly in the vision of sustainable development adopted by the Morocco Green Plan.

C. Financing / Cost Information

- a breakdown of cost estimates analysed according to major cost categories.

C.1. Description of financial elements of the project / program

Component /activities	Prix total (\$ US)
Component 1: Installation of olive pomace and margine Collect units	3 300 000,00
Activity 1.1. : Installations of collects centers	3 000 000,00
Activity 1.2. : contractualisation of GIEs for the recovery of olive oil	150 000,00
Activity 1.3. : Equipment and equipment purchases of collect units	150 000,00
Component 2: Establishment of the biomass recovery unit Energy from olive waste	40 760 000,00
Activity 2.1. : Technical studies of the biomass recovery unit	3 600 000,00
Activity 2.2. : Construction and equipment of the biomass energy recovery unit	36 000 000,00
Activity 2.3. : Intentional Arrangements and Connection to the Electric System	360 000,00
Activity 2.4. : Purchase of means of transport	800 000,00
Component 3: Project Technical Assistance	3 500 000,00
Activity 3.1. : Technical assistance to follow up on the establishment of the unit	1 500 000,00
Activity 3.2. : Technical assistance to beneficiaries	1 000 000,00
Activity 3.3. : Institutional capacity building	1 000 000,00
TOTAL BUDGET	47 560 000,00

C.2. Project financing information

	Financial Instrument	Amount	Currency	Tenor	Pricing
Total project financing (a) = (b) + (c)		47,6	<u>million USD</u> (\$)		
(b) Requested GCF amount	(D) Senior Loans	.....	<u>million USD</u> (\$)	() years	() %
	(ii) Subordinated Loans	.....		( ) years	() %
	(iii) Equity	.....		( ) % IRR	
	(iv) Guarantees	.....		
	(v) Reimbursable grants *	.....		
	(vi) Grants *	41,1			
* Please provide detailed economic and financial justification in the case of grants.					
Total Requested (i+ii+iii+iv+v+vi)		.....		

		Financial Instrument	Amount	Currency	Name of Institution	Seniority
	€Co-financing	<u>Grant</u>	6,5	<u>million USD</u> <u>(\$)</u>	Government budget	
		<u>Grant</u>		<u>million USD</u> <u>(\$)</u>		
		<u>Grant</u>		<u>million USD</u> <u>(\$)</u>		
		Lead financing institution:				
	(d) Covenants					
	€Conditions precedent to disbursement					

D. Expected Performance against Investment Criteria

Please explain the potential of the Project/Program to achieve the Fund's six investment criteria as listed below.

<p>D.1. Climate impact potential [Potential to achieve the GCF's objectives and results]</p>	<p><i>Specify the climate mitigation and/or adaptation impact. Provide specific values for the below indicators and any other relevant indicators and values, including those from the Fund's</i></p> <ul style="list-style-type: none"> - Total Teq Co2 sequestration : 210 000 T CO2 Eq only from Electricity - Beneficairies : 16 000 directs beneficiaries 																					
<p>D.2. Paradigm shift potential [Potential to catalyze impact beyond a one-off project or program investment]</p>	<p><i>Provide the estimates and details of the below and specify other relevant factors.</i></p> <p>Currently, the development of the olive sector poses a real brake with its negative impact on the environment which is caused by the effects of olive pomace and margins on the groundwater table and the environment. The project consists in the recovery of this waste as inputs for the production of clean energy avoiding the pollution of the groundwater.</p> <p>The project will also contribute to the preservation of the environment and the groundwater, to the development of energy from biomass and will facilitate the development of environmentally resilient olive growing.</p> <p>At present, the crushing units discharge approximately 187,000 tons of margin and olive-pomace into the production basins of the area targeted by the project. These solid and liquid discharges are given below per olive-growing basin.</p> <p><i>Estimated quantities of liquid and solid discharges per olive-growing basin</i></p> <table border="1" data-bbox="494 1892 1492 2150"> <thead> <tr> <th>Basins</th> <th>Margin produced 1000 m3/an</th> <th>Olive-pomace produced 1000 T/an</th> </tr> </thead> <tbody> <tr> <td>AKNOUL</td> <td>5</td> <td>4,5</td> </tr> <tr> <td>AZZABA</td> <td>6,3</td> <td>5,7</td> </tr> <tr> <td>DKHISSA-MHAYA</td> <td>18,8</td> <td>17</td> </tr> <tr> <td>ELHAJEB-ISSOUAL</td> <td>12,2</td> <td>12</td> </tr> <tr> <td>ELORJANE-OUTAT LHAJ</td> <td>0,6</td> <td>0,5</td> </tr> <tr> <td>FES-MY YACOUB</td> <td>25,7</td> <td>23,2</td> </tr> </tbody> </table>	Basins	Margin produced 1000 m3/an	Olive-pomace produced 1000 T/an	AKNOUL	5	4,5	AZZABA	6,3	5,7	DKHISSA-MHAYA	18,8	17	ELHAJEB-ISSOUAL	12,2	12	ELORJANE-OUTAT LHAJ	0,6	0,5	FES-MY YACOUB	25,7	23,2
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<i>FRITISSA</i>	<i>0,9</i>	<i>0,8</i>
<i>GHAFSAI</i>	<i>24,6</i>	<i>22,2</i>
<i>IGHEZRANE</i>	<i>7,4</i>	<i>6,7</i>
<i>KARIA</i>	<i>10</i>	<i>9</i>
<i>KSABI</i>	<i>0,3</i>	<i>0,3</i>
<i>MISSOUR</i>	<i>0</i>	<i>0</i>
<i>MY DRISS ZARHOUNE</i>	<i>11</i>	<i>9,9</i>
<i>OUED AMLIL</i>	<i>8,7</i>	<i>7,9</i>
<i>RAS TABOUDA</i>	<i>6,9</i>	<i>6,2</i>
<i>SEKKOURA</i>	<i>0,9</i>	<i>0,8</i>
<i>TAHALA</i>	<i>4,2</i>	<i>3,8</i>
<i>TAINASTE</i>	<i>7,5</i>	<i>6,8</i>
<i>TAOUNATE</i>	<i>30,6</i>	<i>27,6</i>
<i>TAZA</i>	<i>10</i>	<i>9</i>
<i>TISSA</i>	<i>14</i>	<i>12,6</i>
<i>TISSAF</i>	<i>0,4</i>	<i>0,4</i>
<i>WIZEGHT</i>	<i>0,2</i>	<i>0,2</i>
<i>Total</i>	<i>206,2</i>	<i>187,1</i>

Most of the liquid discharges are concentrated in the province of Taounate (80,000 m³ annually), affecting the quality of surface water and groundwater, and accelerating soil degradation.



The replicability of the project – scaling-up of project : The project represents a pilot experiment at the national level and its replicability is feasible in other olive-growing basins distributed throughout the national territory.

The project will facilitate the implementation of the law on energy in Morocco -Law 13-09, particularly for the production of energy from biomass and will therefore open the way to other forms of recovery and facilitate the implementation of Law on Renewable Energy.

The project will also promote the development of other energy recovery projects from agricultural waste, as the potential is still not efficiently tapped, and green waste is used only as manure or disposed of in landfills.

D.3. Sustainable development potential
[Potential to provide wider development co-benefits]

Provide the estimates of economic, social and environmental co-benefits. Examples include the following:

In addition to energy production, the project also ensures the sustainability of the water source from the groundwater table, since it will not be polluted. It will also allow the development of the olive sector, resilient to the environment, and will meet

	<p>international requirements in terms of respecting standards for trituration and for recovery of waste from trituration. The project will yield a positive impact with additional income to olive growers in the project area.</p> <p>Energy produced will be injected into the grid and consumed locally for public lighting or other forms of consumption. This mode will reduce the energy dependence of the area in relation to the imported energy. This economic impact will yield an impact on incentives for attractive investment in the project area.</p>
<p>D.4. Needs of recipient <i>[Vulnerability to climate change and financing needs of the recipients]</i></p>	<ul style="list-style-type: none"> • <i>Level of exposure to climate risks for beneficiary country and groups</i> <p>The project for the energy recovery of biomass from olive-pomace is located in the area of the region. This area is characterized by a semi-arid climate with variable rainfall and temperatures very variable from one year to the next. This variability in the climate prompted farmers to move towards environmentally resilient agriculture, especially olive growing.</p> <p>The Nationally Determined Contribution for mitigation aims to reduce GHGs by 42% by 2030, compared to emissions projected under a "normal course of business" scenario. This goal can be achieved only if it receives substantial support from the international community.</p> <p>The biomass energy recovery project fits perfectly with Morocco's ambition to mitigate and enhance waste from fruit trees.</p> <p>In addition, the olive sector is both important and vulnerable to climate change. Indeed, the sector, which is the basis of inputs for energy production, occupies an important place in the economy and contributes by about 5% to the formation of agricultural GDP upstream, and by 15% in agri-food exports at the national level. This sector generates about 15 million days of work per year, or about 70,000 permanent jobs. The olive sector covers about 18% of the country's needs in food-grade vegetable oils and supplies olive canneries which produce an average of 120 000 tons annually, half of which is exported. This situation remains at least fragile because of its vulnerability to climate change. Indeed, Morocco has experienced periods of drought and floods.</p> <p>To date, no project for the recovery of biomass energy from olive-pomace has received regular financing due to the failure of the local financial system to adapt to projects devoted to climate change and the valorization of agricultural waste . On the other hand, access to climate finance is the only alternative to stimulate the development of the sector, but also the extension of the experience to other areas.</p> <p>The project will both produce energy from olive residue, and change the way in which agricultural waste is recycled and, thus, will boost the economic and social development of rural populations. The project also strengthens the stakeholders' capacities in terms of waste recovery and clean energy production. To date, the lack of knowledge on valorization due to the absence of pilot experiment forces the institutions to be more conservative as to the method of valorization of the pomace on the national scale. The project will also facilitate the enforcement of legislation relating to the production of clean energy and its injection into the national grid.</p>
<p>D.5. Country ownership <i>[Beneficiary country ownership of project or program and capacity to implement the proposed activities]</i></p>	<p><i>Provide details of the below and specify other relevant factors.</i></p> <ul style="list-style-type: none"> • Coherence and alignment with the country's national climate strategy and priorities in mitigation or adaptation <p>Nationally Determined Contribution of Morocco</p>

The implementation of Morocco's NDC is part of an integrated approach that goes beyond climate change to include respect of human rights and gender equality and enshrined in Morocco's 2011 constitution, synergies with two other Rio conventions, alignment of actions related to climate change with the UN's Sustainable Development goals and Implementation of the advanced regionalization projects in Morocco. Two parts of Morocco's NDC are :

- Adaptation plan : the proposition of Morocco's national budget dedicated to adaptation is a testimony to the scale of the challenge facing Moroccan society. Efforts will have to increase over the coming years and decades. Morocco forecasts that, between 2020 and 2030, the implantation of adaptation program will cost at a minimum USD 35 billion for the most vulnerable sectors, namely water, forestry and agriculture ;
- Mitigation plan : Morocco commits to reducing its GHG emissions by 42% below business-as-usual (BAU) levels by 2030. This commitment will only be made possible if Morocco gains access to news sources of finance and to additional support relative to support received in recent years. This commitment leads to a total of 527 million tones of carbon dioxide equivalent (Mt CO2 eq) between 2020 and 2030. The total cost to reach this goal is USD 50 billion, of which USD 24 billion would be conditional on international support made available through new climate finance mechanisms, including the Green Climate Fund (GCF).

Morocco Green Plan

The project will contribute to the achievements of the national development strategy for the agricultural sector toward 2020 and beyond. The project is in line with the National Charter for Environment and Sustainable Development, which aims at strengthening a 'green economic growth'. In particular, it is in accordance with the national strategy for the agricultural sector called "Green Morocco Plan", which promotes food security through a sustainable improvement of productivity while saving natural resources.

Morocco National Strategy of Energy

Morocco's commitment to the climate and the development of renewable energies, will lead to increasing the share of renewable energies from 42% of planned installed capacity in 2020 to 52% by 2030. This strong impetus given to energetic transition will reduce Moroccan expenditure on imports of commercial energies to less than 82% by 2030.

The energy strategy, which attaches great importance to the development of renewable energies and energy efficiency, is based on four fundamental objectives:

- Strengthening security of energy supply and energy availability;
- Widespread access to energy at competitive prices;
- Mastering the demand;
- The preservation of the environment

<p>D.6. Effectiveness and efficiency <i>[Economic and financial soundness and effectiveness of the proposed activities]</i></p>	<p><i>Provide details of the below and specify other relevant factors (i.e. debt service coverage ratio), if available.</i></p> <p>The whole project will be designed to increase cost-efficiency and effectiveness of future investments in biomass energy mitigation in Morocco. Moreover, procurement procedures, based on open competitive bidding, will favor a more cost-effectiveness selection process. Through project implementation, duplication costs shall be avoided.</p> <p>The ratio between GCF grant and total amount of the project is 86%.</p>
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E. Brief Rationale for GCF Involvement and Exit Strategy

Please specify why the GCF contribution is critical for the project/program.

In order to achieve this investment, Morocco is counting on the mobilization of climate finance to achieve its goals on climate change and it is in this context that the use of GCF is essential in order to contribute to reduce GHG by using biomass energy.

The GCF contribution is critical for the project in order to finance the operationalization and strengthening resilience to climate change and produce energy from biomass. The grant will provide a strong incentive to go beyond current policy of reduction of vulnerability to climate change and also to reduce energy access barriers in the vulnerable area..

The implementation of the GCF grant by ADA and Executing Entity will also be instrumental in increasing the institution's legitimacy and comfort its position as the main policy maker on biomass energy at the national scale. The GCF funding, in the form of a grant, will permit better efficiency of the similar future investment.

After completion of the project, the EOI will be managed and ensure that the unit will operate to produce energy.

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

The call for expressions of interest for the selection of a private partner to ensure, according to a specification, the operation of the recovery unit after completion of the works.

The executing entity and the Accredited Entity will be responsible for monitoring the operation of the project with the region after completion of the work.

F. Risk Analysis

The preliminary risk analysis is as follows:

- The availability of the raw material: the collection of olive-pomace and its supply for the operation of the recovery unit presents a significant risk to which the project must take action. The draft provides for the establishment of agreements with economic interest groups and with the inter-branch in order to guarantee collection and supply. On the other hand, the purchase of olive-pomace will be made at a competitive price in order to encourage the guarantee of the raw material. On the other hand, the deposit of agricultural green waste makes it possible to mitigate the supply risk in terms of sufficient quantity of olive residue. It should be noted that in the case of insufficient quantity, the use of the collection of olive-residue from other regions makes it possible to mitigate this risk.
- Risk of connection to the electricity network: the current law 13-09 and the application texts are in progress in order to facilitate the injection of energy into the network.
- Technology used: the technology used will be studied and an international benchmark will be carried out before the adoption of the final technology. It should be noted that, a priori, Spain has a great deal of experience in terms of energy recovery of biomass from olive-pomace.

- Maintenance of the equipment: the supply of the recovery equipment will be ensured according to the regulations in force and according to the European and international standards in this matter. The risk of the material is assured by the solution provider for the duration of the project evaluation. All the more so in the evaluation of the project's profitability, the costs of maintenance of the equipment are provided for in the financial model.
- Social risk: Refusal to cooperate for the supply of pellets after the completion of the project: the capacity building component of the actors will focus on the sustainable adherence of the project beneficiaries.
- Environmental Risk during the construction phase: The Environmental and Social Management Plan will put all the mitigation actions that will be budgeted, followed by an expertise in the matter to ensure compliance with all environmental and social safeguard policies.

G. Multi-Stakeholder Engagement

Please specify the plan for multi-stakeholder engagement, and what has been done so far in this regard.

The project is part of the Morocco Green Plan. Currently, the ministry is conducting the consultation with the major stakeholders and beneficiaries (the GIE and INTEPROLIVE, ONCA, ...).

H. Status of Project/Program

- 1) A pre-feasibility study is expected to be completed at this stage. Please provide the report in section J.
- 2) Please indicate whether a feasibility study and/or environmental and social impact assessment has been conducted for the proposed project/program: Yes No
(If 'Yes', please provide them in section J.)
- 3) Will the proposed project/program be developed as an extension of a previous project (e.g. subsequent phase), or based on a previous project/program (e.g. scale up or replication)? Yes No
(If yes, please provide an evaluation report of the previous project in section J, if available.)

I. Remarks

J. Supporting Documents for Concept Note

- Map indicating the location of the project/program
- Financial Model
- Pre-feasibility Study
- Feasibility Study (if applicable)
- Environmental and Social Impact Assessment (if applicable)
- Evaluation Report (if applicable)