



United Nations Development Programme

Annotated Project Document template for nationally executed projects financed by the GEF Trust Fund, and the GEF LDCF and GEF SCCF Trust Funds

Project title: Promotion of Sustainable Charcoal in Angola through a Value Chain Approach	
Country: ANGOLA	Implementing Partner: Ministry of Environment (Climate Change Cabinet)
Management Arrangements: National Implementation Modality (NIM) (Assisted)	
UNDAF/Country Program Outcome: No. 4: By 2019, the environmental sustainability is strengthened through the improvement of management of energy, natural resources, access to green technology, climate change strategies, conservation of biodiversity, and systems and plans to reduce disasters and risks	
UNDP Strategic Plan Output: 1.5: Inclusive and sustainable solutions adopted to achieve increased energy efficiency and universal modern energy access (especially off-grid sources of renewable energy)	
UNDP Social and Environmental Screening Category: B (moderate)	UNDP Gender Marker: either 1, 2, or 3. Note that a gender marker of 0 (zero) is not appropriate for any UNDP-GEF project. See further information at (to be added to this page https://intranet.undp.org/unit/bpps/gender/_layouts/viewlsts.aspx?BaseType=0)
Atlas Proposal/Award ID (also known as 'project'): 00084488	Atlas output Project ID (also known as 'output'): 00092469
UNDP-GEF PIMS ID: 5331	GEF ID: 5719
Planned start date: 1 April, 2016	Planned end date: 31 March, 2022
FINANCING PLAN	
GEF Trust Fund or LDCF or SCCF or other vertical fund	USD 4,620,000
UNDP TRAC resources	USD 875,000
Cash co-financing to be administered by UNDP	USD 0
(1) Total Budget administered by UNDP	USD 5,495,000

PARALLEL CO-FINANCING		
Government of Angola	USD 15,000,000 (cash)	
Government of Angola	USD 1,000,000 (in-kind)	
Universidad de Cordoba (UCO-ETSIAM), Spain	USD 650,000 (in-kind)	
Ajuda de Desenvolvimento de Povo a Povo (ADPP), Angola	USD 1,000,000 (in-kind)	
Cooperazione e Sviluppo dei Paesi Emergenti (COSPE), Italy	USD 186,700 (in-kind)	
(2) Total co-financing	USD 17,836,700	
(3) Grand-Total Project Financing (1)+(2)	USD 23,331,700	
Brief project description: The Project aims to introduce energy-efficient charcoal technologies in Angola and trigger market demand for certified, sustainable charcoal. Through selected Responsible Partners, energy-efficient charcoal kilns, briquetting machines and efficient stoves will be transferred to rural and peri-urban beneficiaries, thereby adding value along the chain while creating opportunities for income and job creation. Environmental benefits are attained by mitigation of baseline greenhouse gas emissions, reduction of local pollution, and saving of forest-based biomass resources. The Project will deliver key elements for building and financing a sustainable charcoal sector, including a policy white paper and sustainability criteria and verification mechanisms. The Project will further build relevant human resources at all levels for implementing and sustaining low-emission development strategies in Angola, with a focus on charcoal and rural biomass utilization. Finally, the Project will mainstream sustainable charcoal into existing Governmental poverty reduction and rural development programs.		
SIGNATURES		
Signature:	Agreed by Government	Date/Month/Year:
Signature:	Agreed by Implementing Partner	Date/Month/Year:
Signature:	Agreed by UNDP	Date/Month/Year:

Table of Contents

I.	Situation Analysis.....	7
	Policy conformity	7
	Country eligibility	7
	Country ownership and drivenness.....	7
	Alignment with UNDP Assistance Framework	8
II.	Development Challenge.....	9
	Country situation and development context	9
	The charcoal value chain.....	11
	Problem statement	12
	Long-term solution.....	12
	Barrier analysis	12
	Baseline project and rationale for GEF involvement.....	16
	Rationale for GEF involvement.....	19
III.	Strategy.....	19
	Development objective	19
	Approach.....	19
IV.	Results and Partnerships.....	22
	Project strategy	22
	Project components	22
	Environmental benefits.....	31
	Economic and social benefits	32
	Mainstreaming gender.....	33
V.	Feasibility	35
	Cost efficiency and effectiveness	35
	Risk Management.....	36
VI.	Project Results Framework	42
VII.	Monitoring and Evaluation (M&E) Plan	45
	Inception Workshop.....	45
VIII.	Governance and Management Arrangements	48
	Political level	48
	Institutional level.....	48
	Operational level.....	51
IX.	Financial Planning and Management.....	52
X.	Sustainability of Results	52
	Sustainability and replicability	52
	Socio-environmental safeguards.....	53
XI.	Legal Context	53
	Other Arrangements	53
XII.	Total Budget and Work Plan	55
	Budget Notes.....	57
XIII.	Annexes.....	60

List of Acronyms and Abbreviations

ADPP	Ajuda de Desenvolvimento de Povo para Povo
AKZ	Angolan Kwanza
ANEER	African Network for Education in Energy Resources
APR	Annual Progress Report
AWP	Annual Work Program
CC	Climate Change
CCC	Climate Change Cabinet
CCM	Climate Change Mitigation
CDM	Clean Development Mechanism
CDR	Combined Delivery Report
CETAC	Centro de Ecologia e Alterações Climáticas)
CH ₄	Methane
CLOD	Centros de Logística e Distribuição
CMA	Comissão Multisectorial para o Ambiente
CO	Country Office (UNDP)
COP	Conference of Parties (UNFCCC)
COSPE	Cooperazione per lo Sviluppo dei Paesi Emergenti
CO ₂	Carbon Dioxide
CO _{2eq}	Carbon Dioxide Equivalents
CPAP	Country Program Action Plan
DSA	Daily Service Allowance
EDEL	Empresa de Distribuição de Electricidade (formerly)
EE	Energy Efficiency
EPF	Escola de Professores do Futuro
EPP	Escola Polivalente e Profissional
ESIA	Environmental and Social Impact Assessment
EU	European Union
FA	Financial Assistant
FC	Farmers' Club
FCA	Faculdade de Ciências Agrárias
FUNEL	National Electrification Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
GOA	Government of Angola
GPS	Global Positioning System
GWh	Gigawatt (GW)-hours (1 x 10 ⁶ kWh)
HDI	Human Development Index
HQ	Headquarter (UNDP)
LOA	Letter of Agreement
LPG	Liquefied Petrol Gas
ICT	Information and Communication Technology
IDAF	Centro de Investigaciones Aplicadas al Desarrollo Forestal
IDF	Institute for Forestry Development
IDP	Internally Displaced People

IIA	Institute for Agronomic Research, Huambo
INAPEM	Instituto Nacional de Pequenas e Médias Empresas
IW	Inception Workshop
kWh	kilowatt (kW)-hours
LDC	Least Developed Country
LNG	Liquid Natural Gas
LPAC	Local Project Appraisal Committee
LPG	Liquefied Petroleum Gas
MED	Ministry of Education
MINAMB	Ministry of Environment
MINCO	Ministry of Commerce
MINGEO	Ministry of Geology and Mines
MINPET	Ministry of Petroleum
MOU	Memorandum of Understanding
MRV	Measuring, Reporting and Verification
MTR	Mid-term Review
MW	Megawatt (1×10^3 kW)
MWh	Megawatt (MW)-hours (1×10^3 kWh)
M&E	Monitoring and Evaluation
NAMA	Nationally Appropriate Mitigation Action
NGO	Non-Governmental Organization
NIM	National Implementation Modality
NPD	National Project Director
NPFE	National Portfolio Formulation Exercise
PAC	Project Appraisal Committee
PAPAGRO	Programa de Aquisição de Produtos Agropecuárias
PB	Project Board
PC	Project Coordinator
PES	Payment for Ecosystem/Environmental Services
PIF	Project Identification Form
PIR	Project Implementation Review
PMIDRCP	Programa Municipal Integrado de Desenvolvimento Rural e Combate a Pobreza
PM	Project Management
PMT	Project Management Team
PND	National Development Plan
PO	Project Officer
PPG	Project Preparation Grant
PPR	Project Progress Report
PRODOC	Project Document
PT	Portuguese
PV	Photovoltaic
RE	Renewable Energy
REDD+	Reduce Emissions from Deforestation and forest Degradation
RCU	Regional Coordinating Unit
RP	Responsible Party
RTA	Regional Technical Advisor
SBAA	Standard Basic Assistance Agreement
SES	Social and Environmental Standards
SESP	Social and Environmental Screening Procedure

SRF	Strategic Results Framework
S(M)ME	Small (Micro) and Medium Enterprise
STAP	Scientific Technical Assistance Panel (GEF)
TA	Technical Advisor
TA	Technical Assistance (GEF)
TE	Terminal Evaluation (GEF)
TNA	Technology Needs Assessment
UCO	University of Córdoba, Spain
UJES	Univesidade Jose Eduardo dos Santos, Huambo
UNDAF	United Nations Development Assistance Framework
UNDG	United Nations Development Group
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention for Climate Change
USD	United States Dollar
W	watt

List of Annexes

Annex A	List of Documents
Annex B	Agreements
Annex C	Direct Project Costs
Annex D	Calculation of Greenhouse Gas Benefits
Annex E	UNDP Environmental and Social Screening Template
Annex F	GEF CCM Tracking Tool
Annex G	Terms of Reference
Annex H	Minutes PPG Inception Workshop, February 2015 (PT)
Annex I	Minutes and presentation PPG Validation Workshop, July 2015 (PT)
Annex J	PPG Report “Avaliação Técnica e Análise da Linha de Base da Fase PPG do Projecto”, CETAC Huambo and UCO-IDAF, June 2015 (PT)
Annex K	PPG Mission Report International Consultant, May 2015
Annex L	Rural charcoal production pilot ADPP Angola
Annex M	Rural charcoal production pilot COSPE
Annex N	Capacity building pilot UJES-UCO

I. SITUATION ANALYSIS

Policy conformity

1. The present Project “Promotion of Sustainable Charcoal in Angola through a Value Chain Approach” envisages to increase the energy efficiency of the charcoal value chain from biomass inputs (wood) to charcoal production and energy service delivered to the end-user (heat). As such, it is supportive to GEF-5 CCM Objective #2 (“Promote market transformation for energy efficiency in industry and the building sector”). The Project specifically aims to assist Angola to re-orient the rapidly growing national charcoal market towards more sustainable, low-emission models by increasing the energy- and resource-efficiency of the production and utilization phase of the charcoal value chain, thereby increasing the locally added value to strengthen rural and peri-urban economies.
2. The Project will deliver critical inputs for the Government of Angola to increase governance of the charcoal supply chain and test mechanisms for monitoring, verification and reporting (MRV) of emission reductions delivered. Investment in sustainable, energy-efficient charcoal technologies is encouraged through a first upscaling round under the Project, while demand for certified, sustainable charcoal is created through Governmental programs acting as the delivery channel.

Country eligibility

3. Angola is a signatory to the UNFCCC (signed 14 June, 1992 and ratified 17 May, 2000). The country is also signatory to the Kyoto Protocol (accession 8 May, 2007)¹.

Country ownership and drivenness

4. Angola’s National Development Plan (PND) 2013-2017, the first of this kind prepared under the framework of the new Constitution (2010), outlines the priority areas, lines of action and investment programs defining the country’s path towards modernization and sustainable development. The PND elaborates the Government’s Long-Term Strategy “Angola 2025” (2008)², which identifies the main challenges faced by the country including – among others – poverty reduction and improvement of quality of life, technological development, promotion of entrepreneurship, and a more harmonious (decentralized) development of the national territory.
5. The PND defines four priority clusters: (i) food production and agro-industries; (ii) energy and water; (iii) housing; and (iv) transport and logistics (p.14). The present Project is directly supportive to the energy cluster, and is intrinsically linked to food production given the fact that charcoal production is part of mixed, small-scale agricultural subsistence systems, while transport and facilitation of logistics are critical conditions for cost-effective and efficient access to urban markets. Basic education and preparation of professional human resources are identified as a key condition for equitable, sustainable development. Poor management of natural resources and disintegration of social and productive structures in rural areas, and environmental degradation are identified as critical weaknesses (p.23). The PND envisages programs to address these issues and multi-sectorial committees to improve coordination and governance of environmental-related issues³.
6. The Action Plan for the Energy and Water Sector 2013-2017⁴ outlines the following initiatives: (i) investment of US\$ 3.3 million for rural electrification (targeting municipalities and community centres); (ii) utilization of renewable energy resources (specifically small hydropower, PV systems, wind generators, and biomass from forestry and residues) for rural electrification, to be developed under public-private partnerships to generate local impact; (iii) restructuring of the public enterprises currently involved in both sub-sectors to increase business performance; (iv) adjustment of electricity tariffs towards increased cost recovery and reduction of subsidies; and

¹ Source: <http://unfccc.int/>.

² Angola 2025, Angola um País com Futuro, Estratégia de Desenvolvimento a Longo Prazo para Angola (2025).

³ The Multisectorial Committee for the Environment.

⁴ Plano de Accção do Sector de Energia e Águas 2013-2017, MINEA (Abril 2013).

(v) separation of electricity generation, transport, and commercialization. The Action Plan prioritizes investment in large-scale generation and transmission infrastructure and acknowledges the importance of energy efficiency in the electricity system and the oil industry. Positive actions put forward include: (i) the Energy Savings Plan (EDEL, 2009) promoting energy-efficient lighting among public institutions and private consumers; (ii) the Solar Village (“Aldeias Solares”) program to install PV systems in public buildings in rural areas; (iii) the use of prepaid meters; and (iv) the National Strategy for New Renewable Energies (MINEA, 2014).

7. Traditional fuelwood and charcoal are the main energy sources for nearly 80% of the population⁵, in particular rural and peri-urban households, and make up 57% of the country’s energy consumption⁶. Angola’s First National Communication (2011) to the UNFCCC highlights the importance of biomass utilization, which is predicted to exponentially increase up to 2030. The sector ministries MINEA and MINAGRI’s Institute for Forestry Development (IDF) are in the process of developing a national biomass strategy and inventory of forestry resources. Traditional biomass as such is not covered by the national energy policy as yet, but its importance and impact on deforestation, desertification and loss of soils and biodiversity have been mentioned by the Ministry of Agriculture.⁷ In 2004, IDF participated in a project to support charcoal producers and improve production methods and techniques.⁸ Improvements in regulation require charcoal producers to be licensed by IDF, but enforcement mechanisms are still weak.

8. The Multi-Sectorial Committee for the Environment (CMA), led by MINAMB, has been created⁹ to improve coordination between sector ministries and strengthen governance. It is recognized that the informal and small-scale character of the charcoal sector is an impediment for effective policy; formalization and economic development are viewed as critical for promoting more sustainable production methods. In the medium to long term, a fuel switch to LPG or LNG is conceived as a measure to curb growing charcoal demand in the urban areas. It is further recognized that financing opportunities exist from payment for environmental services. However, at present (2015) no formal policy has been developed into this direction.

Alignment with UNDP Assistance Framework

9. The present Project is aligned with the United Nations Development Assistance Framework (UNDAF) outcomes involving UNDP¹⁰ Outcome No. 4: “By 2019, the environmental sustainability is strengthened through the improvement of management of energy, natural resources, access to green technology, climate change strategies, conservation of biodiversity, and systems and plans to reduce disasters and risks.” Output 4.1: “Legal and regulatory frameworks and institutions enabled to ensure the conservation, sustainable use, access to and benefit-sharing of environmental resources in line with international conventions and national legislations.”¹¹ Outcome No. 1: “By 2019, Angola has put into place and is implementing policies and strategies to promote inclusive and sustainable growth, leading to graduation from the least developed countries group.” Output 1.2: “Strengthened national systems and institutions to achieve diversification, entrepreneurial development and sustainable livelihoods.”¹²

⁵ Angola: Towards an Energy Strategy, IEA, 2006.

⁶ National Strategy for Forestation and Reforestation, MINAGRI (2008).

⁷ According to estimations in the Global Evaluation of World Forest Resources, Angola loses in average every year around 106,000 ha of natural forests and 370 ha of plantations, at an annual rate of 0.2% and 0.5% respectively. Source: SE4All Gap Analysis, UNDP, June 2014.

⁸ Project TCP/ANG/2802, “Apoio a Promoção de Plantações para a Produção de Carvão e Lenha nas Províncias de Luanda, Bengo e Huambo” Institute of Forestry Development, 2004

⁹ The Multi-sectorial Environmental Committee (Comissão Multisectorial para o Ambiente – CMA), established 21 June 2014 (Pres. Decree No.30/10).

¹⁰ Country program document for Angola (2015-2019), DP/DCP/AGO/3 April 2014.

¹¹ Indicator 4.1.1: Number of responsive legal, policy and institutional frameworks supported for sustainable management of environment resources.

¹² Indicator 1.2.1: Number of schemes enabled to expand and diversify employment and livelihood opportunities for youth and women.

II. DEVELOPMENT CHALLENGE

Country situation and development context

10. With an area of approximately 1,246,700 km², Angola is the sixth-largest country of Africa. The main cities are located along the Atlantic coastline; the interior is sparsely inhabited, sharing borders with Congo, the Democratic Republic of the Congo, Zambia, and Namibia. In May 2014, Angola conducted a general census, updating obsolete data from the 1970. The data analysis is currently being finalized. Preliminary results indicate a resident population of 24,383,301 inhabitants, of which 11,803,488 male (48%) and 12,579,813 female (52%). Angola is divided in 18 provinces, subdivided into a total of 163 municipalities and 618 communes. The provinces are governed by a provincial government and the municipalities and communes have local administrations.¹³

11. Since independence in 1975, a protracted armed conflict ravaged the country destroying most of its infrastructure and agricultural production. Millions of people died and the rural population massively migrated to the capital, Luanda, and the smaller provincial towns seeking shelter from the violence. Hostilities finally ceased in 2002, after which a process of social reconciliation and reconstruction was started. Yet, productive systems, markets and infrastructure in the interior are still disrupted, social reinsertion of ex-combatants and relocation of Internally Displaced People (IDP) is complex, and millions of landmines and other unexploded ordnance impede free access to agricultural and pasture land.

12. In spite of these difficulties, Angola has made significant progress, to a large extent fueled by the rapidly growing oil industry. Oil accounts for 85% of public revenues. Annual GDP growth has been above 8%, and at US\$ 4,580 per capita, Angola is above the middle-income country threshold. Since the end of the war, the country has enjoyed political and social stability and security. On the other hand, human development has not kept pace with economic growth; with an HDI of 0.508, it ranks 148 out of 187 countries, reflecting LDC conditions. The social and economic disparities between the capital-intensive extractive sector (oil and diamonds) and the rural subsistence livelihoods are enormous; while Luanda is among the most expensive capitals of the world, many people in the countryside must survive on one or two dollars per day. Poverty in Angola prevails in the rural areas, and is gender-biased. In the National Development Plan (2013-2017), the Government of Angola expresses its commitment to more equitable development, improvement of living standards for all, and diversification of the economy.

13. Energy end-use in Angola clearly reflects the economic and geographical divide between the social strata. Overall access to electricity is about 37% (2010-2014)¹⁴ but almost non-existing in rural areas. The use of oil products is limited to the urban areas. Firewood and charcoal represent over 57% of total energy consumption, followed by petroleum products (41.7%) and LPG (less than 1%)¹⁵. Charcoal is the main source of energy in peri-urban areas of the main coastal cities (Luanda, Benguela); rural dwellers rely on firewood. Population growth and increasing energy demand has triggered charcoal production in the interior of Angola, where it often represents the only opportunity to generate cash income. It is estimated that around 100,000 people are involved in the activity of wood collection and charcoal production. Only a small fraction of charcoal production and trade is formalized and compliant with national regulation.

14. In 2006, the FAO reported a total annual charcoal consumption of 7.2 million m³, equivalent to 0.96 m³ (100 kg) per capita.¹⁶ Growing charcoal demand and extremely inefficient production methods¹⁷ contribute to progressive deforestation. Severe local deforestation has moved charcoal production several hundred kilometers

¹³ Source: SE4All Gap Analysis, UNDP (June 2015).

¹⁴ Source: World Bank, <http://data.worldbank.org/indicator>. Formal electricity grid connections reach about 10% of households, but many illegal connections exist. Some urban people run gasoline generators for a few hours per day. Larger buildings and upper-class houses are equipped with large diesel generators. In rural areas, gasoline use for electricity production is very rare outside the towns.

¹⁵ Source: PIF

¹⁶ Source: PIF

¹⁷ About 9.6 m³ of wood is used to produce 1,000 kg of charcoal. Source: IEA.

away from Luanda. According to IEA estimates, about 130,000 earth mound pits are required to meet growing demand in Luanda alone, consuming wood from 185,000 ha of forest area. Meanwhile, charcoal utilization is also very energy-inefficient.

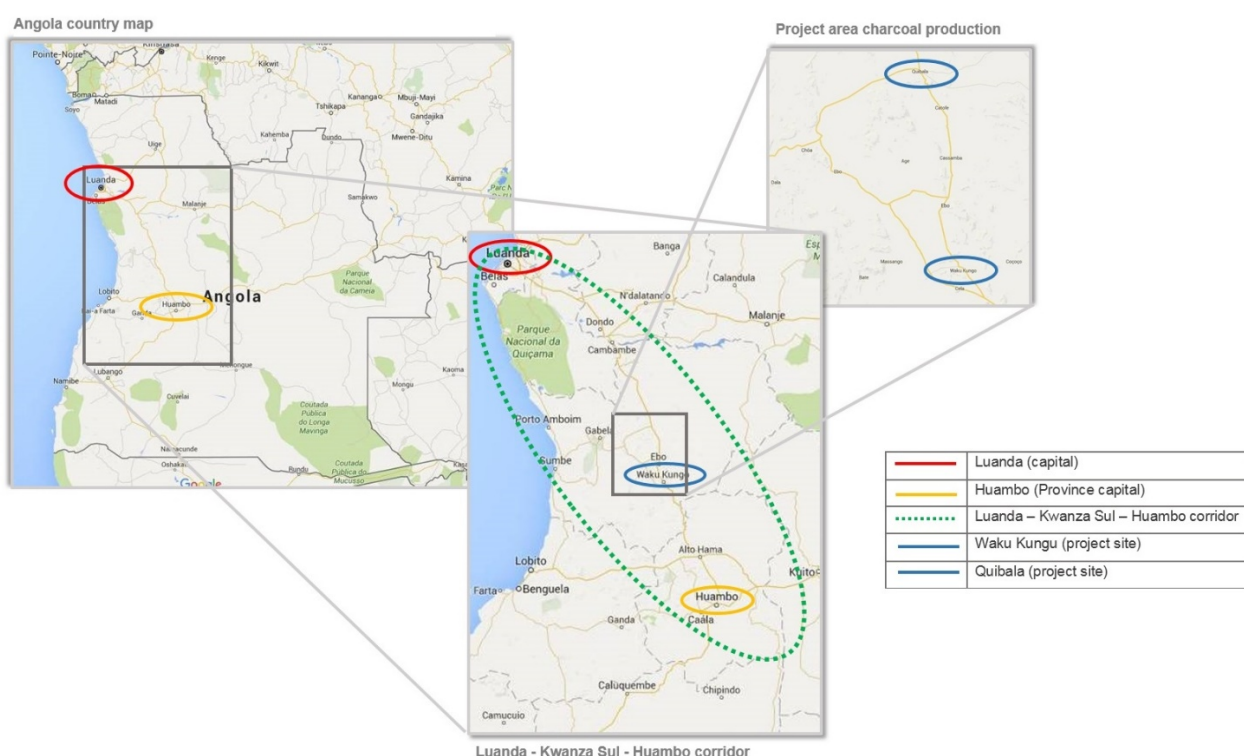


Figure 1 Location of main charcoal production region in Angola.

15. The main charcoal production area in Angola is the *Planalto Central*, with a subtropical climate due to the altitude of 1,300 m average above sea level. This central plateau hosts the subtropical Miombo woodlands, which are a major source of natural resources providing the conditions for the social, economic and cultural development of Angola's heartland. It covers the provinces of Benguela, Huambo, Bié, Kuanza Sul, and Huíla. The region is characterized by warm and humid summers and mild and dry winters, with abundant rainfall (1,100 -1,400 mm/y) especially in Huambo, in the centre of the region. Several of Angola's biggest rivers part from the Planalto, including the Kwanza, Keve, Cunene and Kubango. The woodlands also provide a range of products important to rural livelihoods, from medicines and food to timber, and are also central to the spiritual needs of many ethnic tribes in these areas, with specified trees and even blocks of woodland being conserved by communities for cultural reasons.¹⁸

16. Charcoal demand is having a particularly adverse impact on the natural Miombo woodlands of Huambo Province, leading to losses in forest stock, biodiversity and opportunities for rural livelihoods. Moreover, environmental degradation exacerbates the effects of global climate change, increasing vulnerability of settlements. Persistent floods and drought exacerbate erosion and loss of soils, thereby accelerating deforestation and losses of livelihood. In spite of substantial progress over the last decade, there are challenges of institutional coordination, data management, institutional capacity, the need to work across sectors, and insufficient tools and capabilities to prepare and carry out public or private works, and to translate policy objectives into effective

¹⁸ "Huambo: An Atlas and profile of Huambo, its environment and its people", Development Workshop Angola (2013), compiled and published with funds provided by UNDP Angola through the GEF ELISA project and the Integrated Development Research Center (IDRC).

governance. The absence of a corps of capable human resources as a direct result of the conflict, is a great limiting factor.

The charcoal value chain

17. Charcoal has the potential to be a sustainable and affordable (transition) fuel. To attain sustainability, improvements are needed along each step of the value chain¹⁹: (1) forest management; (2) carbonization; (3) transport, (4) distribution (including warehousing) and retail; and (5) consumption. These five steps are depicted (from left to right) in the figure below.

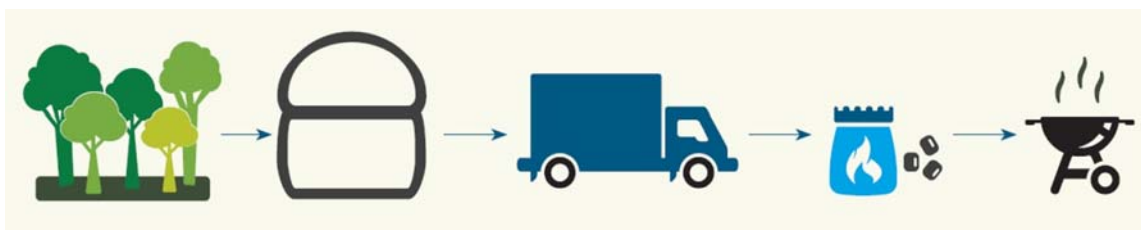


Figure 2 Typical charcoal value chain (Source: UNDP).

18. The present Project focuses on improving value chain steps 2-5, considering that: (i) forest management (step 1) is outside the scope of the GEF-5 CCM-2 objectives; (ii) it was previously addressed by parallel activities, including the GEF SLM Project (PIMS 3379), various Government programs and NGO-driven initiatives; (iii) it is impacted by systemic barriers, including land tenure and access to forest resources, which reduce the probability to achieve significant impact for a project with a short time horizon; and (iv) studies demonstrate that improved charcoal kilns and energy-efficient stoves are among the most effective measures²⁰ for preserving forest stocks compared to a business as usual scenario.

19. UNDP believes that it is important to improve the production and use of charcoal as well as aim at achieving sustainability across its entire value chain. Doing so will address multiple goals and generate important co-benefits. Providing people with cleaner charcoal that is produced in a low-carbon manner and used more efficiently (in improved stoves) will have critical environmental dividends (in the form of reduced greenhouse gas emissions and reduced deforestation); can professionalize the value chain and create jobs and livelihoods; and will be beneficial to the end-users (health-wise but also resulting in cost-savings and hence will have a positive impact on household budgets). In recent years, UNDP has started up initiatives to promote sustainable charcoal in several Sub-Saharan African countries including Sierra Leone, Uganda and Zambia (all GEF-funded) and Côte d'Ivoire and Ghana (NAMA studies funded by UNDP). Under the SE4All Global Initiative, UNDP has promoted rural energy access in the region, and a gap analysis has recently (2015) been completed for Angola which includes recommendations for efficient charcoal production and utilization²¹. The present GEF project is aligned with the recommendations on charcoal given in that report, specifically database development, efficient charcoal production kilns, efficient stoves, and awareness-building.

¹⁹ ESD 2007 defines it as follows: "Sustainable charcoal refers to charcoal that has been produced from sustainably managed woodlots, woodlands or forests combined with improved processing and utilization techniques, where the conversion along the charcoaling chain is as efficient as the current levels of technology allow. The sustainable charcoal concept aims at minimizing material and energy losses at all stages of the charcoaling chain. In this case, wood obtained from sustainably produced biomass resource is harvested using efficient ways ensuring minimum waste is generated. The wood is then converted into charcoal using improved and efficient kilns after which proper handling is ensured during packaging, storage and transportation to minimize waste."

²⁰ See: "Environmental Crisis or Sustainable Development Opportunity? Transforming the charcoal sector in Tanzania - A Policy Note", World Bank, 2009.

²¹ "Sustainable Energy for All, Rapid Assessment and Gap Analysis: Angola", República de Angola – Ministério da Energia e Águas and UNDP Angola, September 2015.

Problem statement

20. Given the situation described above, the development problem associated with the charcoal value chain in Angola may be formulated as follows: *“Unsustainable charcoal production – not reflecting the real social, economic and environmental costs – leads to degradation of natural resources, deforestation and a high level of emission of greenhouse gases, as well as sub-optimal economic growth and poor job creation in rural areas, due to: (i) informal and poorly understood business models; (ii) lack of access to adequate technology and other inputs; (iii) under-capitalization of natural resources (wood and land) and labor; (iv) lack of information for planning purposes and weak governance capabilities; and (v) a generalized lack of awareness of the impact of current, unsustainable production methods.”*

21. The main drivers behind the fast expansion of charcoal production in Angola are the large demand from the growing population in peri-urban areas, the lack of alternative fuels such as LPG in all parts of the country, the availability of cheap labor and forest resources in the interior, and the absence of alternatives for cash income generation by rural people²². The latter is a consequence of the poverty problem, exacerbated by the disrupted infrastructure and markets characterizing the post-conflict situation.

22. As a result of inadequate business models, energy- and resource-efficiency issues are hardly recognized by the actors involved in the charcoal value chain. The main problem with the baseline charcoal production is the low conversion efficiency of the wood used as both fuel and feedstock for the pyrolysis process. This results in high CO₂ emissions compared to an optimized charcoal chain. Excessive emissions of methane (CH₄) result under poor process conditions, while properly controlled retorts can entirely avoid such emissions. Other GHG emissions occur due to land conversion. This Project targets the value chain from production to consumption (steps 2-5).

Long-term solution

23. Traditional charcoal is a first generation form of bioenergy that is carbon intensive. Under appropriate conditions, its production and consumption can be considered sustainable. The main lines of action for developing a more sustainable charcoal sector in Angola are: (i) promotion of rural economic development to reduce the availability of cheap labor; (ii) technological inputs (equipment and skills) to attain higher yields and efficiency of charcoal production; (iii) management of natural resources (land tenure and extracted wood); (iv) strengthened governance and control structures²³; (v) internalization of social and environmental costs in the value chain, for example by payments to charcoal producers; and (vi) replacement of native forest resources with renewable biomass (plantations with native species).

24. The indicated lines of action are applicable to smallholder charcoal production, as well as more large-scale, vertically integrated production schemes based on renewable biomass plantations. While the latter model will benefit from capital-intensive technologies (advanced retort kilns) and optimized operations, the potential of sustainable charcoal production by smallholders as a driver for rural economic development should not be underestimated. In fact, charcoal is a high-density, locally available fuel that can drive productive, income-generating processes – including electricity generation in certain cases – in off-grid areas.

Barrier analysis

25. The following paragraphs analyze the identified barriers impeding the development of a more sustainable, low-emission charcoal value chain in Angola. It must be noted that these barriers are inter-related and often depend on systemic issues and root causes, in particular the incipient institutional framework and the lack of skilled human resources, affecting governance; and to the overall condition of poverty in the rural areas, giving rise to a large and scattered, informal sector.

Policy barriers and sector governance

²² Allowing for low costs of charcoal compared to other energy carriers.

²³ Including verification of delivered environmental services, such as GHG emission reductions.

26. In most countries in Sub-Saharan Africa, the charcoal sector is predominantly informal. Policies, regulation and institutions are not geared for effective intervention in the charcoal sector. As a result natural resources are exploited at virtually zero cost and beyond control; earnings remain untaxed; regulation and safeguards concerning labor, safety and environmental protection are not applied; revenues are inequitably distributed among stakeholders; and the potential of charcoal to support national and local development remains unharnessed. The charcoal sector is driven by consumers and producers with few other alternatives. Formalization and law enforcement, empowerment of rural charcoal producers, and rational management of natural resources (wood and land) are critical elements in any successful approach to improve sector governance.²⁴

27. A first step needed for countries to harness the charcoal sector is to assume ownership of the problem. The Government of Angola has done this and acknowledges the relevance of charcoal as a factor contributing to deforestation. Effective governance is hampered by institutional mandates divided among several sector ministries, in spite of recent improvements to facilitate coordination through the Inter-Sectorial Committee for the Environment (CMA) under the Ministry of Environment (MINAMB). The lack of adequate information on land use, forest resources and rural economic activities poses a major obstacle for effective policy development.

28. In 2014, the Ministry of Energy and Water (MINEA) finalized mapping of domestic renewable energy resources: biomass, small hydropower, solar, and wind. Traditional biomass utilization, including charcoal, is not yet covered. Charcoal is widely available in urban and peri-urban markets as an alternative to other energy carriers, specifically liquefied petrol gas (LPG). Ignoring charcoal has led to a situation in which LPG and electricity prices are regulated but charcoal is not. This situation affects the effectiveness of current LPG subsidies – in the end leading to higher than necessary energy costs for buyers.²⁵ The only reason why charcoal is not treated similar to – for example – mineral coal in many countries, is its diffuse, itinerant capital-intensive production system built on informal labor.

Technology barriers

29. Traditional charcoal production relies on a combination of rudimentary technology, involving virtually zero capital investment, and basic operator skills. The predominant charcoal kiln type in Sub-Saharan Africa, including Angola, is the earth mound built from local clay. Conversion efficiencies are very low (10% or lower) and process cycles (firing, pyrolysis and cooling down) are long (up to 30 days). If the wood is wet or the kiln is improperly operated, large emissions of methane, smoke particles and volatile organic substances are released, which are harmful for the producers, pollute the local environment, deteriorate the soil, and contribute to global warming. In the *Planalto Central*, charcoal is produced by subsistence farmers during the idle, dry season (2-3 months). In spite of its low efficiency, the charcoal production process is highly effective for smallholders as a means to convert natural resources into immediate cash income – as long as forest stocks are free and the opportunity costs of labor remain low. Efforts in Sub-Saharan countries to introduce more efficient kilns are constrained by the fact that laborers are paid per charcoal output instead of wood input utilization. Moreover, the conditions to migrate from low-cost, disposable charcoal kilns to more capital-intensive stationary units, are usually not in place.

30. However, scope for improvement exists, such as with the Casamance kiln, which – in combination with proper operator skills and pre-treatment of wood resources – can boost conversion rates from 10% to up to 25%, implying that the same amount of charcoal is produced with only 40% of the wood inputs. Payment schemes that reward resource-efficiency rather than volumetric output could provide the financial incentive to sustain such improved production process. The successful implementation of such measures ultimately relies on increased awareness and ownership by local communities, including a valorization of the wood resources.

Information barriers

²⁴ “Environmental Crisis or Sustainable Development Opportunity? Transforming the charcoal sector in Tanzania - A Policy Note”, World Bank, 2009.

²⁵ This problem was already observed by the IEA (2006), p.161-162. In its recent publication (2015) the IMF highlights the ineffective use of fossil-fuel subsidies in Angola and urges for tailored, transparent instruments for making basic energy services accessible for the low-income population stratae.

31. The lack of adequate data as input for effective sector policy development is a major problem in Angola. This situation is a direct consequence of the decades of conflict; only after 2003, a start could be made to renew the obsolete information sources from the pre-independence period. Moreover, the country had to rebuild its institutions, invest in data collection systems and the tools and experts for data analysis. In this context, the Government of Angola had to set priorities to advance in a number of key areas such as population statistics, health, and education. The organization of the recent Census (2014), currently being finalized, is a major achievement.

32. Recently (2014) MINEA performed an assessment of renewable energy resources in the national territory, including biomass.²⁶ With substantial delay, MINAGRI – IDF is implementing the FAO-sponsored National Forestry Inventory, which currently covers 5-6 provinces of a total of 15. Work contracted by UNDP under the PPG was aimed at data collection and mapping of the actors involved in the charcoal value chain, in an attempt to understand its mechanisms and estimate production and trade. This work did not proceed as hoped due to capacity reasons and difficulties to engage with the sector. It was learned that duly preparation of work and technical assistance in the use of (participatory) methods for analyzing value chains²⁷ are essential factors for success. Also, the pricing and payment mechanisms along the value chain are still not well understood. Among other issues, it is not clear whether prices paid to charcoal producers vary in function of quality, which may provide an incentive to control the production process.²⁸

33. Traditional biomass use is not included in national energy policy and statistics. Studies of the charcoal trade cover only selected areas and are outdated. National emissions from charcoal production have not been quantified and land change caused by charcoal production is not being monitored. With a view on forestry, energy and climate change policy, there is an urgent need for a comprehensive national charcoal survey and regular monitoring of biomass exploitation and trade, as well as a standardized baseline, accurate emission factors, and methodologies to assess the impact of fuel and technology switches. Recognition of charcoal as a relevant energy carrier and its formal inclusion into national energy policy, would be a key step forward to valorization of charcoal and the associated externalities. This would also bring along a need for accurate data collection and statistics to support sector governance.

Delivery skills and business models

34. Accurate characterization of the mechanisms and business models that make up the charcoal value chain in Angola is a great challenge. The actors involved in production, transport and commercialization are seldom formalized, with the exception of the large supermarkets in the main cities which sell charcoal to the more wealthy Angolans. Customary rights concerning access to land and forest resources act in parallel to the official system. Traditional patterns of communal work exist for specific (usually labor-intensive) activities alongside more formalized production systems such as cooperatives. A general understanding of the charcoal sector, identifying the key driving forces, has developed based on studies in other countries in Sub-Saharan Africa.²⁹ One may point out two dominant characteristic factors in Angola: (i) the availability of relatively large native forest resources at a low population density; and (ii) a very large peri-urban sector driving charcoal demand as a result of massive migration triggered by the internal conflict.

²⁶ Atlas das Energias Renováveis de Angola, Gesto Energy Consulting.

²⁷ See, for example: (1) “Gender Equity, Charcoal and the Value Chain in Western Kenya, Alannah Delahunty-Pike, Policy Innovation Systems for Clean Energy Security (PISCES)”, Working Brief November 2012, funded by DFID, UK; (2) “Mapping the Market – a Framework for Rural Enterprise Development Policy and Practice”, Mike Albu and Alison Griffith, Practical Action, UK, June 2005.

²⁸ Specific recommendations to address these knowledge barriers were given by CODESPA during the PIF design phase. Letter CODESPA to UNDP, Luanda 15 February 2014.

²⁹ A host of studies on charcoal production have been conducted in Sub-Saharan Africa, including Kenya, Tanzania, Uganda, Namibia, South Africa, Sierra Leone, and other countries. Based on these insights, it is worth mentioning the ongoing work towards common Sustainable Charcoal Policy for the region, with support from NEPAD and UNDP.

35. The perceptions and criteria for the decision-making of individual actors along the value chain are still poorly understood.³⁰ However, charcoal production by smallholders is typically part of a subsistence strategy to generate cash income rather than a business. By consequence, rural people may not always respond as expected to rational economic drivers for technological innovation and resource efficiency. Adequate information about the benefits of improved charcoal production and strengthening of basic business skills may raise their awareness. In addition, rural economic development would change the rules of the game by increasing the opportunity costs of labor and natural resources, making investment in improved technology economically attractive.

36. The business models for transport and commercialization of charcoal obey to rational decisions. People are aware of cost factors and pricing of charcoal to make a living. Interviews in peri-urban markets suggest that transport and warehousing in Angola is still relatively small-scale, and often organized along communities or families. In any case, transport in Angola is expensive due to the poor infrastructure and long distances and controlled by individuals or companies with the capacity to hold larger capital assets (cargo trucks).

37. Few small businesses acknowledge the benefits of formalizing their business; moreover, the process is costly, complex and time-consuming and therefore prohibitive for most people in more remote areas. The Government has identified business and SME development as a key priority but there is a very long way to go.³¹ Effective support for business development is hampered by the incipient institutional framework and weak human resource base. Meanwhile, opportunistic sector agents benefit from weak governance and poor enforcement to exploit the country's natural resources.

38. The retail sector in urban and peri-urban areas is differentiated according to location and purchase power of consumers with individual street sellers (predominantly women) serving low-income households with small packages (at high unit price) and formalized supermarkets serving the wealthier consumers. Obviously, the informal character of most charcoal businesses implies that minimum standards in terms of safety, labor conditions, environmental externalities, adequate income levels and equitable distribution of benefits among participants, are not met. Women and vulnerable people are among the most exposed groups involved in smallholder charcoal production and street selling.³²

Access to finance barrier

39. Sustainable charcoal production technologies and skills, and sustainable management of forest stocks require investment. However, capital inputs in the rural subsistence economy are minimal and operational costs consist of “free” biomass and cheap labor (especially in the idle season). Rural people would need economic incentives to apply improved practices and obtain tangible (financial) benefits to move away from the current low-cost, but highly effective traditional production methods. Payment of environmental services is one of the options to reward rural producers for adopting more sustainable methods. An initiative in this direction is being developed by the Italian NGO COSPE under the Plan Vivo voluntary standard targeting forest conservation (carbon sinks).³³

40. Formalization of the production chain is often considered a necessary condition to enable external financing. Because informal actors are generally not creditworthy, they have difficulties to accrue and transfer financial resources, and their performance may be difficult to monitor. At PIF stage, the Government program Angola Investe (INAPEM) was identified as an effort aimed at strengthening and financing SMEs. However, further analysis revealed that the eligibility criteria outmatch the profile of rural charcoal producers, who will unlikely be able to formalize in the near future. Moreover, it must be stressed that charcoal production is mostly part of mixed

³⁰ See Annex L, first report delivered under the PPG of this project: “Relatório Preliminar do Trabalho de Campo dentro da Componente 1 da Fase PPG do Projecto”, CETAC Huambo and UCO-IDAF, March 2015 (in Portuguese).

³¹ Angola ranks 174th for doing business. Starting a business takes 66 days compared to 27.9 days average in Sub-Saharan Africa; the cost of the process is 123% of the per capita income (56.2% in SSA). Outside Luanda, the throughput times are even longer. Obtaining a Commercial Operations Permit costs USD 1,000, which is prohibitive for most rural agents. Source: <http://www.doingbusiness.org/data/exploreeconomies/angola/>.

³² Especially the “zungueiras” (female streetsellers). A good insight in the organization of informal markets is given in: “Estudo de Mercado para Identificao e Desenvolvimento de Possiveis Actividades Geradoras de Rendimento para Mulheres dos Municípios do Kuito e Andulo, Provincia do Bié, Angola”, FOCO Project, People in Need, Angola.

³³ As described in Annex Q. See also: <http://www.planvivo.org/about-plan-vivo/>.

production systems, which would make formal organization around the charcoal business improbable and counterproductive – instead, it would be preferable to channel investment in sustainable charcoal production and trade through broader initiatives targeting rural production systems and markets. Government awareness about the need to reach informal micro-businesses is increasing and new programs are now under development.

41. It is also important to note that informal lending mechanisms exist in the rural areas, allowing people to make necessary purchases and start making a living. These mutual assistance mechanisms are based on trust and are a sort of “crowd funding” at small scale. The charcoal sector may benefit from local financing capacity for investment in sustainable technology. In fact, the capital investments for improved charcoal technology are quite small and would not justify a full formalization process. Mobilization of local capital would greatly contribute to local problem ownership and validation of the benefits delivered.

42. Finally, the Government program PAPAGRO is operated by the Ministry of Commerce for buying produce from rural markets and selling this to urban customers through its system of logistical centres (CLOD). This program may procure sustainably produced charcoal at a defined price, thereby providing a direct financial incentive for rural producers to adopt adequate production practices. A payment for environmental services could be included in the price offered. While such a system would initially be subsidy-driven, in the absence of a developed market, it provides opportunities for the Government to recover costs through the sales of verified carbon credits to international buyers. Adequate governance, transparency and verification of the charcoal chain are critical factors to be developed.

Baseline project and rationale for GEF involvement

A. Government programs and initiatives:

1. Ministry of Environment (MINAMB)

43. The Sustainable Management of Natural Resources Program provides the framework under which MINAMB facilitates the line ministries MINAGRI, MINGEO and MINPET in their efforts to include natural resource conservation principles and practices in sector policies and programs. The Program responds to the challenges outlined in Angola’s Long-term Development Strategy and the National Development Plan 2013-2017 and provides orientation and technical support for sectoral action plans and programs, including: (i) the Strategic National Program for the Water 2013-2017; (ii) the National Plan for Preparedness, Contingencies, Response and Recovery from Calamities and Disasters 2015-2019; (iii) the National Policy on Forestry, Fauna and Areas of Conservation (Res. 1/10, January 2014); and (iv) the National Environmental Quality Program (NEQP) 2016-2021³⁴. Among other objectives, the NEQP aims to map atmospheric pollution and GHG emissions from industry, urban and rural areas, produce a national emission plan and mitigation roadmap by 2025, set up an air quality monitoring system, and introduce legislation penalizing air polluting activities. Education is one of the spearheads to increase environmental awareness, as pursued by MINAMB under its National Education, Training and Environmental Awareness Program³⁵. In line with its mandate and national priorities, MINAMB’s Climate Change Cabinet actively explores opportunities to link national natural resources conservation programs with international sources of climate funding.

2. Ministry of Commerce (MINCO)

44. MINCO is in charge of implementing the national Integrated Municipal Program for Rural Development and Poverty Reduction PMIDRCP³⁶. As part of this program, PROAJUDA (2014) has set up the subprogram “Cartão Kikuia” which deploys a voucher system allowing low-income families to buy baskets of basic necessities, school supplies, agricultural inputs, etc in special shops, the “Lojas Kikuia”. The total monthly value assigned to each

³⁴ Programa Nacional da Qualidade Ambiental 2016-2021.

³⁵ Programa Nacional de Educação, Formação e Consciencialização Ambiental 2017-2022.

³⁶ Programa Municipal Integrado de Desenvolvimento Rural e Combate a Pobreza (PMIDRCP).

family is around US\$ 100. For 2017, the program strives at a coverage of 54% of the identified target group (180,000 families). The program is concentrated in the peri-urban municipalities of Luanda. The mechanism is that MINCO buys the baskets (kits) and organizes their distribution to the Lojas Kikua. The Project is financed from the government budget.

45. The Program PAPAGRO was established in November 2013 in function of the National Strategy for Rural Commerce and Entrepreneurship.³⁷ Its objectives are: (1) to procure agricultural produce from rural families to ensure supplies in the main centres of consumption; and (2) to provide regular supplies of agricultural and livestock products, and domestically manufactured products, to rural communities to promote local trade and the exchange of products. PAPAGRO operates through 14 agricultural markets in 14 provinces and 4 logistical centres. The Program is financed from the national budget.

3. MINAGRI Ministry of Agriculture – Institute for Forestry Development (MINAGRI –IDF)

46. The National Forestry Inventory (NFI) has been conceived as an instrument to facilitate the efficient administration of national forest resources and enable their sustainable exploitation. Work initiated in 2008 with technical assistance from FAO. The NFI is implemented by the Ministry of Agriculture through the Institute for Forestry Development (IDF) with the following objectives: (a) strengthening of institutional capacity; (b) assessment of forestry resources; (c) mapping of forest areas and soil uses; (d) establishment of a monitoring system; and (e) harmonization of classification systems and definitions. The program aims to ensure alignment of national processes with international conventions and guidelines and as such, provide a basis for financing multilateral instruments based on payment for environmental services such as REDD+. Implementation of the program is hindered by institutional and human capacity barriers, as well as constrained, intermittent Government funding. At present, only approx. 25% of the defined 591 survey areas have been covered by IDF. The NFI would strongly benefit from international expertise and the introduction of modern, effective techniques for data collection and analysis, such as pursued under the partnership UCO-UJES, which has close working relations with IDF in the Huambo region (see baseline item 5, below).

4. Ministry of Energy and Water (MINEA)

47. MINEA finalized its national renewable energy strategy in June 2014.³⁸ The Strategy aims to articulate the overarching principles outlined in Law 256/11, i.e. energy diversification, energy security and environmental sustainability, preference for domestic energy resources, and more equitable social and territorial development of the country. While focused on electricity generation, including increasing electricity coverage in rural areas, the Strategy also acknowledges the relevance and the sustainability problem associated with current charcoal production and consumption.³⁹ Three objectives are defined: (i) promotion of off-grid renewable energy (RE) sources for increased access to energy services in rural areas; (ii) promotion of on-grid RE-based electricity generation and expansion of the national system; and (iii) fostering of public and private investment in RE systems. Specific activities pursued by MINEA under the Strategy include, among others: the distribution of 100,000 improved cooking stoves and 50,000 solar lanterns; implementation of REs for productive uses in 200 rural communities; establishment of training centers for technicians in RE technologies; allocation of public funds to the National Electrification Fund FUNEL to facilitate financing of RETs by SMMEs.

B. Non-Government initiatives:

5. Partnership University Jose Eduardo dos Santos in Huambo (UJES) and University of Córdoba, Spain (UCO)

³⁷ Estratégia Nacional de Comércio Rural e Empreendedorismo (ENACRE – Presidencial Decree Nº 28/14 de 11 Feb 2013.

³⁸ Estratégia Nacional para as Novas Energias Renováveis, República de Angola, Ministério da Energia e Águas, June 2014.

³⁹ Ibidem, par. 2.3.4.

48. Both universities collaborate under an agreement aimed at strengthening of the education and research capabilities of UJES' Faculty of Agricultural Sciences (FCA).⁴⁰ Through the UCO spin-off IDAF⁴¹, support is given to build capable academic staff within FCA-UJES (at graduate-level, MSc and PhD) and to provide direct assistance to implement the Forestry Engineering curriculum (assignment of expat teachers). In December 2014, a first group of five students graduated, being the first ones in Angola who reached this level (BSc).

49. Both universities also participate in the EU-funded project "African Network for Education in Energy Resources (ANEER)"⁴², together with the Higher Polytechnic Institute of Gaza, Mozambique (ISPG). The project aims to strengthen academic skills in the field of energy efficiency and to improve the overall management of higher education in Angola and Mozambique, thereby contributing to energy security for local populations, improved energy efficiencies and capabilities to harness local energy resources. The ANEER project aims to increase the technical capacities of the institutions and teachers by introducing new teaching techniques, virtual tools and state-of-the-art programs. Specific modules on EE will be inserted within existing curricula in Forest Engineering and Agricultural Engineering. UJES and IDAF-UCO carry out applied research on the Miombo Ecosystem, which is supportive to IDF's reforestation program.

50. An agreement with the Institute for Agronomic Research (IIA) from 2012 enables UJES-FCA to make use of the experimental facilities in Chianga (Huambo Province). This facility is a valuable asset for studying the Miombo and its forest species. UJES-FCA and IDAF-UCO have established a plan of activities to study the impact of charcoal production on the Miombo ecosystem and to design and test methodologies for mitigating this impact, including transfer of know-how and engineering skills to implement more sustainable charcoal kilns, measures to improve the regenerative capacity of the woods, and adequate selection of species for biomass energy production.

6. Ajuda de Desenvolvimento de Povo para Povo (ADPP Angola)

51. ADPP is an Angolan non-governmental organization, which started in 1986 and was registered with the Ministry of Justice in 1992. ADPP works in 17 of Angola's 18 provinces and directly engages more than 8,000 people in work or study on a daily basis. ADPP reaches hundreds of thousands of people through projects in health, education and community development. All activities are built on four pillars: (i) a perspective that empowers individuals, families and communities to make positive changes in their own lives; (ii) building of in-country capacity through projects which complement government policy; (iii) an integrated approach to development for maximum impact; and (iv) the recognition of the Government as a key player in promoting long-term sustainable development, and close working partnerships with local, provincial and national Government officials.

52. ADPP has an established school system in Angola that has graduated 6,613 Ministry of Education (MED)-certified primary school teachers and currently graduates a further 1,000 per year via its 14 teacher training colleges run in collaboration with the MED. In Huambo, ADPP has a college as well as its Frontline Institute aimed at training project leaders with specific expert skills. ADPP further operates 8 schools for young people offering combined practical and theoretical training. In addition, ADPP currently has 100,000 adults involved in literacy projects in 12 provinces.

53. Through its Farmers' Club (FC) projects, ADPP assists subsistence farmers to adopt environmentally sustainable techniques to improve productivity, and trains FC members to get organized for buying inputs and selling to the market. As of 2014, ADPP was running FC projects in Bengo, Bie, Cabinda, Huambo, Kwanza Norte, Kwanza Sul, Kuando Kubango, Kunene, Luanda, Malange and Uíge.⁴³ ADPP has committed itself to transfer sustainable charcoal technology to rural producers, taking advantage of its training facilities and capabilities and its Farmers' Club system.

⁴⁰ Faculdade de Ciências Agrárias da Universidade José Eduardo dos Santos (FCA-UJES).

⁴¹ Centro de Investigaciones Aplicadas al Desarrollo Agroforestal (IDAF-UCO).

⁴² African Network for Education in Energy Resources (ANEER) - FED/2013/320-205. See: www.acp-edulink.eu.

⁴³ Text adapted from: <http://www.adpp-angola.org/who-we-are/about-adpp-angola>.

7. Cooperazione per lo Sviluppo dei Paesi Emergenti (COSPE)

54. COSPE is an Italian registered NGO, founded in Florence in 1983. COSPE is committed to the implementation of more than 100 projects in around 30 countries, in Europe, Africa, Latin America, Asia, the Mediterranean and Eastern Europe, promoting dialogue between people, populations and cultures, equitable and sustainable development, human rights, and the realization of peace and justice among people. COSPE is working in Angola since 1993. Environmental and agricultural projects have been implemented co-funded by the Italian Ministry of Foreign Affairs and the EU, including the Integrated Project for the Protection and Development of Angolan Coastal Forests (PIPDEFA).

55. Since 2008 COSPE has promoted REDD+ actions, with activities such as: training and capacity building for IDF, forest inventory and community forest management of Miombo woodlands of about 4,000 ha, and alternative income generating activities for charcoal producers such as beekeeping.

56. COSPE is involved in a project aimed at establishing a payment for ecosystem services (PES) system in the Canjombe community in Cela Municipality near Waku Kungu (Kwanza Sul), covering an area of about 105 km². This integrated project, which will benefit around 2,000 people, covers the introduction of improved charcoal kilns alongside other income-generating activities, agroforestry and sustainable agriculture. COSPE has submitted the project for acceptance under the Plan Vivo mechanism to generate financial revenues for the ecosystem services delivered by the community.

Rationale for GEF involvement

57. The identified baseline activities do not adequately address all of the barriers identified for establishing a more sustainable charcoal value chain in Angola. Specific charcoal-related barriers that are not, or only partially, addressed under the baseline project include: (i) the collection and analysis of relevant data on the charcoal value chain (information barrier); (ii) the design, promotion and demonstration of more sustainable business models (business skills barrier); (iii) training and promotion of more energy-efficient, low-emission charcoal technologies (technology barrier); (iv) awareness raising activities and supportive studies for designing a sustainable charcoal sector (policy barrier); and (v) exploring of financing opportunities (finance barrier). The baseline activities would benefit from a national-level initiative linking together these initiatives, fostering charcoal policy development, and pursuing scalable business models. Addressing the identified barriers will bring along substantial reductions in global GHG emissions, as well as socio-economic and environmental benefits. This provides a rationale for GEF involvement under the GEF-5 CCM Focal Area.

III. STRATEGY

Development objective

58. The objective of the Project has been formulated as follows: “To reduce the current unsustainable and GHG-intensive mode of charcoal production and utilization from Angola’s Miombo woodlands, via an integrated set of interventions in the national charcoal value chain.”

Approach

59. Work done under the PPG was aimed at complementing information and validating the assumptions underlying the Project Identification Form (PIF). Based on the findings of the PPG, the Project will adopt three key lines of action aimed at addressing systemic barriers related to: (i) sector information and governance; (ii) availability and acceptance of more sustainable charcoal production and utilization technologies (including energy-efficient kilns and briquetting); and (iii) availability of qualified and skilled human resources to support a sustainable charcoal sector in Angola. The Project interventions along these lines of action will primarily consist of

technical assistance rather than investment⁴⁴. The justification of this approach and its consequences for the Project design are outlined in the next paragraphs.

Geographical scope

60. Given the great challenges faced, the Government of Angola and UNDP CO decided to limit the scope of the intervention to the Huambo – Luanda corridor, the region covering the main centres of charcoal production and consumption in the country. This will improve manageability of project activities and increase impact.

Business formalization

61. The PPG phase led to the conclusion that conditions are not in place as yet for formalization of charcoal producer groups and briquetting businesses as legally established organizations. Such a process is out of control of the Project and is unlikely to occur in the near future. Agricultural production systems are family-based and rely on mutual assistance when required. The Project will support the development of group capacities which are required to build and operate Casamance charcoal kilns, to implement marketing strategies, and to administer businesses.

62. In principle, the charcoal chain provides opportunities for job specialization and the development of micro-enterprises. Financial instruments targeting small enterprises were identified during the PIF (INAPEM, Angola Investe). However, the PPG found that these instruments are basically designed for larger and formalized businesses and require conditions that cannot be met by small-scale rural charcoal producers or peri-urban briquetters. While the Government of Angola is committed to reducing barriers to foster SME business development, it is unlikely that adequate conditions will evolve under the Project's time horizon given the large institutional, regulatory, capacity and governance challenges.

63. Moreover, rural people would first need to understand and acknowledge the benefits of formalization. The PPG concludes that the anticipated goal (formalized businesses) is too ambitious and unrealistic under the Project's timeframe and instead, one should try working towards demonstration and acceptance of sustainable charcoal production technologies – which is already a great challenge by itself.

Delivery channels

64. Angola, emerging from conflict, has just begun rebuilding its physical infrastructure needed to unleash the economic potential of the country's interior. In fact, difficult access is one of the factors that impeded the PPG to produce a detailed description and analysis of the charcoal value chain in Angola. It was learned that charcoal production in Angola is a recent but rapidly growing activity, characterized by large numbers of small, often family-based, informal agents. Transport from the production areas to the main cities is often organized by families joining each other to make transport economically viable, rather than by professional transport companies. Without a detailed understanding of underlying mechanisms, the PPG could not assess the viability of a market for certified charcoal in Angola, let alone provide a detailed proposal how to organize the value chain to serve such a market.

65. On the other hand, the PPG identified and explored opportunities to market sustainable, certified charcoal, through existing Government programs (PAPAGRO) linking national agricultural producers and consumers. Under the framework of this Project, programs of this kind offer an attractive alternative for establishing a vertically integrated value chain with opportunities for the application sustainability criteria for certified charcoal, the introduction of a verification mechanism, product labelling, and pricing in alignment with the social and environmental value of charcoal. While governance issues are basically the same as under a market-based approach, a partnership with government programs would greatly reduce the number of actors and clarify responsibilities. Sustainable charcoal and efficient cooking stoves can further be incorporated into the Government programs providing basic assistance through a voucher system to low-income and vulnerable people (the Loja Kikuia)⁴⁵.

⁴⁴ Moreover, the capital-extensive nature of disperse, rural charcoal production does not lend itself for large-scale investment.

⁴⁵ Recently (2015), the IMF has published a road map for revising the existing subsidy system for fuels in Angola, which is non-

66. The Project envisages to benefit from these programs to increase the visibility of sustainable charcoal – and charcoal technology – among consumers and producers, and use these programs to communicate its benefits. Parallel government initiatives and assistance by NGOs will support private informal and formal agents to strengthen their capacities and supply these programs, eventually evolving into more mature market mechanisms. The Project will aim at incorporating a verification mechanism for sustainable charcoal into vertically integrated Government programs such as PAPAGRO, thereby increasing sector governance and fostering demand. This approach allows for a Project strategy more closely aligned with the GEF incrementality principle.

67. The PPG did not succeed to map the logistical and commercial structures underpinning the charcoal supply chains serving the urban centers, but some observations could be made. Professional retailers were found active on the peri-urban markets, with predominant involvement of women. These markets are governed by informal relations which presumably places these women in a vulnerable position. Based on the interviews held, these retailers source the charcoal directly from their communities of origin and trade partly develops along family ties. As such, the retailers provide an entry point for creating awareness about sustainable charcoal along the chain. Moreover, retail prices for charcoal are differentiated according to quality, the cheapest products being bought by the poorest households, and in small quantities. Briquetting can be an option to serve this low-end market; very few retailers had heard about it.

Human and institutional capacity

68. Multiple limitations were encountered during the PPG in terms of data collection; analytical skills; and ability to engage with sector stakeholders - ranging from Government entities, rural beneficiaries, to peri-urban businesses and market agents. Alongside the gaps in human and institutional capacity already identified, the experiences during the PPG highlighted the importance of qualified human resources for effective governance and successful economic activity, as duly recognized by the national Government in the PND. The Project will respond to this need by focusing on human resource development rather than strengthening of institutions that are still in evolution. By following such approach, the Project aims to deliver more sustainable outcomes, which reduces its risk profile.

69. Institutional limitations directly impact upon the Project's execution options and capacity. The PPG confirmed the choice for a UNDP-assisted NIM modality. Few stakeholders were found with capabilities for smooth implementation of project activities and long-term engagement with targeted beneficiaries. Stakeholders would also need technical assistance from the Project to master sustainable charcoal technology and practices. Capacities in the field of business, market development, and micro-financing could not be identified at this stage.

70. The Project will therefore collaborate with some of the identified organizations, which will act as Responsible Parties (RPs) assuming responsibility for the execution of one or more project outputs. These RPs are selected on the basis of their institutional track record and long-term presence in Angola, and their capacity to draw upon national and international human, technical and financial resources. The selected RPs are the NGOs ADPP Angola and COSPE (Italy), and Huambo University (UJES-FAC) in partnership with the University of Córdoba (UCO-IDAF), Spain. These RPs currently deploy activities in the Huambo – Luanda corridor that are relevant to the Project.

71. It is acknowledged that the present Project will not establish a mature market for sustainable charcoal in Angola; instead, it will shape the cornerstones for building such a market. Systemic issues exist that are beyond reach of a GEF Project, including: regulation of land tenure and access; development of markets and logistical infrastructure for agricultural produce and forestry, including charcoal; competences and governance structures to enforce compliance with regulation; and unsustainable coping mechanisms in response to rural poverty. Specifically, the Project will not aim at economic and financial sustainability under the Project's time horizon.

72. It is assumed that the energy-efficiency measures along the value chain will translate into monetary, social and environmental benefits that justify such measures. It is also recognized that the financial span of Government programs such as PAPAGRO is limited – and they may be discontinued over time. However, the Project creates an

selective and mainly benefits the wealthiest population group. The most effective way to mitigate the impact of such a reform is through cash transfers or vouchers for low-income people in need of social assistance. The proposed incorporation of charcoal technology into a voucher system is in line with this recommendation. (See IMF, p.17).

opportunity for the Government to certify delivered emission reductions and explore opportunities for financing of environmental services (such as carbon markets and REDD+). Mobilized capital under such mechanisms can be considered as leveraged investment and tracked during project implementation. However, conditions are not in place for the Project to commit itself to such a result.

IV. RESULTS AND PARTNERSHIPS

Project strategy

73. The Project “Promotion of Sustainable Charcoal in Angola through a Value Chain Approach (PIMS 5331)” will pursue its objective through the following components, which are described in detail in the next sections:

- I. Information and strengthening of the policy framework for sustainable charcoal;
- II. Transfer of sustainable charcoal technology to agents along the charcoal value chain;
- III. Strengthening of human capacities and institutions;
- IV. Monitoring and evaluation.

74. In order to test and demonstrate proposed solutions, the Project will implement pilot initiatives among rural charcoal producers to demonstrate the benefits of low-emission charcoal production technologies and enhanced production skills. The Project will further raise awareness of sustainable charcoal among all actors along the value chain, including advocacy at policy levels. It will strengthen the implementation capacity of relevant Government entities, including the Ministry of Environment (MINAMB), the Ministry of Energy and Water (MINEA) and the Ministry of Agriculture - National Forestry Institute (MINAGRI - IDF). The Project will further enhance the program of the Ministry of Commerce (MINCO) “Integrated Municipal Program for Rural Development and Poverty Alleviation” (PMIDRCP) by including basic energy services based on sustainable charcoal. The Project will closely collaborate with provincial and municipal authorities in Huambo Province and engage into partnerships with Huambo University (UJES) and the non-governmental organizations ADDP Angola and COSPE for the design and implementation of technology transfer activities, including field pilots, directly involving the envisaged rural beneficiary groups.

75. The Project funds implemented by UNDP amount to a total of US\$ 5,495,000, for which a grant is requested from the Global Environment Facility (GEF) of US\$ 4,620,000. Parallel co-funding amounts to US\$ 16,000,000 including Government baseline programs: (i) the Sustainable Management of Natural Resources program (MINAMB, US\$ 3,500,000); (ii) the programs PAPAGRO and PROAJUDA Cartão Kikuia under the PMIDRCP program (MINCO, US\$ 10,000,000); (iii) the National Forestry Inventory (MINAGRI – IDF, 1,500,000); and (iv) National renewable energy strategy and biomass mapping (MINEA, US\$ 1,000,000). Other co-financing partners are: (v) Huambo University “José Eduardo dos Santos” in partnership with the University of Córdoba (EU Project ANEER, US\$ 650,000⁴⁶ in-kind); (vi) NGO ADPP Angola (US\$ 1,000,000, in-kind); and (vii) NGO COSPE (US\$ 186,700, in-kind). The total parallel co-financing resources amount to US\$ 17,836,700; the total non-GEF funds are US\$ 18,711,700.

Project components

76. The envisaged Project outcomes and outputs are described in the following paragraphs.

Component I. Information and strengthening of the policy framework for sustainable charcoal.

Outcome 1: The policy framework to support a sustainable charcoal value chain in Angola, has been strengthened (GEF US\$ 1,220,000; co-finance US\$ 5,990,000).

⁴⁶ ANEER project budget of EUR 587,497.25 converted to US\$ 650,000 at the November 2015 exchange rate of approx. EUR/USD = 1.106.

77. The objective of this project component is to support charcoal policy development in Angola and enhance sector governance by generating and analyzing key input information and strengthening institutional capacities. Key stakeholders in this component include the Ministries of Environment (MINAMB), Energy and Water (MINEA), and Agriculture (MINAGRI). This component will foster inter-institutional coordination at a national Government level and provide inputs to design and evaluate policy measures, market mechanisms and incentives supportive to sustainable charcoal production and consumption.

78. The involved ministries will work towards the compilation of a charcoal white paper outlining the key challenges and possible courses of action. The interaction between stakeholders will expectedly contribute to more effective governance of the charcoal sector. At an operational level, this component pursues the establishment of objective and verifiable criteria for sustainable charcoal produced in Angola. Mechanisms will be devised for the certification of sustainably produced charcoal and for MRV of the volumes produced and traded. Such mechanisms provide a basis for accounting achieved social, economic and environmental benefits, and may be used to attract carbon funding in the near and medium future.

79. This component will take benefit from the existence of social and rural development programs deployed by the Government to initiate the introduction of sustainable charcoal and energy-efficient charcoal stoves on the national market, thereby generating direct impact among rural farmers and low-income peri-urban households. These programs offer a valuable environment for testing and fine-tuning the envisaged certification and MRV schemes and address upcoming governance and sustainability issues, including pricing. Finally, this component will support the organization of a national conference on sustainable charcoal production in Huambo, with the aim to strengthen the links between stakeholders, exchange experiences and viewpoints, and firmly position charcoal on the national development and sectorial agendas.

Output 1.1. Baseline information updated and completed covering energy, forestry, economic, environmental, social, and gender aspects of the charcoal value chain (GEF US\$ 343,000; co-finance US\$ 4,300,000).

80. This output will expand and update the limited information on the charcoal value chain collected during the project preparation phase. Recently (2014) MINEA has endeavored into renewable energy resource mapping, including biomass resources; however, informal and traditional biomass utilization was not yet included. Adequate data are critical for Angola to establish a baseline in terms of biomass resource (forest) utilization, socio-economic parameters, demographic effects and environmental impact.

81. GEF resources under this output will fund surveys and consultancies during the first project year to understand and describe in detail the functioning and potential of the charcoal value chain in the corridor Huambo – Kwanza Sul – Luanda. Besides mapping of forest resources, field surveys will be carried out targeting provincial authorities, municipalities, charcoal producers and other stakeholders. The role of charcoal as part of rural production systems will be assessed, as well as its relevance for local development and income generation. A systematic approach will be followed to track and systemize gender-disaggregated impacts and aspects of the charcoal value chain.

Output 1.2. Inter-institutional coordination enhanced to strengthen governance of charcoal sector (GEF US\$ 435,000; co-finance US\$ 730,000).

82. The purpose of this output is to facilitate government entities including line ministries, provincial authorities and decentralized public organizations, to interact effectively in an effort to improve governance of the charcoal sector. This goal is pursued by strengthening coordination between institutions through the CMA⁴⁷ providing technical assistance when necessary, and by close coordination and follow-up on project activities with key actors in Luanda and the charcoal production areas. Adequate coordination is critical since the transversal character of the charcoal business causes mandates to be divided among several institutions, involving forest management, agriculture, climate change policy, and rural development. A full-time National Project Coordinator (PC) will be recruited by the Government of Angola and funded by GEF project resources. The PC will be based in Huambo and work under the guidance of the National Project Director (NPD).

⁴⁷ See footnote 9.

83. Significant challenges exist to design and enforce adequate regulation in the field of land tenure, access to forest resources, business development, access to investment capital, basic infrastructure, and to improve overall governance of the sector. The Project will support the Ministry of Environment (MINAMB) through the active involvement of the Project's Technical Advisor (TA), an international expert in rural energy and development who will be hired by UNDP and budgeted under TRAC co-funding. The TA will be based in Luanda. Logistical support, government staff, hosting of meetings and events will all be assumed by MINAMB. The tandem PC-TA will provide the Project with the responsive capacity necessary to face the challenging institutional and development context of this Project. Moreover, this core team will bring the in-house expertise to assist the Government of Angola in pursuing development of the charcoal sector. Both persons are expected to deliver substantial technical inputs, when and if required supported by a pool of experts (funded under output 2.4).

Output 1.3. Preparation and endorsement of a national white paper on sustainable charcoal production (GEF US\$ 85,000; co-finance US\$ 200,000).

84. This output will deliver technical assistance to support and accompany the process of developing a concerted vision on the role of charcoal for Angola's energy sector and as a catalyst for rural development. It is envisaged to work towards the development of a national white paper on sustainable charcoal for endorsement by the central Government. The expected throughput time of this process is estimated at 2-3 years. This output is expected to accelerate the incorporation of charcoal into national policy, which is a first step to unleashing its economic potential and strengthening sector governance. This output can draw upon studies and policy recommendations developed in other areas in Sub-Saharan Africa.⁴⁸ GEF funding will be used to contract an international consultancy firm for provision of specific expertise and drafting the document, and a national consultant for liaison and process management.

Output 1.4. Design of a certification scheme for sustainable charcoal including a mechanism for monitoring, reporting and verification (MRV) of charcoal production, distribution and commercialization (GEF US\$ 130,000; co-finance US\$ 200,000).

85. This output pursues the identification of criteria for characterizing sustainable charcoal in the context of Angola, thereby benefitting from experiences and best practices in other markets. Such criteria need to be unambiguous, verifiable, realistic and objective. Verification inevitably requires engagement of the supply chain and commitment from at least part of the suppliers and producers with the objective. The prospect of price differentiation and/or law enforcement may be crucial to obtain such commitment. Based on the supply chain structure, a protocol (mechanism) can be devised for monitoring, verification and reporting of sustainable charcoal production and trade.

86. As a first step, an MRV mechanism may be designed specifically for Government-led programs such as PAPAGRO. Charcoal that meets the sustainability criteria in a verifiable manner, may be certified as such and, possibly, identified through differentiated transport, packaging or labelling. MRV provides a basis for tracking of delivered environmental benefits, including GHG reductions, thereby opening the perspective for external funding, for example through (voluntary) carbon credits. GEF funding will be used for contracting specialized consultancies to design certification, MRV, and labelling/packaging schemes in detail and to discuss the options with the key stakeholders, including MINAMB and MINCO.

Output 1.5. Incorporation of certified, sustainable charcoal and fuel-efficient stoves into national poverty reduction and rural development programs under application of MRV mechanism (GEF US\$ 95,000; co-finance US\$ 400,000).

87. This output encompasses technical assistance aimed at starting up the delivery of certified charcoal and sustainable charcoal technology (efficient stoves) into existing Government programs targeting the low-income population in Angola. MINCO's PAPAGRO program procures agricultural produce from rural communities and sells this to eligible families at preferential prices, thereby linking supply and demand in the absence of private market actors and providers of adequate logistics. The program serves multiple goals: preservation of valuable domestic

⁴⁸ Including the African Sustainable Charcoal Policy framework pushed forward by the NEPAD Planning and Coordinating Agency with support from UNDP and the SE4All platform.

produce (national food security), income generation for producers (rural development) and financial support for consumers (social assistance). The Project envisages to include sustainable charcoal into this program and to generate similar market benefits for rural charcoal producers and peri-urban consumers. Charcoal producers will have to comply with the identified sustainability criteria for eligibility. Specifically, this output will assist MINCO to formalize procurement rules for sustainable charcoal and prepare the program for the application of an MRV system; this aspect of the process is critical and directly linked to overall governance of the program.

88. Another MINCO program is the Loja Kikuia, which consists of a voucher system for low-income families for periodic supplies of basic food and other articles at a subsidized price. It is envisaged to create an additional “energy basket” including efficient charcoal stoves and, possibly, supplies of certified charcoal. As an innovative element, efficient stoves combined with thermo-electric generators for small-scale electricity generation, may be considered if pilot tests prove successful. It is expected that both programs will produce a host of valuable lessons for the verification of sustainable charcoal value chains in a future, more market-oriented context.

Output 1.6. National conference and field visits implemented for key stakeholders to discuss and disseminate results and prospects for sustainable charcoal in Angola and region (GEF US\$ 132,000; co-finance US\$ 160,000).

89. This output aims to facilitate the exchange of experiences and viewpoints among key stakeholders of the charcoal value chain, in particular provincial and municipal authorities in charge of adequate forest management and local economic development; central government entities involved in forestry, energy, economy, commerce, and climate change policy; representatives from the academic sector; representatives from charcoal producers and distributors; and non-governmental organizations and other stakeholders of the Project. This output will take the lead in organizing a national conference as an instrument to bring together the different faces of the charcoal value chain: urban and rural; consumption and production; national policy and rural development. It is envisaged to organize the event in Huambo. Field visits will also be organized for key stakeholders to show them on a first-hand basis how low-carbon charcoal technologies work and showcase project activities in the field. GEF funding will be used for contracting of hosting and organizational services; optionally, some funds can be used for inviting international experts from other Sub-Saharan countries to foster the exchange of knowledge with peer programs in the region, including the UNDP-GEF charcoal projects in Uganda, Sierra Leone and Côte d’Ivoire, and work on a regional charcoal policy in conjunction with NEPAD.

Component II. Transfer of sustainable charcoal technology to agents along the charcoal value chain.

Outcome 2: The benefits of sustainable charcoal production technology, briquetting and energy-efficient charcoal stoves, have been accepted by producers and peri-urban consumers (GEF US\$ 1,940,000; co-finance US\$ 11,086,700).

90. The objective of this component is to transfer sustainable charcoal technology to rural producers and (peri-urban) consumers through a two-step approach, taking benefit from partnerships with non-governmental organizations in the Corridor Huambo – Kwanza Sul – Luanda, and of existing Government programs linking rural production systems with urban markets. The first step involves the introduction of sustainable charcoal production technology (energy-efficient, low-emission kilns) to rural communities (2.1 and 2.2).

91. The Project will envisagedly partner with the NGOs ADPP Angola and COSPE to promote low-carbon charcoal technology following different approaches, thereby generating a variety of experiences from which lessons for scaling-up can be drawn. Each NGO has its unique selling points: ADPP has long-term presence in the region and an established institutional structure for training and knowledge transfer, which is acknowledged by the Government. Moreover, ADPP’s Farmer’s Club system is expected to provide an effective entry point for engaging with the rural communities and facilitating replication of the technologies. Against the backdrop of the low level of association in rural communities, let alone the existence of formalized organizations, the Farmer’s Clubs are a promising environment to disseminate sustainable charcoal technology in rural Angola.

92. The ultimate goal of this first step is to have sustainable charcoal production technology accepted by the producers. Following a different approach - integrating charcoal production with sustainable forestry activities - a second pilot, implemented by COSPE, has also been designed to achieve this goal.

93. Moreover targeting the peri-urban areas, ADPP will aim to introduce and demonstrate charcoal briquetting technology as a business opportunity, while making a case for energy-efficient stoves and the use of sustainably produced charcoal through its school system (2.3). The Project will provide technical assistance to its partners throughout the process, including technical backstopping by foreign experts and the sharing of lessons by peer agencies and programs in other countries in Sub-Saharan Africa. This component will assist the RPs to enhance their infrastructure for demonstrating charcoal technology and enabling small-scale production. In order to increase momentum, some other small-scale low-emission technologies relevant for rural, agricultural communities will be put on display as well, as and if appropriate.

94. The second step involves dissemination of charcoal production technology (kilns and briquetting machines) to interested producers and entrepreneurs on a cost-shared basis. This is pursued under output (2.6) which departs from the assumption that a first group of users has accepted the technology and understands its benefits. The Project will subsidize the initial investment, the remainder being paid by the producer. The Project further aims to trigger initial demand for sustainable charcoal from the Government's PAPAGRO program under the application of a certification mechanism, and distribute energy-efficient charcoal stoves to low-income consumers through the Loja Kikuia program (2.7). Finally, experiences will be documented and systematized in detail, and lessons learned will be drawn (2.5).

Output 2.1. Demonstration and introduction of improved charcoal kilns among selected rural communities in the Huambo-Luanda corridor (GEF US\$ 570,000; co-finance US\$ 200,000).

95. This project output comprises the demonstration, local production and initial operation of improved, energy-efficient charcoal kilns by rural farmers. The pilot will be implemented by a Responsible Partner under this Project, and will take benefit from ADPP's training facilities and working relations with rural communities, specifically those organized into the Farmer's Clubs. After establishing a core group of charcoal production experts, a final selection will be made with respect to the chosen kiln technology, taking into account locally available materials and construction capabilities. The chosen kiln models will be based on the Casamance kiln. For demonstration and promotional purposes, more advanced kilns such as the Adam's retort may be produced as well and put on display (paying the required royalty if needed). Simultaneously, a group of technicians will be trained to transfer the technology, including operating skills, to the farmers.

96. In a first round, the technology will be introduced among six Farmer's Clubs, tentatively targeting 6 farmers per Club (36 people in total). Expectedly, these farmers will be organized in 12 teams, each operating a cluster of 3 Casamance kilns (36 kilns in total). The objective is to achieve full acceptance of the technology, which involves an interactive process to adjust the technology to match the farmer's needs, as well as ongoing training and joint learning to identify and materialize real benefits. A total throughput time of 2-3 years is envisaged with recurrent training activities, intensive monitoring and expert assistance following an integrated and multi-disciplinary approach. This output will build upon the training and educational activities described under output 3.2. Both outputs together constitute the full ADPP rural charcoal pilot project. The present output involves the supervision, monitoring, hardware, testing and implementation of the pilot. In coordination with the Project's Technical Advisor, ADPP can request expert support on charcoal-specific topics (see output 2.4). As a Responsible Party, ADPP will be subjected to a HACT assessment and enter into a service contract with the executing agency of the Project.

Output 2.2. Demonstration and introduction of energy-efficient technologies (briquetting and efficient stoves) in selected peri-urban municipalities of Luanda (GEF US\$ 207,000; co-finance US\$ 200,000).

97. This output encompasses the demonstration of briquetting technology among peri-urban micro-entrepreneurs and promotion of sustainable charcoal technology among consumers, school children, students, and their families. This output will be implemented as a pilot project under responsibility of ADPP. To this purpose, ADPP will enter into a service contract with the Project, funded by the GEF. The pilot will be implemented in at least two peri-urban municipalities in Luanda, Viana and Cazenga. This output will build upon the training and educational activities described under output 3.2. Both outputs together constitute the full ADPP urban briquetting pilot project.

98. The approach will be to train students at three lower secondary academic and technical schools (EPP)⁴⁹ on the relevance of sustainable charcoal production in relation to global warming and local environmental degradation, and train them on briquetting technology (financed under output 3.2). These students will transfer their knowledge and skills to 10 nearby schools, thereby creating significant impact in the area. The objective is to spread awareness of the opportunities of briquetting, and benefit from the momentum to generate demand for energy-efficient stoves and certified charcoal. Energy Assistant students in Viana will be prepared to initiate and operate briquetting micro-enterprises at the EPP schools, and replicate this model in the area.

99. This output envisages demonstrating the viability of briquetting technology in peri-urban areas under appropriate business models. Differentiation of briquette quality and price in function of the purchase power of user groups will be considered in combination with adequate labelling. As part of the pilots, technological, financial, knowledge and operational barriers will be addressed. Particular attention will be given to scalability of proposed solutions.⁵⁰ Screw-type briquetting presses are expected to provide the best compromise between investment costs, output and product quality.⁵¹ The present output involves the supervision, monitoring, hardware, testing and implementation of the pilot over an estimated 3-year period. In coordination with the Project's Technical Advisor, ADPP can request expert support on charcoal-specific topics (see output 2.4).

Output 2.3. Integration of improved charcoal production technology in sustainable forest management and rural development initiatives in communities in the Huambo-Luanda corridor (GEF US\$ 323,000; co-finance US\$ 186,700).

100. This output covers the rural charcoal production pilot, to be implemented by a Responsible Partner. The pilot will build upon COSPE's existing initiative aimed at establishing a payment for ecosystem services (PES) system in the Canjombe community near Waku Kungo (Kwanza Sul). This project, which will benefit around 2,000 people, covering the introduction of improved charcoal kilns coupled with other income-generating activities to improve livelihoods and promote sustainable utilization and management of forest resources among charcoal producers.

101. COSPE has presented the project under the Plan Vivo mechanism to generate financial revenues for the ecosystem services delivered. GEF funding to this pilot will be used to enhance the process of charcoal technology transfer by fine-tuning kiln technology to local circumstances and training of operators, and to support the integration of reforestation practices into charcoal production to offset carbon emissions and preserve other environmental values, including biodiversity. Technical expertise, the exchange of experiences with the ADPP pilot (output 2.1) and other countries in the region will maximize the chance of success, which is measured by the degree of user acceptance of improved kiln technology and its adoption by other charcoal producers in the area.

102. GEF funding will finance equipment, consultancies and the costs of local training events, supervision and monitoring. COSPE will enter into a service contract with the executing agency of the Project and report regularly to the Project Coordinator. In coordination with the Project's Technical Advisor, COSPE will receive expert support on charcoal-specific topics (see output 2.4). For more information about the COSPE pilot please refer to Annex N.

Output 2.4. Targeted technical assistance and equipment to support charcoal pilots and enhance facilities of project partners (GEF US\$ 240,000; co-finance US\$ 0).

103. This output aims to fill the identified capacity gaps among project partners in terms of specific knowledge and expertise of charcoal technology. International consultancies and expert visits will ensure the effective, high-quality transfer of sustainable charcoal technology from the region to the project partners and beneficiaries. Procurement of proven charcoal technology from abroad is foreseen as well as auxiliary equipment to facilitate the successful demonstration of sustainable energy technology. It is considered to put at display more advanced

⁴⁹ EPP = Escola Polivalente e Profissional. This school type was launched by ADPP in 2011 to introduce a new type of education in Angola. The aim of EPP is to graduate well- rounded, knowledgeable, proficient, dynamic young people, who are capable of contributing to development in Angola. Eight EPP schools now exist and in 2015, providing sound and varied education for more than 1.500 young people.

⁵⁰ For more information about the barriers for briquetting, see: Analyzing briquette markets in Tanzania, Kenya and Uganda - Report January 2013, EEP Energy and Environment Partnership / Southern and East Africa.

⁵¹ Screw presses are operated by an electric motor (preferably). Investment costs are about US\$ 1,350 and outputs in the range of 150 kg/hr. Screw presses and manual presses offer opportunities for local production. Source: Project PIF, March 18, 2014.

charcoal kilns (such as retort kilns) as these may become of interest as the charcoal sector in Angola professionalizes. Such retorts would deliver additional resource and GHG benefits compared to Casamance kilns but are only affordable for more capitalized charcoal producers. and .

104. Opportunities will be taken to demonstrate the value of sustainable charcoal for productive processes in rural areas, including institutional kitchens, laundries, and food processing. To this purpose, synergies will be sought with existing initiatives, such as the ADPP Frontline Institute and the Government-led “Aldeias Solares” program. Specifically, consultancies and equipment supplied under this output shall be supportive for the delivery of outputs 2.1-3 and 2.6-7.

Output 2.5. Detailed documentation and systematization of project experiences, and generation of recommendations for policy development, and design of financing production and business models (GEF US\$ 50,000; co-finance US\$ 100,000).

105. This project output consists of one or two consultancy services during the last project year aimed at the collection, analysis, and systematization of the experiences and lessons learned under the Project. The outcomes will be assessed in the context of the charcoal value chain in Angola, but also compared with experiences in other countries and the advances towards a regional charcoal policy for Sub-Saharan Africa. The lessons learned will be translated into recommendations for effective charcoal policy development in Angola, the design of Government programs, market development and business models, and financing of the private sector.

Output 2.6. Introduction of energy-efficient charcoal kilns in selected rural communities, and of briquetting technology in selected peri-urban areas, on a cost-sharing basis (GEF US\$ 350,000; co-finance US\$ 400,000).

106. This output builds forth on the efforts under output 2.1 and 2.2 to introduce improved charcoal kilns in rural communities, and briquetting machines in peri-urban areas, respectively. Both pilots aim to make people familiar with these technologies, demonstrate the benefits and make people convinced about their benefits. The present output departs from the assumption that successful introduction will trigger demand from neighbors, who wish to exploit these technologies to become more productive and increase their income. This output will initiate market introduction of improved (Casamance) kilns and screw-type briquetting machines on a cost-shared basis. This first replication round will be managed and organized by the Responsible Partner. The Project aims at adoption of the Casamance kilns by 90 producer teams, operating a total of 270 kilns in the pilot area and its surroundings. For a more detailed description of the organization of the pilot and replication phase, please refer to Annex M. As a base case, a 50% subsidy on equipment cost is proposed, with the remainder to be paid by the beneficiaries. More advanced financing schemes, such as micro-credits will be preferred if these become operational for the target groups in the course of the Project.

Output 2.7. Dissemination of certified charcoal and energy-efficient charcoal stoves among low-income households through government poverty reduction and/or market development programs (GEF US\$ 200,000; co-finance US\$ 10,000,000).

107. This output, which builds forth on output 1.5, aims to deliver at least 10,000 certified efficient charcoal stoves to low-income consumers through the MINCO programs PAPAGRO and Loja Kikuia, which are both part of the Integrated Municipal Program for Rural Development and Poverty Reduction (PIMDRCP). The Programs will procure certified, sustainable charcoal from eligible producers in the Huambo-Luanda corridor, as well as energy-efficient, low-emission charcoal appliances (stoves). This procurement will bring along tangible and verifiable GHG reductions compared to the baseline, while offering monetary income and financial benefits for producers and consumers, respectively. As a base case, a 15% subsidy on equipment cost is proposed, with the remainder to be paid by the beneficiaries. More advanced financing schemes, such as micro-credits will be preferred if these become operational for the target groups in the course of the Project. A full analysis of the appropriate GEF subsidy will be done during the first year of the project

Component III. Strengthening of human capacities and institutions.

Outcome 3: Institutional and human capacities for sustainable charcoal production and utilization have been strengthened through partnerships for knowledge transfer and professional training (GEF US\$ 1,040,000; co-finance US\$ 950,000).

108. This component has the objective to strengthen the national human resource base required for sustaining a low-emission, energy-efficient charcoal sector in Angola. Qualified and properly skilled human resources are a key asset for effective institution building and as such, a critical factor for sector governance. Angola, emerging from decades of conflict and with a very young population, is faced with the challenge to educate and train a next generation of professionals in all disciplines and at all levels. Since the institutional landscape is still evolving and strong partner organizations are scarce, the Project will initially focus on the development of human resources, thereby also benefitting the involved institutions.

109. Specifically, this Project component will implement a range of capacity building activities with the objective to enhance the technical and institutional capacities of the national Forestry Development Institute IDF in Huambo, which is a key actor for strengthening governance of the forestry and charcoal sector, and for promoting sustainable forest management practices. Short training activities and seminars are also envisaged, targeting public officers and professionals of involved Government entities, as well as policy-makers at the national and provincial levels. The Project will partner with appropriate organizations in Huambo to implement the planned capacity building activities and ensure institutionalization of results; the PPG phase identified the University of Huambo (UJES) as a potential partner.

110. This component will further transfer sustainable charcoal technologies through to schools and training institutes. To this purpose, the Project envisages a partnership with ADPP as a Responsible Partner, but other institutions can also be addressed. This output is expected to disseminate sustainable charcoal production technologies, including practical skills and hands-on training, among a broad group of charcoal producers in the area. The Project will further address professional charcoal retailers in the peri-urban areas to become familiar with sustainable charcoal practices and assist them in setting up briquetting micro-enterprises.

Output 3.1. Technical assistance and capacity building activities for the Institute for Forestry Development (IDF) in Huambo Province. (GEF US\$ 320,000; co-finance US\$ 450,000).

111. This output builds forth on baseline activities implemented by the Jose Eduardo dos Santos University in Huambo (UJES-FCA) in the field of sustainable forest management, bioenergy and charcoal production. The UJES has entered into a partnership with the University of Cordoba (UCO-IDAF) in Spain. This partnership receives support through the EU-financed project "ANEER". Besides institutional strengthen of universities in Angola and Mozambique, the program aims to improve the understanding of the dynamics of the Miombo ecosystem in Angola, including its regenerative capacity, and issue recommendations for nursery schemes for native trees and more appropriate selection of species for charcoal production. The UJES has established working relations with the IDF and COSPE under the PIPDEFA project.

112. This output are focused on strengthening the technical and managerial capacities of the IDF covering topics including activities including: (i) training on more sustainable forest management methods and techniques; (ii) training on the use and interpretation of modern forestry data acquisition and monitoring methods such as remote sensing; (iii) monitoring and management of tree nurseries to increase yields of reforestation programmes; (iv) training on traditional and improved charcoal production methods in relation with forest management; and (v) sharing of best practices to strengthen sector governance and interact with the charcoal sector.

113. During the PPG phase, the UJES was identified as an appealing entry point to engage with forestry sector stakeholders in the Huambo region. The University will likely play a role in shaping the Project's exit strategy, which aims to institutionalize the enhanced skills and capacities in the Huambo region and enable IDF to adequately perform its tasks in line with its mandate. The activities pursued under this output will be designed by the Project team in close engagement with IDF, UJES, and other local stakeholders, and be organized and programmed in function of the specific scope and objectives defined.

Output 3.2. Design and implementation of a training program and extension work on efficient charcoal production for student teachers and community workers (GEF US\$ 260,000; co-finance US\$ 200,000).

114. This output encompasses the design and implementation of training activities by ADPP to transfer charcoal technology to rural teachers, extension workers, and groups of charcoal producers. The training process will start at the level of ADPP's Frontline Institute with the formation of a core working group of experts, which will develop a training methodology and training material. Prototype and full-scale Casamance kilns will be constructed for demonstration and hands-on experience. Once in place, the experts will transfer their skills to ADPP's schools, which trains teachers and technicians prepared for deployment in rural Angola.

115. The approach is to have these students creating awareness about sustainable charcoal production among the local population, and therefore transferring practical knowledge and skills to the producers. These students will be backed by ADPP's teachers and core experts. The Project can provide further assistance by specialized consultancies, financed under output 2.4. This output will lay the basis for the initial demonstration and transfer of charcoal technology as described under output 2.1. It is foreseen that ADPP will implement the outputs 3.2 and 2.1 under one service contract as a Responsible Party.

Output 3.3. Training activities conducted for relevant government staff on sustainable charcoal production, charcoal policy, financing and monitoring, verification and reporting systems (GEF US\$ 200,000; co-finance US\$ 100,000).

116. The purpose of this output is to transfer relevant knowledge to public officers and policy makers, enabling them to understand the causes and impact of unsustainable charcoal production; to understand the benefits of improved charcoal production and consumption technologies and practices; and to take ownership of measures proposed to sustain a more sustainable charcoal value chain. Increased awareness and knowledge contribute to institution building in Angola and are a key condition for effective sector governance.

117. The envisaged training activities are expected to be spread over the full Project duration, and be organized in small groups to cover specific subjects and target groups more effectively. This approach adds to overall flexibility to adjust to changes in the project or institutional context. GEF resources will be used to hire the requested training activities under one or more service contracts. As and if appropriate, expert backup can be provided under output 2.4.

Output 3.4. Training activities targeting professional charcoal retailers in peri-urban markets on the establishment of sustainable charcoal supply chains, and technical assistance for briquetting micro-enterprise development (GEF US\$ 230,000; co-finance US\$ 200,000).

118. This output envisages implementing awareness raising campaigns specifically targeting the professional charcoal retailers in peri-urban markets to promote the commercialization of sustainable charcoal as a viable business (although initially targeting the high-end market).. Moreover, the impact of traditional charcoal production will be explained, making a case for sustainable charcoal from renewable biomass resources.

119. This output will further promote briquetting technology among the peri-urban retailers, provide technical training and assistance, as well as support for setting up micro-businesses based on briquetting. The benefits of energy-efficient charcoal stoves are also explained. sett

Component IV. Monitoring and evaluation.

Outcome 4: The Monitoring & Evaluation plan for the Project has been implemented (GEF US\$ 200,000; co-finance US\$ 145,000).

120. Monitoring of project progress is essential for the adequate and timely delivery of results. This component covers project monitoring and oversight by UNDP in close coordination with the Ministry of Environment and the project partners, as well as mid-term review and terminal evaluation of the Project.

Output 4.1. Design and implementation of a Monitoring and Evaluation plan, including reporting on progress indicators and targets (GEF US\$ 85,000; co-finance US\$ 145,000).

121. This output covers the organization of an inception workshop, the refinement of progress and impact indicators and the design and implementation of a detailed monitoring plan and methodology. Gender aspects will be a key focus area and it is anticipated that a gender analysis be carried out during the inception phase to facilitate gender mainstreaming throughout project implementation. The following activities will be implemented

using GEF resources: (i) hosting of inception workshop; (ii) design of monitoring plan and tools for data collection and recording; and (iii) M&E and gender specialists to provide backstopping.

Output 4.2. Implementation and reporting of Mid-term Review and Terminal Evaluation (GEF US\$ 90,000; co-finance US\$ 0).

122. This project output consists of the Mid-term Review (MTR) and the GEF terminal evaluation (TE), to be carried out by a team of independent national and international consultants. The MTR will be carried out by UNDP after 24 months of project implementation. The TE will be conducted in the last three months before operational closure of the Project.

Output 4.3. Execution of project audits (GEF US\$ 25,000; co-finance US\$ 0).

123. This project output encompasses annual project audits in line with UNDP guidelines.

Environmental benefits

124. Environmental benefits include: (i) reduction of CH₄ releases into the atmosphere per unit of charcoal produced as a result of improved kilns; (ii) reduction of the rate of non-renewable biomass (wood) consumption as a result of increased kiln efficiency (gravimetric yield); (iii) avoided charcoal losses by promotion of briquetting; (iv) reduced consumption of charcoal by end-users through the dissemination of energy-efficient charcoal stoves; (v) reduced soil contamination at charcoal production sites due to improved production processes and increased user awareness; and (vi) reduced indoor pollution with associated health benefits, especially for women and children, as a result of energy-efficient stove use. The benefits (i-iv) have been quantified in Annex D and directly contribute to the GEF-5 objectives to combat global warming through the mitigation of carbon releases into the atmosphere under the CCM focal area, objective 2.

125. The methodology for calculating emission reductions is based on a standardized baseline developed by Mueller and Michaelowa.⁵² It is assumed that increased kiln efficiency will proportionally reduce the inputs of non-renewable biomass. The share of non-renewable biomass is included as a key parameter in the methodology. In the absence of specific data, a share of non-renewable biomass (X) of 50% is assumed under the baseline, which seems conservative for Angola. The methane emission reductions are estimated based on CDM methodology AM0041, which provides a simple formula relating to CH₄ emissions in charcoal kilns, to the gravimetric yield (i.e. mass of charcoal outputs divided by mass of wood inputs).⁵³

126. Assuming the use of mound-type kilns under the baseline with a conversion efficiency (gravimetric yield) of 10%, and Casamance kilns with 20% efficiency under the alternative scenario (the Project), emission reductions of 31.6 kg CH₄ per ton charcoal (0.664 ton CO_{2eq}/ton charcoal) are obtained. It is further assumed that the reduced demand for wood inputs will save non-renewable biomass resources (which requires producer awareness), offsetting 1.164 ton CO_{2eq} per ton charcoal. In total, GHG emission reductions of 1.828 ton CO_{2eq} are achieved per ton of charcoal produced compared to the baseline.

127. The project will follow a two-step approach: an initial pilot involving 36 kilns followed by an expansion (replication) phase to attain a total of 270 operational Casamance kilns at the end of the project. A kiln volume of 50 m³ is assumed. The kilns are typically operated in groups of 3 units operated by a team of three people, during a 3 months per year, yielding 9 charcoal batches per year. Other direct emission reductions are achieved by the introduction and operation of 10 briquetting machines in urban areas, and the dissemination of 10,000 energy-efficient charcoal kilns.

128. The following table summarizes the estimated direct GHG emission reductions obtained from the installed technologies, totaling **209,120 ton CO_{2eq}** over lifetime (10 years).

⁵² See, for example: "Proposal for a new Standardized Baseline for Charcoal Projects in the Clean Development Mechanism", Mueller, M, Michaelowa, A. Eschman, M, Zurich, Switzerland, December 2011.

⁵³ The emissions of methane produced per ton of charcoal during the carbonization process (M) are given by the empirical formula: $M \text{ [kg CH}_4\text{/ton charcoal]} = 139.13 - 313.80 \cdot Y$, in which Y represents the conversion efficiency (tons of charcoal obtained per ton wood input).

PROJECT ESTIMATED DIRECT GHG EMISSIONS PER TECHNOLOGY				
	Technology			
	Casamance Charcoal Kilns	Briquetting Machines	Energy-Efficient Stoves	[Unit]
Charcoal production per unit (team with 3 kilns)	36,000	-	-	[kg charcoal/yr]
Charcoal savings per unit	-	130,500	365	[kg charcoal/yr]
Number of units	90 teams (270 kiln)	10 machines	10,000 stoves	[-]
Annual charcoal production	6,480	-	-	[ton charcoal/yr]
Annual charcoal savings	-	1,305	3,650	[ton charcoal/yr]
Charcoal yield : wood input	1:5 (20%)			[-]
Annual wood savings	32,400	6,550	18,250	[ton wood/yr]
	57,200			[ton wood/yr]
Energy density wood	15			[GJ/ton]
Annual energy savings	486,000	98,250	273,750	[GJ/yr]
	858,000			[GJ/yr]
Specific GHG emission reduction	1,828			[ton CO2eq/ton charcoal]
Annual GHG emission reductions	11,845	2,395	6,672	[ton CO2eq/yr]
	20,912			[ton CO2eq/yr]
Lifetime savings (10-year period)				
Wood savings	572,000			[ton wood]
Energy savings	8,580,000			[GJ]
Direct GHG emission reductions	209,120			[ton CO2eq]

129. The Project further pursues indirect emission reductions through market transformation as a result of improved policy, technology transfer and capacity building. An indicative top-bottom estimate can be derived from the total market volume for charcoal in the country, which is of the order of 2 million peri-urban households, each consuming 500 kg charcoal or more annually. The total charcoal demand would be around 1.0 million ton/yr, requiring 5.0 million ton wood. Since off-setting of non-renewable biomass through improved kiln efficiency is beyond control of the Project at such a scale, only avoided methane releases are claimed here (0.664 ton CO₂eq/ton charcoal). Assuming a successful implementation of the charcoal pilots, a market penetration of 30% and a GEF causality factor of 60%, the attainable annual CH₄ emission reductions would be of the order of **1.2 million ton CO₂eq** over a 10-year period after Project termination.

Economic and social benefits

130. The Project “Promotion of Sustainable Charcoal in Angola through a Value Chain Approach” is expected to be instrumental for attaining a series of social and economic benefits.

131. At the level of the national economy, sustainable charcoal production and utilization imply a higher resource-efficiency in terms of biomass material (forest stocks) while other resources, specifically land and labor, are used more efficiently. Methodologies to assess the cost of forest resources should not only consider their environmental value (biodiversity, carbon sink) but also the economic potential of the wood and the land. The efficient use of forest resources preserves their availability for other purposes. The opportunity cost of conserved

forest resources varies greatly. An estimate of US\$ 350 per hectare is given⁵⁴ for conversion to low-productive agriculture.⁵⁵

132. Departing from a business-as-usual annual forest area of 100,000 ha converted due to non-sustainable charcoal production in Angola, an indicative economic value of US\$ 35,000,000 can be derived. With attainable efficiency gains of 50% or better targeted under the Project, more sustainable charcoal production would yield at least US\$ 17,500,000 in savings per year for the national economy. An increase in resource efficiency also translates into fuel savings in the transport sector, estimated at about US\$ 500,000 per year. The products generated by the Project will support the Government of Angola to articulate national forestry and climate change policy in order to capitalize the country's forest stocks in designated areas.

133. Rural communities in principle obtain social, environmental and economic benefits from more sustainable charcoal production. However, to them these benefits are not always visible⁵⁶. Charcoal production is not a core business and - as respondents during the PPG confirmed - people dislike the heavy and dirty work. Improved, cleaner production methods and technologies would assist in improving the labor conditions and reduce local pollution due to fumes, ashes and tar. However, as long as rural people lack alternative sources of cash income, they will see the opportunity cost of labor, land and forest resources as negative and keep the business going.

134. Alongside effective regulation of land tenure and forest access, local economic development is key to increasing the cost of labor, making non-sustainable charcoal production less rewarding. Based on an analysis of the value chain, producers are paid around AKZ 500 per 40-kg bag of charcoal (4-5 US\$). The Project makes a strong case for decentralized development models that are in alignment with the National Development Plan. Such models are particularly relevant for Angola given the poorly developed energy and road infrastructure, the need to consolidate communities and settlements outside the urban centres, and the urgency to improve quality of life (HDIs) in the rural areas.

135. Peri-urban people will benefit from more efficient charcoal utilization, not only through the use of efficient charcoal stoves but also efficient transport, packaging and briquetting technology. Specifically, the benefits extend to reduced pollution and transport and the appearance of new business opportunities. However, it is uncertain whether such businesses can be self-sustaining (i.e. operate without any type of subsidy); experiences in other countries indicate that briquetted fuels must be differentiated in terms of cost and energy density to serve specific, low-income strata in the peri-urban areas⁵⁷, but would rather be a niche market.⁵⁸ Efficient charcoal stoves would translate into direct cost savings up to 30-50%. Given the precarious household budget of the target group, these savings will help families to better cover other basic needs.

Mainstreaming gender

136. The GEF recognizes that gender equality is an important goal in the context of the projects that it finances because it advances both the GEF's goals for attaining global environmental benefits and the goal of gender equity and social inclusion.⁵⁹ The charcoal value chain comprises a range of actors including producers, transporters and retailers. Gender equity refers to fair sharing of resources and benefits by both women and men who are involved

⁵⁴ Source: Estimating the opportunity costs of REDD+ - A Training Manual, Version 1.3. http://wbi.worldbank.org/wbi/Data/wbi/wbicms/files/drupal-acquia/wbi/OppCostsREDD%20v1.3_Part%2001_0.pdf.

⁵⁵ Research in this field is done in the framework of REDD+ schemes and basically reflects the long-term, economic value. It must be noted that from the perspective of local communities, lost income opportunities should be compensated as well. Charcoal production generating cash-income, have a great impact, indicating real costs in the range of US\$ 6.50 - US\$ 12 per ton CO₂. See for example work by Fisher, Balmford, Lewis and Munishi (<http://www.cam.ac.uk/research/news/scientists-calculate-the-true-cost-of-saving-rainforest-and-improving-food-security#sthash.gykS3Uz7.dpuf>, 31 May 2011).

⁵⁶ Moreover, resettled people do not commonly share and understand traditional values supporting long-term survival strategies.

⁵⁷ Analysing briquette markets in Tanzania, Kenya and Uganda - Report January 2013, EEP Energy and Environment Partnership / Southern and East Africa

⁵⁸ Possibly, wood and charcoal briquettes may be more economical for larger-scale applications such as small industries, but more research into this field is needed.

⁵⁹ GEF Roadmap for Gender Equality, brochure based on the GEF-6 Replenishment Paper; Strategic Positioning of the GEF (GEF/R6/19).

in charcoal production and the marketing process, ranging from care of tree seedling nurseries to distribution and sale of charcoal, particularly at the small-scale community level. In the charcoal sector, women and men play different roles, therefore making gender equity an important aspect of the entire sector.

137. Interviews held during the PPG⁶⁰ indicated that tree felling and charcoal production is male-dominated (92% of respondents), while retail distribution is basically done by women (91%). These figures are aligned with the general role distribution between men (doing heavy labor) and women (market trade) in rural Angola. Poverty in rural areas is strongly gender-biased since female-headed households are deprived of male labor for land clearance and ploughing. The situation of widows is even more precarious since they do not have a piece of land of their own.

138. In post-conflict Angola, the need for women to earn an income by themselves has increased, and they have become involved in petty trading in both rural and urban settings.⁶¹ In peri-urban areas, very low male-to-female ratios have been found due to the armed conflict with resulting adult males killed, separation of families, displacement and migration. The traditional perception of male and female roles persist in the peri-urban setting, but especially the male role has become dysfunctional. This is one of the factors leading to men having greater difficulties to adapt than women.

139. Trading is the easiest way of economic activity for women, as they have very little access to capital assets and professional training – a reality inherited from the rural past. Trading has allowed female-led households in urban areas to survive somewhat better than male-led households (63% vs. 68% below poverty line, respectively). The primary reason behind this phenomenon is that the informal sector, with its overwhelming majority of women, offers more opportunities to make a living one way or another. The men tend to seek formal jobs, which offer social status and stability, but are greatly affected by salary cuts and unemployment. On the other hand, women now combine work outside the house with the traditional care for children and elderly.

140. A detailed gender analysis is hampered by the (systemic) lack of socio-economic data in the country, let alone gender-disaggregated data. A survey among IDPs⁶² covered the provinces of Huila, Benguela, Malange and Zaire (SRHFL, UNFPA/ANGOLA, 2001). No recent data have been found for the Huambo – Luanda corridor (Huambo, Cuanza Sul, Cuanza Norte, Bengo, and Luanda) but it seems reasonable to assume that the findings for Benguela are applicable to Luanda. As a general observation, the Project appears to bring benefits for both men and women. While the men may benefit from improved labor conditions, financial benefits through savings via retail trade and household charcoal utilization rest predominantly with the women.

141. It must be noted that national legislation grants equal rights to men and women in the private, family, and economic domain⁶³. However, there is still a wide gap to bridge with customary law and traditional perceptions. In practice, women rarely control capital assets and as a direct consequence, they have little or no access to external finance (micro-credits) and are pushed to informal occupations. By consequence, transporters, authorities and intermediaries involved in the charcoal value chain are male-dominated⁶⁴, hence it is likely that they will reap the larger share of the financial benefits produced by a more sustainable charcoal chain. Moreover, sector formalization and capitalization of land, forest resources and productive systems (improved charcoal kilns, briquetting companies, and charcoal-consuming processes) may tend to exclude women if not addressed properly.

⁶⁰ See Annex L, “Relatório Preliminar do Trabalho de Campo dentro da Componente 1 da Fase PPG do Projecto”, CETAC Huambo and UCO-IDAF, March 2015 (in Portuguese).

⁶¹ See: Gender and Family life in Angola: Some aspects of the post-war conflict concerning displaced persons, Joao Baptista Lukombo Nzatuzola, *African Sociological Review*, 9 (2), 2005, p.106-133.

⁶² Ibidem.

⁶³ The principle of equality and non-discrimination between citizens on the basis of race, gender, political affiliation or religion is anchored in the Constitution. However, many factors exist affecting the social and economic position of women. See for an overview: Angola – Country Gender Profile, African Development Bank (OSAN), August 2008 (p.9).

⁶⁴ Reliable data for Angola is not available but qualitative descriptions confirm the role division identified for Kenya (2012). Also, in Kenya only 5% of women of farming women own the land. Although rural communities in Angola are matriarchal, unlike Kenya, in practice the men have gained control. Source: Gender Equity, Charcoal and the Value Chain in Western Kenya, Alannah Delahunty-Pike, Working Brief November 2012, prepared for PISCES by Practical Action Consulting, UK.

142. A gender-responsive approach fits into national policy to promote gender equality and the introduction of gender budgeting in Angola. Close monitoring and counselling of involved authorities on gender aspects throughout the Project can assist in identifying gaps and needs and ensuring that benefits are gender-balanced. As a final conclusion, societal changes in Angola seem aligned with observations in Kenya that younger men are more open to women owning assets, suggesting there exists a potential for generational transformation in cultural traditions.⁶⁵ The Project may identify workshop activities to tap into this potential and encourage attitudinal changes in both genders. The Strategic Results Framework for the Project includes gender-differentiated indicators when applicable.

V. FEASIBILITY

Cost efficiency and effectiveness

Indicatively, the cost-effectiveness of the Project is approx. US\$ 3.3 per ton CO_{2eq} avoided considering the direct and indirect GHG emission reductions. If related to the direct emission reductions only, cost-effectiveness is about US\$ 22 per ton CO_{2eq} but as mentioned the project's impact on the baseline and policy environment is substantial and therefore the assessment of cost-effectiveness against the combined benefits is more appropriate as a metric.

⁶⁵ Ibidem, p.12.

Risk Management

Project Title:	Promotion of Sustainable Charcoal in Angola through a Value Chain Approach	Award ID:	00084488	Date:	CEO Endorsement
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#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mgmt. response	Owner	Submitted, updated by	Last Update	Status
1	Weak governance structures and political support would hamper the implementation of sustainable charcoal in Angola.	PPG	Strategic	P = 1; I = 4	As in most countries in Sub-Saharan Africa, the charcoal sector in Angola is largely informal and existing regulation is ineffective and poorly enforced. Systemic barriers include legislation concerning land tenure and access to forests, complex and costly procedures to do business, as well as human institutional capacity issues. Charcoal policy is further shared by several sector ministries including MINAMB, MINEA, and MINAGRI. Notwithstanding, high-level policy support for sustainable management of natural resources, development of rural areas, and micro-entrepreneurship is growing, as evidenced in key policy documents. In the context of a need for diversification of the national economy, it is expected that policy support for sustainable charcoal will be continued during the Project's time horizon.	National Project Director	UNDP CO	Submission date	No change
2	Slow decision-making processes would impede timely delivery of project activities and procurement of goods and services.	PPG	Operational	P = 4; I = 3	The PPG confirmed that processes in Angola can be lengthy and complex, given rise to substantial delay. Frequent changes in Government staff further add to this problem. Although not critical, delays may compromise the quality of Project outputs and affect the integrity of the Project as a whole. Several measures have been taken to mitigate this risk, to the extent possible: (1) Assisted NIM modality with strong support from UNDP CO to shorten communication lines and reduce process complexities. (2) Structuring of the project into larger sub-projects, each of which assigned to organizations with proven implementation capacities as Responsible Parties. (3) Simplified project implementation arrangement and clarified roles, acknowledging the existence of the CMA (Multi-Sectorial	National Project Director	UNDP CO	Submission date	No change

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mgmt. response	Owner	Submitted, updated by	Last Update	Status
					Committee for the Environment) to address issues that go beyond the Project scope.				
3	Identified constraints in human and institutional capacity would affect the quality and successful execution of Project activities.	PPG	Operational	P = 2; I = 2	<p>The need to build professional individual and institutional capacities is widely acknowledged by the Government. Barriers of this kind affected smooth implementation of the PPG phase. Lessons learned are incorporated into the Project design through the following measures: (1) increased attention on human resource development through a dedicated Outcome 3 addressing different target groups and building institutional capacity in academic and government entities; (2) introduction of the position of a senior Technical Advisor as Project Team member; (3) resources made available for expert TA to assist pilot implementation; (4) strengthening of reporting mechanisms and accountability through Responsible Parties.</p> <p>The Project's logical frame-work has been revised to enhance robustness by adjusting the level of ambition, and by reducing inter-dependencies between products. As a result of these measures, this risk is deemed as relatively low.</p>	National Project Director	UNDP CO	Submission date	No change
4	Beneficiaries would reject improved charcoal technology due to technical, socio-economic, or other reasons.	PPG	Development	P = 3; I = 5	<p>Acceptance of sustainable charcoal technology is proposed as the goal of project Outcome 2. Experiences in other countries indicate this to be a great challenge, as rural users would need to see real benefits. Hence, user acceptance is critical for Step 2 (production) in the charcoal value chain. In order to mitigate this risk, the Project will invest substantial resources into implementing a variety of charcoal production pilots under different approaches, enabling the extraction of best practices and lessons learned. Extensive TA, training activities and interaction with the stakeholders are foreseen to best match user needs and expectations.</p>	Technical Advisor	UNDP CO	Submission date	No change

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mgmt. response	Owner	Submitted, updated by	Last Update	Status
5	The proposed improved charcoal kilns would not perform as expected due to technical or operational factors.	PIF	Development	P = 2; I = 3	<p>Improper construction and operation of charcoal kilns translates into low conversion efficiency and higher emissions than expected. Given the rudimentary baseline technology, the introduction of more advanced charcoal kilns is very challenging for the local producers. In order to mitigate the risk of non-performance, a path of small steps (incremental improvements) will be followed. The Project will aim at successfully implementing the Casamance type (or equivalent) in Angola. Although simple, it may reduce wood consumption with a factor 2.5. More advanced, retort-type kilns can be put on display for demonstration purposes.</p> <p>Intensive technical assistance will be deployed to ensure that people fully understand, accept and adopt the Casamance technology. Lesson drawn from earlier experiences in Angola (ADRA, COSPE) will be taken into account.</p> <p>By setting forward a modest level of ambition, and intensive support, this risk is deemed low/moderate.</p>	Technical Advisor	UNDP CO	Submission date	No change
6	The implementation of EE charcoal kilns would lead to increase pressure on native forests.	PIF	Sustainability	P = 1 I = 3	<p>It is stressed that unsustainable utilization of natural resources is fundamentally caused a result of poverty and the lack of technology.</p> <p>The Project strives at synergies with parallel initiatives to increase rural income, thereby opening alternatives to charcoal production; this element is also covered by the COSPE pilot. Improved technology will have a great impact on wood consumption. Moreover, research under the Project will assist in identifying alternative biomass sources for charcoal production, which may prove more cost-effective than the Miombo species.</p> <p>Finally, the Project will design and introduce a certification and verification mechanism to control the sustainable charcoal supply chain. Incentives to producers should encourage</p>	Technical Advisor	UNDP CO	Submission date	No change

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mgmt. response	Owner	Submitted, updated by	Last Update	Status
					<p>adherence to sustainability criteria. In parallel, advances in the country's governance capabilities is expected to gradually improve enforcement of regulatory instruments.</p> <p>The likeliness of this risk to occur is deemed low. In any case, controlling this risk lies beyond the Project's boundaries and time horizon.</p>				
7	Low levels of association and poor credit-worthiness of rural farmers would impede effective upscaling of sustainable charcoal schemes.	PPG	Development	<p>P = 3</p> <p>I = 4</p>	<p>The association levels in rural Angola are very low due to a combination of factors, including the degradation of traditional communities as a result of conflict and resettlement. Stability and programs to build rural markets, education and entrepreneurship, the level of association will expectedly improve in the coming years.</p> <p>Notwithstanding, rural farmers are undercapitalized, the banking system is hardly present in rural areas, and experience with micro-enterprises is lacking. Moreover, charcoal production is part of mixed production systems that would require an integrated, holistic approach. Addressing charcoal through formal business development and financing will therefore take time to take place (more than 5 years).</p> <p>Positive factors however are the existence of local, informal financing mechanisms and mutual assistance, as well as the fact that the investment costs for improved charcoal kilns (Casamance) is very low.</p> <p>The Project will not address this risk directly but aims to promote sustainable charcoal, and charcoal technology, thereby increasing demand.</p>	National Project Director		Submission date	No change
8	Changes in global carbon and REDD+ markets would reduce the prospects for	PIF	Finance	<p>P = 2</p> <p>I = 2</p>	Control of carbon finance markets is beyond the scope of this Project. However it is expected that that market demand for carbon certificates will continue to grow. The Project will endeavor into carbon finance at a pilot scale, through the	National Project Director	UNDP CO	Submission date	No change

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mgmt. response	Owner	Submitted, updated by	Last Update	Status
	external financing of sustainable charcoal production.				<p>COSPE pilot (Plan Vivo).</p> <p>Such funding may assist in paying sustainable charcoal producers for environmental services delivered. The Project will provide Angola with the building blocks to tap into international carbon funding in the future, which may be used to complement fiscal resources to support a sustainable charcoal value chain in the country.</p>				
9	Inadequate mapping of actors and mechanisms in the charcoal value chain would lead impede of affect empowerment of women.	PPG	Development	<p>P = 3</p> <p>I = 4</p>	<p>Although this risk is not critical for achieving GHG reductions and value addition along the charcoal chain, there is a significant likelihood that the economic and social benefits would become unevenly distributed and specifically, would not reach the most vulnerable stakeholders, especially rural women. It must be recalled that existing structures tend to benefit men more than women; capitalized and formal businesses are especially male-dominated while the informal sector has a female face. These structures are systemic and hard to address.</p> <p>As a countermeasure, the Project will make a continuous effort to identify gender-sensitive issues during its full throughput time; it will review proposed activities and pilots to ensure a gender-neutral or gender-positive approach. As part of annual project monitoring, performance on gender-specific criteria will be assess and recommendations for corrective action will be made, as and if appropriate.</p>	Technical Advisor	UNDP CO	Submission date	No change

VI. PROJECT RESULTS FRAMEWORK

Project title: Promotion of Sustainable Charcoal in Angola through a Value Chain Approach (PIMS 5331)					
Intended Outcome as stated in the UNDAF/Country Program Results and Resources Framework: No. 4: By 2019, the environmental sustainability is strengthened through the improvement of management of energy, natural resources, access to green technology, climate change strategies, conservation of biodiversity, and systems and plans to reduce disasters and risks					
Outcome indicators as stated in the Country Program Results and Resources Framework, including baseline and targets: Indicator 4.1.1. No. of responsive legal, policy and institutional frameworks supported for sustainable management of environment resources. Baseline: Weak institutional capacities and policy frameworks. Target: At least 2 policy frameworks enabled. (Data Source: MINAMB. Frequency: Annual)					
Applicable Outputs from the 2014 – 2017 UNDP Strategic Plan: Output 1.5: Inclusive and sustainable solutions adopted to achieve increased energy efficiency and universal modern energy access (especially off-grid sources of renewable energy)					
Applicable Output Indicators from the UNDP Strategic Plan Integrated Results and Resources Framework: Output 1.5 indicator 1.5.2: a) Number of people with improved energy access as a result of UNDP-supported intervention. b) Percentage of households benefitting from improved access to energy which are female-headed households.					
	Objective and Outcome Indicators	Baseline⁶⁶	Mid-term Target⁶⁶	End of Project Target⁶⁶	Assumptions⁶⁷
Project Objective: To reduce the current unsustainable and GHG-intensive mode of charcoal production and utilization from Angola's Miombo woodlands via an integrated set of interventions in the national charcoal value chain.	(Aa) Achieved direct GHG emission reductions over lifetime (ton CO2eq);	(Aa) 0 ton CO2eq;	(Aa) 0 ton CO2eq;	(Aa) 209k ton CO2eq;	<ul style="list-style-type: none"> - Sustained commitment of, and dialogue with, national authorities. - Project activities can be implemented as planned. - Effective engagement of all stakeholders. - Adequate technical performance and social acceptance by all stakeholders. - Effective mobilization of non-GEF funding.
	(Ab) Estimated indirect GHG emission reductions over lifetime (ton CO2eq);	(Ab) 0 ton CO2eq;	(Ab) 0 ton CO2eq;	(Ab) 1.2 M ton CO2eq	
	(Ba) ⁶⁸ Number of people with improved energy access as a result of UNDP-supported intervention.	(Ba) 0;	(Ba) 200;	(Ba) 10,000;	
	(Bb) Percentage of households benefitting from improved access to energy which are female-headed households	(Bb) 25%	(Bb) 50%	(Bb) 50%	
	(Bc) Average monetary savings by households using sustainable charcoal in efficient stoves (US\$/household-year).	(Bc) 0 US\$/hh-y)	(Bc) 100 US\$/hh-y)	(Bc) 100 US\$/hh-y)	
	(C) ⁶⁹ Policy and regulatory framework for sustainable charcoal sector supported.	(C) rated "1" (no policy/regulation/strategy in place)	(A) rated "2" policy/regulation/strategy discussed and proposed)	(A) rated "4" (policy/regulation/strategy adopted ⁷⁰ but not enforced)	
Outcome 1: The policy framework to support a sustainable charcoal value	(1a) white paper on sustainable charcoal, endorsed by Government (-);	(1a) no concept for white paper (0);	(1a) concept for white paper presented (0);	(1a) white paper completed and endorsed (1);	- Sustained commitment, and dialogue with, national Government entities.

⁶⁶ Baseline, mid-term and end of project levels must be expressed in the same neutral unit of analysis as the corresponding indicator.

⁶⁷ Risks must be outlined in the Feasibility section of this project document.

⁶⁸ Indicators Ba and Bb are aligned with UNDP IRRF indicator 1.5.2.

⁶⁹ Indicator C is aligned with the GEF CC TT template, using a rating scale 0..6.

⁷⁰ I.e. the charcoal white paper on sustainable charcoal endorsed by the Government.

chain in Angola, has been strength-ened.	(1b) certification and MRV mechanism designed and implemented;	(1b) no certification and no MRV mechanism designed nor implemented (0,0);	(1b) certification and MRV mechanism for sustainable charcoal production chain designed (1,0);	(1b) certification and MRV mechanism for sustainable charcoal designed and implemented in government programs (1,2) ⁷¹	- Project activities can be implemented as planned. - Regional public institute proved capable to host and sustain charcoal expertise centre.
Outcome 2: The benefits of sustainable charcoal production technology, briquetting and energy-efficient charcoal stoves, have been accepted by producers and peri-urban consumers.	(2a) Number of improved charcoal kilns and briquetting machined effectively in use;	(2a) No improved charcoal kilns (0), nor briquetting machines in use (0);	(2a) 18 improved kilns and 3 briquetting machines;	(2a) 270 improved kilns and 10 briquetting machines;	- Sustained commitment, and dialogue with, national Government entities. - Adequate technical performance and social acceptance by all stakeholders. - Ability to enhance level of organization of charcoal producers.
	(2b) Annual volume of certified, sustainable charcoal delivered to consumers (ton/yr);	(2b) No certified, sustainable charcoal delivered (0 ton.yr);	(2b) No certified, sustainable charcoal delivered (0 ton.yr);	(2b) 3,024 ton/yr certified, sustainable charcoal delivered per year	- Ability to monitor and verify charcoal production and utilization activities.
	(2c) Number of energy-efficient (EE) charcoal stoves delivered to peri-urban consumers (-).	(2d) No EE charcoal stoves delivered (0);	(2c) 3,000 EE charcoal stoves delivered	(2c) 10,000 EE charcoal stoves delivered.	- Project activities can be implemented as planned.
Outcome 3: Institutional and human capacities for sustainable charcoal production and utilization have been strengthened through partnerships for knowledge transfer and professional training.	(3a) Number of persons skilled in sustainable forest management and charcoal technology (male, female);	(3a) No persons skilled in charcoal technology (0 male, 0 female);	(3a) 40 persons skilled (20 male ; 20 female)	(3a) 150 persons skilled (75 male ; 75 female)	- Sustained commitment, and dialogue with, national Government entities. - Project activities can be implemented as planned. - Adequate technical performance and social acceptance by all stakeholders.
	(3b) Number of partnerships strength-ened and active at project termination;	(3b) 1 partnership in place (UCO-UJES)	(3b) 2 active partnerships	(3b) 3 active partnerships	- Effective mobilization of non-GEF funding.
Outcome 4: The Monitoring & Evaluation plan for the Project has been implemented.	(4a) Mid-term review (1) and follow-up on recommendations (1) on gender mainstreaming and sustainability of project results; (4b) Terminal Evaluation document (-).	(4a) No Mid-term Review (0) and no recommendations (0); (4a) No Terminal Evaluation (0).	(4a) Mid-term Review completed (1); (4b) No Terminal Evaluation (0).	(4a) Follow-up on MTR recommendations completed (1); (4b) Terminal Evaluation completed (1)	- Project activities can be implemented as planned. - Project Management is aware of gender and sustainability aspects and risks and able to define adequate mitigation measures.

⁷¹ Envisaged in the programs PAPAGRO and Loja Kikuja of the Ministry of Commerce (MINCO).

VII. MONITORING AND EVALUATION (M&E) PLAN

143. Project monitoring and evaluation (M&E) will be conducted in accordance with established UNDP and GEF procedures and be led by the PMU and UNDP CO with support from UNDP/GEF. The Strategic Results Framework (SRF, see Section II) provides performance and impact indicators. The SRF will be the reference for monitoring the Project's implementation and for (independent) evaluation of performance and impact. Day-to-day monitoring of implementation progress will be the responsibility of the Project Coordinator, supported by the TA. The PM will inform UNDP CO of any delays or issues faced during implementation so that appropriate support can be given and corrective measures adopted, in a timely and remedial fashion.

144. The PMU will prepare a detailed M&E plan to be presented at the Inception Workshop. This Workshop (see below) provides a platform for reviewing and fine-tuning the indicators and means of verification, in a manner consistent with the envisaged Project outcomes.

Inception Workshop

145. An Inception Workshop (IW) will be held within four (4) months after Project commencement. Prior to the IW, the Project Coordinator must be contracted and a constituent meeting for the Project Board be held on initiative of the NPD and UNDP CO. All entities that have assigned roles in the project organization structure shall participate in the IW. When appropriate and feasible, other national stakeholders and representatives from the UNDP regional office and UNDP/GEF shall be invited.

146. The IW is crucial to building ownership for the Project and to plan the first year's Annual Workplan. The IW shall address at least the following issues: (i) Assist all partners to fully understand and take ownership of the project. (ii) Present the roles, support services and complementary responsibilities of UNDP CO and RCU staff vis-à-vis the Project team. (iii) Clarify the roles, functions, and responsibilities of the Project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. (iii) Finalize the first Annual Work Plan and Procurement Plan. (iv) Clarify and fine-tune the Terms of Reference for project staff as needed. (v) Present a detailed overview of reporting, monitoring and evaluation (M&E) requirements. (vi) Agree upon the indicators and targets set forth in the Strategic Results Framework. (vii) Approve the M&E plan and budget. (viii) Clarify financial reporting procedures and obligations, and arrangements for annual auditing. And: (ix) Establish the time schedule for project meetings and events.

147. The outcomes of the Workshop shall be documented in the Inception Report, which is a key reference document that shall be shared with the participants to formalize the various agreements and plans decided during the meeting. The Inception Report shall be formally approved by the Project Board.

Quarterly monitoring

148. The quarterly monitoring and reporting requirements are as follows:

- Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform.
- Based on the initial risk analysis submitted, the risk log regularly shall be updated in ATLAS. Risks become critical when both impact and probability are high.⁷²
- Based on the information recorded in Atlas, a Project Progress Report (PPR) can be generated in the Executive Snapshot.
- Other ATLAS logs can be used to monitor issues, lessons learned etc. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

Bi-annual monitoring

149. The semestral monitoring and reporting requirements are:

⁷² Note that for UNDP GEF projects, all financial risks associated with financial instruments: such as revolving funds, micro-finance schemes, or capitalization of ESCOs should always be classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical).

- Status Survey Questionnaires to indicate progress and identify bottlenecks as well as technical support needs will be carried out twice a year.

Annual monitoring

150. Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and GEF reporting requirements. The APR/PIR includes, but is not limited to, reporting on the following:

- Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative);
- Project outputs delivered per project outcome;
- Lesson learned/good practice;
- AWP and other expenditure reports;
- Risks and adaptive management; and
- ATLAS QPR.

Field visits

151. UNDP CO and the UNDP RCU will conduct visits to project sites based on the schedule agreed in the Project's Inception Report and/or the Annual Work Plan, to acquire first-hand information about the Project's status and progress. Members of the Project Board may also join these visits. A Field Visit Report/BTOR will be prepared by UNDP CO and UNDP RCU and will be circulated to the PM and Project Board no more than two weeks after the visit.

Mid-Term Review (MTR)

152. The Project will undergo an independent Mid-Term Review 24 months after Project start. The MTR will determine progress being made toward the achievement of outcomes and will identify course corrections if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of the MTR will be incorporated as recommendations for enhanced implementation during the second half of the Project's term. The organization, Terms of Reference and timing of the MTR will be decided after consultation between the parties to the Project Document. The Terms of Reference for this Mid-term review will be prepared by the UNDP CO based on guidance from the RCU and UNDP-GEF. The GEF CCM Tracking Tool will be filled out by the Mid-Term Review.

Terminal Evaluation (TE)

153. An independent Terminal Evaluation will take place in the last three months before operational closure of the Project and be implemented in compliance with UNDP and GEF guidelines.⁷³ The TE will focus on the delivery of the Project's results as initially planned (and adjusted after the MTR, if any such correction took place). The TE will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF.

154. The GEF Tracking Tool will be filled out by the Terminal Evaluation. The TE shall provide specific recommendations for follow-up activities and requires a Management Response, which shall be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Center (ERC). The selection and contracting process of the evaluation team members will be assumed by UNDP CO. The associated budget commitments will be charged to the GEF resources allocated to the Project.

⁷³ See: "Handbook on Planning, Monitoring and Evaluating for Development Results", UNDP, 2009 (www.undp.org).

End of Project

155. During the last three months, the PMU will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the Project's results.

M&E Workplan and Budget

156. The Budget for M&E is US\$ 200,000 (GEF grant) plus US\$ 145,000 support by UNDP, as described in Component IV. Day-to-day monitoring of the status of the activities under implementation, standard reporting including the preparation of APR/PIR, is considered as part of Project Management and financed from the PM budget.

GEF M&E requirements	Primary responsibility	Indicative costs to be charged to the Project Budget ⁷⁴ (US\$)		Time frame
		GEF grant	Co-financing	
Inception Workshop	UNDP Country Office	USD 5,000	0	Within 2 months of project document signature
Inception Report	Project Coordinator M&E Expert	USD 5,000	None	Within 2 weeks of inception workshop
Standard UNDP monitoring and reporting requirements as outlined in the UNDP POPP	UNDP Country Office	None	50,000	Quarterly, annually
Monitoring of indicators in project results framework	Project Coordinator with M&E Expert support	USD 62,500 USD 2,500 travel	50,000	Annually
GEF Project Implementation Report (PIR)	Project Coordinator and UNDP Country Office and UNDP-GEF team	None	None	Annually
NEX Audit as per UNDP audit policies	UNDP Country Office	USD 25,000	0	Annually or other frequency as per UNDP Audit policies
Supervision missions	UNDP Country Office	None ⁷⁵	25,000	Annually
Oversight missions	UNDP-GEF team	None ⁷⁵	None	Troubleshooting as needed
Knowledge management as outlined in Outcome 4	Technical Advisor	None	20,000	On-going
GEF Secretariat learning missions/site visits	Project Coordinator and UNDP-GEF team	None	None	To be determined
Mid-term GEF Tracking Tool to be updated	Project Coordinator	None	None	As part of MTR.
Independent Mid-term Review (MTR)	UNDP Country Office and external evaluation expert	USD 40,000 USD 5,000 travel	None	24 months after Project start
Final GEF Tracking Tool to be updated	Project Coordinator	None	None	As part of TE

⁷⁴ Excluding project team staff time and UNDP staff time and travel expenses.

⁷⁵ The costs of UNDP Country Office and UNDP-GEF's participation and time are charged to the GEF Agency Fee.

GEF M&E requirements	Primary responsibility	Indicative costs to be charged to the Project Budget ⁷⁴ (US\$)		Time frame
		GEF grant	Co-financing	
Independent Terminal Evaluation (TE) included in UNDP evaluation plan	UNDP Country Office and external evaluation expert	USD 50,000 USD 5,000 travel	None	Three months before operational closure
Translation of MTR and TE reports into English or Portuguese, as and if needed	UNDP Country Office	None	None	To be determined
TOTAL indicative COST Excluding project team staff time, and UNDP staff and travel expenses		USD 187,500 USD 12,500 travel Total: USD 200,000	USD 145,000	

VIII. GOVERNANCE AND MANAGEMENT ARRANGEMENTS

Political level

157. The Project will be implemented under the National Implementation modality (NIM) with direct support from UNDP CO. This modality assists in developing ownership within the host country and helps creating conditions for sustainability. The total project duration is 6 years.

158. On behalf of the Government of Angola, the Ministry of Environment (MINAMB) will be the Implementing Partner for the Project. MINAMB will be responsible for achieving the Project's objectives and for ensuring proper alignment with national policy. MINAMB will be supported by the UNDP Country Office in Angola in conformity with the Standard Basic Assistance Agreement (18 February, 1977) and the UNDP Country Program Action Plan 2015-2019 signed between the UNDP and the Government of Angola.

Institutional level

159. MINAMB will provide overall leadership for the project in close collaboration with the Ministry of Energy and Water (MINEA) and the Ministry of Agriculture (MINAGRI-IDF).

Project Director

160. The Director of the Climate Change Cabinet (Ministry of Environment) will assume the position of National Project Director (NPD) and assign an alternate to act on his/her behalf when required to ensure continuity. The NPD will administer the Project on a day-to-day basis on behalf of MINAMB in line with UNDP Policies and Procedures and assume direct responsibility for the successful implementation of the Project towards the objectives and outcomes specified in the Project Document.

161. The NPD is accountable for the quality, timeliness and effectiveness of the activities carried out, and for the appropriate use of project funds. The NPD will represent the Project at the highest national political level and at relevant national and international events. He/she will ensure adequate coordination with other Government entities and programs and provide advocacy for the Project at the highest levels. The NPD will further liaise with relevant parallel initiatives and exploit synergies wherever possible and relevant.

UNDP

162. UNDP is the GEF Implementing Agency for the Project. The UNDP Country Office (CO) will ensure that GEF funds are disbursed and administered in accordance with UNDP's fiduciary standards and in alignment with the objective of the Project. The UNDP CO and the UNDP RCU will monitor the Project's implementation and achievement of the project outcomes and outputs, provide overall guidance and recommendations to enhance project performance, and promote the exchange of experiences and lessons learned across its global portfolio and other members of the international donor and financial community.

163. On request of the Government of Angola, UNDP CO shall provide the following support services for the implementation of the Project: (i) payments, disbursements and other financial transactions; (ii) recruitment of staff, project personnel, and consultants; (iii) procurement of services and equipment, including disposal thereof; (iv) organization of training activities, conferences, workshops, and fellowships; (v) travel authorization, Government clearances ticketing, and travel arrangements; and (vi) international shipment, custom clearance, and vehicle registration. UNDP CO will recover the direct and indirect costs incurred into by the Country Office in delivering such services in conformity with UNDP's Universal Prices List.

Project Board and Steering Committee

164. The Project Board (PB) provides political oversight and guidance to the Steering Committee and ensures integration with broader climate and other national policies.

165. The responsibilities and roles of the Project Board include: (i) to set strategic direction, reinforce government leadership of the program and coordinates all interventions; (ii) to provide guidance and agree on possible countermeasures/management actions to address specific risks; (iii) to guide and support program delivery at sector level; (iv) to provide support in resource mobilization to support program funding gaps. The PB will meet once or twice per year.

166. The Steering Committee (SC) is the group responsible for making by consensus management decisions for a project when guidance is required by the Project Coordinator, including recommendation for UNDP/Implementing Partner approval of project plans and revisions. In order to ensure UNDP's ultimate accountability, SC decisions should be made in accordance to standards that shall ensure best value to money, fairness, integrity, transparency and effective international competition. Project reviews by this group are made at designated decision points during the running of a project, or as necessary when raised by the Project Coordinator. This group is also consulted by the Project Coordinator for decisions when project management tolerances (normally in terms of time and budget) have been exceeded. The SC will meet 3-4 times per year and more often if required.

167. The responsibilities and roles of the Steering Committee include: (i) to provide guidance on the Project's strategy and activities towards reaching its objectives, thereby reinforcing Government leadership and coordination of interventions; (ii) to provide guidance on the Project's risk mitigation strategy and identify appropriate countermeasures; (iii) to review and approve the Project's Inception Report and Annual Work Plans (AWPs); (iv) to authorize major deviations from the agreed AWP⁷⁶; (v) to approve the Annual Progress Reports (APR/PIR) prior to submission to the UNDP RCU and the GEF; (vi) to review and comment the Project's Mid-term Review and Terminal Evaluation; (vii) to approve the Terms of Reference and appointment of the National Project Coordinator (PC) and Cabinet other members of the Project Management Team; (viii) to provide support in resource mobilization to ensure parallel co-financing commitments and increase long-term sustainability; (ix) to review and approve substantive revisions of the Project Document, if any, prior to submission the UNDP RCU and the GEF; and (x) to arbitrate in case of internal conflicts in the Project. Steering Committee decisions will be timely and in compliance with UNDP's fiduciary standards.

⁷⁶ The SC will define the autonomy of the Project Coordinator to deviate from the activities and budgets established in the AWP as approved by UNDP. This refers to the authorization of PC to make adjustments up to a certain percentage; for larger adjustments, PC shall require written consent of the SC.

Responsible Parties

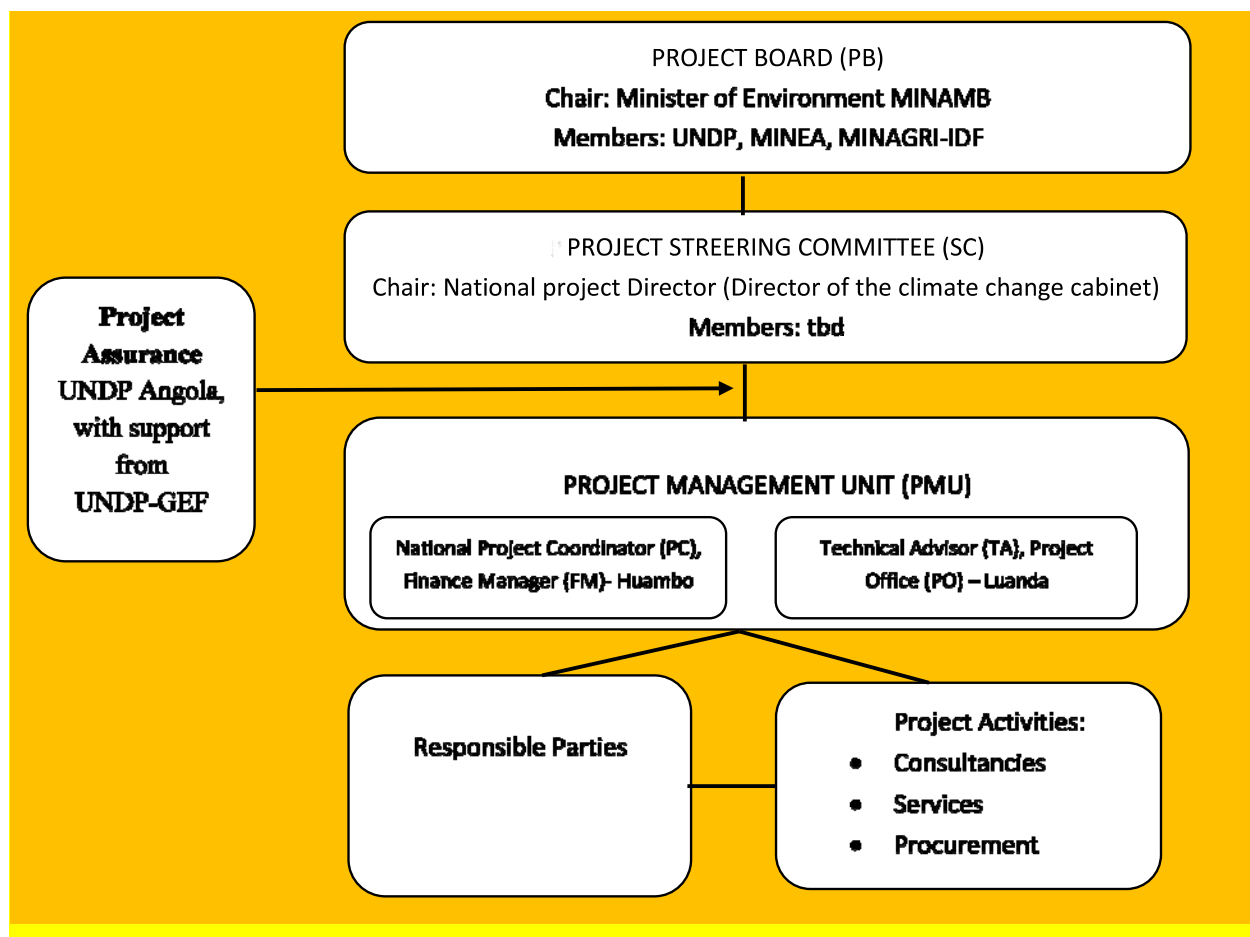
168. Based on IP request UNDP will contract one or more CSOs or non-governmental entities as Responsible Parties (RP) to execute specific project tasks or components following UNDP POPP and NIM guidelines. The preferred method for selecting the RPs will be a Collaborative Advantage selection process but if that is not allowed a competitive selection process will be undertaken.

169. Several local entities working in Angola have confirmed their interest to serve as RPs subject to the selection process chosen: (1) ADPP Angola, based in Luanda, Angola; (2) COSPE, based in Florence, Italy; (3) University José Eduardo dos Santos, based in Huambo, Angola. For further information, please see Engagement of CSOs in UNDP projects in the Contracts and Procurement Section of the POPP.

170. The capacity assessment of the responsible partners will be carried out according to applicable UNDP rules and guidelines on the matter.

171. In response to the request from MINAMB, UNDP CO will assume the following tasks under the Project: (a) procurement of goods and equipment for the project; (b) recruitment process of project staff (technical advisor and national financial manager) as well as human resources management for this project staff; (c) recruitment process of auditors and follow-up; and (d) recruitment process of evaluators and follow-up. This arrangement is in line with UNDP rules and regulations for National Implementation Modality with CO support on specific tasks.

Diagram of Institutional Arrangements of the Project.



Operational level

Project Management Team

172. The day-to-day management of the Project shall be entrusted to the Project Management Unit (PMU) which will be accountable to the NPD and SC for the performance of the project. The PMU will consist of the following persons: National Project Coordinator (PC), Finance Manager (FM), Project Officer (UNV) and Technical Advisor (TA). The PC will be recruited by the Government of Angola and funded with GEF resources; the TA will be recruited by UNDP and budgeted under UNDP TRAC co-financing resources. Both PC and TA will be full-time positions. The UNV will be hired by UNDP and funded under GEF budget. The FM will be hired by UNDP and funded under GEF budget on a 50% cost-shared basis with other GEF projects in the portfolio.⁷⁷

173. The PMU will hold office in Luanda, with daily presence of the PC, UNV and FM. The TA will be based in Luanda, dividing his/her time between MINAMB and UNDP. MINAMB will recruit a Project driver to be funded by the Project. The Project will also procure one vehicle. UNDP CO will support the team through its Program Officer for Climate Change (P4) without financial contribution from the GEF. The associated direct and indirect Project costs will be charged to the Project budget.

174. The PMU will have responsibility for, among others: (i) managing and executing the Project; (ii) coordinating the management of financial resources and procurement; (iii) reporting on the application of resources and results achieved; (iv) preparing reports for the PB, UNDP, and the GEF; (v) promoting of inter-institutional linkages; and (vi) monitoring and evaluation, and disseminating project results. During the Project's inception phase, appropriate agreements will be made concerning the levels of authority between the MINAMB, UNDP, and the PMUC to allow a swift implementation of the project procedures. Furthermore, the signatures required for validating project procedures and transactions will be determined and approved.

National Project Coordinator

175. The National Project Coordinator (PC) will be responsible for the day-to-day project operations, financial accounts, periodic reporting to UNDP CO and for allocation of the GEF grant according to the quarterly work plans and budgets in coordination with UNDP CO. The PC will be the primary contact person for the Project for external communications and will act as the convener of SC meetings, as well as ad-hoc meetings between MINAMB and UNDP. The PC will play a pivotal role to enhance inter-institutional communication and coordination under the overall guidance of the NPD. The FM will support the PC with administrative tasks.

Project Officer (UNV)

176. The Project Officer will be internationally recruited by UNDP as a UN Volunteer. He or she will be responsible for supporting the PC in the day-to-day implementation of the project, including the preparation of work plans and budgets, reports, meeting notes, etc. Beside supporting the administrative and operational tasks of the project, the UNV will provide technical input and literature reviews on specific topics, e.g. as input for workshops or background papers, including on charcoal production and use, certification systems, fair trade, rural energy use, sustainable use of dry forests, biomass energy, climate and carbon finance, etc. The UNV will receive guidance and technical support in these tasks from the TA.

Technical Advisor

177. The Technical Advisor (TA) will be one or several internationally recruited expert(s), possibly shared with other GEF funded climate project of UNDP Angola, and funded by UNDP. He/she will be based in Luanda with frequent missions to Huambo, and is expected to bring specific knowledge on rural energy and development into

⁷⁷ Cost sharing with the UNDP/GEF project "Promoting Climate-resilient Development and Enhanced Adaptive Capacity to Withstand Disaster Risks in Angola's Cuvelai River Basin" (GEF ID 5177) is envisaged.

the Project and will be co-responsible for the design and quality of the activities to be implemented. He/she will draw upon experiences in other countries and take appropriate action when the Project could benefit from specialized support. The TA will provide key inputs for the NPD for strategically positioning the Project to maximize impact. The TA will also support the Climate Change Cabinet and UNDP to coordinate the design of new CC mitigation initiatives.

IX. FINANCIAL PLANNING AND MANAGEMENT

178. Please refer to section XII for details on the Project budget.

X. SUSTAINABILITY OF RESULTS

Sustainability and replicability

179. Based on the initial Project Identification Form, the Project design has been revised to ensure the delivery of robust outcomes addressing the key development barriers: information for policy development; market analysis; understanding and enhancement of business models along the charcoal value chain; transfer of more sustainable charcoal production technologies, including technical skills; demonstration of tangible benefits; and promotion. The attainment of these outcomes must be seen in the context of a post-conflict country characterized by a weak institutional capacity and legal system; lack of skilled human resources; inadequate infrastructure and technological assets; and widespread poverty in the rural areas. As such, this Project can only pretend to lay the cornerstones for developing a more sustainable charcoal sector in Angola.

180. After the Project, Angola needs to further develop the following key conditions to establish a sustainable charcoal value chain: (i) sustained economic development in the rural areas; (ii) effective integration of sustainable charcoal into national energy policy; (iii) effective technological and management assistance aimed at rationalizing charcoal production systems; and (iv) financial inputs for charcoal producers obtained from adequate pricing of sustainable charcoal.

181. The validity and economic benefits of sustainable charcoal production in comparison to the baseline are increasingly acknowledged internationally and by the Government of Angola. Long-term sustainability may benefit from parallel development of forestry and carbon (sink) markets, which may tap into international financing through innovative schemes such as REDD+. However, such schemes represent capital injections from outside the rural systems and in this respect, represent a similar external driver for charcoal production as urban demand. The financial capacity of urban consumers and the international community to fully absorb the cost of sustainable charcoal is limited, as are the awareness and urgency of the charcoal problem.

182. A paradigm shift can occur if charcoal is used for local value creation, an aspect of the value chain that has been paid little attention to so far. This option may be particularly relevant for Angola, given the relative abundance of biomass, high cost of bringing alternative energy carriers into the interior, and relatively sparse rural population. Charcoal can be an asset to start a process of rural economic development and diversification. With a gradual increase of local income, the equilibrium between charcoal price and labor costs will change and more capital-intensive, sustainable charcoal production technologies become more attractive. The Project aims to explore some opportunities into this direction under the envisaged field pilots.

183. In the medium-term, controlled or certified production chains can be made eligible for financial support with gradual reduction of (national or international) subsidies. In the peri-urban context, briquetting offers a potentially viable business opportunity. Through field trials, data collection and analysis, the Project aims to assess existing business models, explore improvements and define the parameters and boundary conditions to make charcoal-based businesses work in Angola. There is large scope for replication in Angola, given the over 100,000 ha of forest needed to supply charcoal demand, and a total market value of more than US\$ 500,000,000. Moreover, the relevance of charcoal for national energy supply, for rural economies, employment, and for meeting basic human

needs has been assessed and described for many countries in Sub-Saharan Africa. The situation in Angola is not different from this.

Socio-environmental safeguards

184. The UNDP Environmental and Social Screening Template has been used to assess project impacts. The Project has been classified as Category "B". In general, the Project is expected to yield positive impacts in all aspects (gender, income, environment, climate change) compared to the baseline scenario.

185. Recommended management actions are: (i) to annually monitor Project activities on gender aspects and issue recommendations for enhancement or corrective action, as and if appropriate; (b) to monitor the social and environmental context for the Project's intervention areas. This specifically applies to the charcoal pilot projects; (c) to share experiences on charcoal production and policy among other Sub-Saharan countries and take benefit from these during the policy development process. Please refer to Annex E for the Screening Template.

XI. LEGAL CONTEXT

186. This document together with the CPAP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the Standard Basic Assistance Agreement (SBAA) and all CPAP Provisions apply to this document. Consistent with the Article III of the SBAA, the responsibility for the safety and security of the Implementing Partner and its personnel and property, and of UNDP's property in the Implementing Partner's custody, rests with the Implementing Partner.

187. The Implementing Partner shall:

- a) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried; and
- b) assume all risks and liabilities related to the Implementing Partner's security, and the full implementation of the security plan.

UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

188. The Implementing Partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via <http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm>. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

Other Arrangements

Communications and visibility requirements

189. Full compliance is required with UNDP's Branding Guidelines. These can be accessed at <http://intra.undp.org/coa/branding.shtml>. Specific guidelines on UNDP logo use can be accessed at: <http://intra.undp.org/branding/useOfLogo.html>. Amongst other things, these guidelines describe when and how the UNDP logo needs to be used, as well as how the logos of donors to UNDP projects need to be used. For the avoidance of any doubt, when logo use is required, the UNDP logo needs to be used alongside the GEF logo. The GEF logo can be accessed at: http://www.thegef.org/gef/GEF_logo. The UNDP logo can be accessed at <http://intra.undp.org/coa/branding.shtml>.

190. Full compliance is required with the GEF's Communication and Visibility Guidelines (the "GEF Guidelines"). The GEF Guidelines can be accessed at: http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08_Branding_the_GEF%20final_0.pdf. Amongst other things, the GEF Guidelines describe when and how the GEF logo needs to be used in project publications, vehicles, supplies and other project equipment. The GEF Guidelines also describe other GEF Requirements regarding promotional press releases, press conferences, press visits, visits by Government Officials, productions and other promotional items. Where other agencies and project partners have provided support through co-financing, branding their policies and requirements should be similarly applied.

Auditing arrangements

191. Audit on project will follow UNDP Financial Regulations and Rules and applicable audit policies.

Learning and knowledge sharing

192. Results from the Project will be disseminated within and beyond the Project's intervention zone through existing information sharing networks and forums. The Project will identify identity and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks. The project will identify, analyze, and share lessons learned that might be beneficial in the design and Implementation of like future projects. There will be a two-way flow of information between this Project and other projects of a similar focus.

UNDP procedures and cost recovery policy

193. The financial arrangements and procedures for the project are governed by the UNDP rules and regulations for National Implementation Modality (NIM), with Country Office support on specific tasks, such as procurement of equipment or recruitment of key project staff.

194. The Government of Angola may enter into an agreement with UNDP for the provision of direct project services. In such case, appropriate cost recovery will be charged as per UNDP rules and regulations, and GEF council decisions as applicable to the GEF funds.

195. The support services will be outlined in the form of a Letter of Agreement signed between the Government of Angola and UNDP. A small budgetary allocation will be assigned in the TBWP under PMC based on calculations for the services to be provided per the UPL. The charges will be incurred after each of the above services is provided by UNDP on a yearly basis.

Disclaimer

196. Any designations on maps or other references employed in this project document do not imply the expression of any opinion whatsoever on the part of UNDP concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries.

XII. TOTAL BUDGET AND WORK PLAN

Award ID:	00084488	Project ID(s):	00092469
Award Title:	Promotion of Sustainable Charcoal in Angola through a Value Chain Approach		
Business Unit:	AGO10		
Project Title:	Promotion of Sustainable Charcoal in Angola through a Value Chain Approach		
PIMS no	5331		
Implementing Partner (Executing Agency)	Ministry of Environment (MINAMB)		

GEF Outcome/Atlas Activity	RP/ IA	Fund ID	Donor Name	Atlas Budgetary Acc. Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Amount Year 6 (USD)	Total (USD)	Budget Notes
Outcome 1. The policy framework to support a sustainable charcoal value chain in Angola, has been strengthened.	MINAMB	62000	GEF	71500	UN Volunteer	35,000	25,000	20,000	20,000	25,000	20,000	145,000	1
				71300	Local Consultants	80,000	80,000	85,000	75,000	75,000	70,000	465,000	2
				71600	Travel	23,000	30,000	20,000	15,000	5,000	0	93,000	3
				71800	Contractual Services - Individuals	0	190,000	185,000	90,000	0	0	465,000	4
				72200	Equipment and Furniture	5,000	0	0	0	0	0	5,000	5
				74200	Audio Visual & Print Prod Cost	2,000	10,000	10,000	10,000	0	0	32,000	6
				74500	Miscellaneous	3,000	4,000	5,000	3,000	0	0	15,000	7
					sub-total GEF	148,000	339,000	325,000	213,000	105,000	90,000	1,220,000	
Outcome 2. The benefits of sustainable charcoal production technology, briquetting and energy-efficient charcoal stoves, have been accepted by producers and peri-urban consumers.	MINAMB	62000	GEF	71500	UN Volunteer	35,000	25,000	30,000	30,000	25,000	20,000	165,000	8
				71800	Contractual Services - Individuals	15,000	15,000	15,000	15,000	15,000	15,000	90,000	9
				71600	Travel	7,500	7,500	7,500	7,500	0	0	30,000	10
				72100	Contractual Services- Companies	200,000	245,000	245,000	300,000	243,000	35,000	1,268,000	11
				72200	Equipment and Furniture	0	85,000	80,000	80,000	60,000	0	305,000	12
				73100	Rental & Maintenance - Premises	12,000	12,000	12,000	12,000	12,000	12,000	72,000	13
				74200	Audio Visual & Print Prod Cost	3,000	1,000	1,000	1,000	1,000	0	7,000	14

				74500	Miscellaneous	0	1,000	1,000	1,000	0	0	3,000	15
					sub-total GEF	272,500	391,500	391,500	446,500	356,000	82,000	1,940,000	
Outcome 3: Strengthening of human capacities and institutions	MINAMB	62000	GEF	71500	UN Volunteer	0	20,000	20,000	20,000	20,000	30,000	110,000	16
				71300	Local Consultants	0	5,000	5,000	5,000	5,000	0	20,000	17
				71600	Travel	0	10,000	10,000	10,000	0	0	30,000	18
				72100	Contractual Services - Companies	60,000	170,000	200,000	208,000	130,000	0	768,000	19
				73100	Rental & Maintenance - Premises	12,000	12,000	12,000	12,000	12,000	12,000	72,000	20
				72200	Equipment and Furniture	30,000	0	0	0	0	0	30,000	21
				74200	Audio Visual & Print Prod cost	0	2,000	1,000	1,000	1,000	0	5,000	22
				74500	Miscellaneous	0	2,000	1,000	1,000	1,000	0	5,000	23
					sub-total GEF	102,000	221,000	249,000	257,000	169,000	42,000	1,040,000	
Outcome 4. The Monitoring & Evaluation plan for the Project has been implemented.	MINAMB	62000	GEF	71200	International Consultants	52,500	20,000	35,000	0	0	40,000	147,500	24
				71300	Local Consultants	5,000	0	5,000	0	0	5,000	15,000	25
				71600	Travel	4,500	0	5,000	0	0	3,000	12,500	26
				74100	Professional Services	0	5,000	5,000	5,000	5,000	5,000	25,000	27
					sub-total GEF	62,000	25,000	50,000	5,000	5,000	53,000	200,000	
Project Management	MINAMB	62000	GEF	71300	Local Consultants	10,000	10,000	10,000	10,000	10,000	9,060	59,060	28
				72200	Equipment and Furniture	1,500	0	0	0	0	0	1,500	29
				74599	Direct Project Costs	34,440	35,000	35,000	30,000	20,000	5,000	159,440	30
				Total Management		45,940	45,000	45,000	40,000	30,000	14,060	220,000	
				PROJECT TOTAL		630,440	1,021,500	1,060,500	961,500	665,000	281,060	4,620,000	

Summary of Funds: ⁷⁸

	Total
GEF	\$ 4,620,000
Ministry of Environment – MINAMB (cash)	\$ 2,500,000
Ministry of Environment – MINAMB (in-kind)	\$ 1,000,000
Ministry of Agriculture – MINAGRI (cash)	\$ 1,500,000
Ministry of Energy and Water - MINEA (cash)	\$ 1,000,000
Ministry of Commerce – MINCO (cash)	\$10,000,000
ADPP Angola (in-kind)	\$ 1,000,000
COSPE (in-kind)	\$ 186,700
University of Cordoba UCO-UJES (in-kind)	\$ 650,000
UNDP CO Angola (cash)	\$ 875,000
TOTAL	\$23,331,700

Budget Notes

OUTCOME 1	
1	(145k\$) UN Volunteer to act as Project Officer (PO) of the PMU (see Terms of Reference).
2	(1.2; 430k\$) Rural energy specialist to act as National Project Coordinator (PC) of the PMU (see Terms of Reference). (1.6; 35k\$) One or more local consultants to act as resource persons for charcoal conference, including logistical support and publishing of outcomes.
3	(93k\$) international travel and DSA. Costs of domestic travel (air tickets, land travel, fuel, DSA).
4	(1.2; 255k\$) One or more experts to: (i) collect comprehensive, quantitative and spatial data on energy, forestry, social, gender, economic and environmental aspects of charcoal production and utilization in key regions in Angola; (ii) make such data accessible through a georeferencial database; (iii) present findings of work to UNDP and Government stakeholders; and (iv) transfer data to national host institute and train staff on its use. (1.3; 40k\$) One or more experts to: (i) lead an interactive process with key government stakeholders towards developing a white paper on charcoal production in Angola; and (ii) to draft and publish the text of such white paper, including supporting studies, annexes and meeting minutes. (1.4; 100k\$) One or more experts to: (i) design and detail a

⁷⁸ Summary table should include all financing of all kinds: GEF financing, cofinancing, cash, in-kind, etc...

	certification scheme; and (ii) design and detail an MRV mechanism for sustainable charcoal; and (iii) present results to Government and draft recommendations for implementation. (1.5; 70k\$) One or more experts to implement sustainable charcoal options into identified Government programs.
5	(1.2; 5K\$) Laptop, digital camera, printer, GPS and communication equipment.
6	(1.1; 14k\$) Digital storage and visualization, and physical reproduction of data sources and reports. (18k\$) Reproduction costs.
7	(15K\$) Miscellaneous expenses
OUTCOME 2	
8	(165k\$) UN Volunteer to act as Project Officer (PO) of the PMU (see Terms of Reference).
9	(90K\$) Contractual service of a Project Driver (Luanda), 6 years, US\$15,000 per year
10	(30k\$) international travel and DSA. Costs of domestic travel (air tickets, land travel, fuel, DSA).
11	(2.1; 443k\$) One or more service contracts to implement rural charcoal production pilot, including project management, supervision, monitoring, financial administration, and reporting. (2.2; 180k\$) One or more service contracts to implement peri-urban briquetting pilot, including project management, supervision, monitoring, financial administration, and reporting. (2.3; 300k\$) One or more service contracts to implement integrated rural charcoal pilot, including project management, supervision, monitoring, financial administration, and reporting. (2.5; 45k\$) One ore more service contracts with specialized firm or organization to collect and systematize lessons learned. (2.6; 300k\$) One or more service contracts for dissemination of sustainable charcoal production pilot under a cost-sharing approach; funds to be used as co-investment.
12	(2.4; 105k\$) Procurement of sustainable charcoal technology (kilns) and components, production facilities, auxiliary equipment; in accordance with requirements as identified by National Project Coordinator and Technical Advisor. (2.7; 200k\$) Co-funding of procurement of sustainable charcoal and EE stoves under national social and market development programs.
13	(72k\$) Rental of office space and cleaning services.
14	(7K\$) Audio Visual and Print Products
15	(3K\$) Miscellaneous expenses
OUTCOME 3	
16	(110k\$) UN Volunteer to act as Project Officer (PO) of the PMU (see Terms of Reference).
17	(3.3; 20\$) One or two local experts on sustainable forestry and (rural) biomass energy, for short-term training activities.
18	(30k\$) international travel and DSA. Costs of domestic travel (air tickets, land travel, fuel, DSA).
19	(3.1; 288k\$) Service contract to implement capacity building program. (3.2; 210k\$) Service contract to design and implement capacity building, training, educational and promotional activities to support transfer of sustainable charcoal production technology, briquetting technology, and energy-efficient charcoal appliances (stoves). (3.3; 100k\$) One or more service contracts with national companies or institutions for implementation of training events. (3.4; 170k\$) One or more service contracts to implement training and awareness raising activities target charcoal retailers.

20	(72k\$) Rental of office space and cleaning services.
21	(30K\$) Procurement of one vehicle for project field visits.
22	(5K\$) Audio Visual and Print Products
23	(5K\$) Audio Visual and Print Products
OUTCOME 4	
24	(4.1; 67.5k\$) One international M&E specialist for backstopping of monitoring process; one international gender specialist for review of project activities on gender aspects and providing pro-gender recommendations. (4.2; 80k\$) Two international, independent evaluation experts to lead MTR and TE teams and conduct evaluations, including reporting.
25	(4.1; 5k\$) One national consultant for logistical support for Project Inception Workshop (4.2; 10k\$) Two national consultants to participate in MTR and TE evaluation team and provide logistical support.
26	(12.5k\$) international travel and DSA. Costs of domestic travel (air tickets, land travel, fuel, DSA).
27	(4.3; 25k\$) One or more service contracts for annual project audits as per indicated in the UNDP financial rules and regulations, translation.
PROJECT MANAGEMENT	
28	(59,060\$) National consultancy contract for project Finance manager (full-time, cost-shared), see Terms of Reference.
29	(1,500\$)Two laptops, printer and digital camera.
30	(159.440\$)These costs, based on the UPL are agreed between the Government of Angola and UNDP for project execution services above and beyond those covered by the implementing agency fee, please refer to Annex for a budget breakdown. LOA to be signed with Government of Angola.

XIII. ANNEXES

ANNEX A List of Documents

The following documents (in English and Portuguese) can be consulted for additional background information:

- Neufeldt H., Langford K., Fuller J., Iiyama M., Doble P., 2015. From transition fuel to viable energy source: improving sustainability in the sub-Saharan charcoal sector, ICRAF Working Paper No. 196, Nairobi World Agroforestry Centre, <http://dx.doi.org/10.5716/WP15011.PDF>.
- SE4All Gap Analysis, UNDP, June 2015.
- Technical Assistant Report – Angola – Fuel Price Subsidy Reform, the Way Forward, International Monetary Fund Country Report No 15/28, Washington D.C., USA, February 2015.
- Letter CODESPA to UNDP, Luanda 15 February 2014.
- Plano de Ação do Sector de Energia e Águas 2013-2017, MINEA (April 2013).
- Huambo: An Atlas and profile of Huambo, its environment and its people, Development Workshop Angola (2013), compiled and published with funds provided by UNDP Angola through the GEF ELISA project and the Integrated Development Research Center (IDRC).
- Analysing briquette markets in Tanzania, Kenya and Uganda - Report January 2013, EEP Energy and Environment Partnership / Southern and East Africa.
- Gender Equity, Charcoal and the Value Chain in Western Kenya, Alannag Delahunty-Pike, PISCES Working Brief, November 2012.
- The Kenya Charcoal Policy Handbook – Current Regulations for a Sustainable Charcoal Sector, prepared for PISCES by Practical Action Consulting East Africa, June 2011.
- Bundles of Energy – The case for renewable biomass energy, Duncan Macqueen and Sibel Korhaliller, International Institute for Environment and Development (IIED), London, UK, 2011, ISBN 978-1-84369-792-3.
- Fisher, Balmford, Lewis and Munishi, <http://www.cam.ac.uk/research/news/scientists-calculate-the-true-cost-of-saving-rainforest-and-improving-food-security#sthash.gykS3Uz7.dpuf>, 31 May 2011.
- Environmental Crisis or Sustainable Development Opportunity? Transforming the charcoal sector in Tanzania - A Policy Note, World Bank, 2009
- Environmental Crisis or Sustainable Development Opportunity? Transforming the charcoal sector in Tanzania - A Policy Note, World Bank, 2009.
- Angola 2025, Angola um País com Futuro, Estratégia de Desenvolvimento a Longo Prazo para Angola (2008).
- National Strategy for Forestation and Reforestation, MINAGRI (2008).
- Angola: Towards an Energy Strategy, IEA, 2006
- Gender and Family life in Angola: Some aspects of the post-war conflict concerning displaced persons, João Baptista Lukombo Nzatuzola, African Sociological Review, 9, (2), 2005, pp.106-133.
- Analysis of Charcoal Value Chains – General Considerations, Steve Sepp – Eco Consulting Group Germany
- Estimating the opportunity costs of REDD+ - A Training Manual, Version 1.3. http://wbi.worldbank.org/wbi/Data/wbi/wbicms/files/drupal-acquia/wbi/OppCostsREDD%20v1.3_Part%2001_0.pdf.
- Angola's First National Communication
- Estudo de Mercado para Identificação e Desenvolvimento de Possíveis Atividades Geradoras de Rendimento para Mulheres dos Municípios do Kuito e Andulo, Província do Bié, Angola, FOCO Project, People in Need, Angola.
- FAO Forestry Paper 4, Rome 1983, Technical Paper, ISBN 92-5-101328-1, (<http://www.fao.org/docrep/x5328e/x5328e00.htm#Contents>)

ANNEX B Agreements

Co-financing letters

Parallel co-financing is included in the Project budget and listed in Part I Section C of the CEO Endorsement Request. The following table summarizes the corresponding letters confirming the co-financing by the listed project sponsors:

Source	Amount	Type
1. Government of Angola – Ministry of Environment	US\$ 16,000,000	cash/in-kind
2. UNDP, Angola	US\$ 875,000	cash (grant)
3. UCO (University of Cordoba), Spain	€ 587,497.25 (approx. US\$ 650,000)	cash
4. ADPP, Angola	US\$ 1,000,000	in-kind
5. COSPE, Italy	US\$ 186,700	in-kind

All co-financing letters are attached in a separate PDF file.

Other agreements

- Standard Letter of Agreement between UNDP and the Government for the Provision of Support Services – this is attached on pg. 73 and will be signed at the time of the LPAC

1. Government of Angola – Ministry of Environment



República de Angola
Ministério do Ambiente
GABINETE DO MINISTRO

À
Exma. Senhora
Naoko Ishii
Directora Executiva do Fundo Global para o
Ambiente
Washington, D.C.
U.S.A.

Of. Nº 84/012/GAB. MINAMB/2016

Assunto: Projecto “Promoção do Carvão Vegetal Sustentável em Angola através de uma Abordagem da Cadeia de Valor”

Os nossos melhores cumprimentos.

Vimos, por este meio, informar-lhe que o Governo de Angola tem inserido nas Despesas de Apoio ao Desenvolvimento (DAD) do Orçamento Geral do Estado (OGE) para 2016, projectos financiados com Recursos Ordinários do Tesouro no valor de USD 16,000,000 conforme consta no quadro anexo, cujos objectivos são complementarios a aqueles indicados no projecto “Promoção do Carvão Vegetal Sustentável em Angola através de uma Abordagem da Cadeia de Valor” e podem considerar-se como projectos base sobre os quais o projecto de carvão sustentável poderá trazer mais benefícios e assegurar a sua sustentabilidade futura.

Ministério	Programa/Projecto	Orçamento aproximado que contribui para o projecto GEF (em USD)
Ministério do Ambiente	Programa de Gestão Sustentável de Recursos naturais	3,500,000
Ministério de Comercio	Programa Municipal Integrado para o Desenvolvimento Rural e Redução da Pobreza (Cartão Kikuia e Programa PAPAGRO)	10,000,000



República de Angola
Ministério do Ambiente
GABINETE DO MINISTRO

MINAGRI	Inventário Florestal	1,500,000
MINEA	Estratégia Nacional de Energia Renováveis	1,000,000
TOTAL		16,000,000

Aproveitamos a oportunidade para reiterar-lhe os protestos da nossa elevada estima e consideração.

Gabinete da Ministra do Ambiente,

Luanda, 11 de FEVEREIRO de 2016.

A Ministra

Maria de Fátima Jardim

Translation

Government of Angola
Ministry of Environment
Minister Office

To
Dr. Naoko Ishii
Chief Executive Officer and Chairperson of Global Environmental Facility (GEF)
Washington, D.C.
U.S.A.

Topic: "Promotion of Sustainable Charcoal in Angola through a Value Chain Approach" Project

Our best regards.

We hereby notify you that the Government of Angola has introduced into the Development Support Expenses (Despesas de Apoio ao Desenvolvimento, DAD) of the General State Budget (Orçamento General do Estado, OGE) for 2016, projects financed with the Treasury Ordinary Resources (Recursos Ordinários do Tesouro) for the value of USD 16,000,000 as stated in the annexed table, which objectives are complementary to those indicated in the "Promotion of Sustainable Charcoal in Angola through a Value Chain Approach" project and can be considered as fundamental projects on which the sustainable charcoal project can benefit and where it can secure its future sustainability.

Ministry	Programme/Project	Approximated Budget for the contribution to the GEF project (in USD)
Ministry of Environment (MINAMB)	Natural Resources Sustainable Management Program	3,500,000
Ministry of Commerce	Integrated Municipal Program for Rural Development and Poverty Reduction (Cartão Kikuia e Programa PAPAGRO)	10,000,000
Ministry of Agriculture (MINAGRI)	Forestry Inventory	1,500,000
MINEA	National Strategy Plan for Renewable Energy	1,000,000
TOTAL		16,000,000

We take the opportunity to renew the mention of our high esteem and consideration.

Minister Of Environment Office,

Luanda, 11 February 2016

2. UNDP, Angola

United Nations Development Programme



Luanda, 16 November 2015

Ref: PROG/POV/104

Subject: Co-financing letter to the UNDP-GEF/CCM Project "Promotion of Sustainable Charcoal in Angola through a Value Chain Approach" (PIMS 5331)

The Angola Country Office presents its compliments to the GEF Secretariat and would like to formally commit through this letter UNDP's contribution to the Project entitled "Promotion of Sustainable Charcoal in Angola through a Value Chain Approach", which aims to introduce energy-efficient charcoal technologies in Angola and trigger market demand for certified, sustainable charcoal.

Through this letter, UNDP Angola commits the total amount of **USD 875,000 of core resources (TRAC)** for the above project, that can be indicatively broken down as follows.

Co-financing Source	Type	Amount - USD
1. Direct UNDP TRAC (core resources) for Project Document Preparation	Grant	25,000
2. Direct UNDP TRAC for the duration of the FSP	Grant	600,000
3. UNDP TRAC from CO support to the project preparation and project implementation	Grant	250,000
TOTAL		875,000

Further to the above, UNDP Angola will also pursue a resource mobilization strategy for the project, and other future GEF projects, in order to secure additional financial contributions for the implementation of UNDP-GEF projects with a view to maximizing existing resources and establishing strategic partnerships to guarantee the sustainability of project outcomes.

Yours sincerely,

Samuel Harbor
UNDP Country Director/Angola

Ms. Adriana Dinu
UNDP-GEF Executive Coordinator a.i.
Global Environment Facility – GEF

CC: - H.E. Ms. Maria de Fátima Monteiro Jardim, the Minister of Environment, Angola
- Mr. Giza Gaspar-Martins, Director of the Climate Change Cabinet, Ministry of Environment
- Mr. Carlos Cadete, GEF Operational Focal Point
- Ms. Kamia Carvalho, GEF Political Focal Point
- Mr. Lucas Black, UNDP-GEF Regional Technical Adviser

3. UCO (University of Cordoba), Spain



ETSIAM

Subdirección de Relaciones Exteriores

Córdoba, 21 de agosto de 2015

A/A. Dr. Naoko Ishii. Chief Executive Officer and Chairperson
Global Environmental Facility (GEF)
1818 H Street, NW, MSN G6-602
USA, Washington DC, 20433

Ref. Carta de apoyo y cofinanciamiento

Proyecto PNUD-GEF "*Promotion of Sustainable Charcoal in Angola through a Value Chain Approach*"

Estimados señores:

Por medio de la presente, y en representación de la Escuela Técnica Superior de Ingenieros Agrónomos y de Montes (E.T.S.I.A.M.) de la Universidad de Córdoba como Subdirector de Relaciones Exteriores, D. Rafael M^a Navarro Cerrillo, manifiesta el APOYO de la Universidad de Córdoba a la ejecución del proyecto *Promotion of Sustainable Charcoal in Angola through a Value Chain Approach* del PNUD-GEF.

La gestión sostenible de los recursos naturales y la cooperación internacional para el desarrollo suponen líneas prioritarias para la Universidad de Córdoba y su Escuela Técnica Superior de Ingenieros Agrónomos y de Montes, así como la cooperación técnica, académica y científica con la República de Angola.


En este sentido, la Universidad de Córdoba está desarrollando en la actualidad el proyecto "*African Network for Education in Energy Resources*" financiado por la Unión Europea con un presupuesto de 587.497,25 EUR. Este proyecto, iniciado en 2015 y cuya finalización está prevista para abril de 2017, tiene como objetivo principal el fortalecimiento de las capacidades académicas y de investigación de Angola y Mozambique en el sector de las energías renovables y la eficiencia en el uso de los recursos naturales. Entre sus principales resultados está prevista la elaboración de un estudio de la realidad energética y la eficiencia en el uso de los recursos naturales complementarias (R.1), el aumento de la cualificación del personal docente de los centros de formación superior para dar respuesta a la falta de profesores formados en materia energética en Angola y Mozambique (R.2), la mejora de la oferta curricular de los centros de educación superior mediante la implantación de asignaturas de eficiencia energética de alto nivel exigidas por los mercados de trabajo en las carreras de

Campus Universitario de Rabanales. Edificio Leonardo Da Vinci. 14.071 – CORDOBA – Tel.: 957218657. Fax: 957212095.

ingeniería agronómica y forestal (R.3), el fomento de las redes institucionales entre los centros de educación superior para la mejora de capacidades académicas y la administración a través de la utilización de nuevas tecnologías (R.4) acompañado todo ello de actividades de difusión de resultados y actividades (R.5).

En este sentido, y dada la complementariedad de las acciones desarrolladas en el ámbito de nuestro proyecto, y la coincidencia geográfica de las mismas con el proyecto *"Promotion of Sustainable Charcoal in Angola through a Value Chain Approach"*, la Universidad de Córdoba manifiesta su interés en contribuir, en el marco de dicho proyecto, con los fondos y recursos del proyecto *"African Network for Education in Energy Resources"*.

Y para que conste a los efectos oportunos, firmo el presente documento en Córdoba, a 21 de agosto de 2015.



D. Rafael Mª Navarro Cerrillo

Subdirector de Relaciones Exteriores E.T.S.I.A.M.

Universidad de Córdoba

Translation

Ref. Letter of support and co-financing

"Promotion of Sustainable Charcoal in Angola through a Value Chain Approach" UNDP-GEF Project

Esteemed Sirs:

On behalf of the present and on behalf of the Escuela Técnica Superior de Ingenieros Agrónomos y de Montes (E.T.S.I.A.M.) of the University of Cordoba, as Sub-director of External Relations, D. Rafael M^a Navarro Cerrillo, I manifest the support of the University of Cordoba in the execution of the "Promotion of Sustainable Charcoal in Angola through a Value Chain Approach" UNDP-GEF project.

The sustainable management of natural resources and the international cooperation for the development are priority statements for the University of Cordoba and the Escuela Técnica Superior de Ingenieros Agrónomos y de Montes, just like the technical, academic and scientific cooperation with the Government of Angola.

Regarding such matter, the University of Cordoba is developing a project with the title "African Network for Education in Energy Resources" financed by the European Union with a budget of 587.497,25 EUR. This project, started in 2015 and which conclusion is expected by April 2017, presents as main objective the strengthening of the academic and research capabilities of Angola and Mozambique in the renewable energy sector and in the efficiency of the use of natural resources. In its main outcomes, it is expected the elaboration of a study of the energetic reality and of the efficiency in the use of complementary natural resources (R.1), the increment of qualification of the teaching staff of the higher education centres to answer the lack of professors formed in energetic subjects in Angola and Mozambique (R.2), the improvement of the curricular offer of the higher education centres by the creation of energetic efficiency subjects of high level required by the work market in the degrees of agronomic and forestry engineering (R.3), the development of the institutional network between the higher education centres for the improvement of the administration and academic capabilities with the application of new technologies (R.4) all of which accompanied by the activity of diffusion of result and activities (R.5).

Regarding such matter, regarding the complementarity of the actions developed in our project and regarding the geographic accordance with the "Promotion of Sustainable Charcoal in Angola through a Value Chain Approach" project, the University of Cordoba manifest its interest in the contribution, in the framework of such project, with the budget and resources of the "African Network for Education in Energy Resources" project.

In witness whereof, so it may be placed on the records, I sign the present document in Cordoba with the date of 21 August 2015.

4. ADPP, Angola

ADPP

AJUDA DE DESENVOLVIMENTO DE POVO PARA POVO

A/A. Dr. Naoko Ishii, Chief Executive Officer and Chair person
Global Environment Facility (GEF)
1818 H Street, NW, MSN G6-602
USA, Washington DC, 20433

314 ADPP/Luanda, 08 de Setembro de 2015

Subject: Co-financing letter to the UNDP/GEF project "Promotion of Sustainable Charcoal in Angola through a Value Chain Approach".

Dear Dr. Naoko Ishii

ADPP Angola presents its compliments to the Global Environment Facility and would like to formally commit through this letter ADPP's contribution to the project entitled: *"Promotion of Sustainable Charcoal in Angola through a Value Chain Approach"*.

ADPP has been working in Angola since 1986 and has been a registered Angolan association since 1992. ADPP currently operates more than 50 development projects, including 23 educational institutions. ADPP has incorporated environmental awareness and environmental protection activities in its project from the beginning, and notably in its "Farmers Clubs" projects ADPP has worked with sustainable environmental friendly farming.

ADPP's contribution in this UNDP/GEF project will build upon the organization and the experiences from these projects. Furthermore ADPP will involve students and teachers from existing schools run by ADPP as well as project leader and staff from other community development projects implemented by ADPP Angola in order to contribute for the replication and the sustainability of the intended project.

ADPP hereby commits to contribute in kind to the total amount of 1.000.000,00 usd during the four years of implementation, that can be indicatively broken down as follows;

Co-financing source	Type	Amount – USD (2016 – 2019)

ADPP Angola, C.P.345,
República de Angola
Tel: 912310860 e 912798352
Contribuinte Nr. 7403008855
Email: adppsede@netangola.com
www.adpp-angola.org




ADPP Angola
Co-fundador e membro de
HUMANA People to People
The Federation for National Associations connected to
the International Humana People to People Movement

1	Use of existing buildings and land for trainings, demonstration sites, meetings, office space.	In kind	331.200,00
2	Contributions of existing ADPP staff in the three provinces of implementation not salaried by the project (directors and teachers at FLI, EPF, EPP, staff of farmers club projects)	In kind	176.800,00
3	Transport contribution of existing ADPP vehicles.	In kind	50.000,00
4	Value of students participants contributing to social mobilization and spreading information about the project and its objectives.	In kind	392.000,00
5	Liaison building at national and provincial level by ADPP country director and top level negotiating staff.	In kind	50.000,00
Total:			1.000.000,00



Best Regards


Rikke Vitholm
Chairperson
ADPP Angola

5. COSPE, Italy



TOGETHER FOR CHANGE



www.cospe.org

Florence, 24/09/2015
Ref. 1504/mb/FV/15

Dr. Naoki Ishii, Chief Executive Officer and Chairperson
Global Environment Facility (GEF)
1818 H Street, NW, MSN G6-602
USA, Washington DC, 20433

Re: Co-financing letter

Dear Dr. Naoki Ishii,

COSPE – Cooperazione e Sviluppo dei Paesi Emergenti, is an Italian NGO that in Angola works in partnership with the Forest Development Institute of the Ministry of Agriculture, to promote environmental protection, food security, rural communities' empowerment, and women and youth rights.


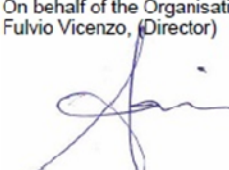
This cofinancing letter is in support of the GEF project "Promotion of Sustainable Charcoal in Angola through a Value Chain Approach", implemented by the Ministry of the Environment together with UNDP, whose objective is "To reduce the current, unsustainable and GHG-intensive, mode of charcoal production and utilization from Angola's Miombo woodlands, via an integrated set of interventions in the national charcoal value chain."

COSPE will contribute to the project, implementing actions in Canjombe community, Waku-Kungo Municipality to establish a Payment for Ecosystem Services (PES) pilot scheme, promote sustainable forest management practices, test and build improved charcoal kilns to reduce GHGs emissions. The pilot project will be of four-years duration, from mid 2016 to the end of 2019. This pilot project will build on the current three-years duration (2014-2017) project "Integrated Program for Angolan Coastal Forests Protection and Development" co-financed by the Italian Ministry for Foreign Affairs, in which COSPE has been working with rural communities of the Municipality promoting participatory forest management, supporting local producers associations and income generating activities alternative to charcoal production, such as beekeeping. For these actions, the in-kind contribution of COSPE to the GEF project has been quantified as follow:

Description	Value of Contribution (USD)
(a) use of existing buildings and equipment	43.200,00
(b) contribution of existing ADPP staff not salaried by the GEF project	59.500,00
(c) transport and local office contribution	38.000,00
(d) PES monitoring and evaluation	10.000,00
(e) backstopping from HQ in Italy	36.000,00
TOTAL CO-FINANCING CONTRIBUTION (IN KIND)	186.700,00

We look forward to collaborate with the Global Environmental Facility on this important project.

On behalf of the Organisation
Fulvio Vincenzo, (Director)



TOGETHER FOR CHANGE

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STANDARD LETTER OF AGREEMENT BETWEEN
UNDP AND MINISTER OF ENVIRONMENT

FOR THE PROVISION OF SUPPORT SERVICES

Under project “Promotion of Sustainable Charcoal in Angola through a Value Chain Approach”

Dear Dra. Maria de Fátima Jardim,

1. Reference is made to consultations between officials of the Government of *Republic of Angola* (hereinafter referred to as “the Government”) and officials of UNDP with respect to the provision of support services by the UNDP country office for nationally implemented programs and projects. UNDP and the Government hereby agree that the UNDP country office may provide such support services at the request of the Government through its institution designated in the relevant program support document or project document, as described below.
2. The UNDP country office may provide support services for assistance with reporting requirements and direct payment. In providing such support services, the UNDP country office shall ensure that the capacity of the Government-designated institution is strengthened to enable it to carry out such activities directly. The costs incurred by the UNDP country office in providing such support services shall be recovered from the administrative budget of the office.
3. The UNDP country office may provide, at the request of the designated institution, the following support services for the activities of the program/project:
 - (a) Identification and/or recruitment of project and program personnel;
 - (b) Identification and facilitation of training activities;
 - (c) Procurement of goods and services;
 - (d) Financial support services
4. The procurement of goods and services and the recruitment of project and program personnel by the UNDP country office shall be in accordance with the UNDP regulations, rules, policies and procedures. Support services described in paragraph 3 above shall be detailed in an annex to the program support document or project document, in the form provided in the Attachment hereto. If the requirements for support services by the country office change during the life of a program or project, the annex to the program support document or project document is revised with the mutual agreement of the UNDP resident representative and the designated institution.
5. The relevant provisions of the *UNDP standard basic assistance agreement with the Government* (the “SBAA”) signed at 18 February 1977, including the provisions on liability and privileges and immunities, shall apply to the provision of such support services. The Government shall retain overall responsibility for the nationally managed program or project through its designated institution. The responsibility of the UNDP country office for the provision of the support services described herein shall be limited to the provision of such support services detailed in the annex to the program support document or project document.

6. Any claim or dispute arising under or in connection with the provision of support services by the UNDP country office in accordance with this letter shall be handled pursuant to the relevant provisions of the SBAA.
7. The manner and method of cost-recovery by the UNDP country office in providing the support services described in paragraph 3 above shall be specified in the annex to the program support document or project document.
8. The UNDP country office shall submit progress reports on the support services provided and shall report on the costs reimbursed in providing such services, as may be required.
9. Any modification of the present arrangements shall be effected by mutual written agreement of the parties hereto.
10. If you are in agreement with the provisions set forth above, please sign and return to this office two signed copies of this letter. Upon your signature, this letter shall constitute an agreement between your Government and UNDP on the terms and conditions for the provision of support services by the UNDP country office for nationally managed programs and projects.

Yours sincerely,

Signed on behalf of UNDP
Dr. Pier Paolo Balladelli
UNDP Resident Representative in Angola

For the Government
Dra. Maria de Fátima Jardim
Minister of Environment
[Date]

DESCRIPTION OF UNDP COUNTRY OFFICE SUPPORT SERVICES

1. Reference is made to consultations between Ministry of Environment, the institution designated by the Government of Angola and officials of UNDP with respect to the provision of support services by the UNDP country office for the nationally managed program or project “Project ID 00092469 – Promotion of Sustainable Charcoal in Angola through a Value Chain Approach”, *“the Project”*.

2. In accordance with the provisions of the letter of agreement signed on *[insert date of agreement]* and the *project document*, the UNDP country office shall provide support services for the *Project “Promotion of Sustainable Charcoal in Angola through a Value Chain Approach”* as described below.

3. Support services to be provided:

Support services	Schedule for the provision of the support services	Cost to UNDP of providing such support services (where appropriate)	Amount and method of reimbursement of UNDP (where appropriate)
<p>1. Services related to procurement (including but not limited to):</p> <ul style="list-style-type: none"> • Procurement of goods • Procurement of services: <ul style="list-style-type: none"> • Consultant recruitment • Advertising • Short-listing & selection • Contract • Travel • Events (training and conferences) 	Throughout project implementation when applicable	157 days over 72 months of GS 7 Procurement Associate: \$62,800	UNDP will directly charge the project upon receipt of request of services from the Implementing Partner (IP)
<p>2. Services related to finance (including but not limited to):</p> <ul style="list-style-type: none"> • Payments • Disbursements 	Throughout project implementation when applicable	<p>157 days over 72 months of GS 7 Finance Associate: \$62,800</p> <p>47 days over 72 months of NOC Finance Specialist: \$33,840</p>	UNDP will directly charge the project upon receipt of request of services from the Implementing Partner (IP)
	Total	\$159,440	

ANNEX C: ANGOLA Estimated Direct Project Costs /UNDP Country Office (ATLAS Budget Line 74599):

Budget Description	Unit price (a)	Amount Year 1		Amount Year 2		Amount Year 3		Amount Year 4		Amount Year 5	
		USD total(a*b)	No of units(b)	USD total(a*b)	No of units(b)	USD total(a*b)	No of units(b)	USD total(a*b)	No of units(b)	USD total(a*b)	No units(b)
Payment process	\$51.74	\$15,052	291	\$15,297	296	\$15,297	296	\$13,112	253	\$8,741	169
Issue Checks	\$19.73	\$338	17	\$343	17	\$343	17	\$294	15	\$196	10
Create Vendor Profile	\$28.66	\$294	10	\$299	10	\$299	10	\$256	9	\$171	6
Disposal of equipment	\$426.86	\$146	0	\$148	0	\$148	0	\$127	0	\$85	0
Procurement (average)	\$362.46	\$17,368	48	\$17,650	49	\$17,650	49	\$15,129	42	\$10,086	28
Consultant Recruitment	\$362.92	\$1,242	3	\$1,262	3	\$1,262	3	\$1,082	3	\$721	2
Total		\$34,440		\$35,000		\$35,000		\$30,000		\$20,000	

ANNEX D Calculation of Greenhouse Gas Benefits

Introduction

An ex-ante estimate of the greenhouse gas (GHG) benefits delivered by the Project can only be indicative, given: (i) the incomplete determination of the baseline situation; (ii) the uncertainties with respect to the quality of the installed kilns (Casamance kilns); (iii) the attainable improvement in operating skills; and (iv) the utilization rate of these charcoal kilns, which are part of mixed production systems. More advanced technologies such as brick retort kilns will also be demonstrated but are not expected to deliver significant GHG emission reductions under the Project's time horizon. All these efforts involve Step 2 of the charcoal value chain.

The estimation of the Project's GHG reductions at this stage involves a great number of assumptions. The PPG phase could not engage sufficiently close with the targeted beneficiaries to obtain accurate and representative data that can be extrapolated. Quantitative data are available for some other countries but also these data are rather coarse and not necessarily representative for Angola. Studies on charcoal for Sub-Saharan Africa are mostly recent (2005 – present) and a body of experiences is developing. Yet, the scattered and informal character of charcoal production and utilization and the spread in technical parameters⁷⁹ limit a precise assessment of greenhouse gas benefits. By consequence, simplified methodologies are proposed as a basis for financing schemes based on verified carbon reductions.

At the consumption side (Step 5), the Project will support Government initiatives to increase the market penetration of energy-efficient charcoal stoves. Also here, a solid baseline is absent, and there are uncertainties in terms of acceptance of these stoves, as well as the most appropriate models for the peri-urban market. As yet, there is no reliable data on the penetration rate of sustainable charcoal technologies in other countries that might be used. The Project proponents believe that the standard tool proposed by STAP in 2013⁸⁰ is not well suited for presenting the expected GHG benefits in a situation that is characterized by large error margins in the input data, non-validated assumptions and poorly specified technologies.⁸¹ The following section will therefore be based on the earlier GEF guidelines⁸² and list the assumptions made. This approach is expected to facilitate refinement of the calculation during and after the Project.

⁷⁹ Including: kiln size, quality, operational skills, type and quality of wood inputs, mode of charcoal production; cooking habits.

⁸⁰ As described in the report "Calculating Greenhouse Gas Benefits of the Global Environment Facility Energy Efficiency Projects - Version 1.0, March 2013"

⁸¹ See: Analysis of Charcoal Value Chains – General Considerations, Steve Sepp – Eco Consulting Group Germany, p.9.

⁸² GEF/C.33/Inf.18, April 16, 2008

The following table (based on the GEF Manual, page 3) summarizes the methodology used:

Type of GHG emission reduction	Direct (A)	Indirect (B, C)	
Component of GEF intervention that can cause this type of GHG emission reduction	Direct implementation of sustainable charcoal technologies (kilns, briquetting, stoves)	The Project does not establish a direct replication mechanism. GHG benefits obtained from leveraged investments are considered as effects of market transformation.	Market transformation
Logframe (SRF) level	Components 2 (2.1, 2.2, 2.3, 2.6, 2.7)	n/a	Medium-term impact after project termination (10 years)
Quantification method	Ex-ante evaluation of GHG reductions over lifetime of 10 years, based on a number of assumptions. GHG emission reduction include CO ₂ through avoided non-renewable biomass use (deforestation), and avoided CH ₄ releases through improved kiln efficiency.	n/a	Top-bottom approach based on expected market development of energy-efficient, low-emission charcoal production, briquetting and consumption technology. Only GHG emission reductions through avoided CH ₄ releases are claimed.
Quality of Assessment	Based on assumptions made and course data (see text). An error range is estimated at +/-50%.	n/a	The error range is estimated at +/- 50% but depends on the assumptions made.

Methodology

The methodology to determine the GHG benefits delivered by more efficient charcoal production is based on two assumptions: (1) the release of CO₂ from fixed carbon stocks into the atmosphere by depleting forest resources; (2) the release of methane that is produced under sub-optimal conversion conditions. Downstream interventions such as briquetting and efficient stoves have a positive impact by reducing the charcoal production rate. The share of non-renewable biomass is included as a key parameter in the standardized methodology. If only renewable biomass sources are used for charcoal production, the carbon cycle would be closed. In the absence of specific data, a share of non-renewable biomass (X) of 50% is assumed under the baseline, which seems conservative for Angola. It is further assumed that increased kiln efficiency (Y) will proportionally reduce the inputs of non-renewable biomass. The methodology is based on Mueller and Michaelowa.⁸³

Methane emission reductions are estimated based on CDM methodology AM0041, which provides a simple formula relating CH₄ emissions in charcoal kilns, to the gravimetric yield (i.e. mass of charcoal outputs divided by

⁸³ See for example: "Proposal for a new Standardized Baseline for Charcoal Projects in the Clean Development Mechanism", Mueller, M, Michaelowa, A. Eschman, M, Zurich, Switzerland, December 2011.

mass of wood inputs). The emissions of methane produced per ton of charcoal during the carbonization process (M) are given by the empirical formula: $M \text{ [kg CH}_4\text{/ton charcoal]} = 139.13 - 313.80 \cdot Y$, in which Y represents the conversion efficiency (tons of charcoal obtained per ton wood input).

	Baseline (b)	Project (p)	Unit	Source
Charcoal technology	Mound-type	Casamance		
Conversion efficiency (Y)	10	20	[%]	assumed
Emission factor for CO ₂ emissions, corrected	4,657		[kg CO ₂ eq/ton charcoal]	Mueller and Michaelova (67% carbon assumed)
Fraction of non-renewable biomass (X)	50%	25%	[%]	= $X \cdot Y_b / Y_p$ (assumed)
Specific CO ₂ emissions, corrected (C)	2,328	1,164	[kg CO ₂ eq/ton charcoal]	calculated
Specific CO ₂ emission reduction compared to baseline	0	1,164	[kg CO ₂ eq/ton charcoal]	= $C \cdot (X_b - X_p)$
Specific CH ₄ emissions (M)	108	76.4	[kg CH ₄ /ton charcoal]	$139.13 - 313.80 \cdot Y$
Specific CH ₄ emission reduction compared to baseline	0	31.6	[kg CH ₄ /ton charcoal]	calculated
Global Warming Potential CH ₄	21		[kg CO ₂ eq/kg CH ₄]	IPCC 2006
Specific CH ₄ emission reduction compared to baseline	0	664	[kg CO ₂ eq/ton charcoal]	calculated
Specific GHG emission reductions compared to baseline (S)	0	1,828	[kg CO ₂ eq/ton charcoal]	calculated

It is concluded that GHG emission reductions amounting to 1,828 kg CO₂eq are avoided per ton of charcoal produced.

Charcoal production ("Step 2")

The following table presents the charcoal consumption and attainable GHG emission reductions for the baseline and improved technology. It is assumed that people can operate 3 kilns in parallel given a typical production cycle for loading, carbonization, cooling and unloading. At a 30-day cycle duration, 9 batches can be produced in total during a 3-month period. A kiln volume of 50 m³ is assumed.

	Baseline	Project	Unit	Uncertainty
Charcoal technology	Mound-type	Casamance		
Kiln volume	50	50	[m ³] (stere)	assumed
Kiln volume (wood mass) ⁸⁴	40,000	40,000	[kg wood]	+/-10%
Composition production team	3	3	[person]	assumed
Batch time per kiln	30	30	[day]	assumed
No kilns per team	3	3	[-]	assumed
Annual operating time	90	90	[days/yr]	assumed
Annual batches per team	9	9	[1/yr]	calculated

⁸⁴ Medium density tropical hardwood (partly seasoned) 800 kg/stere. Source: FAO Charcoal Manual 1983 (conversion factors).

Annual wood consumption	360,000	360,000	[kg wood/yr]	calculated
Annual charcoal production (P)	36,000 (36 ton)	72,000 (72 ton)	[kg wood/yr]	calculated
Annual increase in charcoal yield compared to baseline	0	36,000 (36 ton)	[kg wood/yr]	calculated
Annual GHG emission reductions compared to baseline	0	131,616	[kg CO ₂ eq/yr]	calculated = S _p *P _p

Hence, using 3 Casamance kilns in parallel during a 3-months period per year, one production team would produce 72,000 kg charcoal per year and offset 131,616 kg CO₂eq per year.

Initial pilot phase (technology transfer)

As shown, the charcoal production rate depends linearly on the kiln size and organization of the production in batches. ADPP envisages the parallel introduction of improved kilns in six (6) Farmer's Clubs, involving 12 teams of 3 persons each. A total of 36 kilns would be operated. The actual kiln volume and number of batches may be different however. An accurate estimate of the direct emission reductions is therefore only possible once the pilots are technically specified.

Pilot Technology Transfer Phase (12 teams)		
	Project	Unit
Charcoal technology	Casamance	
Kiln volume	50	[m ³] (stere)
Kiln volume (wood mass)	40	[ton wood]
Annual batches per team	9	[1/yr]
Annual wood consumption per team	360	[ton wood/yr]
Number of teams	12	[-]
Annual wood consumption pilot	4,320	[ton wood/yr]
Annual charcoal production	864	[ton charcoal /yr]
Specific GHG emission reductions compared to baseline (S)	1.828	[ton CO ₂ eq/ton charcoal]
Annual GHG emission reductions compared to baseline	1,579	[ton CO ₂ eq/yr]

The annually avoided GHG emissions would be 1,579 ton CO₂eq/yr. The annual wood consumption would be 4,320 ton, yielding an annual charcoal output of 864 ton/yr. The energy savings compared to the baseline would be: 4,360 ton * 15 GJ/ton = 64,800 GJ. Over a standard 10-year period applied for investments under GEF projects, the emission reductions are about:

$$= 15,800 [\text{ton CO}_{2\text{eq}}] = 15.8 [\text{kton CO}_{2\text{eq}}].$$

Other kiln technologies

It is envisaged to transfer and demonstrate other kiln technologies as well, such as stationary brick kilns and retort kilns. Such kilns do not only have higher conversion rates (and corresponding lower emissions) but also facilitate the collection of ashes and tar, thereby greatly reducing local pollution and long-term contamination of forest soils. The recovery of energy from the tar would further increase energy efficiency along the value chain (from wood to energy services). Full-time operation of such kilns is considered as too ambitious in the near future.

Moreover, the impact of such operation on existing rural production schemes and habits, has not been investigated. For these reasons the potential contribution of such kilns to GHG emission reductions is ignored here.

Technology adoption phase

The approach followed under the rural charcoal production pilot is that other members in the communities (Farmer's Clubs) will adopt improved charcoal production technology based on the successful initial demonstration. It is assumed that a total of about 270 producers will adopt the technology, organized in 90 teams. For simplicity, it is further assumed that no up-scaling of the kiln size will take place.

Pilot technology transfer and adoption phase (90 teams)		
	Project	Unit
Charcoal technology	Casamance	
Kiln volume	50	[m ³] (stere)
Kiln volume (wood mass)	40	[ton wood]
Annual batches per team	9	[1/yr]
Annual wood consumption per team	360	[ton wood/yr]
Number of teams	90	[-]
Annual wood consumption pilot	32,400	[ton wood/yr]
Annual charcoal production	6,480	[ton charcoal /yr]
Annual GHG emission reductions compared to baseline ($S_p \cdot P_p$)	11,845	[ton CO ₂ eq/yr]
Annual wood savings compared to baseline	32,400	[ton wood/yr]
Annual energy savings compared to baseline	486,000	[GJ/yr]

The annual direct GHG reductions would then be 11,845 ton CO₂eq/yr and the total reductions (10-year period):

$$= 118.5 \text{ [kton CO}_2\text{eq]}.$$

Briquetting ("Step 4")

It is assumed that 10 briquetting machines will be deployed under the Project through direct investment. The technology chosen is screw press-type, with a capacity of 150 kg of briquettes per hour. Further, a charcoal content of 50% is assumed, and an effective operating time of 20% (1,740 hours per year). Briquetting production results in the recovery of charcoal waste into the value chain, thereby directly avoiding the production of new charcoal. This amount of avoided charcoal translates into avoided CH₄ emissions in conformity with the above methodology. The annually recovered charcoal mass is per installed briquetting machine is:

$$= 150 \text{ [kg/h]} \cdot 50\% \cdot 1,740 \text{ [h/yr]} = 130,500 \text{ [kg charcoal/yr]} = 131 \text{ [ton charcoal/yr]}.$$

The avoided emissions per unit are:

$$= 131 \text{ [ton charcoal/yr]} * 1.828 \text{ [ton CO}_2\text{eq/ton charcoal]} = 239.5 \text{ [ton CO}_2\text{eq/yr]}.$$

The directly avoided emissions over a 10-year period, for 10 briquetting machines, are about **23,950 [ton CO₂eq]**.

Energy-efficient stoves ("Step 5")

The baseline is dominated by stoves with an assumed efficiency (from chemical energy content to heat delivered to the food) of 10%. Efficient stoves can double this efficiency to 20% or more. It is assumed that an average low-income household consumes 2 kg of charcoal per day per stove; households may have up to three stoves. Per stove, the increase in efficiency would reduce charcoal demand with 1 kg per day. Since people have no alternatives for food preparation, it is assumed that the stoves are used every day.

The Project envisages to support the direct delivery of 10,000 efficient stoves through Government programs. Although stoves have a typical lifetime of 2-5 years, it is assumed that people will become convinced of the benefits and continue their use by purchasing new equipment when required. This justifies the use of a 10-year impact horizon for this direct investment.

The total mass of charcoal saved amounts to:

$$= 1 \text{ [kg charcoal/day]} * 10,000 \text{ [units]} * 365 \text{ [day/yr]} * 10 \text{ [yr]} = 36,500 \text{ [ton charcoal]}.$$

The associated emission reductions due to avoided charcoal production is:

$$= 36,500 \text{ [ton charcoal]} * 1.828 \text{ [ton CO}_2\text{eq/ton charcoal]} = 66,722 \text{ [ton CO}_2\text{eq]}.$$

This is equivalent to: **66.7 kton CO₂eq**.

Total direct emission reductions

The total direct emission reductions over a 10-year period are:

$$= 118.5 + 23.9 + 66.7 = \mathbf{209.1[kton CO}_2\text{eq]}.$$

Given the uncertainties and assumptions made, an error margin of 50% is taken. The direct emission reductions are then in the range of:

$$= \mathbf{105...315 [kton CO}_2\text{eq]}.$$

Indirect emission reductions

The Project pursues indirect emission reductions through market transformation as a result of improved policy, technology transfer and capacity building.

An indicative top-bottom estimate can depart from the total market volume for charcoal, which is of the order of 2 million peri-urban households, consuming 500 kg charcoal or more annually. The total charcoal demand would be

around 1.0 million ton/yr, requiring 5.0 million ton wood. This is 1,150 times the scale of the initial charcoal pilot (864 ton charcoal/yr). Since off-setting of non-renewable biomass through improved kiln efficiency is beyond control of the Project at such a scale, only avoided methane releases are claimed here (0.664 ton CO₂eq/ton charcoal). In fact, the impact of the Project to increase the market penetration of EE charcoal stoves and support for sustainable forest management practices is assumed to be negligible after Project termination, in comparison to sectorial initiatives and Government programs in these areas.

Assuming a successful implementation of the charcoal pilots, a market penetration of 30% and a GEF causality factor of 60%, the attainable annual CH₄ emission reductions would be:

$$= 30\% * 1,000,000 * 0.664 * 60\% = 179,280 \text{ ton CO}_2\text{eq/yr} = \mathbf{119.5 \text{ [kton CO}_2\text{eq/yr]}}.$$

Indicatively, the attainable GHG benefits as a result of market transformation over a 10-year period after Project termination are in the order of:

$$= \mathbf{1.2 \text{ [Mton CO}_2\text{eq]}}.$$

Project Information

Project Information	
1. Project Title	Promotion of Sustainable Charcoal in Angola through a Value Chain Approach
2. Project Number	5331 (Agency ID)
3. Location (Global/Region/Country)	AFR / ANGOLA

Part A. Integrating Overarching Principles to Strengthen Social and Environmental Sustainability

QUESTION 1: How Does the Project Integrate the Overarching Principles in order to Strengthen Social and Environmental Sustainability?
<i>Briefly describe in the space below how the Project mainstreams the human-rights based approach</i>
The Project is designed to improve access to natural resources and land, as well as basic energy services. The Project is expected to deliver social and economic benefits primarily to poor rural people and low-income (peri-)urban households.
<i>Briefly describe in the space below how the Project is likely to improve gender equality and women's empowerment</i>
Women play a very active role in the charcoal value chain. The Project will do a strong effort to introduce more equitable production and business models, which is challenging given the presence of adverse systemic factors (capital assets are largely male-dominated). At the end-use side, the Project favors low-income households, which are predominantly led by women.
<i>Briefly describe in the space below how the Project mainstreams environmental sustainability</i>
Environmental sustainability is at the core of the Project's design and the rationale behind GEF funding. Mainstreaming of environmental sustainability is pursued by: (i) promoting conducive policy for a sustainable charcoal sector (demanding sustainable forest management, resource efficiency and quality standards), (ii) introducing resource-efficient technologies and production processes, and (iii) by supporting market development for sustainable charcoal.

Part B. Identifying and Managing Social and Environmental Risks

QUESTION 2: What are the Potential Social and Environmental Risks? <i>Note: Describe briefly potential social and environmental risks identified in Attachment 1 – Risk Screening Checklist (based on any “Yes” responses).</i>	QUESTION 3: What is the level of significance of the potential social and environmental risks? <i>Note: Respond to Questions 4 and 5 below before proceeding to Question 6</i>			QUESTION 6: What social and environmental assessment and management measures have been conducted and/or are required to address potential risks (for Risks with Moderate and High Significance)?
Risk Description	Impact and Probability (1-5)	Significance (Low, Moderate, High)	Comments	Description of assessment and management measures as reflected in the Project design. If ESIA or SESA is required note that the assessment should consider all potential impacts and risks.
<p>Risk 1: Gender inequality is present in most aspects of the baseline. There is a substantial risk that such inequality is continued or enhanced by the Project in the absence of proactive management measures.</p>	<p>I = 4 P = 4</p>	<p>MODERATE</p>	<p>Gender inequality is a result of baseline conditions, but the Project can exert active control to improve gender situation.</p>	<p>It is proposed to conduct a social and environmental screening exercise as part of the detailed design of the field pilots. This screening should be done by the Responsible Parties (RPs) and include a detailed Risk Management Plan. Engagement and consultations with local groups, CSO's, and authorities should be part of this process.</p> <p>The Plan shall be submitted to the Project Board and UNDP prior to implementation of any field activities. Regular updating of the Plan and integration into UNDP's QA cycle is recommended to ensure compliance is recommended, including interaction with principles and standards.</p>
<p>Risk 2: Growing market demand for charcoal could lead to increased pressure on Miombo stocks if the Project does not achieve its goals of resource-efficient production under application of strict sustainability criteria.</p>	<p>I = 4 P = 2</p>	<p>MODERATE</p>	<p>Adverse environmental impacts would mainly be caused by agents outside the Project and after its termination. However, the Project should maximize its efforts to achieve a transformation of the charcoal sector.</p>	<p>Specific measures are described in the Project's Risk Matrix.</p>
<p>Risk 3: There is a potential risk that people cannot claim their rights to land resources.</p>	<p>I = 2 P = 2</p>	<p>LOW</p>	<p>This risk can be controlled by proper monitoring of the field pilots.</p>	<p>See risk 1.</p>
<p>Risk 4: There is a risk that resource-efficiency and pollution reduction goals are not met.</p>	<p>I = 4 P = 2</p>	<p>MODERATE</p>	<p>Considering the adverse impact of baseline scenario, the Project should maximize its efforts to achieve a transformation of the</p>	<p>Specific measures are described in the Project's Risk Matrix.</p>

			charcoal sector	
[add additional rows as needed]				
	QUESTION 4: What is the overall Project risk categorization?			
	Select one (see SESP for guidance)			Comments
	Low Risk	<input type="checkbox"/>		
	Moderate Risk	<input checked="" type="checkbox"/>	Rated as moderate to reflect that several risk factors (gender, land tenure) are mainly systemic and not a result of the activities proposed under the Project.	
	High Risk	<input type="checkbox"/>		
	QUESTION 5: Based on the identified risks and risk categorization, what requirements of the SES are relevant?			
	Check all that apply			Comments
	Principle 1: Human Rights	<input type="checkbox"/>	Human rights issues are limited to ensuring equitable access to land and natural resources on one hand, and the energy services and economic value delivered.	
	Principle 2: Gender Equality and Women's Empowerment	<input checked="" type="checkbox"/>	Gender inequality is present in most aspects of the baseline. There is a substantial risk that such inequality is continued in the absence of proactive management measures.	
	Principle 3: Environmental Sustainability	<input checked="" type="checkbox"/>		
	1. Biodiversity Conservation and Natural Resource Management	<input checked="" type="checkbox"/>	<p>The Project consists of small-scale interventions in the Miombo ecosystem, which may affect native flora and fauna. In principle, the Project aims to enhance knowledge of this system and introduce positive changes to land and forest management. However, adverse impacts cannot be excluded. Close involvement of expert institutes (IDF, UJES, UCO-IDAF) is expected to minimize this risk.</p> <p>Growing market demand for charcoal will continue in a BAU scenario leading to increased pressure on the Miombo stocks; it is beyond the scope/control of the project to determine the aggregate demand dynamics for charcoal in the country. The Project, at a minimum, is expected to reduce the share of non-sustainable biomass usage compared to the baseline situation and assumes that the aggregate demand for charcoal is fixed</p>	

			and that a shift to more efficient methods will not create additional demand for the resource. Mitigation measures include training and awareness raising of charcoal producers and consumers, and the introduction of alternative income sources for producers.
	2. Climate Change Mitigation and Adaptation	<input type="checkbox"/>	The Project's main goal is to reduce significant global GHG emissions Forest conditions and rural livelihoods may be affected by climate change, thereby changing the environmental and socio-economic context of the Project.
	3. Community Health, Safety and Working Conditions	<input checked="" type="checkbox"/>	Occupational health is a serious issue under the baseline. The Project envisages to improve safety and health conditions for charcoal kiln operators by training. Additional measures may be needed to ensure effectiveness of such training. Note that for small-scale charcoal producers, no international or national labor regulation exists as this sector is fully informal.
	4. Cultural Heritage	<input type="checkbox"/>	No issues identified
	5. Displacement and Resettlement	<input type="checkbox"/>	The main concern is the lack of an effective and accepted legal systems for land tenure and access to forest resources. Customary, formal, and <i>de facto</i> arrangements co-exist, leaving the most vulnerable people in a weak position. Root causes are largely systemic and beyond Project control.
	6. Indigenous Peoples	<input type="checkbox"/>	Small groups of traditional rural people may co-exist with internally displaced people and other migrated population.
	7. Pollution Prevention and Resource Efficiency	<input checked="" type="checkbox"/>	Charcoal production releases GHG emissions, as well as tar, fumes, and ashes leading to soil contamination and local air pollution. The Project aims to introduce better and more efficient production processes, which should reduce such pollution in comparison to the baseline. Operator skills and awareness are a critical factor to achieve such benefits. The Project is resource-intensive (biomass conversion) and aims to improve resource and energy-efficiency. There is a risk that resource-efficiency and pollution reduction goals are not met.

Final Sign Off

<i>Signature</i>	<i>Date</i>	<i>Description</i>
QA Assessor		UNDP staff member responsible for the Project, typically a UNDP Program Officer. Final signature confirms they have “checked” to ensure that the SESP is adequately conducted.
QA Approver		UNDP senior manager, typically the UNDP Deputy Country Director (DCD), Country Director (CD), Deputy Resident Representative (DRR), or Resident Representative (RR). The QA Approver cannot also be the QA Assessor. Final signature confirms they have “cleared” the SESP prior to submittal to the PAC.
PAC Chair		UNDP chair of the PAC. In some cases PAC Chair may also be the QA Approver. Final signature confirms that the SESP was considered as part of the project appraisal and considered in recommendations of the PAC.

SESP Attachment 1. Social and Environmental Risk Screening Checklist

Checklist Potential Social and Environmental <u>Risks</u>	
Principles 1: Human Rights	Answer (Yes/No)
1. Could the Project lead to adverse impacts on enjoyment of the human rights (civil, political, economic, social or cultural) of the affected population and particularly of marginalized groups?	No
2. Is there a likelihood that the Project would have inequitable or discriminatory adverse impacts on affected populations, particularly people living in poverty or marginalized or excluded individuals or groups? ⁸⁵	No
3. Could the Project potentially restrict availability, quality of and access to resources or basic services, in particular to marginalized individuals or groups?	No
4. Is there a likelihood that the Project would exclude any potentially affected stakeholders, in particular marginalized groups, from fully participating in decisions that may affect them?	No

⁸⁵ Prohibited grounds of discrimination include race, ethnicity, gender, age, language, disability, sexual orientation, religion, political or other opinion, national or social or geographical origin, property, birth or other status including as an indigenous person or as a member of a minority. References to “women and men” or similar is understood to include women and men, boys and girls, and other groups discriminated against based on their gender identities, such as transgender people and transsexuals.

5.	Are there measures or mechanisms in place to respond to local community grievances?	Yes
6.	Is there a risk that duty-bearers do not have the capacity to meet their obligations in the Project?	No
7.	Is there a risk that rights-holders do not have the capacity to claim their rights?	Yes
8.	Have local communities or individuals, given the opportunity, raised human rights concerns regarding the Project during the stakeholder engagement process?	No
9.	Is there a risk that the Project would exacerbate conflicts among and/or the risk of violence to project-affected communities and individuals?	No
Principle 2: Gender Equality and Women's Empowerment		
1.	Is there a likelihood that the proposed Project would have adverse impacts on gender equality and/or the situation of women and girls?	Yes
2.	Would the Project potentially reproduce discriminations against women based on gender, especially regarding participation in design and implementation or access to opportunities and benefits?	Yes
3.	Have women's groups/leaders raised gender equality concerns regarding the Project during the stakeholder engagement process and has this been included in the overall Project proposal and in the risk assessment?	No
3.	Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services?	Yes
Principle 3: Environmental Sustainability: Screening questions regarding environmental risks are encompassed by the specific Standard-related questions below		
Standard 1: Biodiversity Conservation and Sustainable Natural Resource Management		
1.1	Would the Project potentially cause adverse impacts to habitats (e.g. modified, natural, and critical habitats) and/or ecosystems and ecosystem services?	Yes
1.2	Are any Project activities proposed within or adjacent to critical habitats and/or environmentally sensitive areas, including legally protected areas (e.g. nature reserve, national park), areas proposed for protection, or recognized as such by authoritative sources and/or indigenous peoples or local communities?	No
1.3	Does the Project involve changes to the use of lands and resources that may have adverse impacts on habitats, ecosystems, and/or livelihoods? (Note: if restrictions and/or limitations of access to lands would apply, refer to Standard 5)	Yes

1.4	Would Project activities pose risks to endangered species?	No
1.5	Would the Project pose a risk of introducing invasive alien species?	No
1.6	Does the Project involve harvesting of natural forests, plantation development, or reforestation?	No
1.7	Does the Project involve the production and/or harvesting of fish populations or other aquatic species?	No
1.8	Does the Project involve significant extraction, diversion or containment of surface or ground water?	No
1.9	Does the Project involve utilization of genetic resources? (e.g. collection and/or harvesting, commercial development)	No
1.10	Would the Project generate potential adverse transboundary or global environmental concerns?	No
1.11	Would the Project result in secondary or consequential development activities which could lead to adverse social and environmental effects, or would it generate cumulative impacts with other known existing or planned activities in the area?	Yes
Standard 2: Climate Change Mitigation and Adaptation		
2.1	Will the proposed Project result in significant ⁸⁶ greenhouse gas emissions or may exacerbate climate change?	No
2.2	Would the potential outcomes of the Project be sensitive or vulnerable to potential impacts of climate change?	Yes
2.3	Is the proposed Project likely to directly or indirectly increase social and environmental vulnerability to climate change now or in the future (also known as maladaptive practices)?	No
Standard 3: Community Health, Safety and Working Conditions		
3.1	Would elements of Project construction, operation, or decommissioning pose potential safety risks to local communities?	No
3.2	Would the Project pose potential risks to community health and safety due to the transport, storage, and use and/or disposal of hazardous or dangerous materials (e.g. explosives, fuel and other chemicals during construction and operation)?	No
3.3	Does the Project involve large-scale infrastructure development (e.g. dams, roads, buildings)?	No

⁸⁶ In regards to CO₂, 'significant emissions' corresponds generally to more than 25,000 tons per year (from both direct and indirect sources). [The Guidance Note on Climate Change Mitigation and Adaptation provides additional information on GHG emissions.]

3.4	Would failure of structural elements of the Project pose risks to communities? (e.g. collapse of buildings or infrastructure)	No
3.5	Would the proposed Project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, erosion, flooding or extreme climatic conditions?	No
3.6	Would the Project result in potential increased health risks (e.g. from water-borne or other vector-borne diseases or communicable infections such as HIV/AIDS)?	No
3.7	Does the Project pose potential risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during Project construction, operation, or decommissioning?	Yes
3.8	Does the Project involve support for employment or livelihoods that may fail to comply with national and international labor standards (i.e. principles and standards of ILO fundamental conventions)?	No
3.9	Does the Project engage security personnel that may pose a potential risk to health and safety of communities and/or individuals (e.g. due to a lack of adequate training or accountability)?	No
Standard 4: Cultural Heritage		
4.1	Will the proposed Project result in interventions that would potentially adversely impact sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g. knowledge, innovations, practices)? (Note: Projects intended to protect and conserve Cultural Heritage may also have inadvertent adverse impacts)	No
4.2	Does the Project propose utilizing tangible and/or intangible forms of cultural heritage for commercial or other purposes?	No
Standard 5: Displacement and Resettlement		
5.1	Would the Project potentially involve temporary or permanent and full or partial physical displacement?	No
5.2	Would the Project possibly result in economic displacement (e.g. loss of assets or access to resources due to land acquisition or access restrictions – even in the absence of physical relocation)?	No
5.3	Is there a risk that the Project would lead to forced evictions? ⁸⁷	No
5.4	Would the proposed Project possibly affect land tenure arrangements and/or community based property	No

⁸⁷ Forced evictions include acts and/or omissions involving the coerced or involuntary displacement of individuals, groups, or communities from homes and/or lands and common property resources that were occupied or depended upon, thus eliminating the ability of an individual, group, or community to reside or work in a particular dwelling, residence, or location without the provision of, and access to, appropriate forms of legal or other protections.

	rights/customary rights to land, territories and/or resources?	
Standard 6: Indigenous Peoples		
6.1	Are indigenous peoples present in the Project area (including Project area of influence)?	No
6.2	Is it likely that the Project or portions of the Project will be located on lands and territories claimed by indigenous peoples?	No
6.3	Would the proposed Project potentially affect the rights, lands and territories of indigenous peoples (regardless of whether Indigenous Peoples possess the legal titles to such areas)?	No
6.4	Has there been an absence of culturally appropriate consultations carried out with the objective of achieving FPIC on matters that may affect the rights and interests, lands, resources, territories and traditional livelihoods of the indigenous peoples concerned?	No
6.4	Does the proposed Project involve the utilization and/or commercial development of natural resources on lands and territories claimed by indigenous peoples?	No
6.5	Is there a potential for forced eviction or the whole or partial physical or economic displacement of indigenous peoples, including through access restrictions to lands, territories, and resources?	No
6.6	Would the Project adversely affect the development priorities of indigenous peoples as defined by them?	No
6.7	Would the Project potentially affect the traditional livelihoods, physical and cultural survival of indigenous peoples?	No
6.8	Would the Project potentially affect the Cultural Heritage of indigenous peoples, including through the commercialization or use of their traditional knowledge and practices?	No
Standard 7: Pollution Prevention and Resource Efficiency		
7.1	Would the Project potentially result in the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and/or transboundary impacts?	Yes
7.2	Would the proposed Project potentially result in the generation of waste (both hazardous and non-hazardous)?	Yes
7.3	Will the proposed Project potentially involve the manufacture, trade, release, and/or use of hazardous chemicals and/or materials? Does the Project propose use of chemicals or materials subject to international bans or phase-outs?	No
7.4	Will the proposed Project involve the application of pesticides that may have a negative effect on the environment or human health?	No

7.5	Does the Project include activities that require significant consumption of raw materials, energy, and/or water?	Yes
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ANNEX F GEF CCM Tracking Tool

Provided as a separate file [Annex F - GEF CCM Tracking Tool].

TOR National Project Coordinator (PC)

The National Project Coordinator will be nationally recruited, based on an open competitive process. She/he will be responsible for the day-to-day administration of the project and will be delegated on full-time basis to the implementation of the Project. He/she will take guidance from the National Project Director to whom he/she will directly report. He/she will be responsible for the overall management of the project to meet government obligations under the Project, under the national implementation modality (NIM), including the mobilization of all project inputs and supervision over consultants and sub-contractors.

Duties and Responsibilities

1. Supervise and coordinate the production of project outputs, as per the Project Document;
2. Mobilize all project inputs in accordance with UNDP procedures for Nationally Implemented Projects;
3. Supervise and coordinate the work of consultants and sub-contractors;
4. Coordinate the recruitment and selection of project personnel;
5. Prepare and revise project work and financial plans;
6. Liaise with UNDP, relevant government agencies, and all project partners, including donor organizations and NGOs for effective coordination/implementation of all project activities;
7. Facilitate administrative backstopping to subcontractors and training activities supported by the Project;
8. Oversee and ensure timely submission of the Inception Report, Combined Project Implementation Review/Annual Project Report (PIR/APR), Technical reports, quarterly financial reports, and other reports as may be required by UNDP, GEF, MINAMB and other oversight agencies;
9. Disseminate project reports and respond to queries from concerned stakeholders;
10. Report Project progress to the Project Board (PB) and ensure the fulfilment of PB directives.
11. Oversee the exchange and sharing of experiences and lessons learned with relevant community based integrated conservation and development projects nationally and internationally;
12. Ensure the timely and effective implementation of all components of the project;
13. Assist relevant government agencies and project partners - including initiatives financed by donor organizations and executed by NGOs - with development of essential skills through training workshops and on the job training thereby upgrading their institutional capabilities;
14. Coordinate and assists scientific institutions with the initiation and implementation of any field studies and monitoring components of the project; and
15. Carry regular field visits of all sites and the activities.

Project Officer (UNV)

The Project Officer will be internationally recruited by UNDP as a UN Volunteer. He or she will be responsible for supporting the PC in the day-to-day implementation of the project, including the preparation of work plans and budgets, reports, meeting notes, etc. Beside supporting the administrative and operational tasks of the project, the UNV will provide technical input and literature reviews on specific topics, e.g. as input for workshops or background papers, including on charcoal production and use, certification systems, fair trade, rural energy use, sustainable use of dry forests, biomass energy, climate and carbon finance, etc. The UNV will receive guidance and technical support in these tasks from the TA.

Technical Advisor

The Technical Adviser (TA) will be internationally recruited by UNDP and she/he will be responsible for providing overall technical backstopping to the Project. He/she will provide technical support to the National Project Coordinator (PC), including an advisory role to the National Project Director (NPD) and other government counterparts. To facilitate his/her functions, she/he will be based in Luanda with frequent travels to Huambo. The TA will coordinate the provision of the required technical inputs, reviewing and preparing Terms of Reference, reviewing the outputs of consultants and other sub-contractors. The TA will provide technical backstopping to the Project's Responsible Parties and coordinate the exchange of knowledge and experiences on sustainable charcoal production with other countries in the SADC region. He/she will report directly to the National Project Director and UNDP.

Duties and Responsibilities

1. Provide technical and strategic assistance for project activities, including planning, monitoring and site operations;
2. Prepare and implement a capacity development plan on climate change mitigation and rural biomass energy;
3. Prepare Terms of Reference for consultants and sub-contractors, and assist in the selection and recruitment process;
4. Ensure quality control of interventions/outcomes/deliverables;
5. Support the National Project Coordinator, consultants and sub-contractors to ensure the timely delivery of expected outputs in accordance with international quality standards, and promote synergies among the various sub-contracted activities;
6. Assist the National Project Coordinator by providing technical inputs during the preparation and revision of the Management Plan, Annual Work Plans, periodic reports such as the Combined Project Implementation Review/Annual Project Report (PIR/APR), inception report, technical reports, quarterly reports for submission to UNDP, the GEF, other donors and Government Departments, as required;
7. Assist the National Project Director in other issues related to Climate Change Mitigation, ensuring coordination between national interventions in the sector in liaison with project partners, donor organizations, NGOs and other groups to ensure effective coordination of project activities;
8. Assist in undertaking revisions in the implementation program and strategy based on evaluation results and orientations received from the National Director and the PSC;
9. Document lessons from project implementation and make recommendations to the Steering Committee for more effective implementation and coordination of project activities;
10. Provide assistance to set up, review and implement the Project's M&E structures with a view on retrieving verified information on project results and impacts; and
11. Perform other tasks as may be requested by the National Project Director.

Finance Manager

The Finance Manager will be locally recruited by UNDP based on an open competitive process. He/She will be responsible for the overall financial administration of the project. He/she will be based in Huambo. The Finance Manager will report to the National Project Coordinator.

Duties and Responsibilities

1. Prepare and follow-up UNDP/GEF financial reports using Atlas (UNDP financial system);
2. Contribute to the preparation and implementation of progress reports;
3. Monitor project budgets and financial expenditures;

4. Advise all project counterparts on applicable administrative and financial procedures and ensure their proper implementation;
5. Support the preparations of project work-plans and operational and financial planning processes;
6. Assist in procurement and recruitment processes;
7. Assist in the preparation of payments requests for operational expenses, salaries, insurance, etc. against project budgets and work plans;
8. Follow-up on timely disbursements by UNDP CO; and
9. Perform other duties as required by the Project Coordinator and/or UNDP.

ANNEX H Minutes PPG Inception Workshop, February 2015

In Portuguese. Provided as a separate file [Annex H - Relatório do 1º Workshop].

ANNEX I Minutes and presentation PPG Validation Workshop, July 2015

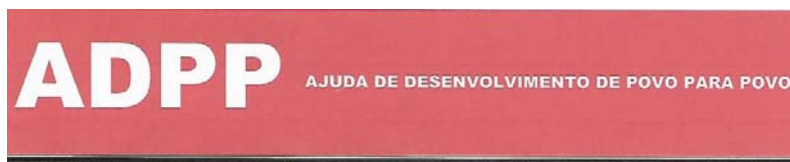
In Portuguese. Provided as a separate file [Annex I - UNDP Angola CO PPT Template Proyecto Carvao].

ANNEX J PPG Report “Avaliação Técnica e Análise da Linha de Base da Fase PPG do Projecto”, CETAC Huambo and UCO-IDAF, June 2015

In Portuguese. Provided as a separate file [Annex J - PPG Report_Avaliação Técnica e Análise].

ANNEX K PPG Mission Report International Consultant, May 2015

Provided as a separate file [Annex K - PPG Mission Report International Consultant].



Ajuda de Desenvolvimento de Povo para Povo (ADPP Angola)

Project partners

ADPP is an Angolan non-governmental organisation, which started in 1986 and was registered with the Ministry of Justice in 1992. ADPP works in 17 of Angola's 18 provinces and directly engages more than 8,000 people in work or study on a daily basis. ADPP reaches hundreds of thousands of others through community-based projects in health, education and community development. All activities are built on four pillars: (i) a community-based perspective that empowers individuals, families and communities to make positive changes in their own lives; (ii) building of in-country capacity through projects which complement government policy; (iii) an integrated approach to development that applies a 'whole community' approach linking education, health and community development activities for maximum impact; and (iv) the recognition of the Government as a key player in promoting long-term sustainable development, and close working partnerships with local, provincial and national Government officials.

ADPP has an established school system in Angola that has graduated 6,613 MED-certified primary school teachers and currently graduates a further 1,000 per year via its 14 teacher training colleges run in collaboration with the Ministry of Education. In Huambo, ADPP has a college as well as its Frontline Institute aimed at training project leaders with specific expert skills. ADPP further operates 8 schools for young people offering combined practical and theoretical training. In addition, ADPP currently has 100,000 adults in literacy projects in 12 provinces. Through its Farmers' Club projects, ADPP assists subsistence farmers to adopt in environmentally sustainable techniques to improve productivity, and trains the members to get organized for buying inputs and selling to the market. As of 2014, ADPP was running Farmers' Club projects in Bengo, Bie, Cabinda, Huambo Kwanza Norte, Kwanza Sul, Kuando Kubango, Kunene, Luanda Malange and Uíge.⁸⁸ ADPP has committed itself to transfer sustainable charcoal technology to rural producers, taking advantage of its training facilities and capabilities and its Farmers' Club system.

Objective

This project component comprises (i) the demonstration, local production and initial operation of improved, energy-efficient charcoal kilns by rural farmers; (ii) the demonstration of briquetting technology among peri-urban micro-entrepreneurs and promotion of sustainable charcoal technology among consumers, school children, students, and their families; and (iii) demonstration of EE charcoal technology and other RE/EE technologies for rural energy supply.

Arrangements

The pilots will be implemented by ADPP Angola if selected as a Responsible Partner.

Approach and main activities

⁸⁸ Text adapted from: <http://www.adpp-angola.org/who-we-are/about-adpp-angola>.

In that context ADDP will implement a range of activities to demonstrate improved charcoal kilns and briquetting machines among its key beneficiaries (Farmer's Clubs and schools) and manage a subsequent replication phase (GEF Project outputs 2.1, 2.2 and 2.6). Training, progress monitoring and outreach are an integrated part of the approach and are critical to initiate and sustain the pilots (GEF Project output 3.2).

1. *EE Charcoal kilns*

The implementation of EE kilns will take benefit from ADPP's training facilities and working relations with rural communities, specifically those organized into the Farmer's Clubs. After establishing a core group of charcoal production experts, a final selection will be made with respect to kiln technology, taking into account locally available materials and construction capabilities. Expectedly, the chosen kiln models will be based on the Casamance kiln. For demonstration and promotional purposes, more advanced kilns such as the Adam's retort may be produced as well and put on display. Simultaneously, a group of technicians will be trained to transfer the technology, including operating skills, to the farmers. In a first round, the technology will be introduced among six Farmer's Clubs, targeting 5 farmers per Club (30 kilns in total). The objective is to achieve full acceptance of the technology, which involves an interactive process to adjust the technology to match the farmer's needs, as well as ongoing training and joined learning to identify and materialize real benefits. A total throughput time of 2-3 years is envisaged with recurrent training activities, intensive monitoring and expert assistance following an integrated and multi-disciplinary approach.

2. *Briquetting machines*

The briquetting pilot will be implemented in two peri-urban municipalities of Luanda, Viana and Cazenga. The approach will be to train students at three lower secondary academic and technical school (EPP)⁸⁹ on the relevance of sustainable charcoal production in relation to global warming and local environmental degradation, and train them on briquetting technology. These students will transfer their knowledge and skills to 10 nearby schools, thereby creating significant impact in the area. The objective is to spread awareness of the opportunities of briquetting, and benefit from the momentum to generate demand for energy-efficient stoves and certified charcoal. Energy Assistant students in Viana will be prepared to initiate and operate briquetting micro-enterprises at the EPP schools, and replicate this model in the area. This output envisages demonstrating the viability of briquetting technology in peri-urban areas under appropriate business models. Differentiation of briquette quality and price in function of the purchase power of user groups will be considered in combination with adequate labelling.

3. *Upscaling*

A replication phase is foreseen that departs from the assumption that successful introduction will trigger demand from neighbours, who wish to exploit these technologies to become more productive and increase their income. This output will initiate market introduction of improved (Casamance) kilns and screw-type briquetting machines on a cost-shared basis. As a base case, a 50% subsidy on equipment cost is proposed, the remainder to be paid by the applicant. More advanced financing schemes, such as micro-credits will be preferred if these would become operational for the target groups in the course of the Project. ADPP will manage this process and provide support on technical issues and business development.

⁸⁹ EPP = Escola Polivalente e Profissional. This school type was launched by ADPP in 2011 to introduce a new type of education in Angola. The aim of EPP is to graduate well- rounded, knowledgeable, proficient, dynamic young people, who are capable of contributing to development in Angola. Eight EPP schools now exist and in 2015, providing sound and varied education for more than 1.500 young people.

Tentative Budget Breakdown

Budget description			Costs (USD)	
			# units	total cost
Project component 2				
2.1	National consultants	Project leaders and logistical support Kwanza Sul and Huambo	3	109,560
2.1		Students’ incentives	11	33,000
2.2		Project leader Luanda	1	43,440
2.6	International consultant	Charcoal expert (technician)	1	112,320
2.2	Contractual services	Sourcing and collecting materials for briquette production at EPP schools in Luanda	2	4,000
2.2		Installation of briquetting machines with schools EPP Zango and EPP Cazenga and entrepreneurs	12	36,000
2.6		Establishment demonstration centre at FLI Huambo	1	65,000
		Hosting of meetings and staff	14	39,200
		ADPP staff support to implementation, including project visits	1	103,680
		Reporting and supervision	1	103,680
2.1	Materials and equipment	Nursery set-up and tree production Quissala and Kwanza Sul	2	4,400
2.1		Kiln production at Quissala, Huambo and Kwanza Sul	28	24,400
2.1		Other materials for charcoal production in Quissala and Kwanza Sul	1	2,000
		Office equipment and computers	12	4,600
	Miscellaneous	Sundries and communication	35	50,400
	Travel	Local travel	36	72,000
	Subtotal			807,680
	Administration costs (5%)			40,384
	TOTAL COMPONENT 2			848,064
Project component 3				
3.2	Service contract	Annual capacity training of project staff	10	17,500
		Training of participants at FLI Huambo	45	90,000
		Training of EPF students	180	18,000
		Training of EPP students in Quissala, Zango and Cazenga	125	14,000
		Training of key staff FC Kwanza Sul	7	8,750
		Workshops with charcoal producers in Huambo and Kwanza Sul	10	42,500
		Training of briquetting entrepreneurs	10	14,375
		Hosting and implementation of Awareness	36	46,800

		raising events in communities targeting 10,000 people in Quissala, FC in Kwanza Sul and EPP schools in Luanda.		
	Audio Visual and Printing cost	Training material	252	20,160
		Office equipment and computers	3	1,150
	Miscellaneous	Sundries and communication	35	7,200
	Travel	Local travel	12	5,200
	Subtotal			285,635
	Administration costs (5%)			14,282
	TOTAL COMPONENT 3			299,917
GRAND TOTAL				1,147,981



COSPE – COOPERAZIONE E SVILUPPO DEI PAESI EMERGENTI

PILOT PROJECT – CANJOMBE (CS)

TITLE: Promoting a Payment for Ecosystems Services (PES) scheme to reduce charcoal production impact in Canjombe community, Cuanza Sul Province.

Project partners

COSPE - Cooperazione per lo Sviluppo dei Paesi Emergenti is a Florence-based Italian NGO, that has been working in Angola since the 1990s implementing projects in food security, agriculture, environmental protection, empowerment and advocacy for rights of women, youth and rural communities. COSPE, in partnership with Instituto de Desenvolvimento Florestal – IDF is currently implementing a project called “Programa Integrado de Protecção e Desenvolvimento das Florestas Costeiras Angolanas - PIPDEFA” (Integrated program for Angolan Forests protection and development). The objective of this project is the reduction of deforestation due to charcoal production from rural communities in Benguela and Cuanza Sul Provinces, through implementation of participatory forest management plans and promotion of income generating activities as alternative to charcoal production, such as beekeeping, local fruits and roots processing and selling. The project’s first phase was financed by European Union (2011-2014) and a second phase is being financed by the Italian Ministry for Foreign Affairs and Cooperation (2014-2017).

Instituto de Desenvolvimento Florestal de Angola (IDF) is the national entity in charge of promoting Angolan forest development and protection, through forest management plan elaboration, logging licenses emission and technical assistance. COSPE-IDF partnership started in 2001 in the project “Luta contra a desertificação no município de Tombwa (código 2471/COSPE/AGO)” – Fight against desertification in Tombwa Municipality- Namibe Province, financed by the Italian Cooperation during 5 years. Partnership continued in the project “Redução da vulnerabilidade alimentar e ambiental na Província de Namibe” (2008-2011) – Food insecurity and environmental vulnerability reduction in Namibe Province – financed by the European Union. Finally partnership strengthened since 2011 in PIPDEFA project (see paragraph above) in 4 provinces (Bengo, Benguela, Cuanza Sul, Namibe). One of the project’s results was the technical empowerment of provincial IDF departments, in order to improve IDF technicians’ role in promoting a more sustainable management of natural resources at rural community level.

Background

During the PIPDEFA project, participatory forest inventories were realized in the forest areas of target communities. The results obtained from those inventories are used to establish forest management plan with community members, to promote more sustainable forest resources use and management.

Furthermore, a Payment for Ecosystem Services (PES) proposal was presented to PLAN VIVO, a certification organization for voluntary carbon credits market that guarantee respect of community members rights and preservation of biodiversity. This project, to be implemented in Canjombe community, Cuanza Sul Province, aims at reducing Miombo forest degradation through the promotion of ecosystem protection and regeneration practices amongst charcoal producers and other community members. The overall strategy is to integrate forest management practices such as reforestation, improved coppicing, fire control, together with improved charcoal kilns to increase production efficiency, and promoting alternative income generating activities such as beekeeping and agro-ecology to reduce income dependency of rural communities on charcoal. The *Project Idea Note (PIN)* has already been approved by PLAN VIVO⁹⁰ and its proposal is supported by the National Designated Authority in

⁹⁰ Project Idea Note document is available at:

Angola (Climate Change Department), which is the entity under MINAMB that is in charge of the GEF project. The full proposal *Project Development Document (PDD)* will be presented to PLAN VIVO in the next months, and if successfully evaluated and approved by PLAN VIVO, it supposes 5 years long plantation activities and results monitoring (stored carbon) during up to 25 years.

GEF project

This COSPE project is an innovative initiative, being the first PES pilot project in Angola that could be replicated in other communities, thanks to the interest and collaboration of the Ministry of Environment, the involvement and empowerment of IDF, and the participation during training and dissemination activities of national NGOs with expertise in climate change sector.

The GEF project will complement and support this project with the activities related to improved kilns building and testing, training of charcoal producers and IDF staff, implementation of forest protection, regeneration practices and management plans, and support of income generating activities alternative to charcoal. Many synergies exist with the strategy of the GEF project and that of its Responsible Parties. For example the Canjombe pilot project will benefit from ADPP's experience in building and testing Casamance kilns and UJES-IDAF's expertise on participatory forest management. Experts funded by the GEF project will assist COSPE and IDF local technicians in PES implementation, monitoring system, improved kilns building and maintenance. Dissemination activities in Waku-Kungo (Cela Municipality) will be also supported by GEF. On the other hand, COSPE will provide its expertise on Miombo forest biodiversity, propagation and management as well as participatory approach in rural communities. The GEF project offers the opportunity to complement activities, exchange knowledge and experience, and the expected synergies will boost efficiency and efficacy.

Description of project area

Canjombe village is located in the Municipality of Cela, Cuanza Sul Province, around 18 kilometers away from the Huambo-Luanda highway, which is one of the most important roads of the country. The project area is located in the Miombo ecoregion at an altitude ranging approximately from 1,300 to 1,445 m. The mean annual rainfall is equal to 1,240.2 mm/year with a marked seasonality. Rains are concentrated in the period going from October to April, with occasional rainfalls in May and September, while June, July and August are almost completely devoid of precipitations⁹¹.

Water availability is good, since some important rivers and streams border the community area. The biggest one is the Cuvila River that constitutes the southern limit of the community area and where subsistence fishing activities take place.

The Phytogeographical Chart of Angola (Grandvaux Barbosa, 1970)⁹² classifies the area as "Sub-montane Miombo woodlands, savannahs and ongote in ferralitic and similar soils in the central plateau". On the other hand, the software "Useful Tree species for Africa" (Kindt et al., 2011)⁹³ which is based on the "Vegetation Map of Africa", classifies the area as belonging to the "Mapping Unit M25a - Wetter Zambezian miombo woodland (iiZCE)". Actually, considering that the mean annual rainfall of the area is usually above 1,000 mm per year, the area can be classified as wet miombo woodland. During the forest inventory of the area, carried out in the preliminary phase of the project, a total of 74 woody species (trees and shrubs) with diameter at breast height higher than 5 cm were recorded. The most common tree species are *Julbernardia paniculata* (Omúe), *Isobertia angolensis* (Mone) and some species belonging to the genus *Brachystegia*. *Anysohyllaea boehmii* (Lohengo) and, to a lower extent, *Pseudolachnostylis maprouneifolia* (Okunyambambi) are the most common shrub species. It is worth mentioning that the widespread presence of *Anysohyllaea boehmii*, a species producing edible berries, might be due to the

http://www.planvivo.org/wp-content/uploads/PIN_Canjombe_published_2014_7_14.pdf

⁹¹ <http://www.worldclimate.com/cgi-bin/data.pl?ref=S11E015+2100+6626006G1> accessed on the 24/02/2015 - Data derived from the Global Historical Climatology Network ver.1 (GHCN 1). 246 months between 1951 and 1972

⁹² Grandvaux Barbosa L.A. (1970) "Carta fitogeográfica de Angola". Instituto de Investigação Científica de Angola.

⁹³ Kindt, R., Osino, D., Orwa, C., Nzisa, A., van Breugel, P., Graudal, L. & Neufeld, H. (2011). "Useful tree species for Africa: interactive vegetation maps and species composition tables based on the Vegetation Map of Africa". World Agroforestry Centre, Nairobi, Kenya http://www.worldagroforestrycentre.org/our_products/databases/useful-tree-species-africa

importance that the local community attributes to this species. The fruit of *A. boehmii* is commonly marketed at roadside nearby the community.

Canjombe is constituted by six neighbourhoods namely *Banza Canjombe*, *Quianga*, *Canguenda*, *Paxe Canguenda*, *Dumba Lussala* and *Butalamo Lussala*. According to the figures provided by the village chief, the total number of inhabitants of the community is equal to 3,013 people. The number of people settled in each neighbourhood is summarized in table 1. The project will involve mainly the neighbourhoods of Banza Canjombe, Quianga and Canguenda.

Table 1: number of inhabitants settled in each neighbourhood of Canjombe

Bairro	Nº habitants
Banza Canjombe	478
Quianga	668
Canguenda	858
Paxe Canguenda	429
Dumba Lusala	369
Butalamo Lussala	211
Total	3.013

The identified target groups are:

- Small-scale farmers
- Charcoal producers
- Traditional and modern beekeepers
- Women farmers who also collect and process non-wood forest products (NWFPs) such as local fruits and roots
- All inhabitants interested in implementing sustainable land husbandry practices.

It is worth pointing out that the identified groups partly overlap. For instance, small-scale farmers are occasional charcoal makers or beekeepers. The great majority of community members are small-scale farmers, growing crops mainly for self-consumption and, secondarily, for the market. Charcoal makers are usually community members, who produce and market charcoal in periods of economic stress, for example after illness or funerals of relatives, or when they have to pay school fees for their children. However, some charcoal makers, mainly young people, produce great quantities of charcoal and make it their most important income generating activity. Beekeepers represent a key group for the project, since they are interested in preserving and enhancing forest resources.

In the community 2 associations exist: a farmers' association, and a beekeepers and kissangua women producers association (*kissangua* is a traditional drink made from the roots of *Pseudeminia benguellensis* locally called *mbundi*). The latter was founded in 2014 with support from the PIPDEFA project and COSPE in order to promote coordination and collaboration amongst local producers and improve production and marketing of local products as income generating alternatives.

Project objectives

The proposed intervention aims at reducing greenhouse gases (GHGs) emissions in Canjombe Community (Angola) through the establishment of a Payment for Ecosystem Services (PES) scheme. The reduction of GHGs emissions will be pursued through the promotion of Sustainable Forest Management practices.

The main problem that the project aims to address is the high deforestation rate affecting the area. This high rate of deforestation, which is often paralleled or followed by forest degradation, can be attributed to two main drivers: charcoal making and shifting agriculture practices. These two drivers interact mutually to generate a

situation where smallholders are forced to manage unsustainably their forest resources. Indeed, unsuitable farming practices bring along low productivity and the need to augment rural incomes. On the other hand, the only alternative available is the production and commercialization of charcoal, which is in great demand in the main cities of the country (mainly Luanda, Sumbe, Huambo, Benguela).

The **overall objective** of the intervention is to slow down the high deforestation and forest degradation rates that are currently affecting the Angolan woodland.

The **specific objective** of the intervention is to improve the effectiveness of environmentally sustainable forest management practices.

The success of the intervention will depend on an integrated and holistic approach. The promotion of Participatory Forest Management will be the point of departure of the intervention, based on which all foreseen activities have been identified and will be implemented. The forest management plan for the area will be based on a balanced integration of Traditional Ecological Knowledge (TEK) and the most recent findings on Miombo woodland ecology and silvicultural practices. This will enhance the ownership of the project by the local stakeholders and facilitate the monitoring of project activities. Innovations will be promoted when community members acknowledge their suitability and sustainability.

Expected results

A Payment for Ecosystem Services scheme allows Canjombe community to manage forest resources in a more sustainable way;

- Canjombe inhabitants are actively involved in sustainable forest resources management, through the implementation of reforestation, agroforestry and improved charcoal production; and
- Sustainable income generating activities (beekeeping, forest products processing and commercialization) for small farmers are supported.

Expected activities

The following activities are expected to contribute to the achievement of results R1, R2, and R3. Note that the activities 1.2, 2.1, 2.3 and 3.3 will be supported by experts and resources made available by the UNDP/GEF project and coordinated with COSPE; the associated costs are therefore not included in the estimated budget given here. Activity 2.1 will be implemented in collaboration with ADPP to take benefit from their expertise in improved Casamance charcoal kilns building and training, which is expected to be beneficial to COSPE Pilot Project.

- 1.1 Preparation of a distribution plan for income obtained from carbon credits to be distributed among the community members participating to the forest management plan
- 1.2. Training of IDF technicians on a Payment for Environmental Services (PES) scheme, participatory forest management and silvicultural practices.
- 2.1. Training of charcoal producers and community members on improved Casamance charcoal kilns preparation, management and safety.
- 2.2. Testing and building of Casamance kilns with local charcoal producers.
- 2.3. Comparing efficiency of Casamance and traditional kilns.
- 2.4. Organization of participatory community meetings to implement and monitor the participatory forest management plan practices (for example annual maximum logging volume and fire management plans, seedlings multiplication through grafting and planting, local authority designed rules and sanctions);
- 2.5. Establishment of timber and fruit tree nurseries in the target barrios of Canjombe community.

2.6. Planting of timber and fruit trees in a total area of 40 ha during 4 years (using native and naturalized⁹⁴ species).

2.7. Planting of tree corridors along agricultural fields' borders in a total area of 6 ha during 4 years (using native and naturalized species).

3.1. Support of alternative income generating activities: beekeeping and agroforestry (with technical support from the COSPE project team, periodical support of international experts and consultants).

3.2. Monitoring of the development of economic activities and their impact on (cash) income generation.

3.3. Promotional activities and materials to raise awareness on forest protection and sustainable charcoal among producers, consumers, schools, government agencies and other stakeholders of Cela Municipality.

3.4. Inputs to support the reformulation of the national forest management policy with data and information gained from field experiences to be shared with the Ministry of Environment, MINAGRI-IDF and UNDP (in support to outcome 1) in order to promote the inclusion of participatory forest management as a legitimate practice for Angolan woodlands.

Tentative Budget Breakdown

Budget description	Amount (years 1-2-3-4) USD
International Consultants	150,000
Local Consultants	35,000
Travels	45,000
Equipment and Furniture	85,000
Miscellaneous	10,000
Backstopping from HQs	25,000
Total	350,000

⁹⁴ Tree species native from other regions of the world but widely cultivated in Angola. These species will not have negative impact on biodiversity or on the provision of key ecosystem services in the project area and in the surroundings.



University Jose Eduardo dos Santos in Huambo (UJES)

University of Córdoba, Spain (UCO-IDAF)

Project partners

Both universities collaborate under an agreement aimed at strengthening of the education and research capabilities of UJES' Faculty of Agricultural Sciences (FCA).⁹⁵ Through the UCO spin-off IDAF⁹⁶, support is given build capable academic staff within FCA-UJES (at graduate-level, MSc and PhD) and to provide direct assistance to implement the Forestry Engineering curriculum (assignment of expat teachers). In December 2014, a first group of five students graduated, being the first ones in Angola who reached this level (BSc).

Both universities also participate in the EU-funded project "African Network for Education in Energy Resources (ANEER)"⁹⁷, together with the Higher Polytechnic Institute of Gaza, Mozambique (ISPG). The project aims to strengthen academic skills in the field of energy efficiency and to improve the overall management of higher education in Angola and Mozambique, thereby contributing to energy security for local populations, improved energy efficiencies and capabilities to harness local energy resources. The ANEER project aims to increase the technical capacities of the institutions and teachers by introducing new teaching techniques, virtual tools and state-of-the-art programs. Specific modules on EE will be inserted within existing curricula in Forest Engineering and Agricultural Engineering. UJES and IDAF-UCO carry out applied research on the Miombo Ecosystem, which is supportive to IDF's reforestation program.

An agreement with the Institute for Agronomic Research (IIA) from 2012 enables UJES-FCA to make use of the experimental facilities in Chianga (Huambo Province). This facility is a valuable asset for studying the Miombo and its forest species. UJES-FCA and IDAF-UCO have established a plan of activities to study the impact of charcoal production on the Miombo ecosystem and to design and test methodologies for mitigating this impact, including transfer of know-how and engineering skills to implement more sustainable charcoal kilns, measures to improve the regenerative capacity of the woods, and adequate selection of species for biomass energy production.

Planned Activities

GEF funding under the project will be used to initiate and/or expand research into the following subjects:

- 1) Studies of the dynamics and regenerative capacity of Miombo tree species;
- 2) Assessment of the aptitude of various Miombo tree species for charcoal production, and comparison with fast-growing species;
- 3) Transfer of know-how and recommendations to IDF in support of design to recover degraded Miombo areas and reforestation programs;
- 4) Technical and economic assessment of improved charcoal production kilns, including social impact and safety and health aspects; and
- 5) Validation of deforestation rates in the Miombo via remote sensing technology.

Sharing of results, training of key stakeholders, and outreach to IDF and local communities will be a cross-cutting theme, aimed at improving the effectiveness of forest management and reforestation programs in the project

⁹⁵ Faculdade de Ciências Agrárias da Universidade José Eduardo dos Santos (FCA-UJES).

⁹⁶ Centro de Investigaciones Aplicadas al Desarrollo Agroforestal (IDAF-UCO).

⁹⁷ African Network for Education in Energy Resources (ANEER) - FED/2013/320-205. See: www.acp-edulink.eu.

area, as well as the efficiency of the charcoal value chain through adequate selection of wood species and the introduction of more energy-efficient charcoal kilns.

1) Studies of the dynamics and regenerative capacity of Miombo tree species

This line of investigation is focused on the characterization of the Miombo ecosystem through empirical data collection. The Miombo is one of the largest ecosystems of Angola and the main ecosystem in the corridor Huambo-Luanda targeted by the GEF project. Although the Miombo has been studied extensively in other parts of Africa, very few studies exist for Angola. This is an impediment to develop the adequate forest management practices that are needed to sustain charcoal production which is predominantly based on wood species from the Miombo. Accurate knowledge is critical to support policy making and to provide inputs for adequate community-based forest management schemes, including aspects such as: dynamics, annual growth rates, regenerative capacity, stress factors and resilience.

The knowledge gained will support the development of sustainable forest management plans applying forestry techniques to create favourable conditions for regeneration and controlling adverse factors. Moreover, the envisaged work will provide a basis to determine acceptable logging volumes for charcoal production and the design of control measures. Other relevant aspects to be studied include the carbon sequestration rate by species endemic to the Miombo ecosystem and the identification of indicators to support natural resource management by the incumbent authorities in Angola. Finally, the knowledge gained will be shared with key stakeholders including Government agencies increasing their institutional knowledge base.

2) Assessment of the aptitude of various Miombo tree species for charcoal production, and comparison with fast-growing species

This line of work comprises a range of comparative studies into charcoal production based on different Miombo species, including the evaluations of parameters affecting production yield and the release of methane and other gases during the production process. This work will enable identification of the most productive species and the design of guidelines for wood selection to enhance the production process, including economic returns, while reducing pressure on other, lower-yield native species. The outcomes of this work will support the development of exploitation schemes for rural communities and the design of strategies for public entities to recover degraded forest areas.

Another subject addressed under this line of work is to compare carbon production based on Miombo wood species with other fast-growing varieties. The studies envisaged to this purpose will cover, among others, aspects such as energy efficiency of the production chain, conversion rate, forest and/or tree management, release of gases and pollutants harmful to workers and the environment, etc. Similar comparative studies have been carried out successfully in other countries in the region. The outcomes will be shared with local communities and institutions in an attempt to address some prevailing misperceptions as to the use of non-Miombo species for charcoal production. A more rational approach to charcoal production would greatly reduce the pressure on native forests, while favouring the exploitation of the already existing forest estates in Angola which are currently abandoned; in addition, local communities may adopt small-scale plantations based on fast-growing trees for energy production.

3) Transfer of know-how and recommendations to IDF in support of programs for recovery of degraded Miombo areas and reforestation programs

This research line will be focused on the optimization of processes underlying the activities and programs for reforestation and recovery of the Miombo, including the production of native species in nurseries, forest recovery and forestry management techniques. A specific problem of the Miombo is the difficulty to produce high-quality plants of native species in nurseries that exhibit the characteristics required for optimum growth in posterior forestation and reforestation programs. This line of work will comprise studies into plant nursery aspects such as pregermination treatments, substrates, fertilization, and used irrigation systems. Another field of work includes aspects of forest recovery, such as terrain preparation, comparative analysis of planting dates, and planting methods. As a third line of work, conservation methods and treatments will be assessed and tested; the results

thereof will be used to produce manuals for forest management. This activity aims to address one of the main barriers related to forest recovery in Angola, which is the lack of field monitoring and the application of conservation techniques. The objective is to increase the survival and growth of planted trees. The envisaged manuals will facilitate the dissemination of gained knowledge and proven practices, specifically targeting the IDF as the main producer of forest plants in the country and the lead entity in charge of forest recovery. As such, this research line will be directly supportive to increase the effectiveness and impact of the “Estrategia Nacional de Povoamento e Repovoamento Florestal de Angola”.

4) Technical and economic assessment of improved charcoal production kilns, including social impact and safety and health aspects

This line of work will cover activities to support the introduction of innovative charcoal production methods and to characterize production parameters of improved charcoal kilns, primarily their conversion efficiency (yield). Several improved charcoal kiln types (including Casamance) will be procured or constructed and subject to tests under controlled conditions as well as in the field. Comparisons will be made with the currently used production methods and technologies in terms of energy efficiency, economy, productivity, quality of charcoal produced, emission of greenhouse gases and pollutants, impact on soil, etc. The outcomes of this work will be shared with Government agencies and local communities and provide a basis for raising awareness on social impact, worker’s safety and health, and charcoal production as a rational activity.

5) Validation of deforestation rates in the Miombo via remote sensing technology

Modernization of strategies for information collection is one of the key challenges for the public entities in Angola in charge of natural resource management. It is vitally important for them to get involved in modern technologies and methods for assessing deforestation processes through the fast delivery of reliable and verifiable data that can generate timely warnings about the status of forest systems in specific geographic areas. In response, tailored measures can be devised and implemented and its effects monitored. This line of work involves the use of Remote Sensing technology to assess the dynamics of the Miombo ecosystem. Specific activities include spatial and time analysis of forest cover, identification of degradation rates, and the production of thematic maps describing critical areas in the Miombo system in the project area.

Tentative Budget Breakdown

Budget description	Amount USD		
	unit cost	# units	total cost
International Consultants	25,000	4 yr	100,000
Local Consultants	2,500	4 yr	10,000
Travels	5,000	4 yr	20,000
Contractual Services - Companies	60,000		240,000
Equipment and Furniture (laboratory equipment, computers, rent of servers)			50,000
Information technology (satellite imagery)			10,000
Audio Visual & Print Production Cost			10,000
Miscellaneous Expenses	10,000		10,000
Total			450,000