UNHCR Ethiopia

Strategic Plan

Safe Access to Fuel and Energy

Ethiopia Country Strategy (2015-2018)

15 March 2015

"Safe access to fuel and energy stands at the intersection of so many things that are of concern to UNHCR - from protection, to nutrition, to health, to the environment, to livelihoods to education."

Steven Corliss
Director, Division of Programme Support and Management, UNHCR

1 refugee without access to safe and sustainable energy is

too many.

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Acronyms

ARRA	Administration of Refugees and Returnees Affairs
FSS	Fuel Saving Stoves
HAP	Household Air Pollution
HH(s)	Household(s)
HoAREC&N	Horn of Africa Regional Environment Center and Network
IP	Implementing Partner
M&E	Monitoring and Evaluation
RBF	Result Based Financing
RE	Renewable Energy
REEE	Renewable Energy and Energy Efficiency
SAFE	Safe Access to Fuel and Energy
SGBV	Sexual and Gender Based Violence
SL	Solar Lantern
SSL	Solar Street Light
UNHCR	United Nations High Commissioner for Refugees
USD	United States Dollar

CURRENCY EQUIVALENTS

Exchange Rate Effective Date: February 15, 2015
Currency Unit = Ethiopian Birr (ETB)
USD1 = ETB 20.2108
Source: http://www.nbe.gov.et/market/dailyexchange.html

FOREWORD

Sustainable access to energy is a necessary pre-requisite for improving the protection and well-being of refugees and other persons of concern. Any initiative to ensure the protection, well-being and livelihoods of refugees will necessarily require corresponding measures in the area of energy and environment.

Ethiopia is the largest refugee-hosting country in Africa. Currently, there are over 670,000 refugees from different countries sheltered in camps scattered throughout the Country. The physical environment around the camps has been under extreme stress due to the massive influx of refugees. The almost complete reliance on biomass energy for cooking; worsening access to fuelwood around the camps; lack of access to adequate and reliable energy for community services and for productive use are posing significant challenges. Responding to these challenges is our major undertaking. We are committed to ensure that all refugees and other peoples of concern satisfy their energy needs in a safe and sustainable manner.

Specifically, this document sets out six overarching goals: scaling-up energy access, expanding the use of renewable energy, attaining efficient use of energy, achieving sustainable management of environmental and natural resources, unlocking the potential of the private sector in energy service delivery, and strengthening the capacity of the UNHCR and partners to effectively manage energy and environment-related operations. This Strategy outlines how we plan to achieve those.

The strategy was developed through a staged and inclusive process with active engagement of key stakeholders and is built on careful evaluation energy resource potential around refugee camps as well as cost-benefit/effectiveness analyses of alternative options.

Finally, I would like to express our deepest appreciation to the Government of Ethiopia, donors and partners for supporting the cause of UNHCR and to appeal for continued support to enable us realize the objectives set out in this Strategy.

Bornwell Katande
Deputy Representative
15 April 2015

Strategy Overview

Mission

Our mission is to responsibly enable all refugees and other peoples of concern satisfy their energy needs for domestic, community services and productive use by placing renewable energy, energy efficiency and sustainable environmental & natural resource management squarely in the center of our Strategy.

Vision

All household and community energy needs are met in a safe and sustainable manner. ONE refugee without access to safe and sustainable energy is TOO MANY.

Core Values

To achieve our mission and vision, we share the following core corporate values. RESPIRE drives our energy and environment operations:

Result-oriented – All our actions will be directed to delivering results.

Excellence – We consistently perform at the highest standard.

Synergy – We develop and strengthen cooperation and collaborative relationships with a wide range of stakeholders to fulfill our mission and vision.

Preparedness – We integrate energy into emergency planning and response.

Innovation – We promote a culture of innovation and continual learning.

Resource utilization – We strive to use our scarce resources optimally.

Empowerment – We are committed to empowering community, private sector, and partners.

Strategic Objectives

To achieve our mission and vision, our SAFE Strategy will build upon the following six strategic objectives.

Table 1. Ethiopia Country SAFE Strategic Objectives

1	Scaling-up Energy Access	Scale-up access to safe and sustainable energy services for domestic cooking and lighting; community services such as water supply, health care, education, and street lighting; and for productive use.
2	Expanding use of Renewable Energy	Replacing the use of non-sustainable biomass and fossil fuels, expanding access through renewable energy systems and increasing the contribution of renewables in the total energy mix for domestic, community and productive use.
3	Improving Energy Efficiency	Improve energy conversion and end-use efficiency
4	Sustainable environment and natural resource management	Ensuring sustainable management of forest resources and biodiversity conservation
5	Unlocking the Business Potential for Energy Service Delivery	Building a vibrant energy market by catalyzing private sector investment and through targeted business development services and encouraging the development and replication of innovative business models.
6	Capacity Building	Strengthen the capacity of the UNHCR and partners to effectively manage this Strategy through improved staffing, staff training and implementation of an effective M&E system.

The above strategic objectives are at all times to be affected by a number of cross-cutting issues including gender equality, equity, social inclusion (persons with HIV/AIDS, persons with disabilities, older persons, etc.), community empowerment, and capacity building.

1. Introduction

1. The UNHCR has long-realized the fact that sustainable access to energy is a necessary prerequisite for improving the protection and well-being of refugees and other persons of concern. The UNHCR and partners are now more than ever aware that any initiative to ensure the protection and well-being of refugees will necessarily require corresponding measures in the area of energy.

2. The UNHCR also recognizes that given the enormous challenges, the business-as-usual approach is simply no longer workable. There is an urgency to scale-up interventions so that transformational results can be achieved. For this to happen, there is a clear need for a well-articulated strategy. In this regard, the UNHCR's adoption of the Global Strategy for Safe Access to Fuel and Energy (SAFE) in 2014 is an important milestone.

3. The Global SAFE Strategy seeks to improve the protection and well-being of refugee and forms a fundamental pillar of the UNHCR's protection mandate. Specifically, through the Strategy, the UNHCR strives to ensure that all refugees are able to satisfy their energy needs for domestic and community services in a safe and sustainable manner, without fear or risk to their health, well-being and personal security. It also aims to expand access to energy for schools, health centers and other institutions, as well as the planting of trees for fuel provision and environmental protection.

4. The Global Strategy identified the urgent need for developing and adopting country-specific strategic plans to effectively translate the global broad objectives into concrete actions on the ground. Ethiopia is among the first five priority countries to develop SAFE Country Strategies and Action Plans in 2014. This Strategic Plan was developed during June – December 2014 and was formally adopted in February 2015.

5. The Strategy is organized in seven Sections. The following Section outlines the process followed in the development of the Strategy. This is followed by background presentation of the refugee population in Ethiopia in Section 3. A description of the state of the energy access and natural resource development and environmental protection interventions is presented in Section 4.

6. Section 5 deals with evaluation of intervention options including energy resource assessment (bio-energy, solar, wind and national electricity grid extension) around the refugee camps as well as cost-effectiveness of cooking and lighting options. Section 6 outlines the strategic objectives, expected results and the actions that need to be undertaken to achieve the objectives and expected results. The Section also presents the targets and the financing needs in the next four years (2015-2018). Finally, Section 7 defines the strategy implementation arrangement including capacity building for strategy implementation, coordination and monitoring and evaluation mechanism.

7. Annexes include detailed interventions actions including targets, time frame, and budget estimates required in the next 4 years by camp.

2. Process Followed

8. The process that has been followed for developing this Strategy are outlined below.

a) A Strategy Steering Committee consisting of the UNHCR Representation in Ethiopia; The Administration of Refugees and Returnees Affairs (ARRA); Ministry of Water, Irrigation and Energy (MoWIE); Gaia Association; and the Horn of Africa Regional Environment Center and Network (HoAREC&N) was established.

b) An action plan for formulating the Strategy and data collection tools were prepared as per the broad outline contained in the Global Strategy and the guidance provided by ProAct Network, a consultancy firm engaged by the UNHCR to assist and coordinate the Country Strategy development process.

c) Consultation meetings with stakeholders (including refugee households, UNHCR, ARRA, regional and local Government and other partners) were held in selected sample refugee camps by the Steering Committee members.

d) The strategic issues were identified and mission and vision statements were drafted. Then, strategic objectives and the intervention actions to achieve the objectives and the performance indicators thereof were formulated. The baseline and the targets for each indicators were set. Financing requirements were estimated. Implementation plan including M&E mechanism were developed.

e) The first draft Strategy was prepared and presented in the workshop organized by the UNHCR HQ in Nairobi, Kenya.

f) The second draft Strategy was presented in a two-day validation workshop during February 4-5, 2015.

g) This final version of the Strategy incorporating inputs from the workshop was prepared.

9. The UNHCR HQ has been fully involved with this exercise from the beginning and has provided guidance throughout the development of the Strategy. Senior management of the UNHCR Representation in Ethiopia and ARRA were also actively involved. Series of presentations were made to the senior management of the two institutions and their inputs were taken into account.

3. Refugee Population in Ethiopia

11. Ethiopia is the largest refugee-hosting country in Africa. At the end of February 2015, there were 676,064 registered refugees from different countries sheltered in 22 camps scattered throughout the Country. The largest refugee groups are Somalis, South Sudanese and Eritreans.

12. **South Sudanese refugees:** South Sudanese are the largest refugee population in the Country accounting for 38% of total number of refugees. There were 260,465 South Sudanese refugees who either fled violence that erupted in December 2013, or have arrived since 1991 seeking refuge from previous inter-ethnic clashes.

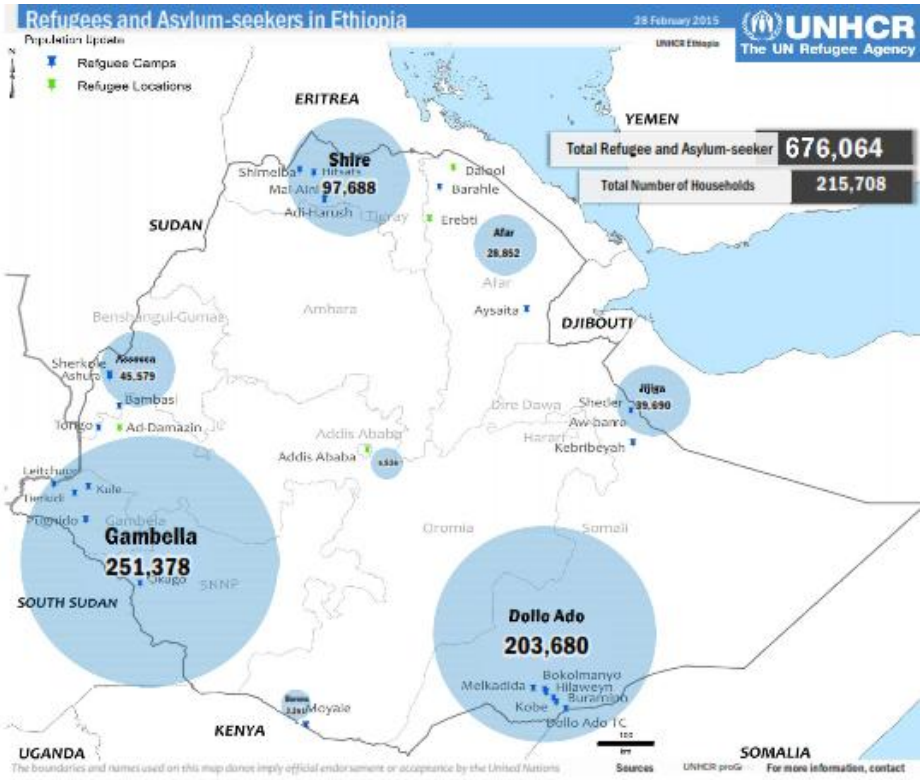
13. South Sudanese refugees are mostly women and children, who need protection and assistance and arrive in often alarming nutritional conditions. South Sudanese refugees are living in camps in the Gambella Regional State in western Ethiopia.

14. **Somali refugees:** There were 244,422 Somali refugees who sought protection in Ethiopia due to insecurity and/or famine at various points between 1990 and 2011. Somali refugees make up 36% of the total number of refugees in the Country. Somali refugees are sheltered in Jijiga and Dollo Ado camps in Somali region, as well as in Addis Ababa.

15. **Eritrean Refugees:** Ethiopia has been hosting Eritrean refugees since the 1998-2000 war with Eritrea. At the end of January 2012, the country hosted nearly 129,816 Eritrean refugees in Shimelba, Mai-aini and Adi-Harush camps in Tigray Region as well as in Berahle, Asayita and other villages in the Afar region, as well as in Addis Ababa and other urban centers. Eritrean refugees account for 19% of total refugees. On average, between 800 and 1000 Eritrean refugees cross the border into Ethiopia every month.

16. Eritrean refugees have a unique profile that is dominated by young, educated and urbanized individuals who find it difficult to adjust to life in a refugee camp. Of late, a large number of unaccompanied minors have been crossing the border on their own.

17. **Sudanese refugees:** There were 5, 259 Sudanese refugees fleeing fighting in the Blue Nile State of Sudan (or Darfur), who live in three camps in the Assosa area in Benishangul-Gumuz region.



Population by Camp/Site & CoO							
Camp/Site	SSD	SOM	ERT	SUD	OTHERS	Total	Camp/Site(%)
Addis Ababa	285	1,052	3,697	46	856	5,936	0.88%
Mai-Aini			18,303		149	18,452	2.73%
Adi Harush			35,934	-	19	35,953	5.32%
Shimelba			6,122	1	230	6,353	0.94%
Hitsats			36,593	1	19	36,613	5.42%
Tigray (OCP)			317			317	0.05%
Aysaita			9,105		2	9,107	1.35%
Barahle			6,591			6,591	0.97%
Erebti*			750			750	0.11%
Dalool*			7,933			7,933	1.17%
Ayne-Deeb*			4,471			4,471	0.66%
Pugnido	54,797			54	8	54,859	8.11%
Kule	46,486			11	3	46,500	6.88%
Leitchuor	18,156				3	18,159	7.17%
Okugo	6,466					6,466	0.96%
Tierkidi	49,319			55	1	49,375	7.30%
Gambella Main Entry Points	31,282					31,282	4.63%
Other Location Gambella**	14,447					14,447	2.14%
Sherkole	1,446			5,753	685	10,884	1.61%
Bambasi	13			14,403	2	14,418	2.13%
Gizan/Ad-Damazin*	7			2,591		2,598	0.38%
Tongo	1,286			10,022	17	11,325	1.68%
Ashura	3,185			3,165	4	6,354	0.94%
Ken-Borena					3,261	3,261	0.48%
Aw-barre		13,053				13,053	1.93%
Kebribeyah		14,714				14,714	2.18%
Sheder		11,918				11,918	1.76%
Bokolmanyo		41,894				41,894	6.20%
Melkadida		43,373				43,373	6.42%
Kobe		39,721				39,721	5.88%
Hilaweyn		39,414				39,414	5.84%
Buramino		39,210				39,210	5.80%
Dollo Ado TC & RC		69				69	0.01%
Total	260,465	244,422	129,816	36,102	5,259	676,064	100.00%
CoO (%)	38.53%	36.15%	19.20%	5.34%	0.78%	100.00%	

Notes:

☞ * Refugees living within host communities

☞ ** Nip-Nip camp=2,888/ Wanthowa has estimated 10,000 SSD and Akula 1,274 (living within host communities)

☞ OCPs: 2,993 in Addis Ababa and 317 in Tigray.

☞ 17,299 individuals in border areas: interviews with some South Sudanese refugees indicate that those with large livestock herds as well as traders and other categories were unwilling to move from border entry locations.

☞ 4,873 new arrivals comprise 623(13%) from Dollo Ado, 3394(70%) from Shire, 708 (15%) from Gambella

Figure 1. Refugee Population in Ethiopia by Location and Country of Origin

4. The State of Energy Access in Refugee Camps

18. Total Energy Access perspective is adopted in the development of this Strategic plan and thus covers domestic/household sector and community services including energy for water supply, health facilities, schools and street lighting. The Sections below deliberate on access to energy services in each of the sectors.

4.1. Domestic Sector

Cooking and Baking

19. Cooking remains the primary domestic energy consumption in the refugee camps in Ethiopia. The majority of refugees in Ethiopia rely almost entirely on traditional biomass for their daily cooking and baking needs (see Table 2). Women are responsible for a much larger share of the collection of the firewood. They spend many hours a day on fuel wood collection. Focus Group Discussions with refugees also revealed that school boys and girls are engaged in firewood collection.

20. Kerosene is used by 9% of the households; 50% of refugee households in Assosa, 38% in Jijiga and 4% in Shire camps. On the other hand, all households in in Kerbibeyah and Aw Barre camps in Jijiga use bio-ethanol use for cooking. The three-stone fire is used by 87% of the households. Among the firewood user households, 1% use rocket stoves.

Figure 2. Left: South Sudanees Refugee baking 'Kirsa' with Miscanthus (Elephant Grass), Kule Camp. Right: Eritrean Refugee baking 'Injera' in grid-connected communal kitchen, Shimelba Camp.

21. Women and girls spend many hours a day on fuel wood collection which exposes them to various forms of sexual and gender-based violence (SGBV). Worsening access to fuelwood is also associated with natural resource-related conflicts with host communities.

22. Many refugee households adopt negative coping strategies to cooking fuel scarcities including undercooking of meals, skipping meals, and exchanging of food ration to purchase cooking fuel. Such negative coping strategies adversely affect the nutritional intake and health of refugees including children.

23. Women and children who spend long periods of time in the kitchen are exposed to high levels of indoor smoke emissions and incident of accidental fire burns. Smoke is one of the largest causes of ill-health and death.

24. Inadequate and worsening access to biomass fuels has resulted in excessive expenditure of time and energy for fuel collection. This reduces available labor for productive activities and affects the school attendance of boys and girls.

Table 2. Distribution of Refugee Households by type of cooking fuel, Cooking devices

Camp	Total Population	Number of Households	Type of Cooking Fuel (%)				Type of Cooking Device (%)				
			Firewood	Kerosene	Ethanol	Electricity	Three-stone	Rocket Stove	Save 80 Stove	Kerosene stove	Clean Cook Stove
Afar											
Berhale	7,261	1,852	100.0	-	-	-	100.0	-	-	-	-
Dallol	7,500	1,860	100.0	-	-	-	100.0	-	-	-	-
Assayta	8,907	2,848	100.0	-	-	-	100.0	-	-	-	-
Ayinedib	3,500	1,481	100.0	-	-	-	100.0	-	-	-	-
Total	27,168	8,041	100.0	-	-	-	100.0	-	-	-	-
Assosa											
Sherkole	10,837	3,717	100.0	-	-	-	80.8	19.2	-	-	-
Bambasi	14,158	3,922	-	100.0	-	-	-	-	-	100.0	-
Tongo	11,138	3,082	-	100.0	-	-	-	-	-	100.0	-
Tsore											
Ashura	6,074	2,463	100.0	-	-	-	100.0	-	-	-	-
Total	42,207	13,184	46.9	53.1	-	-	41.5	5.4	-	53.1	-
Dollo Ado											
Boklomayo	42,439	9,378	100.0	-	-	-	100.0	-	-	55.4	-
Melkadida	44,428	8,600	100.0	-	-	-	100.0	-	-	52.3	-
Kobe	38,762	8,295	100.0	-	-	-	100.0	-	-	60.3	-
Halewein	40,023	8,158	100.0	-	-	-	100.0	-	-	61.3	-
Bur Amino	39,676	8,242	100.0	-	-	-	100.0	-	-	-	-
Total	205,328	42,673	100.0	-	-	-	100.0	-	-	46.2	-
Gambella											
Kule	45,997	12,226	100.0	-	-	-	100.0	-	-	-	-
Terkedi	48,646	12,162	100.0	-	-	-	100.0	-	-	-	-
Pugnido	42,096	10,692	100.0	-	-	-	100.0	-	-	-	-
Okugu	5,996	2,220	100.0	-	-	-	100.0	-	-	-	-
Leitchour/Dimma	40,334	10,084	100.0	-	-	-	34.2	25.8	40.0	-	-
Nipinip	2,192	930	100.0	-	-	-	100.0	-	-	-	-
Total	185,261	48,314	100.0	-	-	-	86.3	5.4	8.3	-	-
Jigjiga											
Aw Barre	12,645	2,147	-	-	100.0	-	-	-	-	-	100.0
Shedder	12,131	2,582	-	100.0	-	-	-	-	-	100.0	-
Keberbeya	15,259	2,129	-	-	100.0	-	-	-	-	-	100.0
Total	40,035	6,858	-	37.6	62.4	-	-	-	-	37.6	62.4
Shire											
Shimelba	6,116	1,231	100.0	-	-	-	100.0	-	-	-	-
Hitsats	24,462	6,116	100.0	-	-	-	99.6	0.4	-	-	-
Mai-Aini	18,482	2,052	-	100.0	-	100.0	-	-	-	100.0	-
Adi-Harush	33,661	5,535.60	100.0	-	-	-	100.0	-	-	-	-
Total	82,721	55,423	96.3	3.7	-	3.7	96.1	0.2	-	3.7	-

Domestic Lighting

25. The majority of the refugees in Ethiopia do not have access to lighting energy. A few use candle, kerosene with low quality wick lamps, dry cell-powered hand torches that provide fewer units of luminescence (lm).

26. A simple, small kerosene wick bottle lamp or a candle provides just 11 lm compared with 1,300 lm from a 100 W incandescent light bulb. The GIZ recommends 300 lm as a minimum 'entry level' of illumination required per household. This can be achieved neither by candles nor kerosene wick lamps, suggesting they are not adequate sources of household lighting.

27. Pollutants from the kerosene wick lamps are dangerous since they are taken more deeply into the lungs. Candles and wick lamps are unsafe and lead to injury and deaths, particularly among women and children.

Device	Open-fire	Tin Lamp	Candle	Torach	Incandescent bulb	Solar Lantern
Fuel	Firewood	Kerosene	Paraffin wax	Dry cell batteries	Electricity	Solar Energy

Figure 3. Main Household Lighting Soures

4.2. Community Services

Energy for Water Pumping

28. Diesel generator sets are used for water pumping in almost all refugee camps in the Country. The UNHCR and partners spend substantial amount on diesel and maintenance of the generators. Figures 4 and 5 show diesel consumption and expenditure on diesel fuel for water supply in selected refugee camps.

29. Although the pump may represent only a small proportion of total installation costs, the on-going costs for maintenance and fuel can be significant, especially with high local fuel costs.

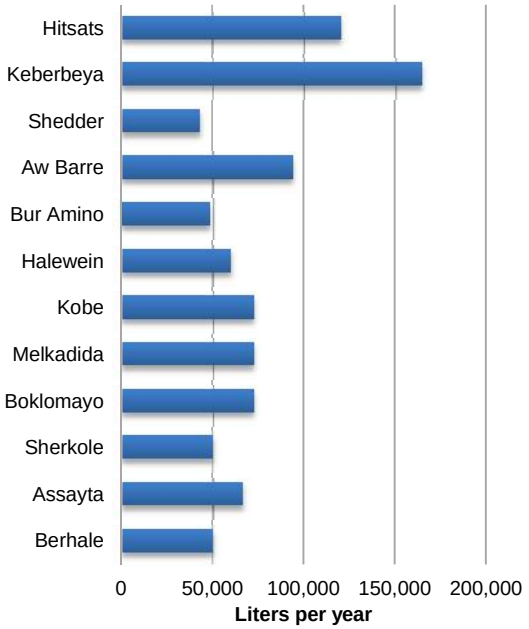


Figure 4. Diesel Consumption for Water Pumping in Selected Refugee Camps

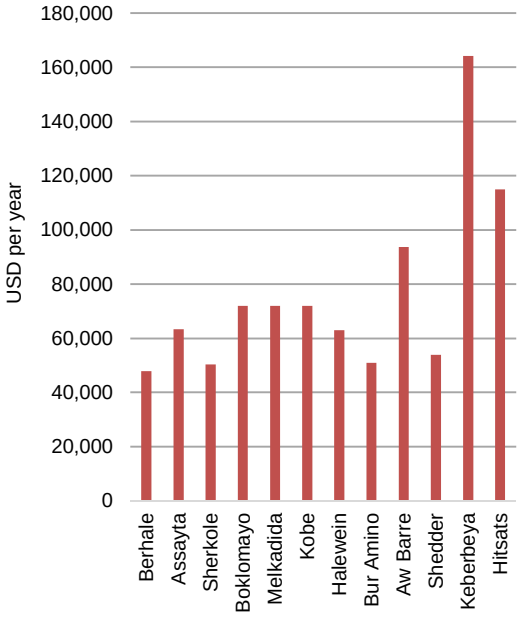


Figure 5. Expenditure on Diesel for Water Pumping in Selected Refugee Camps

Energy for Health Facilities

1 refugee without health care is **too many**.

UNHCR

A critical component of an effective health-care facility is access to energy and needs to be considered alongside investments in infrastructure, as well as staff, equipment, and medicines.

30. The World Health Organization (WHO) states that the right to health can be understood as the right to an effective and integrated health system (WHO, 2007). Ensuring accessible, affordable and clean energy access is critical for delivering adequate health services.

31. Most of the health facilities in the refugee camps in Ethiopia lack of access to reliable energy. Nearly all health facilities rely on diesel generators which provide insufficient and intermittent power supply for power laboratory equipment, refrigeration of vaccines and medicines and sterilization of medical tools. As the generators are used for limited number of hours the health facilities are unable to provide clinical services after sunset.

32. The health facilities do not have access to clean energy for cooking. Most use kerosene and firewood for their in-patient and supplementary feeding programs.

Energy for Schools

1 refugee without education is **too many**.

UNHCR

Access to energy is fundamental to provision of relevant education services.

33. Access to electric lighting allows schools to operate outside daylight hours, extending the working hours for students and teachers. Students without electric lighting at home can stay at school to study and complete homework. Evening classes can also be run for other members of the community. Teachers can prepare for lessons, mark homework, conduct staff meetings and carry out administrative tasks.

34. The schools also rely non-sustainable biomass for cooking for their feeding programs. They spend considerable amount of money on firewood purchase (see Figure 6).

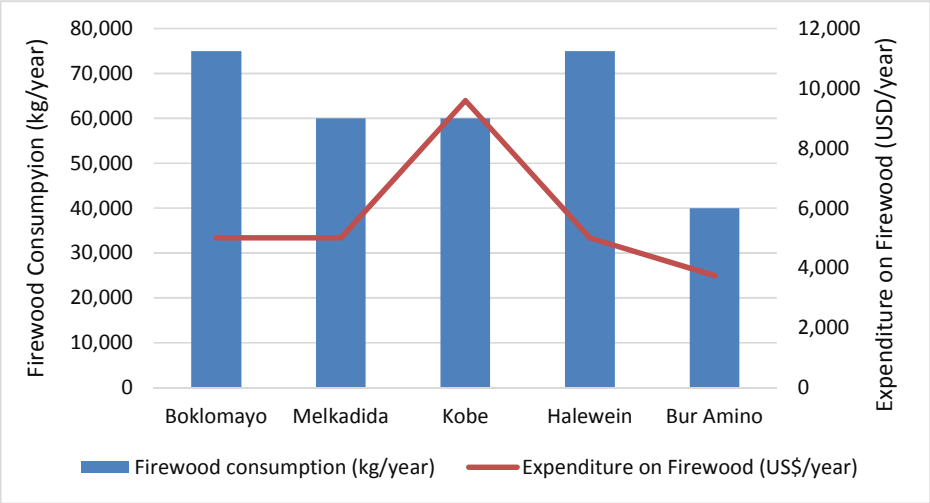


Figure 6. Firewood Consumption and Expenditure for School Feeding Programmes

Street Lighting

35. It is widely acknowledged that street lighting helps promote safety and security, encourages attendance at school, enables economic activity, and brightens social occasions. Lighting can enable markets and food stalls to function more effectively after dark and boost evening activity. Street lights make it easier for health workers and police to respond to emergencies.

36. The vast majority of refugees in Ethiopia do not have access to street lighting (see Table 3). Only a few solar street lights have been installed in Dollo Ado, Jijiga, Shire comps. The solar PVs installed in the camps have proven to be good solutions.

Table 3. Number of Installed and Functioning Street Lights

Region	Camp	Number of Street Lights	
		Installed	Functioning
Afar	Berhale	-	-
	Dalol	-	-
	Assayta	-	-
	Erebti	-	-
Assosa	Sherkole	-	-
	Bambasi	-	-
	Tongo	-	-
	Tsore	-	-
	Ashura	-	-
	Adamazin	-	-
Dollo Ado	Boklomayo	80	72 (90%)
	Melkadida	35	35 (100%)
	Kobe	100	89 (89%)
	Halewein	80	70 (88%)
	Bur Amino	70	66 (94%)
Gambella	Kole	-	-
	Terkedi	-	-
	Pugnido	-	-
	Okugo	-	-
	Leitchour	-	-
Jijiga	Aw Barre	135	125 (93%)
	Shedder	134	129 (96%)
	Keberbeya		
Shire	Shimelba	54	48 (89%)
	Hitsats	53	43 (81%)
	Mai-Ayni #	40	40 (100%)
	Adi-Harush	15	15 (100%)

4.3. Natural Resource Development and Environmental Protection

Environmental Management is a concern for UNHCR as it directly impacts on the well-being and livelihood of refugees.

UNHCR, Environment & Climate Change: An Overview (2014)

37. A number of natural resource development and environmental protection actions being undertaken by the UNHCR and its partners in most of the refugee camps in Ethiopia (see Table 4). These interventions are increasingly addressing the needs of refugees and host communities and complement with Government priorities. However, there exit a number of challenges:

- Scale of intervention limited against the massive natural resource and environmental degradation in and around the camps;
- Excessive dependence on exotic species (over 75%);
- Area enclosure not practiced;
- Weak refugees and host community mobilization in environmental activities;
- Non-integration of fuel-wood plantations except some areas Sherkole (Assosa) and Kobe (Dollo Ado) camps;
- Limited budget and staffing; and
- Weak integration of livelihood activities (such as apiculture and animal fattening) with natural resource interventions.

Table 4. Performance of Natural Resource Development and Environmental Protection Activities

Site/Camp	# of nursery sites	# of seedlings planted	% seedlings survived	Hectare planted	Fuel plantation, ha
Afar					
Berhale					
Dalol					
Assayta	1	19,062	85%	2	
Erebti					
Total	1	19,062	85%	2	-
Assosa					
Sherkole	1	114,130	100%	17	4
Bambasi					
Tongo	1	80,000	94%	2	
Tsore					
Ashura		2,000	100%	6	
Adamazin		10,000	100%	7	
Total	2	206,130	98%	32	4
Dollo Ado					
Boklomayo	-	7,500	80%		
Melkadida	-	10,500	86%		
Kobe	1	73,000	72%	7	5
Halewein	1	60,000	75%		
Bur Amino	-	2,500	75%		
Total	2	153,500	78%	7	5
Gambella					
Kule		25,000	65%		
Terkedi		24,000	55%	10	
Pugnido	1	150,000	85%	60	
Okugo	1	75,000	80%	30	
Leitchour		29,000			
Bonga		75,000	86%	30	
Total	2	378,000	74%	130	-
Jijiga					
Aw Barre	1	18,140	85%	24	-
Shedder	1	31,204	76%	24	-
Keberbeya	1	34,280	86%	26	-
Total	3	83,624	82%	74	-
Shire					
Shimelba	1	254,700	79%	30	
Hitsats	1	100,000	93%	10	
Mai-Ayni	1	265,126		41	
Adi-Harush	1	270,402		46	
Total	4	890,228	86%	127	-

5. Evaluation of Intervention Options

5.1. Intervention Options

38. No single energy technology, whether electricity, bio-energy, wind, solar energy, etc., can meet all the energy requirements of refugee camps. There will have to be a 'mix' of sources, each component (or more) of which should be designed to match a specific end-use (energy-consuming task).

39. A realistic energy strategy would be based on careful analyses of the costs and benefits of all energy supply options (renewable and non-renewable energy sources) as well as demand-side management options. These include petroleum fuels distribution networks, electrification (through non-grid or standalone systems such as the Solar Home Systems, decentralized local grid systems using diesel generators, wind/diesel/solar hybrid systems and other renewable energy systems, or through extension of the national grid), and bio-energy supply enhancement and efficiency improvement. The main intervention options that may be considered along with their sector-wise applications are indicated in the Figure 7.

Figure 7. Intervention Options by Energy Source, Technology and End-use

Sector	Households					Health		Education			
Option / **End-use**	Cooking	Baking	Lighting	Emergency feeding	Water Supply	Power & Lighting	Cooking	Power & Lighting	Cooking	**Street Lighting**	**Small Business**
Petroleum products	☑	☐	☐	☑	☑	☑	☑	☑	☑	☑	☑
Solar Energy											
Photovoltaic	☐	☑	☑	☐	☑	☑	☐	☑	☐	☑	☑
Solar cookers	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Wind Energy											
Wind turbines (electricity)	☑	☑	☑	☑	☐	☑	☐	☑	☐	☑	☑
Water pumps	☐	☐	☐	☑	☑	☑	☐	☑	☐	☐	☐
National grid-extension	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Bio-energy interventions											
Fuel-wood	☑	☑	☐	☑	☐	☐	☑	☐	☑	☐	☑
Bio-ethanol	☑	☐	☐	☐	☐	☐	☑	☐	☑	☐	☑
Briquettes/pellets	☑	☑	☐	☑	☐	☐	☑	☐	☑	☐	☑
Biogas	☑	☐	☐	☐	☐	☐	☑	☐	☑	☐	☑
Fuel-efficient Stoves											
Rocket/Save 80	☑	☑	☐	☑	☐	☐	☑	☐	☑	☐	☑
Babington Stove	☐	☐	☐	☑	☐	☐	☑	☐	☑	☐	☑

5.2. Energy Resource Assessment around Refugee Camps

Bio-energy Energy Resources

40. Ethiopia's biomass energy resource potential is considerable. Available data indicate that the woody biomass stock is estimated at 1,149 million tons with annual yield of 50 million tons in the year 2000. Owing to rapidly growing population, the country's biomass energy resource has been depleting at an increasingly faster rate. It is estimated that between 1990 and 2000, Ethiopia lost an average of 140,900 hectares of forest per year.

41. Demand for wood fuels is growing rapidly while the supply base for wood fuels is shrinking. In more than two-thirds of the Districts in the Country wood fuel consumption surpasses sustainable supply and in a quarter of Districts wood-fuel consumption is more than twice the sustainable supply. As can be observed from Figure 8, the northern highlands and eastern lowlands where most refugee camps are located have severe woody biomass deficits.

Figure 8. Forest Cover in Ethiopia

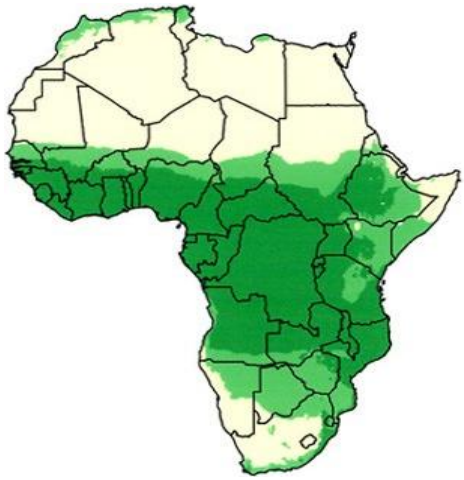


Figure 9. Other Bio-energy potential in Ethiopia

42. In contrast to the woody biomass, the Country has considerable bio-energy resources (see Figure 9). These can be effectively utilized for cooking by refugee household. Briquettes and pellets can be produced in significant volumes around the refugee camps: in Gambella using *Miscanthus* (elephant grass), in Assosa using bamboo and in Tigray using sesame stalk.

43. The production of bio-ethanol from molasses by the existing and under construction sugar factories is expected to increase several folds: from nearly 30 million liters to about 350 million in two to three years. As discussed in previous sections, ethanol is used for cooking by refugee households in Kebribeyah and Aw Barre camps in Jijiga region. Bio-ethanol has the potential to fully displace kerosene for cooking.

Solar Energy

44. Ethiopia, similar to countries located in the tropics, has great potential for utilization of solar energy. The average solar radiation is about 5.26 kWh/m^2 /day. This potential however varies from season to season, with lowest potential being 4.55 kWh/m^2, and the highest potential being about 6.25 kWh/m^2 (see Figures 10 and 11).

45. The application of solar energy in Ethiopia has grown over the past years for telecommunications repeater stations; solar home systems mainly for lighting rural households; health centers health posts for lighting and small power needs; schools for lighting and small power demand (10.5 kW installed capacity); water pumping, and water heating.

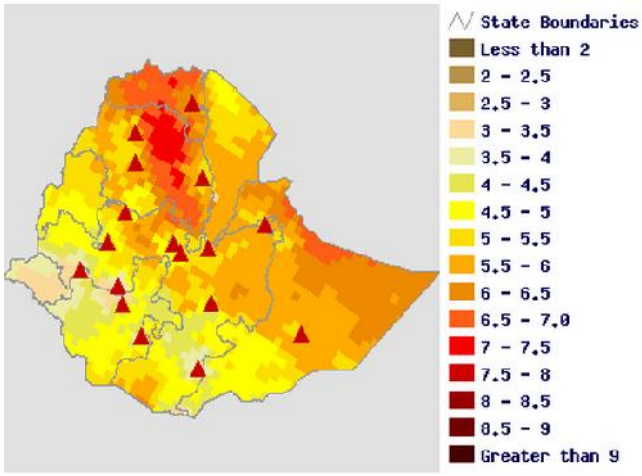


Figure 10. 40 KM Solar Concentrators, kWh/m^2/day)

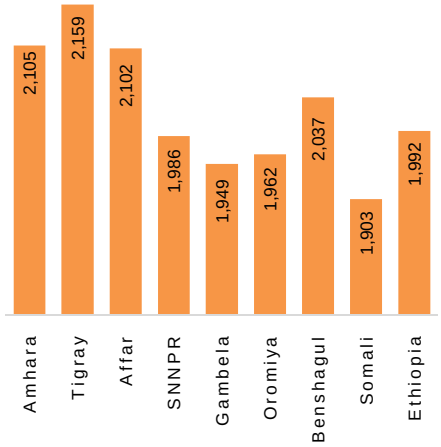


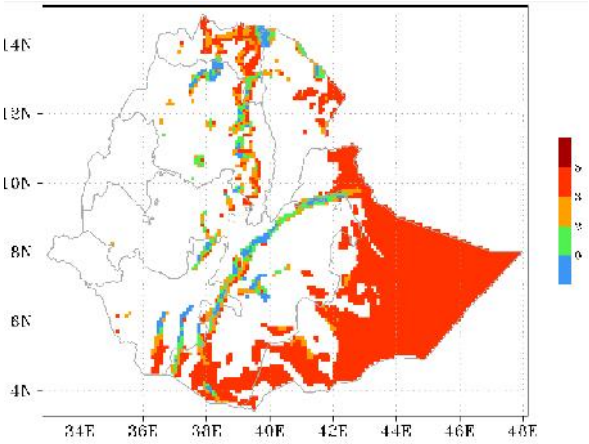
Figure 11. Average solar density (kWh/(m^2/annum)

46. Compared to hydro resources, which provides the bulk of the generation capacity, the total exploitation level of solar energy looks insignificant. However, the energy demands being addressed through solar installations are vital, serving remotely located communities, schools and health centers that otherwise would not have been served.

47. Solar energy resource is more or less equally distributed all over the country and throughout the year and therefore offers a great potential to meet the energy needs of refugee households and small businesses as well as for community services in terms of various PV-based technologies such as mobile solar system, solar home system, battery charging stations and mini-grids. Solar power can be expected to significantly address the challenges for energy access and reduce fossil fuels (diesel and kerosene) consumption.

Wind Energy

48. Ethiopia's wind energy potential is estimated to be 100,000 MW with velocities ranging from 7 to 9 m/s. Wind energy is highly variable over the terrain mainly as a function of topography of the Country (see Figure 12). The western highlands of Ethiopia are relatively wind poor regions, while the eastern low lands, the area bordering Djibouti and Somali Region exceed 200 W/m^2 in height of 10m and exceed 400 W/m^2 in height of 50m, indicating rich wind energy resource.



Wind Class Classification

Wind resource category	Wind Class	Wind Power density (w/m2)	Wind speed @ 50m (m/s)
Poor	1	50-200	3.5 - 5.6
Marginal	2	200-300	5.6 - 6.4
Moderate	3	300-400	6.4 - 7.0
Good	4	400-500	7.0 - 7.5
Excellent	5	500-600	7.5 - 8.0
Excellent	6	600-800	8.0 -8.8
Excellent	7	> 800	>8.8

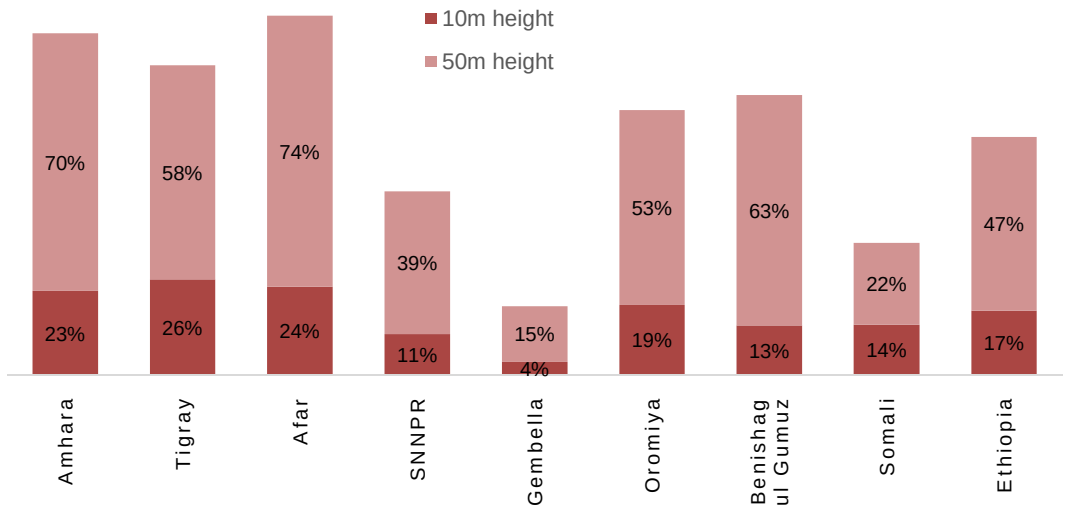


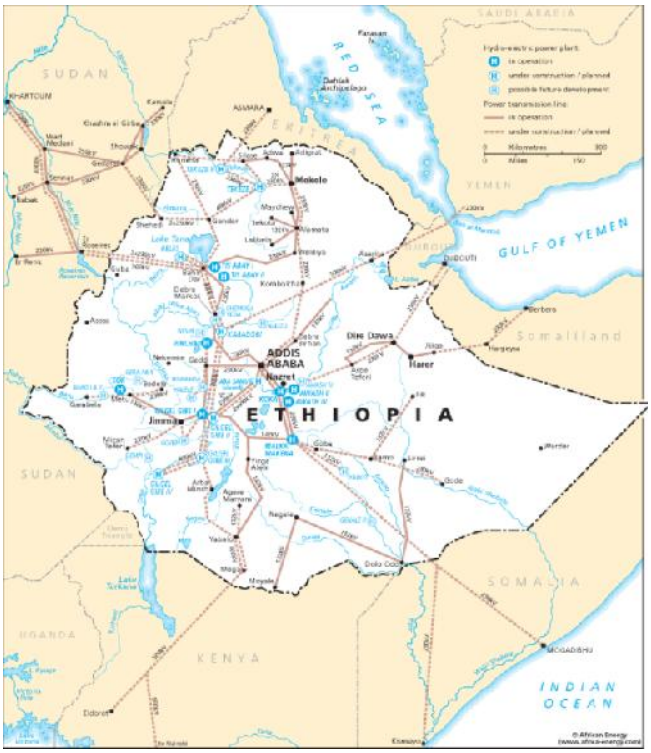
Figure 12. Wind Resouce and Area Suitable for Small-scale Off-grid Power Generation

49. The area suitable for small-scale off-grid power generation is relatively huge in each state of Ethiopia where refugee camps are located. This offers opportunities for power generation and potable water pumping in the refugee camps.

Grid Electricity Connection

50. Currently there are 12 hydropower plants with a total installed capacity of 2178 MW, amounting to an average generation capability of 7,722 GWh/year. The Country's installed electricity generating capacity is expected to reach 10,000 MW by the end of 2014/15. Three major hydropower plants, Gibe III (1870 MW), Grand Ethiopian Renaissance Dam (6,000 MW), and Genale Dawa III (265 MW) are under construction.

51. Three refugee camps (Mai Ayni and Adi Harush in Shire and Kebribeyah in Jijiga) are connected to the national grid. The Ethiopian Government's plan to expand power generation capacity and the ICS, which accounts for about 99% of the electricity supply, offer favorable conditions for grid extension to the refugee camps. Twelve of the camps are very close (just 0-6 km) to the nearest grid-connected towns and are therefore feasible for grid connection (see Figure 13).



Camp	Grid-connected?	Grid connection planned?	Distance from Gird (km)	Grid connection Feasible?
Afar				
Berhale	No	No	60	No
Assayta	No	No	6	Yes
Assosa				
Sherkole	No	Yes	0	Yes
Bambasi	No	Yes	2	Yes
Tongo	No	Yes	1	Yes
Tsore	No		2	Yes
Dollo Ado				
Boklomayo	No	No	300	No
Melkadida	No	No	300	No
Kobe	No	No	300	No
Halewein	No	No	300	No
Bur Amino	No	No	300	No
Gambella				
Kule	No	Yes	2	Yes
Terkedi	No	Yes	2	Yes
Pugnido	No	No	110	No
Leitchour	No	No	130	No
Jijiga				
Aw Barre	No	Yes	3	Yes
Shedder	No	Yes	1	Yes
Keberbeya	Yes	Yes	0	Yes
Shire				
Shimelba	No	Yes	5	Yes
Hitsats	No	Yes	1	Yes
Mai-Aini	Yes			
Adi-Harush	Yes			

Figure 13. Feasibility of gird Extension to Refugee Camps

5.3. Cost Effectiveness of Alternatives

Relative Costs of Cooking

52. The relative costs of cooking on a useful energy basis for alternative cooking fuels (firewood, briquettes/pellets, kerosene and bio-ethanol) using traditional and fuel-saving cooking devices (three-stone fire and rocket stove for fuelwood, and wick stove and Babington (BAB) stove for kerosene) is summarized in Table 5. The average price of fuelwood and briquettes/pallets is estimated at USD 0.15 per kg. The costs of kerosene and bio-ethanol (including purchase prices and transport costs to camps) are estimated at USD0.91 and 0.60 per liter, respectively.

53. The findings from the above analysis are the following:

a. Briquette is the cheapest cooking energy source (USD7.00/month) followed by kerosene with the Babington stove (USD8.00/month) and firewood with a fuel-efficient rocket stove (USD9.00/month).

b. Firewood with three-stone fire is the most expensive (USD21.00 per month) followed by kerosene in a wick stove (USD14.00/month).

c. Among modern fuels, kerosene with the Babington stove is the cheapest. Although ethanol has the least energy cost (USD0.60/liter) than kerosene (USD0.91/liter), two factors have made cooking with kerosene with Babington stove the cheapest: (i) higher efficiency of the Babington stove (90%) in contrast to that of the Cleanook Stove (60%); and (ii) higher energy content of kerosene (35.3 MJ/liter) than ethanol (24 MJ/liter).

d. Cooking with kerosene in a wick stove will be expensive (USD14.00 per month) 40% higher than with ethanol.

Table 5. Relative costs of cooking on a useful energy basis

Fuel Type	Firewood		Briquette	Kerosene		Bio-ethanol
Cooking Device	3-stone	Rocket	Briquette	Wick	BAB	CCS
Fuel Unit	kg	kg	kg	Liter	Liter	Liter
Price of fuel USD/unit	0.15	0.15	0.15	0.91	0.91	0.60
Energy content (MJ/unit)	15	15	19	35.3	35.3	24
Price of stove, USD	0	25	25	20	150	50
Life stove (years)	0	4	4	5	10	10
Efficiency of stove, %	10	25	25	42	90	60
Useful energy MJ/unit	1.5	3.8	4.8	14.8	31.8	14.4
Annualized capital cost (CRF@10%)	-	7.9	7.9	5.3	24.4	8.1
Fuel cost, USD/year	256	102	81	157	73	107
Expenditure, USD/year	256	110	89	162	98	115
Expenditure, USD/month	21	9	7	14	8	10
Index: fuel wood =1	1.00	0.43	0.35	0.63	0.38	0.45
Rank	6	3	1	5	2	4

Notes: Discount rate of 10%/year is used to annualize stove costs.
Annual Fuel wood consumption is based on 7 kg/HH/day

Relative Costs of Domestic Lighting

54. The relative costs are analyzed for different forms of lighting ranging from traditional kerosene lamps, candles and flashlight or torch to incandescent bulb and portable solar lanterns.

55. The findings from the above analysis (see Table 6) are the following:

a. The monthly costs range from USD1.07/month for a portable solar lantern under a fee-for service model to $5.00/month for diesel generator-connected incandescent lamps.

b. Among modern lighting alternatives, solar lantern is the cheapest and among the traditional fuel-based options candles are expensive (USD3.00/month).

56. The relative annualized life cycle cost analysis clearly reveals that solar lantern is the cheapest alternative. Again, among the three alternative delivery models considered, the fee-for-service model where a central solar charging center (the key features of which are described in Figure 14) offer a least-cost option.

Table 6. Relative Costs of Various Types of household Lighting

	Kerosene wick lamp	Candle	Torch	Incandescent bulb	SL with PV module	SL without PV/Rental	SL Fee-for-service
Performance							
Light output (lumens)	15	10	20	225	78	78	78
Light production ('000 lumen hours/year)	21.9	14.6	29.2	328.5	113.9	113.9	113.9
Capital Costs							
Initial cost	0.5	0	2	0.5	42.4	0	20.8
Useful Life, years	1	0	1	1	3	0	3
Annualized capital cost (CRF@10%)	0.55	-	2.20	0.55	17.05	-	8.36
Operating Costs							
Energy consumption/month	2 liters	15 pieces	4D Alkaline				
Operating costs per month, USD	2	3.0	2.4	5.0	0	3.0	0.38
Operating cost per year	24	36	28.8	60	0	36	4.5
Annualized Life Cycle Cost (ALCC), USD	24.55	36.00	31.00	61	17.05	36.00	12.86
Monthly cost, USD	**2.05**	**3.00**	**2.58**	**5.00**	**1.42**	**3.00**	**1.07**
Cost of light (USD/'000 lumen hours)	1.12	2.47	1.06	0.18	0.15	0.32	0.11
Rank	**6**	**7**	**5**	**3**	**2**	**4**	**1**

6. Objectives, Actions, Targets and Financing Needs

6.1. Objectives, Actions and Targets

57. The Strategy seeks to address the various challenges related to energy access in refugee camps. These challenges are linked to protection, relations between host and refugee populations, environment and natural resources, livelihood, health, and education. Specifically, the Strategy is anchored in six strategic objectives:

1. Expanding energy access,
2. Renewable energy,
3. Energy efficiency,
4. Natural resource and environment,
5. Energy Enterprise, and
6. Capacity building.

58. The objectives, expected results, enabling actions and targets for each of the above strategic objectives are outlined below.

STRATEGIC OBJECTIVE 1 - ENERGY ACCESS

Objective

Lack of access sustainable energy services is a major challenge in the refugee camps in Ethiopia. The objective is to address all household and community energy needs.

Expected Results

1. The number of households with access to safe and sustainable energy for cooking and lighting and productive use is increased
2. The proportion of health facilities with adequate and reliable electricity services for 24 hours per day is increased
3. The number of schools with access to adequate and reliable electricity services is increased
4. The number of households with access to street lights is increased

Enabling Actions

1. Promote and enable households to use safe and sustainable energy for cooking and lighting
2. Enable electricity supply to health facilities and schools
3. Adopt and enforce standard requiring newly constructed health facilities and schools to integrate energy as part of the construction works
4. Install street lights in camps
5. Amend solar street lighting procurement rules to include mandatory maintenance and repair services after warranty periods

Table 7. Energy Access Actions, Performance Indicators, Baseline and Targets

Strategic Objective	Actions	Performance Indicator	Unit of Measure	Baseline (2014)	Target				
					Total (2015-2018)	2015	2016	2017	2018
Scale-up access to safe and sustainable energy services for domestic cooking and lighting; community services	Promote and enable households to use safe and sustainable energy for cooking and lighting	HHs cooking with solid biomass	%	91%	25%	70%	65%	45%	25%
		HHs using open-fire for cooking	%	87%	0%	60%	40%	20%	0%
		Households with access to lighting	%	12%	100%	25%	50%	75%	100%
	Enable electricity supply to health facilities	Health facilities with access to electricity for 24 hours a day	%	-	50%	0%	25%	25%	50%
	Enable electricity supply to schools	Schools with access to reliable electricity	%	-	50%	0%	25%	25%	50%
	Adopt and enforce standard requiring newly constructed health facilities and schools to integrate energy as part of the construction works	Standard adopted and enforced requiring newly constructed health facilities and schools to integrate energy	Number	1	1	1			
	Install street lights	Population with access to street lights	%	21%	70%	34%	40%	55%	70%
		Amend solar street lighting procurement rules to include mandatory maintenance and repair services after warranty periods	Number	1	1	1			

STRATEGIC OBJECTIVE 2 – RENEWABLE ENERGY

Objective

To replace non-sustainable biomass and fossil fuels consumption with renewable energy and increase the share of renewables in the total energy mix. Renewable energy of major focus of this Strategy are bio-energy (ethanol, briquettes), solar energy, wind power and connection to the hydro-based national grid

Expected Results

1. Reduced dependence on non-sustainable biomass and on fossil fuels
2. The proportion of households using renewable energy for cooking and lighting is increased
3. The proportions of health facilities and schools using sustainable cooking fuels are increased

Enabling Actions

1. Promote and enable substitution of non-sustainable biomass and kerosene with bio-ethanol and briquettes and for cooking by households, health centers and schools
2. Promote and enable the substitution of fuel-based lighting (kerosene lamp, candle, etc.) with solar lanterns
3. Enable the substitution of diesel use for water pumping with solar PV, wind energy and grid electricity
4. Adopt and enforce standard requirements requiring newly constructed water supply schemes, health facilities and schools to integrate renewable energy

Table 8. Renewable Energy Actions, Performance Indicators, Baseline and Targets

Strategic Objective	Actions	Performance Indicator	Unit of measure	Baseline (2014)	Targets				
					Total (2015-2018)	2015	2016	2017	2018
Replace non-sustainable biomass and fossil fuels with renewable energy	Enable substitution of non-sustainable biomass and kerosene with bio-ethanol and briquettes for cooking by households, health centers and schools	HHs using ethanol fuel for cooking	Number	4,276	17,033	10,258	16,229	16,631	17,033
		HHs cooking with briquettes	Number	-	57,614	-	40,569	57,614	57,614
		Health facilities with feeding programs using alternative fuels	%	10%	100%	-	50%	100%	100%
		Schools with feeding programs using alternative fuels for cooking	%	0%	100%	-	50%	100%	100%
	Enable substitution of diesel use for water pumping with solar PV, wind or hybrid systems	Water supply schemes using solar/wind/hybrid systems	%	0%	50%	-	10%	30%	50%
	Adoption and enforcement of standard requirements requiring newly constructed water supply schemes, health facilities and schools to integrate renewable energy	Standard Requirements adopted and enforced to require newly constructed water supply schemes, health facilities and schools to integrate renewable energy	Number	1	1	1			

STRATEGIC OBJECTIVE 3 - ENERGY EFFICIENCY

Objective

To promote energy efficiency in households, health facilities, schools and businesses

Expected Results

1. The proportion of refugee households using improved stoves is increased
2. Proper utilization of fuel-saving stoves
3. The number of households using sustainable lighting sources is increased

Enabling Actions

1. Adopt and enforce Global Quality Standards for improved stoves and solar lanterns
2. Promote and enable the use of fuel-saving stoves by households
3. Provide training on kitchen management practices for households
4. Promote and enable the use of electrified communal kitchens
5. Enable the use of fuel-efficient Babington stoves by health centers, schools and for emergency operations

Table 9. Energy Efficiency Actions, Performance Indicators, Baseline and Targets

Strategic Objective	Actions	Performance Indicator	Unit of Measure	Baseline (2014)	Targets				
					Total (2015-2018)	2015	2016	2017	2018
Promote energy efficiency in households, health facilities, schools and businesses	Adopt and enforce Global Quality Standards for Fuel Saving Stoves (FSS)	Quality Standards adopted and enforced for FSS	Number	-	1	1	-	-	-
	Adopt and enforce Global Quality Standards for solar lanterns	Quality Standards adopted and enforced for SL	Number	-	1	1	-	-	-
	Enable the use of FSS by HHs	HHs using FSS	%	5%	70%	15%	30%	50%	70%
	Provide training on kitchen management practices and proper utilization of FSS technologies	Persons trained in kitchen management and cooking practices and proper utilization of technologies	Number	-	218,832	-	87,315	153,072	218,832
	Enable the use of grid-connected communal kitchens	HHs with access to grid communal kitchens	Number	7,588	22,573	14,934	22,573	22,573	22,573

	Enable use of fuel-efficient Babington stoves by health centers, schools and in emergency operations	Schools with feeding programs using Babington stove	%	-	50%	-	25%	50%	-
		Health facilities feeding program using Babington stove	%	-	50%	-	25%	50%	-
		Babington stoves stand-by for emergency operations	Number	-	10	5	10		-
		Contingency budget for purchase of diesel/kerosene for emergency operations	Amount (USD)	-	450,000	-	450,000	-	-

STRATEGIC OBJECTIVE 4 – ENERGY ENTERPRISE & MARKET DEVELOPMENT

Objective

To unlock the potential of the private sector in addressing the challenge of expanding access to low-cost, clean and sustainable energy for households and businesses and develop a vibrant energy market

Expected Results

1. The number of local private/community renewable energy enterprises (improved stoves, briquettes, solar technologies, etc.) is increased
2. Private sector capacity for renewable energy technology adaptation, development, testing, production and maintenance is increased
3. Increased and equitable access to efficient and reliable energy services among HH, SME's and communities through innovative business models
4. Increased employment and income-generating opportunities

Enabling Actions

1. Pilot and demonstration projects that prove the viability of innovative renewable energy and energy efficiency and/or innovative business models that could be replicated by private sector
2. Provide targeted business development services- market opportunity study, business plan preparation, market information, promotion,
3. Technical and business training

4. Overcome the critical private sector funding gap through targeted capital grant to developers with promising technological and innovative business-models
5. Promote business linkage (suppliers: input, technology, etc.)
6. Implement results-based financing approaches

Table 10. Energy Enterprise & Market Development Actions, Performance Indicators, Baseline and Targets

Strategic Objective	Actions	Performance Indicator	Unit of Measure	Baseline (2014)	Targets				
					Total (2015-2018)	2015	2016	2017	2018
To unlock the potential of the private sector in expanding access to low-cost, clean and sustainable energy for households and businesses and develop a vibrant energy market	Provide targeted BDS: market opportunity study/ business plan preparation	Market opportunity studies/business plans prepared	Number	-	1	-	1	-	-
	Technical and business training	Persons trained	Number	-	200	-	100	50	50
	Overcome private sector funding gap through targeted capital grant	Capital grants disbursed to private sector	Amount (USD '000)	-	2,769.2	1,414.2	1,005.0	350.0	-
	Provide market development support: market information and promotion	Market promotions undertaken	Number	-	12	-	6	3	3
	Implement results-based financing (RBF)	RBF Studies undertaken	Number	-	3	-	1	1	1
		RBF funding	Amount (USD '000)	-	1,000.0	-	250.0	250.0	500.0

STRATEGIC OBJECTIVE 5 – SUSTAINABLE ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT

Objective:

To ensuring sustainable management of forest resources and biodiversity conservation

Enabling Actions

1. Afforestation of degraded areas and camp greening
2. Rehabilitation of gullies and degraded areas with physical structures
3. Awareness raising on environmental issues
4. Livelihood projects to be integrated with environmental activities
5. Gabion wall construction
6. Area enclosure

Table 11. Natural Resource and Environmental Protection Actions, Performance Indicators, Baseline and Targets

Strategic Objective	Actions	Performance Indicator	Unit of Measure	Baseline (2014)	Targets				
					Total (2015-2018)	2015	2016	2017	2018
Ensure sustainable management of forest resources and biodiversity conservation	Afforestation/ Reforestation of degraded areas and camp greening	Land reforested	Hectare cumulative	373	705	455	530	610	705
	Rehabilitation of gullies with physical structures	Area Rehabilitated with physical structures	M^3	-	27,000	12,000	17,600	24,000	34,000
	Awareness raising on environmental issues	Person aware of environmental issues	Number	-	36,000	14,500	24,500	34,500	45,000
	Livelihood integrated with environmental interventions	Person engaged in livelihood activities	Number cumulative	-	2,150	800	1,310	1,900	2,550
	Gabion wall construction	Gabion wall constructed	M3	-	4,000	2,300	2,900	3,700	5,000
	Area enclosure	Area enclosed	Hectare cumulative	-	145	52	90	130	170

STRATEGIC OBJECTIVE 6 – CAPACITY BUILDING

Objective

To strengthen the technical and management capacity of UNHCR and partners to effectively implement this Strategy

Expected Results

1. Enhanced implementation capacity and quality of results
2. Improved resource mobilization
3. Improve monitoring and evaluation

Enabling Actions and Targets

1. Address staffing gap within the UNHCR recruitment of Energy, environment and M&E Expert
2. Train UNHCR and IPs staff in energy, energy need assessment, resource assessment, innovative delivery models, resource mobilization and project proposal development, Business Development Support
3. Establish and operationalize an effective M&E system

Table 12. Capacity Development Actions, Performance Indicators, Baseline and Targets

Strategic Objective	Enabling Actions	Indicator	Unit of measure	Baseline (2014)	Targets				
					Total (2015-2018)	2015	2016	2017	2018
Strengthen the technical and management capacity of UNHCR and partners to effectively implement SAFE Strategy	Address staffing gap within the UNHCR recruitment of Energy, environment officers in Sub Offices, Renewable Energy Officer, and M&E officer in Addis Ababa Office	Energy and Environment Officer recruited	Number	-	6		6		
		Renewable energy officer recruited	Number	-	1		1		
		M&E Officer recruited	Number	-	1		1		
	Training of UNHCR and IPs staff in energy, resource mobilization, proposal development, Business Development Support	Staff of the UNHCR and Partners trained	Number	-	100	50		50	
	Establish an effective M&E system	M&E system developed and operationalized	Number	-	1				

59. The implementation of the actions contained in this Strategy will achieve the targets outlined below.

a) 70% of households have access to renewable energy sources for cooking (bio-ethanol, briquettes and grid-electrified communal kitchen) displacing non-sustainable fuelwood;
b) 70% households have access to fuel saving stoves;
c) 70% of households have access to modern energy (solar PV) for domestic lighting;
d) 50% of water supply schemes use renewable energy (solar, wind or hybrid systems);
e) 50% of health facilities and schools have access to reliable electricity; and
f) 70% population has access to street light.

60. Table 13 summarizes the targets by fuel type and camp.

Table 13. Summary of Targets for domestic energy (2015-2018)

Camp	Total # of persons	Total # of HHs	% of households using…					
			Ethanol	Briquette	Kerosene	Communal kitchen	Fuel Saving Stove	Solar Lantern
Afar								
Berhale	7,261	1,852	30%	0%	0%	0%	70%	100%
Dalol	7,500	1,860	30%	0%	0%	0%	70%	100%
Assayta	8,907	2,848	30%	50%	0%	0%	70%	100%
Ayinedib	3,500	1,481	30%	0%	0%	0%	70%	100%
Total	27,168	8,041						
Assosa								
Sherkole	10,837	3,717	100%	0%	0%	100%	0%	100%
Bambasi	14,158	3,922	0%	50%	0%	100%	100%	100%
Tongo	11,138	3,082	0%	50%	0%	0%	0%	100%
Tsore	-	-	0%	0%	0%	0%	100%	100%
Ashura	6,074	2,463	0%	50%	0%	0%	100%	100%
Total	42,207	13,184						
Dollo Ado								
Boklomayo	42,439	9,378	0%	36%	28%	0%	45%	50%
Melkadida	44,428	8,600	0%	37%	26%	0%	48%	50%
Kobe	38,762	8,295	0%	35%	30%	0%	40%	50%
Halewein	40,023	8,158	0%	35%	31%	0%	39%	50%
Bur Amino	39,676	8,242	0%	50%	0%	0%	100%	50%
Total	205,328	42,673						
Gambella								
Kule	45,997	12,226	0%	50%	0%	0%	100%	50%
Terkedi	48,646	12,162	0%	50%	0%	0%	100%	50%
Pugnido	42,096	10,692	0%	50%	0%	0%	100%	50%
Okugu	5,996	2,220	0%	50%	0%	0%	100%	50%
Leitchour	40,334	10,084	0%	50%	0%	0%	100%	50%
Nipinip	2,192	930	0%	50%	0%	0%	100%	50%
Total	185,261	48,314						
Jigjiga								
Aw Barre	12,645	2,147	100%	0%	0%	0%	0%	100%
Shedder	12,131	2,582	100%	0%	0%	0%	0%	100%
Keberbeya	15,259	2,129	100%	0%	0%	0%	0%	100%
Total	40,035	6,858						
Shire								
Shimelba	6,116	1,231	0%	100%	0%	100%	100%	100%
Hitsats	24,462	6,116	33%	67%	0%	100%	67%	100%
Mai-Ayni	18,482	2,052	100%	0%	0%	100%	0%	100%
Adi-Harush	33,661	5,536	0%	100%	0%	100%	100%	100%
Total	82,721	55,423						

6.2. Financing Needs

61. The estimated financing needs to implement the actions under this Strategy over 2015-2018 is about US$44.5 million of which US$ 26.7 million (60%) will be to meet the household cooking energy needs and approximately US$ 1.4 million (3%) will be for domestic lighting. Energy for community services (i.e., water pumping, health care, education, and street lights) is about US$ 3 million (7%).

62. The actions under the sustainable natural resource and environment management will require US$3.7 million (8%) while Energy Enterprises and Market Development, and Capacity Building will need US$ 4.0 million (9%) and US$ 1.2 million (3%) in their respective orders. Project management costs are estimated at US$4.0 million (9%).

63. A summary of the financing needs over the four year period is provided in Table 14 and Figure 14. A detailed budget by intervention actions and camps is provided in Table 15.

Table 14. Summary of Financing Needs ('000 USD)

Actions	2015	2016	2017	2018	2015-18	Percent
1. Domestic Energy						
1.1. Cooking	3,516.0	8,290.2	7,644.2	7,241.6	26,692.0	60.0
1.2. Lighting	329.8	543.6	357.7	160.4	1,391.5	3.1
1.3. Emergency Operations	500.0	-	-	-	500.0	1.1
Sub-total	**4,345.8**	**8,833.8**	**8,001.9**	**7,402.0**	**28,583.5**	**64.2**
2. Community Services						
2.1. Water pumping	-	250.0	250.0	500.0	1,000.0	2.2
2.2. Health Facilities	-	175.0	175.0	350.0	700.0	1.6
2.3. Schools	-	125.0	125.0	250.0	500.0	1.1
2.4. Street Lights	-	142.0	294.0	331.0	767.0	1.7
Sub-total	**-**	**692.0**	**844.0**	**1,431.0**	**2,967.0**	**6.7**
3. Natural Resource Development and Environmental Protection	875.9	833.5	902.8	1,132.5	3,744.6	8.4
4. Energy Enterprise and Market Development	1,489.2	1,352.5	637.5	500.0	3,979.2	8.9
5. Capacity Building	447.0	211.2	282.3	255.6	1,196.1	2.7
6. Program Management	715.8	1,192.3	1,066.9	1,072.1	4,047.0	9.1
Total	7,873.6	13,115.3	11,735.4	11,793.2	44,517.5	100.0

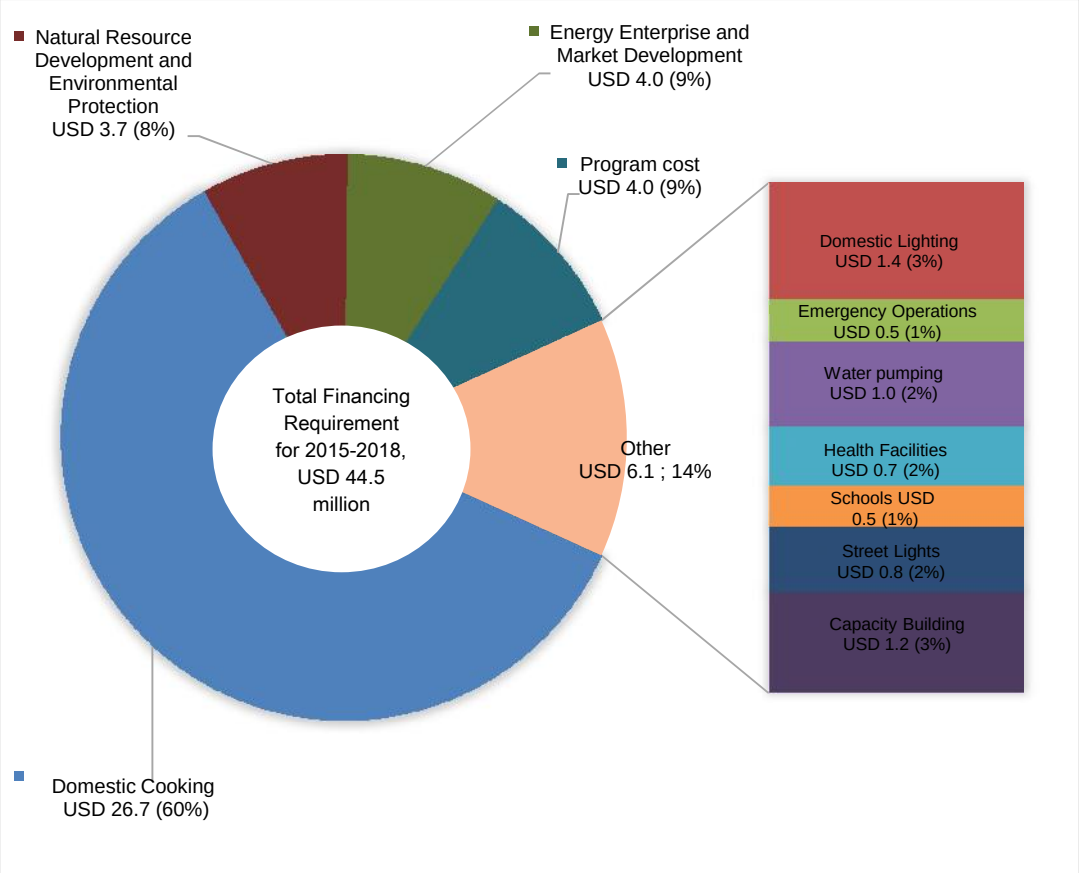


Figure 14. Summary of Financing Needs (2015-2018)

Table 15. Estimated Financing Needs by Intervention Actions in '000 USD

Action	2015	2016	2017	2018	2015-18
1. Domestic Cooking	3,516.0	8,209.3	7,659.3	7,307.4	26,692.0
1.1. Bio-ethanol for cooking	1,598.9	2,569.5	2,247.3	2,301.0	8,716.7
Infrastructure Development	-	-	-	-	-
Ethanol stove	229.5	403.0	27.1	27.1	686.8
Ethanol fuel	1,369.4	2,166.5	2,220.2	2,273.8	8,029.9
1.2. Kerosene for cooking	1,752.7	1,752.7	1,752.7	1,752.7	7,010.7
Infrastructure Development	-	-	-	-	-
Kerosene stoves	-	-	-	-	-
Kerosene fuel	1,752.7	1,752.7	1,752.7	1,752.7	7,010.7
1.3. Briquettes/pellets	-	2,221.1	3,154.4	3,154.4	8,529.9
Briquettes cost	-	2,221.1	3,154.4	3,154.4	8,529.9
1.4. Grid Electrified communal kitchen	164.4	233.6	33.6	33.6	465.2
Kitchen construction and stove	150.0	200.0	-	-	350.0
Electricity bill for communal kitchen					
1.5. FSS, training on kitchen management& cooking practices	-	1,432.4	471.3	65.8	1,969.5
2. Domestic Lighting (solar lanterns)	329.8	543.6	357.7	160.4	1,391.5
3. Emergency Operations	500.0	-	-	-	500.0
3.1. Babington mobile stove	50.0	-	-	-	50.0
3.2. Kerosene fuel Reserve (pre-paid)	450.0	-	-	-	450.0
4. Water pumping	-	250.0	250.0	500.0	1,000.0
4.1. Solar PV (or hybrid with diesel gens)	-	250.0	250.0	500.0	1,000.0
5. Health Facilities	-	175.0	175.0	350.0	700.0
5.1. Solar PV (or hybrid with diesel gens)	-	175.0	175.0	350.0	700.0
5.2. Cooking: in-patient & supplementary feeding	-	-	-	-	-
6. Schools	-	125.0	125.0	250.0	500.0
6.1. Supply and installation of Solar PV (hybrid with diesel gens)	-	125.0	125.0	250.0	500.0
6.2. Cooking: school feeding	-	-	-	-	-
7. Installation of Solar Street Lights	-	142.0	294.0	331.0	767.0
8. Natural Resource Development and Environmental Protection	875.9	833.5	902.8	1,132.5	3,744.6
8.1. Afforestation of degraded areas and camp greening	205.6	287.5	300.0	387.5	1,180.6
8.2. Rehabilitation of gullies and degraded areas	156.0	116.0	124.0	200.0	596.0
8.3. Awareness raising on environmental issues for host and host communities	32.5	36.3	36.3	42.5	147.5
8.4. Livelihood integrated with environmental interventions	118.0	112.5	125.0	137.5	493.0
8.5. Gabion wall construction	138.8	56.3	67.5	90.0	352.5
8.6. Area enclosure	225.0	225.0	250.0	275.0	-
9. Energy Enterprise and Market Development	1,414.2	1,360.0	652.5	552.5	3,979.2
9.1. Market opportunity study and Business plan preparation	-	25.0	-	-	25.0
9.2. Technical and business training	-	25.0	12.5	12.5	50.0
9.3. Capital grant funding	1,414.2	1,005.0	350.0	-	2,769.2
Briquetting Plants	750.0	375.0	-	-	1,125.0
Improved cook stove production Plants	114.2	30.0	-	-	144.2
Solar charging Centers	550.0	600.0	350.0	-	1,500.0
9.4. Market promotion of RE and EE	-	30.0	15.0	15.0	60.0
9.5. RBF study	-	25.0	25.0	25.0	75.0
9.6. RBF funding	-	250.0	250.0	500.0	1,000.0
10. Capacity Building	447.0	211.2	282.3	255.6	1,196.1
10.1. Staffing	192.0	211.2	232.3	255.6	891.1
Energy and Environment Officer	144.0	158.4	174.2	191.7	668.3
Renewable Energy Officer	24.0	26.4	29.0	31.9	111.4
M&E Officer	24.0	26.4	29.0	31.9	111.4
10.2. Training of UNHCR and Partners	50.0	-	50.0	-	100.0
10.3. M&E system and MIS	25.0	-	-	-	25.0
10.4. Vehicles	180.0	-	-	-	180.0
Total - All Actions	7,083	11,850	10,699	10,839	40,470
Program Costs, 10%	708	1,185	1,070	1,084	4,047
Grand Total	**7,791**	**13,035**	**11,768**	**11,923**	**44,517**

7. Strategy Implementation Arrangement

7.1. Implementation Management and Coordination

64. **Capacity building for SAFE Implementation.** Realization of the Strategy requires a strong technical and management capacity within the UNHCR and partners. Accordingly, in order to address the existing technical and management capacity gaps, the UNHCR will offer series of trainings to its and partners' staff. The training areas will include:

- Conducting energy surveys;
- Energy supply and demand management;
- Energy resource assessment;
- Energy, environment and climate change nexus;
- Innovative energy access delivery models;
- Financial, economic, social and environmental analyses;
- Project proposal development and resource mobilization;
- Barriers for private sector engagement in energy service delivery and business development support; and
- Monitoring and Evaluation.

65. In order to address the existing staffing limitations, the UNHCR will strengthen its Addis Ababa Office and Sub Offices through additional staffing. Specifically, it will recruit Energy and Environment Officer in each of the six Sub Offices; and a Renewable Energy Officer, and M&E Officer in Addis Ababa.

66. **Stakeholder Participation and Coordination.** Stakeholder participation supports increased engagement and maximizing their potential, organizational learning and stakeholder empowerment. The success the SAFE Strategy requires concerted efforts from multiple players. This also depends on the level of coordination at all levels. A clear coordination mechanism is therefore needed.

67. In order to ensure stakeholder participation and coordination in the implementation of the Strategy, the UNHCR will establish a SAFE Steering Committee (SAFESteer). The SAFESteer will be a high-level inter-agency forum and will take the broad responsibility of ensuring that the Strategy is followed through. More specifically, it shall will have the following broad roles:

- Promotes and coordinates the implementation of the Strategy seeking synergies and avoiding duplication of effort and overlaps;
- Monitors the progress of the implementation of the Strategy; prepare assessments of progress made and propose priorities for actions, identify issues and propose corrective measures, where appropriate;
- Facilitates mobilization of resources;
- Establishes ad hoc working groups, task forces as needed to implement the actions contained in the Strategy; and
- Serves as a forum for the consideration of issues related to the Strategy.

68. The SAFESteer will have seven members consisting of the UNHCR's Senior Program Officer or his/her representative; representative of ARRA, Implementing Partners (three) and the private sector. The IPs and the private sector shall be nominated each year by the UNHCR's Task Force Meeting. The Energy and Environment Officer at the UNHCR Addis Ababa Office will serve as a Secretary of the SAFESteer (see Table 16).

Table 16. Proposed Membership of SAFE Steer

Organization	Position
1. UNHCR, Senior Program Office	Chairperson
2. ARRA	Member
3. Implementing Partners (Three)	Member
4. Private Sector (one)	Member
5. UNHCR Energy and Environment Officer	Member and Secretary

7.2. Monitoring and Evaluation Mechanism

69. Monitoring and Evaluation (M&E) is an important element of Strategy implementation. Monitoring entails taking a periodic look at how the Strategy implementation is going while evaluation entails a systematic and objective assessment of on-going or completed actions and the resulting impacts.

70. An effective mechanism for monitoring and evaluating system for SAFE Strategy will be important for at least the following reasons:

a) Ensures that the actions being undertaken conform to the Strategy;
b) Ensures that the results being achieved are aligned with the Strategic objectives;
c) Provides regular information to all stakeholders on the progress of implementation, challenges encountered and opportunities;
d) Ensures the continuous sharpening and focusing of strategic actions and allows timely corrective measures leading to improved Strategy implementation;
e) Demonstrates accountability and transparency in the implementation of the Strategy through clearly defined implementation plans and regular evaluation and reporting of progress towards achieving results; and
f) Promotes learning, feedback, and knowledge sharing on results achieved and lessons learned among stakeholders.

71. The emphasis of the M&E exercises will be monitoring of outcomes and impact rather than processes and activities. Regular monitoring will focus on the following issues:

a) Actions being implemented within set timelines and progress being made;

b) The rate at which inputs (budgets, staffing and finances) are being used within agreed budget lines;
c) The extent to which the desired results are being achieved in relation to set targets; and
d) Changes in the internal and external environment and whether the assumptions still hold.

72. An outline of an M&E timelines are provided in Table 17. Activities under the Monitoring will include operationalization monthly, quarterly, bi-annual and annual reports using standard and approved formats.

- **Monthly Activity Report.** The report will be prepared on a monthly basis by UNHCR Sub Offices and Implementing Partners and submitted to M&E Officer in UNHCR Addis Ababa. The monthly report will contain the status of implementation of key activities and related actions undertaken during that particular month. The report will highlight any technical support that may be required.

- **Quarterly Performance Report**. A quarterly progress report shall be generated to provide the status of achievement of targeted outputs and the assessment of progress towards achieving the objectives. It will provide information and updates on actions under implementation.

- **Bi-Annual Progress Report (Six months**). The bi-annual progress report shall be prepared by M&E Officer in Addis Ababa in collaboration with the Sub Offices and IPs. The report shall allow lessons to be shared, and adjustments made or corrective actions be taken. The report shall be presented in the Bi-Annual Evaluation workshops.

- **Annual Report.** The annual report shall provide information and data on the progress made in implementation of the Strategy. The report will highlight the success stories, challenges encountered and innovative solutions to the challenges and the priority actions for next year.

73. Evaluations will be conducted by way of systematic and objective assessment of on- going or completed interventions and the resulting impacts. The aim will be to determine the relevance, efficiency, effectiveness, impact and sustainability of the interventions.

74. Evaluation activities will include bi-annual review workshops mid-term review, and final evaluation.

Table 17. Monitoring and Evaluation Plans/Timetables

Type of M&E Activity	Responsible Parties	Issues Addressed	Time Frame
Monthly Report	M&E Officer in Addis Ababa Sub Offices and IPs	• The monthly report will contain the status of implementation of key activities and related actions undertaken during that particular month. The report will highlight progress made and any technical support that may be required. • Issues related to project implementation	Monthly
Quarterly Report	M&E Officer in Addis Ababa Sub Offices and IPs	• Up-dates on actions under implementation • Status of achievement of targeted outputs and deviation from agreed implementation schedules • A assessment of progress towards the strategy objectives	Quarterly
Bi-annual Report	M&E Officer in Addis Ababa Sub Offices and IPs	• Provide progress made in implementing the Strategy. The report will be deliberated in the Bi-Annual Review Workshops.	Bi-annually
Annual Report	UNHCR Addis Ababa Office, Sub Offices, Implementing Partners	• Progress in implementation of the Strategy • Success stories, challenges and innovative solutions • Priority actions for next year	Annually
Bi-annual Review workshops	UNHCR Addis Ababa Office, Sub Offices, Implementing Partners	• Review progress in implementation of the Strategy and identify implementation challenges, and recommend remedial actions and adjustments or corrective actions and decisions to be taken, where necessary • Experience sharing among stakeholders	Bi-annually
Mid-term Evaluation	UNHCR and External Consultants	• Comprehensive review of the design and implementation of the Strategy • Review the continued relevance of the Strategy to the needs and priorities of refugees and other peoples of concern, coherence with the UNHCR's mandate and local context • Effectiveness and efficiency of the Strategy implementation • Quantification of the results achieved • Assessment of the sustainability of the benefits/impacts generated and recommendation of measures to ensure sustainability and follow-up actions • Documentation of lessons learned	At the end of the second year of Strategy Implementation (beginning of 2017)
Final Evaluation	UNHCR and External Consultants	• Comprehensive review of the design features and implementation of the SAFE Strategy • Review the continued relevance of the SAFE Strategy to the needs and priorities of beneficiaries • Effectiveness and efficiency of Strategy implementation • Quantification of the results achieved • Assessment of the sustainability of results achieved and recommendation of measures to ensure sustainability and follow-up actions • Documentation of lessons learned	At the end of the Implementation of the Strategy (2019)

Annexes

Targets and Financing Needs by Intervention Action and Camp

Annex A
Ethanol Fuel Intervention

Intervention:	***Displacement of fuel-wood and kerosene with Ethanol fuel and stove***	
Sector:	Households (domestic)	
End-use:	Cooking, baking, water heating	
Outcome:	Promote Renewable Energy	
Assumptions:		
Ethanol consumption	0.6	liters/HH/day
Ethanol consumption	219	liters/HH/year
Fuel loss, 2%	4	
Ethanol consumption including loss	223	liters/HH/year
Ethanol stove price		
Single burner	60	USD/stove
Double burner	90	USD/stove
Factory gate price of Ethanol	0.5	USD/liter
Transport cost	0.125	USD/liter
Total cost	0.60	USD/liter

Targets (all Camps)	*2015*	*2016*	*2017*	*2018*	*2015-2018*
Target (# of HHs, number of stoves)	10,258	5,971	402	402	17,033
# of ethanol stoves					
Single burner (75%)	7,694	4,478	302	302	12,775
Double burner (25%)	2,565	1,493	101	101	4,258
Ethanol Fuel Requirement (liters)	2,291,466	3,625,279	3,715,089	3,804,899	13,436,731
Ethanol Infrastructure cost, USD	-	-	-	-	-
Ethanol Stove cost, USD	229,510	403,046	27,138	27,138	686,833
Ethanol Fuel cost, USD	1,369,400	2,166,498	2,220,169	2,273,840	8,029,908
Total cost, USD	1,598,910	2,569,544	2,247,308	2,300,979	8,716,740

Targets by Camp

		Baseline	*Target*		***Target (%)***				***Target (# of HHs, number of stoves)***						*Total cost, USD*	
Camp	# of HHs	2014	2014-2018	2015	2016	2017	2018	2015	2016	2017	2018	2015	2016	2017	2018
Afar															
Berhale	1,852	0%	30%	15%	20%	25%	30%	278	93	93	93	55,836	55,697	68,058	80,420
Dalol	1,860	0%	30%	15%	20%	25%	30%	279	93	93	93	56,077	55,937	68,352	80,767
Assayta	2,848	0%	30%	15%	20%	25%	30%	427	142	142	142	85,865	85,650	104,660	123,669
Ayinedib	1,481	0%	30%	15%	20%	25%	30%	222	74	74	74	44,651	44,539	54,424	64,310
Total	**8,041**							**1,206**	**402**	**402**	**402**	**242,429**	**241,823**	**295,494**	**349,166**
Assosa															
Sherkole	3,717	0%	100%	5%	95%			200	3,517	-	-	40,199	733,594	496,197	496,197
Bambasi	3,922	0%	0%					-	-	-	-	-	-	-	-
Tongo	3,082	0%	0%					-	-	-	-	-	-	-	-
Tsore	-	0%	0%					-	-	-	-	-	-	-	-
Ashura	2,463	0%	0%					-	-	-	-	-	-	-	-
Total	**13,184**							**200**	**3,517**	**-**	**-**	**40,199**	**733,594**	**496,197**	**496,197**
Dollo Ado															
Boklomayo	9,378	0%	0%					-	-	-	-	-	-	-	-
Melkadida	8,600	0%	0%					-	-	-	-	-	-	-	-
Kobe	8,295	0%	0%					-	-	-	-	-	-	-	-
Halewein	8,158	0%	0%					-	-	-	-	-	-	-	-
Bur Amino	8,242	0%	0%					-	-	-	-	-	-	-	-
Total	**42,673**							**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Gambella															
Kule	12,226	0%	0%					-	-	-	-	-	-	-	-
Terkedi	12,162	0%	0%					-	-	-	-	-	-	-	-
Pugnido	10,692	0%	0%					-	-	-	-	-	-	-	-
Okugu	2,220	0%	0%					-	-	-	-	-	-	-	-
Leitchour	10,084	0%	0%					-	-	-	-	-	-	-	-
Nipinip	930	0%	0%					-	-	-	-	-	-	-	-
Total	48,314							-	-	-	-	-	-	-	-
Jigjiga															
Aw Barre	2,147	100%	100%	100%				2,147	-	-	-	286,611	286,611	286,611	286,611
Shedder	2,582	0%	100%	100%				2,582	-	-	-	344,681	344,681	344,681	344,681
Keberbeya	2,129	100%	100%	100%				2,129	-	-	-	284,208	284,208	284,208	284,208
Total	6,858							**6,858**	-	-	-	915,501	915,501	915,501	915,501
Shire															
Shimelba	1,231	0%	0%					-	-	-	-	-	-	-	-
Hitsats	6,116	0%	33%	33%	0%	0%	0%	1,994	-	-	-	400,782	266,187	266,187	266,187
Mai-Ayni	2,052	0%	100%		100%			-	2,052	-	-	-	412,439	273,929	273,929
Adi-Harush	5,536	0%	0%					-	-	-	-	-	-	-	-
Total	14,934							1,994	2,052	-	-	400,782	678,626	540,116	540,116

Annex 2
Briquette Intervention

Intervention:	***Displacement of fuelwood with Briquette from crop residue and Miscanthus (elephant grass)***	
Sector:	Households (domestic)	
End-use:	Cooking, baking, water heating	
Outcome:	Promote Renewable Energy	
Assumptions:		
Briquette consumption	1.5	kg/hh/day
Briquette consumption	0.5475	tonnes/hh/year
Briquette stove price	20	USD/stove
Price of Briquette	0.1	USD/kg
Annual Production Capacity per plant	3,600	tonnes/year
Investment cost	250000	USD/plant

Targets (all camps)	*2015*	*2016*	*2017*	*2018*	*2015-2018*
Target (# of HHs, number of stoves)	-	40,569	17,046	-	57,614
Briquette Fuel Requirement (tonnes/year)	-	22,211	31,544	31,544	85,299
Briquettes Investment cost, USD	750,000	750,000	-	-	1,500,000
Briquette Stove cost, USD	-	811,370	340,912	-	1,152,282
Briquette Fuel cost, USD	-	2,221,125	3,154,372	3,154,372	8,529,869
Total cost, USD	750,000	3,782,495	3,495,284	3,154,372	11,182,151
Number of Briquetting Plants	3	3	-	-	6

Targets by Camp

		Baseline	*Target*		*Target (%)*				*Total cost, USD*		
Camp	**# of HHs**	**2014**	**2014-2018**	2015	2016	2017	2018	2015	2016	2017	2018
Afar											
Berhale	1,852	0%	0%	0%	0%	0%	0%	-	-	-	-
Dalol	1,860	0%	0%	0%	0%	0%	0%	-	-	-	-
Assayta	2,848	0%	50%	0%	0%	50%	0%	-	250,000	106,444	77,964
Ayinedib	1,481	0%	0%	0%	0%	0%	0%	-	-	-	-
Total	8,041							-	250,000	106,444	77,964
Assosa											
Sherkole	3,717	0%	0%					-	250,000	-	-
Bambasi	3,922	0%	50%			50%		-	-	146,585	107,365
Tongo	3,082	0%	50%			50%		-	-	115,190	84,370
Tsore	-	0%	0%					-	-	-	-
Ashura	2,463	0%	50%			50%		-	-	92,055	67,425
Total	13,184							-	250,000	353,829	259,159
Dollo Ado											
Boklomayo	9,378	0%	36%		36%			-	253,328	185,548	185,548
Melkadida	8,600	0%	37%		37%			-	237,331	173,831	173,831
Kobe	8,295	0%	35%		35%			-	216,588	158,638	158,638
Halewein	8,158	0%	35%		35%			-	211,468	154,888	154,888
Bur Amino	8,242	0%	50%		50%			-	308,045	225,625	225,625
Total	42,673							-	1,226,760	898,530	898,530
Gambella											
Kule	12,226	0%	50%		50%			250,000	456,947	334,687	334,687
Terkedi	12,162	0%	50%		50%			-	454,555	332,935	332,935
Pugnido	10,692	0%	50%		50%			250,000	399,614	292,694	292,694
Okugu	2,220	0%	50%		50%			-	82,973	60,773	60,773
Leitchour	10,084	0%	50%		50%			250,000	376,890	276,050	276,050
Nipinip	930	0%	50%		50%			-	34,759	25,459	25,459
Total	48,314							750,000	1,805,736	1,322,596	1,322,596
Jigjiga											
Aw Barre	2,147	0%	0%					-	-	-	-
Shedder	2,582	0%	0%					-	-	-	-
Keberbeya	2,129	0%	0%					-	-	-	-
Total	6,858							-	-	-	-
Shire											
Shimelba	1,231	0%	100%			100%		-	250,000	92,017	67,397
Hitsats	6,116	0%	67%			67%		-	-	308,082	225,652
Mai-Ayni	2,052	0%	0%			0%		-	-	-	-
Adi-Harush	5,536	0%	100%			100%		-	-	413,786	303,074
Total	14,934							-	250,000	813,885	596,123

Annex 3
Fuel Saving Stoves and Training on Cooking Practices

Intervention:	***Displacement of three-stone fire/traditional stove with Fuel Saving Stoves***	
Sector:	Households (domestic)	
End-use:	Cooking, baking, water heating	
Outcome:	Energy Efficiency	
Assumptions:		
Stove manufacturing plant cost	10,000	USD/workshop
Fuel Saving Stove price	20	USD/stove
Training on cooking practices	2.5	USD/household

Target All Camps	*2015*	*2016*	*2017*	*2018*	*2015-2018*
Number of improved stoves	-	67,253	20,279	-	87,533
Stove Manufacturing plants , USD	114,200	30,000	-	-	144,200
Stove cost, USD	-	1,345,068	405,586	-	1,750,654
Training on cooking practices, USD	-	87,315	65,758	65,758	218,832
Total cost, USD	114,200	1,462,383	471,344	65,758	2,113,685

Target by Camp

		Baseline	Target	Target Households (%)				Training on Cooking Practices				Total cost, USD			
Camp	# of HHs	2014	2014-2018	2015	2016	2017	2018	2015	2016	2017	2018	2015	2016	2017	2018
Afar															
Berhale	1,852	0%	70%		70%			-	3,241	-	-	-	39,169	-	-
Dalol	1,860	0%	70%		70%			-	3,255	-	-	-	29,295	-	-
Assayta	2,848	0%	70%			70%		-	-	2,492	2,492	-	-	42,364	2,492
Ayinedib	1,481	0%	70%			70%		-	-	1,296	1,296	-	-	22,030	1,296
Total	8,041							-	6,496	3,788	3,788	-	68,464	64,394	3,788
Assosa															
Sherkole	3,717	19%	0%					-	-	-	-	-	-	-	-
Bambasi	3,922	100%	100%			100%		-	-	4,903	4,903	-	10,000	83,343	4,903
Tongo	3,082	100%	0%					-	-	-	-	-	-	-	-
Tsore			100%					-	-	-	-	-	-	-	-
Ashura	2,463	0%	100%			100%		-	-	3,079	3,079	-	-	52,339	3,079
Total	13,184							-	-	7,981	7,981	-	10,000	135,681	7,981
Dollo Ado															
Boklomayo	9,378	55%	45%		45%			-	5,223	2,611	2,611	10,000	88,783	2,611	2,611
Melkadida	8,600	52%	48%		48%			-	5,125	2,563	2,563	10,000	87,125	2,563	2,563
Kobe	8,295	60%	40%		40%			-	4,119	2,059	2,059	10,000	70,019	2,059	2,059
Halewein	8,158	61%	39%		39%			-	3,948	1,974	1,974	10,000	67,108	1,974	1,974
Bur Amino	8,242	0%	100%		100%			-	10,303	5,151	5,151	10,000	175,143	5,151	5,151
Total	42,673							-	28,716	14,358	14,358	50,000	488,176	14,358	14,358
Gambella															
Kule	12,226	0%	100%		100%			-	15,283	7,641	7,641.25	21,400	259,803	7,641	7,641
Terkedi	12,162	0%	100%		100%			-	15,203	7,601	7,601	-	258,443	7,601	7,601
Pugnido	10,692	0%	100%		100%			-	13,365	6,683	6,683	21,400	227,205	6,683	6,683
Okugu	2,220	0%	100%		100%			-	2,775	1,388	1,388	-	47,175	1,388	1,388
Leitchour	10,084	66%	100%		34%			-	4,315	2,158	2,158	21,400	73,355	2,158	2,158
Nipinip	930	0%	100%		100%			-	1,163	581	581	-	19,763	581	581
Total	48,314							-	52,103	26,051	26,051	64,200	885,743	26,051	26,051
Jigjiga															
Aw Barre	2,147	100%	0%		0%	0%	0%	-	-	-	-	-	-	-	-
Shedder	2,582	100%	0%		0%	0%	0%	-	-	-	-	-	-	-	-
Keberbeya	2,129	100%	0%		0%	0%	0%	-	-	-	-	-	-	-	-
Total	6,858							-	-	-	-	-	-	-	-
Shire															
Shimelba	1,231	0%	100%			100%		-	-	1,539	1,539	-	10,000	26,159	1,539
Hitsats	6,116	0%	67%			67%		-	-	5,122	5,122	-	-	87,069	5,122
Mai-Ayni	2,052	100%	0%			0%		-	-	-	-	-	-	-	-
Adi-Harush	5,536	0%	100%			100%		-	-	6,920	6,920	-	-	117,632	6,920
Total	14,934							-	-	13,580	13,580	-	10,000	230,860	13,580

Annex 4
Kerosene Fuel Intervention

Intervention:	**Kerosene Fuel Distribution**	
Sector:	Households (domestic)	
End-use:	Cooking, baking, water heating	
objectives:	Energy Access	
Assumptions:		
Ethanol consumption per HHs/day	0.5	kg/day
Ethanol consumption per HHs/year	182.5	liters/year
Fuel loss, 5%	5	
	187	
Kerosene stove price	40	USD/stove
Pump price of kerosene	0.9	USD/liter
Transport cost	0.125	USD/liter
Total cost	0.98	USD/liter

Targets All Camps	*2015*	*2016*	*2017*	*2018*	*2015-2018*
# of Households	9,850	-	-	-	9,850
Kerosene stove cost, USD	-	-	-	-	-
Kerosene Requirement (liters/year)	1,797,625	1,797,625	1,797,625	1,797,625	7,190,500
Kerosene Infrastructure cost, USD	-	-	-	-	-
Kerosene stove cost, USD	-	-	-	-	-
Kerosene Fuel cost, USD	1,752,684	1,752,684	1,752,684	1,752,684	7,010,738
Total cost, USD	1,752,684	1,752,684	1,752,684	1,752,684	7,010,738

Targets by Camp

		Baseline	*Target*		***Target (%)***				***Target (# of HHs)***				*Total cost, USD*			
Camp	# of HHs	2014	2014-2018	2015	2016	2017	2018	2015	2016	2017	2018	2015	2016	2017	2018
Afar															
Berhale	1,852	0%	0%					-	-	-	-	-	-	-	-
Dalol	1,860	0%	0%					-	-	-	-	-	-	-	-
Assayta	2,848	0%	0%					-	-	-	-	-	-	-	-
Ayinedib	1,481	0%	0%					-	-	-	-	-	-	-	-
Total	8,041							-	-	-	-	-	-	-	-
Assosa															
Sherkole	3,717	0%	0%	0%				-	-	-	-	-	-	-	-
Bambasi	3,922	100%	0%	0%				-	-	-	-	-	-	-	-
Tongo	3,082	100%	0%	0%				-	-	-	-	-	-	-	-
Tsore	-		0%	0%				-	-	-	-	-	-	-	-
Ashura	2,463	0%	0%	0%				-	-	-	-	-	-	-	-
Total	13,184							-	-	-	-	-	-	-	-
Dollo Ado															
Boklomayo	9,378	28%	28%	28%				2,600	-	-	-	462,638	462,638	462,638	462,638
Melkadida	8,600	26%	26%	26%				2,250	-	-	-	400,359	400,359	400,359	400,359
Kobe	8,295	30%	30%	30%				2,500	-	-	-	444,844	444,844	444,844	444,844
Halewein	8,158	31%	31%	31%				2,500	-	-	-	444,844	444,844	444,844	444,844
Bur Amino	8,242	0%	0%	0%				-	-	-	-	-	-	-	-
Total	42,673							9,850	-	-	-	1,752,684	1,752,684	1,752,684	1,752,684
Gambella															
Kule	12,226	0%	0%	0%				-	-	-	-	-	-	-	-
Terkedi	12,162	0%	0%	0%				-	-	-	-	-	-	-	-
Pugnido	10,692	0%	0%	0%				-	-	-	-	-	-	-	-
Okugu	2,220	0%	0%	0%				-	-	-	-	-	-	-	-
Leitchour	10,084	0%	0%	0%				-	-	-	-	-	-	-	-
Nipinip	930	0%	0%	0%				-	-	-	-	-	-	-	-
Total	48,314							-	-	-	-	-	-	-	-
Jigjiga															
Aw Barre	2,147	0%	0%	0%				-	-	-	-	-	-	-	-
Shedder	2,582	100%	0%	0%				-	-	-	-	-	-	-	-
Keberbeya	2,129	0%	0%	0%				-	-	-	-	-	-	-	-
Total	6,858							-	-	-	-	-	-	-	-
Shire															
Shimelba	1,231	0%	0%	0%				-	-	-	-	-	-	-	-
Hitsats	6,116	0%	0%	0%				-	-	-	-	-	-	-	-
Mai-Ayni	2,052	0%	0%	0%				-	-	-	-	-	-	-	-
Adi-Harush	5,536	0%	0%	0%				-	-	-	-	-	-	-	-
Total	14,934							-	-	-	-	-	-	-	-

Annex 5
Grid-connected Communal Kitchen Intervention

Intervention:	***Electrified Communal kitchen***
Sector:	Households (domestic)
End-use:	Baking
Outcome:	Energy Access, Renewable Energy, Energy Efficiency
Assumptions:	
Number of household per kitchen	100
Kitchen construction cost,	USD/25,000/kitchen
Electricity bill, USD	2,400 USD/year/kitchen

Target All Camps	*2015*	*2016*	*2017*	*2018*	*2015-2018*
Target # of Households	14,934	7,639	-	-	22,573
Number of Communal Kitchens	6	8	-	-	14
Investment Cost of Kitchens, US%	150,000	200,000	-	-	350,000
Electricity Bill, USD/year	14,400	33,600	33,600	33,600	115,200
Total cost, USD/year	164,400	233,600	33,600	33,600	465,200

Targets by Camps

		Baseline	*Target*	***Target (%)***				***Target # of Households***				***Total cost, USD/year***			
Camp	# of HHs	2014	2014-2018	2015	2016	2017	2018	2015	2016	2017	2018	2015	2016	2017	2018
Afar															
Berhale	1852	0%	0%					-	-	-	-	-	-	-	-
Dalol	1860	0%	0%					-	-	-	-	-	-	-	-
Assayta	2848	0%	0%					-	-	-	-	-	-	-	-
Ayinedib	1481	0%	0%					-	-	-	-	-	-	-	-
Total	8041	0%	0%					-	-	-	-	-	-	-	-
Assosa															
Sherkole	3717	0%	100%		100%			-	3,717	-	-	-	27,400	2,400	2,400
Bambasi	3922	0%	100%		100%			-	3,922	-	-	-	27,400	2,400	2,400
Tongo	3082	0%	0%					-	-	-	-	-	-	-	-
Tsore	0	0%	0%					-	-	-	-	-	-	-	-
Ashura	2463	0%	0%					-	-	-	-	-	-	-	-
Total	13184	0%	0%					-	7,639	-	-	-	54,800	4,800	4,800
Dollo Ado															
Boklomayo	9378	0%	0%					-	-	-	-	-	-	-	-
Melkadida	8600	0%	0%					-	-	-	-	-	-	-	-
Kobe	8295	0%	0%					-	-	-	-	-	-	-	-
Halewein	8158	0%	0%					-	-	-	-	-	-	-	-
Bur Amino	8242	0%	0%					-	-	-	-	-	-	-	-
Total	42673	0%	0%					-	-	-	-	-	-	-	-
Gambella															
Kule	12226	0%	0%					-	-	-	-	-	-	-	-
Terkedi	12162	0%	0%					-	-	-	-	-	-	-	-
Pugnido	10692	0%	0%					-	-	-	-	-	-	-	-
Okugu	2220	0%	0%					-	-	-	-	-	-	-	-
Leitchour	10084	0%	0%					-	-	-	-	-	-	-	-
Nipinip	930	0%	0%					-	-	-	-	-	-	-	-
Total	48,314							-	-	-	-	-	-	-	-
Jigjiga															
Aw Barre	2147	0%	0%			0%		-	-	-	-	-	-	-	-
Shedder	2582	0%	0%			0%		-	-	-	-	-	-	-	-
Keberbeya	2129	0%	0%			0%		-	-	-	-	-	-	-	-
Total	6858							-	-	-	-	-	-	-	-
Shire															
Shimelba	1231	0%	100%	100%				1,231	-	-	-	-	54,800	4,800	4,800
Hitsats	6115.5	0%	100%	100%				6,116	-	-	-	-	109,600	9,600	9,600
Mai-Ayni	2052	100%	100%	100%				2,052	-	-	-	54,800	4,800	4,800	4,800
Adi-Harush	5,536	100%	100%	100%				5,536	-	-	-	109,600	9,600	9,600	9,600
Total	14934.1							14,934	-	-	-	164,400	178,800	28,800	28,800

Annex 6
Solar Lanterns and Solar Charging Stations

Intervention:	***Solar Lanterns and Solar Charging Center***
Sector:	Household (domestic)
End-use	Lighting
Objectives:	Improved Access, Energy Enterprise Development
Assumptions:	
Cost of centrally rechargeable solar lantern	USD30 per lantern
Number of Solar lanterns per center	1,000
Solar charging center investment cost	USD 50,000 per center

Targets All Camps	*2015*	*2016*	*2017*	*2018*	*2015-2018*
Number of solar lanterns	11,268	39,260	17,884	8,020	76,432
Solar lantern purchase cost, USD	329,770	543,629	357,683	160,400	1,391,482
Charging centers, USD	550,000	600,000	350,000	-	1,500,000
Lanterns & charging center , USD	879,770	1,143,629	707,683	160,400	2,891,482
Number of charging centers	11	12	7	-	30

Targets by Camp

		Baseline	*Target*	***Target (%)***				***Target (# of Solar Lanterns)***				***Total Cost, USD***			
Camp	# of HHs	2014	2014-2018	2015	2016	2017	2018	2015	2016	2017	2018	2015	2016	2017	2018
Afar															
Berhale	1,852	0.0%	100%	30%	20%	20%	30%	556	370	370	556	11,112	57,408	7,408	11,112
Dalol	1,860	0.0%	100%	0%	30%	30%	40%	-	558	558	744	-	61,160	11,160	14,880
Assayta	2,848	4.9%	100%	30%	20%	20%	30%	854	570	570	854	17,088	11,392	61,392	17,088
Ayinedib	1,481	0.0%	100%	0%	30%	30%	40%	-	444	444	592	-	8,886	58,886	11,848
Total	8,041							1,410	1,942	1,942	2,746	28,200	138,846	138,846	54,928
Assosa															
Sherkole	3,717	0.0%	100%	0%	20%	40%	40%	-	743	1,487	1,487	-	64,868	29,736	29,736
Bambasi	3,922	0.0%	100%	0%	20%	40%	40%	-	784	1,569	1,569	-	65,688	31,376	31,376
Tongo	3,082	0.0%	100%	0%	20%	40%	40%	-	616	1,233	1,233	-	12,328	74,656	24,656
Tsore	-	0.0%	100%	0%	20%	40%	40%	-	-	-	-	-	-	50,000	-
Ashura	2,463	0.0%	100%	0%	20%	40%	40%	-	493	985	985	-	9,852	69,704	19,704
Total	13,184							-	2,637	5,274	5,274	-	152,736	255,472	105,472
Dollo Ado															
Boklomayo	9,378	0.0%	50%		25%	25%		-	2,345	2,345	-	50,000	46,890	46,890	-
Melkadida	8,600	0.0%	50%		25%	25%		-	2,150	2,150	-	50,000	43,000	43,000	-
Kobe	8,295	0.0%	50%		25%	25%		-	2,074	2,074	-	-	91,475	41,475	-
Halewein	8,158	0.0%	50%		25%	25%		-	2,040	2,040	-	-	90,790	40,790	-
Bur Amino	8,242	0.0%	50%		25%	25%		-	2,061	2,061	-	-	91,210	41,210	-
Total	42,673							-	10,668	10,668	-	100,000	363,365	213,365	-
Gambella															
Kule	12,226	42.8%	50%	0%	25%	25%			3,057			161,130	-	-	-
Terkedi	12,162	48.6%	50%	0%	25%	25%			3,041			160,810	-	-	-
Pugnido	10,692	0.0%	50%	0%	25%	25%		-	2,673			153,460	-	-	-
Okugu	2,220	0.0%	50%	0%	25%	25%		-	555			61,100	-	-	-
Leitchour	10,084	0.0%	50%	0%	25%	25%		-	2,521			100,420	-	-	-
Nipinip	930	0.0%	50%	0%	25%	25%		-	233			54,650	-	-	-
Total	48,314							-	12,079	-	-	691,570	-	-	-
Jigjiga															
Aw Barre	2,147	100.0%	100%	100%				2,147	-	-	-	-	50,000	-	-
Shedder	2,582	0.0%	100%	100%				2,582	-	-	-	-	50,000	-	-
Keberbeya	2,129	0.0%	100%	100%				2,129	-	-	-	-	50,000	-	-
Total	6,858							6,858	-	-	-	-	150,000	-	-
Shire															
Shimelba	1,231	0.0%	100%	0%	100%			-	1,231	-	-	-	74,620	-	-
Hitsats	6,116	19.6%	100%	20%	80%			1,200	4,916	-	-	24,000	148,310	-	-
Mai-Ayni	2,052	41.4%	100%	41%	59%			850	1,202	-	-	17,000	24,040	50,000	-
Adi-Harush	5,536	17.2%	100%	17%	83%			950	4,586	-	-	19,000	91,712	50,000	-
Total	14,934							3,000	11,934	-	-	60,000	338,682	100,000	-

Annex 7. Street Lighting

	Number of Street Lights				*Target (%)*	***Target Number of Street Lights required***					***Estimated cost, USD***				
Camp	Population	Installed	Currently Functioning	Additional SSL required	2015-2018	2015-2018	2015	2016	2017	2018	2015-2018	2015	2016	2017	2018
Afar															
Berhale	7,261	0	0	24	100%	24	-	24			24,000	-	24,000	-	-
Dalol	7,500	0	0	25	100%	25	-	15	10		25,000	-	15,000	10,000	-
Assayta	8,907	0	0	30	100%	30	-		15	15	30,000	-	-	15,000	15,000
Ayinedib	3,500	0	0	12	100%	24	-		12		24,000	-	-	12,000	12,000
Total		0	0	**91**	113%	**103**	**-**	**39**	**27**	**15**	**103,000**	**-**	**39,000**	**37,000**	**27,000**
Assosa															
Sherkole	10,837	0	0	36	50%	18	-	8	10		18,000	-	8,000	10,000	-
Bambasi	14,158	0	0	48	50%	24	-	8	8	8	24,000	-	8,000	8,000	8,000
Tongo	11,138	0	0	38	50%	19	-		9	10	19,000	-	-	9,000	10,000
Ashura	6,074	0	0	20	50%	10	-			10	10,000	-	-	-	10,000
Adamazin	2,608	0	0	10	50%	5	-	5			5,000	-	5,000	-	-
Total				**152**	50%	**76**	**-**	**21**	**27**	**28**	**76,000**	**-**	**21,000**	**27,000**	**28,000**
Dollo Ado															
Boklomayo	42,439	80	72	70	50%	35	-	10	10	15	35,000	-	10,000	10,000	15,000
Melkadida	44,428	35	35	114	50%	57	-	15	20	22	57,000	-	15,000	20,000	22,000
Kobe	38,762	100	89	40	50%	20	-		10	10	20,000	-	-	10,000	10,000
Halewein	40,023	80	70	64	50%	32	-		16	16	32,000	-	-	16,000	16,000
Bur Amino	39,676	70	66	66	50%	33	-		16	17	33,000	-	-	16,000	17,000
Total				**354**	50%	**177**	**-**	**25**	**72**	**80**	**177,000**	**-**	**25,000**	**72,000**	**80,000**
Gambella															
Kole	45,997	0	0	154	50%	77	-	20	20	37	77,000	-	20,000	20,000	37,000
Terkedi	48,646	0	0	162	50%	81	-	20	20	41	81,000	-	20,000	20,000	41,000
Pugnido	42,096	0	0	140	50%	70	-		35	35	70,000	-	-	35,000	35,000
Okugo	5,996	0	0	20	50%	10	-		10		10,000	-	-	10,000	-
Leitchour	40,334	0	0	136	50%	68	-		30	38	68,000	-	-	30,000	38,000
Total				**612**	50%	**306**	**-**	**40**	**115**	**151**	**306,000**	**-**	**40,000**	**115,000**	**151,000**
Jijiga															
Aw Barre	12,645	135	125	-		-	-				-	-	-	-	-
Shedder	12,131	134	129	-		-	-				-	-	-	-	-
Keberbeya	15,259	0	0	50	50%	25	-	12	13		25,000	-	12,000	13,000	-
Total				**50**	50%	**25**	**-**	**12**	**13**	**-**	**25,000**	**-**	**12,000**	**13,000**	**-**
Shire															
Shimelba	6,116	54	48	-		-	-				-	-	-	-	-
Hitsats	24,462	53	43	40	50%	20	-	5	5	10	20,000	-	5,000	5,000	10,000
Mai-Ayni	18,482	40	40	20	50%	10	-		5	5	10,000	-	-	5,000	5,000
Adi-Harush	33,661	15	15	100	50%	50	-		20	30	50,000	-	-	20,000	30,000
Total				160	50%	**80**	**-**	**5**	**30**	**45**	**80,000**	**-**	**5,000**	**30,000**	**45,000**
Grand Total				**1,419**	54%	**767**	**-**	**142**	**294**	**331**	**767,000**	**-**	**142,000**	**294,000**	**331,000**

Annex 8
Natural Resource Development and Environmental Rehabilitation Interventions

All Camps

No.	*Description*	*Unit*	***Cost, USD/unit***	***Baseline, 2014***	***Target (2015-18)***	***Target Values (in Cumulative numbers)***				***Funding Needs, USD***			
						2015	**2016**	**2017**	**2018**	**2015**	**2016**	**2017**	**2018**
1	Afforestation of degraded areas and camp greening	ha	4,000	373	705	455	530	610	705	329,000	300,000	320,000	380,000
2	Rehabilitation of gullies and degraded areas with physical structures	m3	20	-	27,000	12,000	17,600	24,000	34,000	240,000	112,000	128,000	200,000
3	Awareness raising on environmental issues	person	5	-	36,000	14,500	24,500	34,500	45,000	72,500	50,000	50,000	52,500
4	Livelihood projects to be integrated with environmental activities	person	250	-	2,150	800	1,310	1,900	2,550	200,000	127,500	147,500	162,500
5	Gabion wall construction	m3	75	-	4,000	2,300	2,900	3,700	5,000	172,500	45,000	60,000	97,500
6	Area enclosure	ha	6,500	-	145	52	90	130	170	338,000	247,000	260,000	260,000
	Total									**1,352,000**	**881,500**	**965,500**	**1,152,500**

Afar

No.	Description	Unit	**Cost, USD/unit**	**Baseline 2014**	**Total target**	**Target Values (in Cumulative numbers)**				**Funding Needs, USD**			
						2015	**2016**	**2017**	**2018**	**2015**	**2016**	**2017**	**2018**
1	Afforestation of degraded areas and camp greening	ha	4,000.00	2.3	30	5	10	20	30	10,800	20,000	40,000	40,000
2	Rehabilitation of gullies and degraded areas with physical structures	m3	20.00		5000	1000	2000	3000	5000	20,000	20,000	20,000	40,000
3	Awareness raising on environmental issues	person	5.00		8000	2000	4000	6000	8000	10,000	10,000	10,000	10,000
4	Livelihood projects to be integrated with environmental activities	person	250.00		400	100	200	300	400	25,000	25,000	25,000	25,000
5	Gabion wall construction	m3	75.00		1000	500	600	750	1000	37,500	7,500	11,250	18,750
6	Area enclosure	ha	6,500.00		20	5	10	15	20	32,500	32,500	32,500	32,500
	Total									**135,800**	**115,000**	**138,750**	**166,250**

Assosa

No.	Description	Unit	Cost, USD/unit	Baseline 2014	Total target	Target Values (in Cumulative numbers)				Funding Needs, USD			
						2015	2016	2017	2018	2015	2016	2017	2018
1	Afforestation of degraded areas and camp greening	ha	4,000.00	32	75	40	50	60	75	32,000	40,000	40,000	60,000
2	Rehabilitation of gullies and degraded areas with physical structures	m3	20.00		5000	1000	2000	3000	5000	20,000	20,000	20,000	40,000
3	Awareness raising on environmental	person	5.00		8000	2000	4000	6000	8000	10,000	10,000	10,000	10,000
4	Livelihood projects to be integrated with environmental activities	person	250.00		400	100	200	300	400	25,000	25,000	25,000	25,000
5	Gabion wall construction	m3	75.00		1000	500	600	750	1000	37,500	7,500	11,250	18,750
6	Area enclosure	ha	6,500.00		20	5	10	15	20	32,500	32,500	32,500	32,500
	Total									**157,000**	**135,000**	**138,750**	**186,250**

Dollo Ado

No.	Description	Unit	Cost, USD/unit	Baseline, 2014	Total target	Target Values (in Cumulative numbers)				Funding Needs, USD			
						2015	2016	2017	2018	2015	2016	2017	2018
1	Afforestation of degraded areas and camp greening	ha	4,000.00	7	40	10	20	30	40	10,800	40,000	40,000	40,000
2	Rehabilitation of gullies and degraded areas with physical structures	m3	20.00		5000	1000	2000	3000	5000	20,000	20,000	20,000	40,000
3	Awareness raising on environmental	person	5.00		8000	2000	4000	6000	8000	10,000	10,000	10,000	10,000
4	Livelihood projects to be integrated with environmental activities	person	250.00		400	100	200	300	400	25,000	25,000	25,000	25,000
5	Gabion wall construction	m3	75.00		1000	500	600	750	1000	37,500	7,500	11,250	18,750
6	Area enclosure	ha	6,500.00		80	20	40	60	80	130,000	130,000	130,000	130,000
	Total									**233,300**	**232,500**	**236,250**	**263,750**

Gambella

No.	Description	Unit	Cost, USD/unit	Baseline, 2014	Total target	Target Values (in Cumulative numbers)				Funding Needs, USD			
						2015	2016	2017	2018	2015	2016	2017	2018
1	Afforestation of degraded areas and camp greening	ha	4,000	130	200	150	165	180	200	80,000	60,000	60,000	80,000
2	Rehabilitation of gullies and degraded areas with physical structures	m3	20		5000	1000	2000	3000	5000	20,000	20,000	20,000	40,000
3	Awareness raising on environmental	person	5		4000	1000	2000	3000	4000	5,000	5,000	5,000	5,000
4	Livelihood projects to be integrated with environmental activities	person	250		400	100	150	250	400	25,000	12,500	25,000	37,500
5	Gabion wall construction	m3	75		0					-	-	-	-
6	Area enclosure	ha	6,500		0					-	-	-	-
	Total									**130,000**	**97,500**	**110,000**	**162,500**

Jijiga

No.	Description	Unit	Cost, USD/unit	Baseline 2014	Total target	Target Values (in Cumulative numbers)				Funding Needs, USD			
						2015	2016	2017	2018	2015	2016	2017	2018
1	Afforestation of degraded areas and camp greening	ha	4,000	74	160	100	120	140	160	104,000	80,000	80,000	80,000
2	Rehabilitation of gullies and degraded areas with physical structures	m3	20		7000	4000	4800	6000	7000	80,000	16,000	24,000	20,000
3	Awareness raising on environmental issues	person	5		8000	4500	5500	6500	8000	22,500	5,000	5,000	7,500
4	Livelihood projects to be integrated with environmental activities	person	250		550	300	360	450	550	75,000	15,000	22,500	25,000
5	Gabion wall construction	m3	75		1000	500	600	750	1000	37,500	7,500	11,250	18,750
	Total									**397,000**	**143,000**	**175,250**	**183,750**

Shire

No.	Description	Unit	Cost, USD/unit	Baseline 2014	Target (2015-18)	Target Values (in Cumulative numbers)				Funding Needs, USD			
						2015	2016	2017	2018	2015	2016	2017	2018
1	Afforestation of degraded areas and camp greening	ha	4,000	127	200	150	165	180	200	91,400	60,000	60,000	80,000
2	Rehabilitation of gullies and degraded areas with physical structures	m3	20			4000	4800	6000	7000	80,000	16,000	24,000	20,000
3	Awareness raising on environmental issues	person	5			3000	5000	7000	9000	15,000	10,000	10,000	10,000
4	Livelihood projects to be integrated with environmental activities	person	250			100	200	300	400	25,000	25,000	25,000	25,000
5	Gabion wall construction	m3	75			300	500	700	1000	22,500	15,000	15,000	22,500
6	Area enclosure	ha	6,500			10	15	20	25	65,000	32,500	32,500	32,500
	Total									**298,900**	**158,500**	**166,500**	**190,000**