Federal Democratic Republic of Ethiopia

Ministry of Water and Energy

Scaling - Up Renewable Energy Program
Ethiopia Investment Plan (Draft Final)

January 2012

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LIST OF ABBREVIATIONS

AFD	French Development Agency
BADEA	Arab Bank for Economic Development of Africa
COOPI	International Cooperation (Italy)
CRGE	Climate Resilient Green Economy
CSA	Central Statistics Agency
EC	European Commission
EIB	European Investment Bank
EEA	Ethiopian Electricity Agency
EEPCO	Ethiopian Electric Power Corporation
EPA	Environmental Protection Authority
GEF	Global Environmental Facility
GHG	Green House Gas
GoE	Government of Ethiopia
GSE	Geological Survey of Ethiopia
GTP	Growth and Transformation Plan
GWh	Giga Watt hour
HoA-REC/N	Horn of Africa – Regional Environment Centre and Network
HV	High Voltage
INBAR	International Network for Bamboo and Rattan
ICS	Interconnected System
IP	Investment Plan
LED	Light Emitting Diode
LV	Low Voltage
MoFED	Ministry of Finance and Economic Development
MoM	Ministry of Mines
MoWE	Ministry of Water and Energy
MW	Mega Watt
NBPE	National Biogas Program of Ethiopia
NGO	None Governmental Organizations
OPEC FID	Organization of Petroleum Exporting Countries – Fund for International Development
REF	Rural Electrification Fund
RET	Renewable Energy Technologies
REES	Rural Electrification Executive Secretariat
SCS	Self-Contained System
SNNPR	Southern Nations Nationalities and Peoples Region
SNV	Netherlands Development Organization
SREP	Scaling-up of Renewable Energy Program
USD	United States Dollar

PROPOSAL SUMMARY

Objectives

1. Driven by accelerating socio - economic growth and development, Ethiopia is experiencing increased energy consumption and unmet demand for the last 7 years. In this regard, the major objective of the energy sector during the existing 5 year Growth and Transformation Plan period (GTP) and beyond is to meet the demand for energy in the country by providing sufficient and reliable power supply that meets international standards at all times. This objective will be achieved by accelerating and completing the construction of hydroelectric power and other renewable energy generation projects, expanding and strengthening the existing transmission and distribution lines to provide improved access to rural villages all over the country. An additional objective is to export power to the neighboring countries. Modernizing the distribution system will also be considered, so as to reduce power losses to international benchmark levels.

2. Development of alternative energy from renewable sources such as wind, geothermal, solar, biomass as well as energy efficiency measures will be a key part of Ethiopia's energy mix and integrated with the country's new Climate Resilient Green Economy (CRGE) Strategy, which has the ambitious objective of a transforming Ethiopia into climate resilient green economy by 2025. The GTP and the CRGE – as well as other national development plans – are explicitly focused on addressing issues of energy access, quality of supply and productive energy use in the context of new energy policies and planning.

3. Potential SREP investments have thus been prioritized vis-à-vis their contribution to assisting the Government of Ethiopia (GoE) in meeting the overall demand for energy and improve access to energy at international standards as per the GTP, while adhering to the low-carbon mission statement of the CRGE and addressing the GoE's broader structural concerns regarding energy access and productive energy use, particularly for rural communities focusing on women and girls.

Expected Outcomes

4. SREP is embedded in Ethiopia's GTP, which sets the major outcomes for the energy sector in the short-term, as well as the CRGE, which provides a road map for the country's long-term low-carbon growth path. The GTP aims to increase the power generation capacity of the country from the present level of 2000 MW to 10,000 MW by the end of 2015. The aim is to address both domestic demand while exporting surplus power to neighboring countries and beyond. The need to expand the transmission and distribution system is also emphasized in order to deliver the energy generated to the consumer in an efficient and reliable manner. The GTP further envisages increasing the customer base of

the power utility from the current level of 2 million to 4 million and the universal electricity access rate from 45% to 75%.

5. It further aims at increasing the dissemination of renewable energy technologies and increasing access to modern energy sources in order to reduce the deforestation rate and mitigate carbon emissions. At the end of the GTP period at least 80 % of households where majority of women and girls will be beneficiaries of modern energy services from dissemination of efficient cook stoves and other RE sources since in most cases they are in charge of collecting firewood and other types of fuel. This has an effect on their lives namely in terms of health, less access to school for girls, risk of violence and abduction. Furthermore, in many cases, the time used in the collection of firewood could be used for economic activities (for women), and better attendance to school (for girls).

6. Successful implementation of SREP will pave the way for improving the energy mix of the national power system by incorporating geothermal and wind power in a sustainable way, thereby increasing the system's reliability and resilience towards climate change. It will also accelerate the electrification of the country by making more energy available in the system. With the radically scaled-up dissemination of improved cook stoves though training and capacity building of SME's that will facilitate the development of private sector participation and will bring transformation and sustainable exploitation of the country's biomass resources, SREP will help alleviate the social, economic and environmental problems faced largely by the rural population, especially women and girls by allowing them to spend time in productive activities and improving their health. At the same time a significant contribution to Ethiopia's goals of achieving the reductions in green-house gas emissions as set in the CRGE strategy document.

Program criteria, Priorities, Financing Matrix and Channeling of Funds

7. The SREP Investment Plan (IP) has analyzed various options for the scaling-up of renewable energy utilization based on all the known renewable energy sources of the country (including hydropower below 10 MW) within the planning horizon of 2011 - 2015. The total budget requirement for the renewable energy investment outside of the large hydropower and the transmission and distribution network extension, requiring intervention from SREP and other leveraged sources of finance, is USD 532 million. Investments were ranked and prioritized according to the following seven criteria:

i. Strategic relevance to the country's development;

ii. Gender Equality Promotion;

iii. Positive impact;

iv. Potential to scale-up;

v. Cost effectiveness;

vi. Potential for new direct beneficiaries;

vii. Implementation readiness.

8. Based on this exercise and according to the criteria mentioned, the following components have been prioritized with their accompanying budget requirements as presented in Table 1 below.

TABLE 1: FINANCING MATRIX

SREP	#	Project	Total Cost	GoE	SREP	MDBs	Others
Initial Allocation	**1**	**Aluto Langano Geothermal Field Development**	**231.2**	**78.7**	**26.0**	**60.0**	**66.5**
	1.1	- Component I: Aluto Langano Geothermal Power Generation Project	**229.2**	78.2	24.5	60.0	66.5
	1.1.1	Phase I: Appraisal and Production Drilling	**93.0**	42.0	24.5	10.0**	16.5*
	1.1.2	Phase II: Power Plant and Transmission Line Construction	**136.2**	36.2	-	50.0+	50.0***
	1.2	- Component II: Design of a Long-Term Strategy for the Geothermal Sector	**2.0**	0.5	1.5	-	-
	2	**Assela Wind Farm Project**	**250.0**	**40.0**	**20.0**	**140.0**	**50.0++**
	2.1	Project Preparation Grant (feasibility study)	**2**	0.3	1.7	-	-
	2.2	Construction	**248**	39.7	18.3	140.0	50.0
	3	**Clean Energy SMEs Capacity Building and Investment Facility**	**12.0**	**-**	**4.0**	**4.0**	**4.0+++**
	3.1	Project Preparation Grant (Scoping Study)	**0.4**	-	0.4	-	-
	3.2	Advisory Services and Capacity Building	**1.6**	-	1.6	-	-
	3.3	Financing Facility	**10.0**	-	2.0	4.0	4.0
SUB-TOTAL			**493.2**	**118.7**	**50.0**	**200**	**124.5**
Reserve	4	**Tendaho Geothermal Field Development**	**319.6**	**60.85**	**10.0**	**188.0**	**60.75**
	5	**Sor SHEPP Expansion Project**	**25.1**	**5.9**	**9.0**	**10.2**	**-**
SUB-TOTAL			**344.7**	**66.75**	**19.0**	**198.2**	**60.75**
TOTAL			**837.9**	**185.45**	**69.0**	**398.2**	**185.25**

* It includes a USD 10 million from Government of Japan. The USD 6.5 million gap is expected to be closed by other donors. In case this amount is not secured, the GoE will come up with the amount.

** USD 10 million co-financing from the WB.

*** Following preliminary discussions between the GoE and the GoJ, the gap is expected to be closed by the GoJ (USD 50 million)

+ USD 50 million will be used to finance the construction of the Power Plant and is pending country's allocation under the next cycle of ADF and/or IDA. If the GoE chooses to increase its ADF and/or IDA allocation to the Project, the sources of financing can change in the future.

++ The USD 50 million gap is expected to be closed by other donors. In case this amount is not secured, MDBs in conjunction with the GoE will hold donor meetings to bring in other co-financiers. In case this proves to be unfeasible, the GoE will prioritize further ADF and/or IDA allocations to this project.

+++ USD 4 million are expected to be financed by local financial institutions.

9. The proposed lead MDB to channel SREP funds for financing the projects outlined in this IP is shown in Table 2 below.

TABLE 2: CHANNELING OF SREP RESOURCES

#	Project	SREP Allocation (USD million)	Project Preparation Grant (Y/N)	Lead MDB for PPG Implementation	Lead MDB	Executing Agency
1	**Development of Aluto Langano Geothermal Field**					
1.1	- Component I: Aluto Langano Geothermal Power Generation Project	24.5	N	-	AfDB	MoWE/EEPCo/GSE
1.2	- Component II: Design of a Long-Term Strategy for the Geothermal Sector	1.5	N	-	IFC	MoWE/IFC
2	**Assela Wind Power Project**	20	Y	AfDB	AfDB	MoWE/EEPCo
3	**Clean Energy SMEs Capacity Building and Investment Facility**	4	Y	IFC	IFC	Local Commercial Bank

I. COUNTRY CONTEXT

THE ENERGY SECTOR IN ETHIOPIA

10. Access to energy is among the key elements for the economic and social developments of Ethiopia. The energy sector in Ethiopia can be generally categorized in to two major components: traditional and modern (traditional biomass usage and modern fuels i.e electricity and petroleum). As more than 80% of the country's population is engaged in the small-scale agricultural sector and live in rural areas, traditional energy sources represent the principal sources of Energy in Ethiopia.

11. Domestic energy requirements in rural and urban areas are mostly met from wood, animal dung and agricultural residues. At the national level it is estimated that biomass fuels meet 88 % of total energy consumed in the country. In urban areas access to petroleum fuels and electricity has enabled a significant proportion of the population there to employ these for cooking and other domestic energy requirements.

12. Access to biomass fuels has declined significantly in all areas of the country and drastically in some parts. Reduced access to woody biomass has had serious developmental and social impacts. Less access to wood means more has to come from other sources of biomass to meet demand for fuel. This has eroded the balance between what goes in for agricultural production and animal manure for fertilizer, and what goes out of it, i.e. food for humans and animals.

13. A survey by the Central Statistics Agency (CSA) in 2004 showed that about 71.1% of the total households use kerosene for lighting followed by firewood (15.7%) and electricity (12.9%). A higher proportion of urban residents use electricity (75.3%) for lighting, while the use of kerosene (80.1%) and firewood (18.5%) are predominant in rural areas. Major types of cooking fuel used by all households are firewood, leaves, dung cakes and kerosene. The study by CSA at the country level, suggests that about 81.4 % of the households use firewood, around 11.5 % cook with leaves and dung cakes and only 2.4 % use kerosene for cooking. The majority of rural households use firewood (84.4 %) and few of them (12.7 %) use leaves and dung cakes. The use of modern source of cooking fuel such as butane gas, electricity and kerosene for cooking is uncommon in the rural areas (0.4 %). Use of kerosene is common in urban areas and stands at 13.8 % following firewood (65.4 %). Charcoal (7.7 %), electricity (2.4 %) and leaves (5.3 %) are also used by urban households. On the other hand, only 0.2 % of the households in rural areas are observed to use charcoal for cooking.

14. The total energy sales of the Interconnected System (ICS) – the main electricity grid and the Self-Contained System (SCS) – separate mini grids, stand at 3894 GWh during the 2009/2010 fiscal year. Of this the sales in the ICS take about 98% of the total. Category-wise the

domestic consumption takes the highest share at 38% seconded by the total industrial consumption (LV and HV) which is 37%.

TABLE 3: 2010/2011 GC ENERGY CONSUMPTION BY TARIFF CATEGORY

TARIFF CATEGORY	ICS		SCS		TOTAL	
	Sales	%	Sales	%	Sales	%
Domestic	1,462	38.14%	28	45.90%	1,490	38.27%
Commercial	939.1	24.50%	22	36.07%	961	24.68%
St. Lighting	29.5	0.77%	1	1.64%	31	0.78%
Industries	1395.2	36.39%	8	13.10%	1,402	36.03%
Own consumption	7.6	0.20%	1	1.64%	9	0.22%
TOTAL	**3,834**	**100%**	**60**	**100%**	**3,894**	**100%**

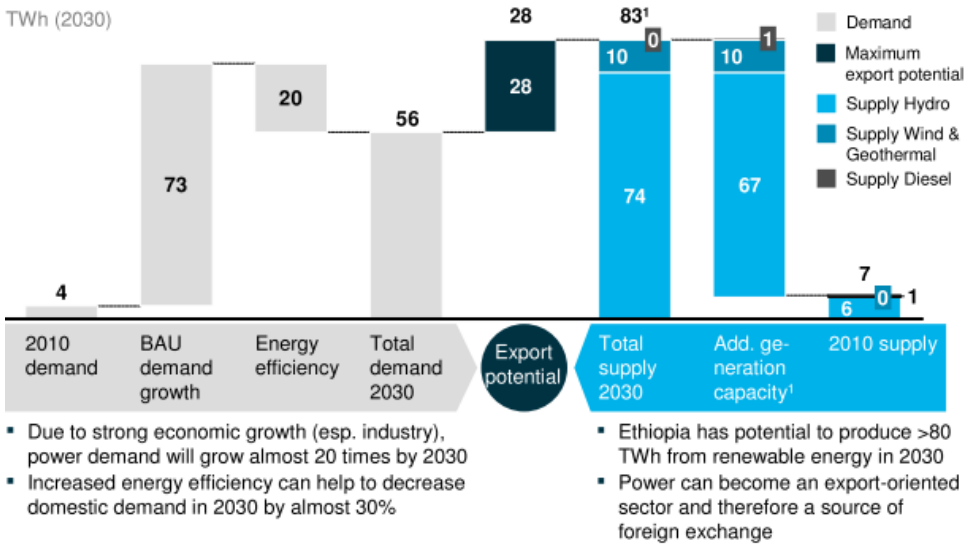
Source: EEPCo, Corporate Planning Department

15. Annual per capita consumption of electricity is 100 kWh per year. The same figure for the Sub-Saharan Africa is 510 kWh. This reveals that most of the energy usage is still from traditional energy sources such as wood and animal waste. Moreover it also informs the fact that with the country's economic development and improvement of the per-capita income, there will be huge potential for consumption of electricity within the country.

16. System losses as determined from the generation and sales figure stand at 23%. This figure represents both technical and non-technical losses and the major share is attributable to the distribution network poor design. Distribution system rehabilitation and power factor improvement projects are launched in major cities of the country in order to address this problem. In 2009/2010 fiscal year, the generated energy stood at 4976.5 GWh and the system peak was 913.93 MW. The actual generation was constrained for the past three years (2008-2011) due to shortage of generation and transmission capacity. These problems have been alleviated with the commissioning of Tekeze (300 MW) and Beles (460 MW) hydroelectric power plants.

17. In the Climate-Resilient Green Economy (CRGE) initiative that has been launched in Ethiopia and also during the COP17 Meeting in Durban, South Africa, a demand forecast has been prepared. The forecast are based on GDP data, sectoral energy consumption intensities, and projections of the potential for increasing energy efficiency. As shown in the next figure total power demand is projected to grow from 4 TWh in 2010 to a maximum of nearly 70 TWh in 2030. The steep increase in demand (14% per annum) reflects both the growing electrification of the country – the target for 2020 is to expand access to grid connection to nearly 100% of the country (measured in area coverage) – and rapid growth of electricity-intensive industries – projected at a rate of more than 15% a year, outpacing even the overall GDP growth rate. When specific energy efficiency measures are factored into the forecast the demand requirement will be limited to 50 TWh in 2030, which still represents a more than tenfold increase over today's demand.

FIGURE 1: POWER DEMAND AND SUPPLY

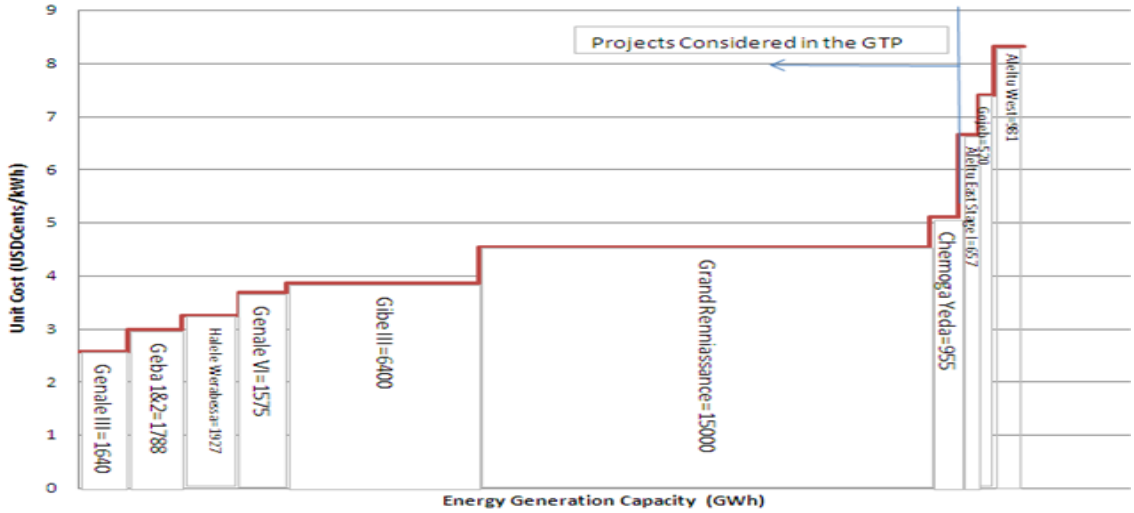


Source: CRGE, 2011

18. There is significant generation resource in the country. Ethiopia's hydropower resources, which are distributed in nine major river basins and their innumerable tributaries, are estimated to generate 650 TWh per year. The technically feasible potential is estimated to be 40% of the theoretical potential i.e. 260 TWh per year (45 GW equivalent with 65% plant factor). This would constitute about 15% of the total technically feasible potential of Africa, which is 1750 TWh per year. In order to tap from these resources various studies are being undertaken both by MoWE and the Ethiopian Electric Power Corporation (EEPCo). Starting from the basin-wide water resource master plan studies, specific reconnaissance, prefeasibility and feasibility studies are being undertaken and attractive projects are prioritized in the GTP and CRGE using the levelized cost of generation and implementation readiness of the projects (their status in terms of study completions, whether or not EPC contracts are signed, and the status of construction). The next figure shows the unit generation costs for all projects whose feasibility study currently is completed. As can be seen from the figure some projects are not included in the current GTP plan since their unit costs are relatively high.

19. Most of these hydro projects, except GIBE III, indicated in the above figure are planned to be commissioned after 2014. Wind power plants having a total of 770MW capacity are also planned to be commissioned before 2014 in order to avert possible shortfalls and also due to their added advantage in complementing the hydro generations during unfavorable dry periods. For the later reason, the Aluto Langano Geothermal Field (up to 75 MW) is also planned to be commissioned by year 2015.

FIGURE 2: HYDRO PROJECTS UNIT GENERATION COST



Source: EEPCO, Corporate Planning Department

20. Almost all hydro projects which are planned to be constructed in the GTP period have their unit generation costs below 5USD cents per kWh, as shown in the figure above. These generations are meant to serve both the domestic and export demands. In the CRGE it is anticipated that on average 24 TWh will be exported annually from Ethiopia between the years 2011 and 2030. It is further elaborated that the presence of demand is not a point of contest since most of Ethiopia's neighbors' expansion are planned to be met with conventional thermal generations having average generation costs ranging between USD 0.15 and USD 0.24 per kWh. In the short term this export is expected to be limited by the available export capacity of the interconnector lines. In the long term the limiting factor will be the surplus from Ethiopia as it will diminish with growing internal demand.

21. Regarding the interconnectors the construction of Ethiopia-Djibouti interconnection line is completed and power export has been operational since 2011. The construction of the interconnector (200 MW) with Sudan is completed and power flow is expected to start on early 2012. The feasibility study for the 2000 MW HV DC interconnector with Kenya has been completed and is now at the early construction stage. The finance for the construction is already secured from development partners and a Power Purchase Agreement between the two countries was agreed and signed. The Eastern Nile Power Trade study project which is commissioned by the Eastern Nile Technical Regional Office under the Nile Basin Initiative has concluded the feasibility of implementing 3200 MW interconnector between Ethiopia, Sudan and Egypt starting from year 2018. Furthermore, the East Africa Power Pool master plan study has recommended expediting and making on-line the Ethiopia-Sudan-Egypt and the Ethiopia-Kenya interconnection lines before 2016 in order to increase the regional interconnection benefits.

22. ***Dispatch Composition.*** Table 4 presents the current, 2015 and 2030 Ethiopia's electricity generation system composition. At present 93.1% of the system generation capacity is from renewable sources. The majority share (92.5%) comes from hydro generation. Generation dispatch always follows economic merit order. Since thermal generation based on imported fuel has high GHG emissions and high operating costs, they are usually used as a standby to the system and dispatched when the generation from the other renewable energy sources is below the demand. For this reason fossil fuel based annual generation will always be much less than their capacity as presented hereunder.

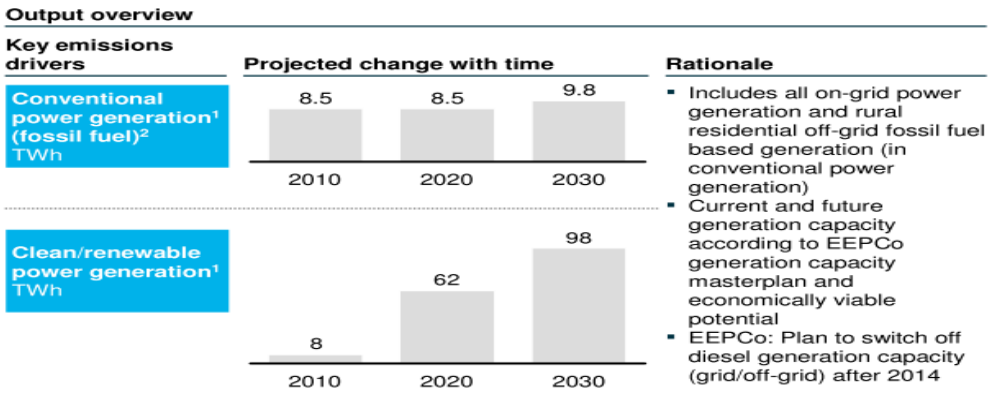
TABLE 4: CURRENT AND FUTURE GENERATION COMPOSITION OF THE POWER SYSTEM

Type	Existing			2015			2030		
	MW	GWh	%	MW	GWh	%	MW	GWh	%
Thermal	79.2	563.6	6.90%	79.2	563.6	1.40%	79.2	563.6	0.57%
Non-Renewable Total	**79.2**	**563.6**	**6.90%**	**79.2**	**563.6**	**1.40%**	**79.2**	**563.6**	**0.57%**
Hydro	1,850.6	7574	92.50%	10,641.6	36506	90.80%	22,000.0	86,724.0	87.26%
Wind			0.00%	772.8	1,928.2	4.80%	2,000.0	4,029.6	4.05%
Geothermal	7.3	49	0.60%	77.3	571.0	1.40%	1,000.0	7,446.0	7.49%
Bagass			0.00%	103.5	626.7	1.60%	103.5	626.7	0.63%
Renewable Total	**1,857.9**	**7623**	**93.10%**	**11,595.2**	**39,631.9**	**98.60%**	**25103.5**	**98,826.3**	**99.43%**
Total	**1,937.1**	**8,186.6**	**100.00%**	**11,674.4**	**40,195.5**	**100.00%**	**25,182.7**	**99389.9**	**100.00%**

Source: EEPCO, Corporate Planning Department

23. The growing share of the renewable energy sources in the generation system tells the same story that Ethiopia's power sector development follows what is termed green development path. In addition the system in 2015 and 2030 has a better generation mix which is comprised of wind and geothermal besides hydro.

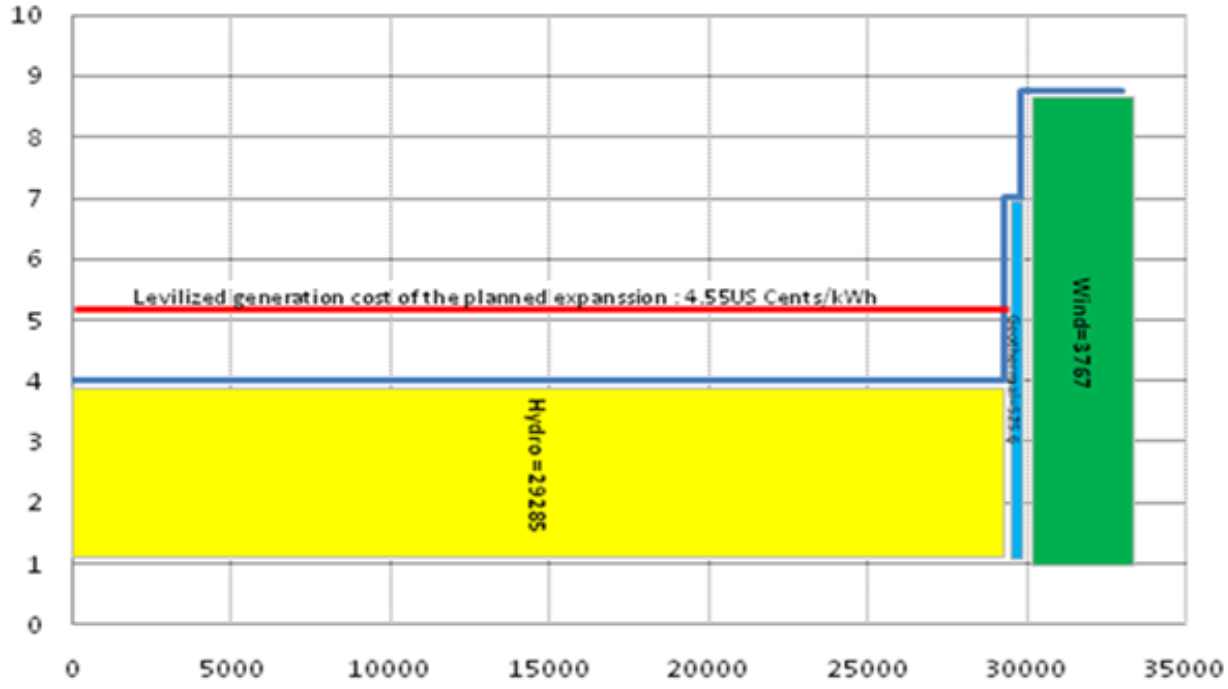
FIGURE 3: OUTPUT OVERVIEW



1 Total Generation (before T&D losses); 2 Includes rural domestic off-grid fossil fuel based generation
Source: EEPCO, Corporate Planning Department

24. ***Electricity Cost and Pricing.*** The costs of a power system usually are expressed in terms of long run marginal costs. The levelized costs for the planned system additions are used here to estimate the system long run marginal costs. The average levelized system generation cost for the planned expansion is 0.0455 USD per kWh. The generation cost by source type is indicated in following figure. The levelized cost for transmission is estimated to be 0.007 USD per kWh. This figure for the distribution system is estimated to be 0.014 USD per kWh. Therefore, the levelized cost of power supply for the planed GTP period expansion is 0.067 USD per kWh.

FIGURE 4: UNIT GENERATION COST BY SOURCE TYPE



Source: EEPCO, Corporate Planning Department

25. Ethiopia's average electricity tariff had been stable in nominal terms for almost fifteen years, until July 2006, when there was an increase of 22%, which took the average tariff to 0.06 USD per kWh. Since 2006 no increase has been made. The implication is that real tariff has been falling throughout these years. Currently the real electricity price is around 0.032 USD per kWh. The detailed tariff structure by customer category is shown in Table 5.

26. The gap between the cost and the existing tariff has been recognized both by the GoE and EEPCO. EEPCO has already submitted an application to Ethiopian Electricity Agency (EEA) to raise the tariff to a system cost recover level.

TABLE 5: ELECTRICITY TARIFF SINCE 2006

Tariff category	Consumption kWh/month)	Tariff Rate (Birr/kWh)
1. **Domestic**		
Equivalent Flat Rate		**0.3897**
First Block	First 50 kWh	0.273
Second Block	Next 50 kWh	0.2921
Third Block	Next 100 kWh	0.4093
Fourth Block	Next 100 kWh	0.4508
Fifth Block	Next100 kWh	0.4644
Sixth Block	Next 100 kWh	0.482
Seventh Block	Above 500 kWh	0.5691
2. **General**		
Equivalent Flat Rate		**0.5511**
First Block	First 50 kWh	0.499
Second Block	Above 50 kWh	0.5691
3. **Low Voltage Time-of-Day Industrial**		
Equivalent Flat Rate		**0.4736**
4. **High Voltage Time-of-Day Industrial 15 kV**		
Equivalent Flat Rate		**0.3349**
5. **High Voltage Time-of-Day Industrial 132 kV**		
Equivalent Flat Rate		0.3119
6. **Street Light Tariff**		
Equivalent Flat Rate		0.397

Source: EEPCO, Corporate Planning Department

INSTITUTIONAL STRUCTURE AND CAPACITY

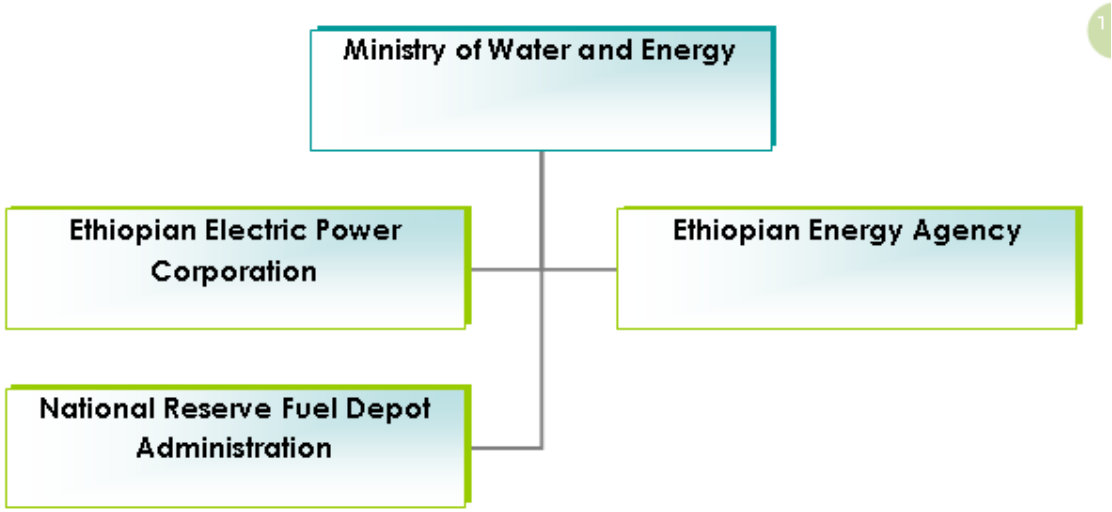
27. The MoWE is the responsible organ of the GoE concerning the country's energy sector development and expansion. The energy related directorates within MoWE are responsible for energy policy drafting, implementation follow up and supervision. They are also responsible for conducting research and studies including development and promotion of rural energy efficient technologies such as improved stoves, solar and bagasse. In addition they also have the

responsibility to set standards for biofuel and petroleum oil products, depots and retail facilities.

28. Under MoWE institutions there are three supervised institutions which are directly related to the energy sector. These are:

- EEA which is responsible for the regulation of the operations in the electricity supply sector including licensing and ensuring safety and quality standards.
- EEPCO which is the national electricity utility engaged in the generation, transmission, distribution and sales of electricity in Ethiopia.
- National Strategic Petroleum Reserve Administration that manages and administers strategic fuel reserve depots located throughout the country to ensure sustained supply at times of sudden shocks.

FIGURE 5: GOVERNMENT STRUCTURE FOR THE ENERGY SECTOR



29. Other institutions that play a key role in the energy sector in Ethiopia include the Ministry of Finance and Economic Development (MoFED) in charge of public finances, the Ministry of Trade which is involved in the petroleum pricing system, the Ministry of Mines (MoM) in charge of upstream hydrocarbon and geothermal resources exploration the Environment Protection Agency in charge of regulating the environmental aspects of energy development activities.

II. RENEWABLE ENERGY SECTOR CONTEXT

ANALYSIS OF RE OPTIONS

30. ***Issues and Constraints.*** The rural communities in Ethiopia have low access to energy, both for subsistence and productive purposes, and rely almost entirely on biomass fuels. The consumption of wood fuel has far exceeded its supply. Excessive dependence on biomass energy involves a trade-off in agricultural productivity, the crop residues and animal wastes being diverted from farms, where they supplement soil nutrition, to provide energy needs. Similarly, as fuel wood scarcity has become increasingly serious, rural households who depend on collecting wood freely have to travel longer distances to obtain it, thus causing loss of human availability for productive work. Furthermore, fuel wood scarcity will advance further deforestation and lead to a general environmental degradation.

31. Unavailability of modern energy in the rural areas has resulted in lack of opportunities for provision of social amenities such as water supply, health services and educational facilities for which modern energy sources are essential inputs.

32. In general, the prevailing pattern of energy supply and consumption shows many elements of un-sustainability. The energy problem in the country arises not from excessive reliance on non-renewable energy sources, but rather the main source of energy for the population - fuel wood - is being consumed at an unsustainable rate, while the vast potential of other forms of renewable energy (solar, wind, geothermal, hydropower, etc) remains virtually undeveloped.

33. The most important constraints for rural energy development are summarized below.

- **Low Levels of socio-economic and infrastructure development**
  - The high incidence of rural poverty means that modern energy sources like kerosene and electricity and associated appliances are not affordable
  - Low energy consumption that is decentralized and dispersed; advantages of economies of scale are lacking
  - Lack of rural infrastructure - poor rural infrastructure services increase transaction costs in modern energy services and technologies

- **Insufficient Assessment of Biomass Energy Resources and Technologies**
  - Lack of detailed, site-specific data needed for project site selection and design optimization is very critical. The solution requires data collection, but also assembly, quality control, processing and dissemination.

- **Lack of Information**

  - Lack of access to substantive information on recent technical developments, on new program approaches, manufacturing techniques and financing methods, and on international rural development experiences is a major problem for rural energy development.

- **Under-developed rural energy markets**

  - There is low participation of the private sector due to the capital intensity of the sector and other performance barriers. There is also insufficient experience in commercial operations and delivery systems. Knowledge of market operations and mechanisms is weak.

- **Others**

  - For grid connected areas, with most of its generation capacity being in hydropower, Ethiopia may face challenging times during droughts. The majority of power plants in Ethiopia depend on water from different rivers and tributaries. Maintaining the appropriate mix of generation from various sources will mitigate this problem.

  - Electricity being one means of modern energy service delivery, some of its applications may be substituted by other energy forms, but for others comparable quality service is not possible without it. Such critical applications include lighting (domestic, commercial or social), communication and information, industrial machines, and home appliances. In the rural Ethiopian context, current demand for electricity is mostly limited to lighting and for running small industrial machines for mills. With rapid rural development, however, the demand for electricity in terms of both the range of applications as well as amount will increase.

  - While electricity is highly desired by rural people and may be required to deliver critical economic and social services, the effective demand or the amount of electricity that many rural households would be capable of paying the full price for is low. On the other hand, investment requirements for electrification are substantial and often obstruct rural communities from transition to better means of energy service through electricity. This is despite the fact that investments in better services are financially attractive on life cycle cost basis. The underlying causes for the very low rate of rural electrification is low incomes (low economic activity) and the highly dispersed nature of rural settlements (where even in many of the settlements classified as towns, residents are only a few hundred). As a result, electricity demand density in most rural areas is very low and cost of supply is high.

BARRIER ANALYSIS

34. With only 17% of households directly connected to the grid and 45% of the population living in areas with general access to electricity from EEPCO the electrification rate is still considered very low. Dispersed demand (because of scattered settlement) and very low consumption level of electricity among rural consumers, limited grid electricity penetration to rural population, and the fact that electricity expansion has been costly compared to the demand, there is an evident need for a greater effort and investment in the area of electrification and hence, it is unlikely that all the rural population would be connected to the grid with in the coming 5-10 years. Despite the progress in renewable energy, a number of barriers restrict its development and penetration. Some of these are the relatively higher investment requirements for RETs, intermittent electricity generation characteristics from renewable resources leading to their low reliability in meeting power demand, need for effective back-up power supply options that increases costs, lack of full cost pricing in determining cost of competing energy supplies.

35. Some of the barriers and constraints for development and penetration of renewable energy technologies are presented in Table 6 below.

TABLE 6: BARRIERS FOR RENEWABLE ENERGY DEVELOPMENT

Barriers / Constraints	Mitigation	Resources Affected
Technical and Human		
Lack of locally developed and adapted technologies that fit with local conditions	- SREP will finance for capacity building and training of SME's to develop and promote efficient cook stoves and other renewable energy markets - Promotion of partnerships between local manufacturers and international technology providers to adapt proven technologies to local conditions	Biomass, Solar, Wind
Human Resources Constraints	- The MoWE signed an MOU with six Ethiopian Universities for the creation of Centers of Excellence. - SREP will finance a capacity building component in the geothermal sub-sector that will train decision-makers, geoscientists, drilling and engineering personal.	Solar, Wind, Hydro, Geothermal and Biomass
Lack of on-job training experiences	- Projects financed by SREP will help fill that gap by providing such opportunities.	Wind, Geothermal
Lack of technology transfer	- Stimulation of local manufacturers. - Hiring of international experts throughout the development stage.	Wind, Geothermal
Lack of proven Track Record in the new renewable energy technologies	- SREP will help to demonstrate the viability of these new forms of energy for Ethiopia.	Wind, Geothermal,

	- SREP will scale-up further geothermal and wind installed capacity.	Biomass
Information		
Lack of detailed Road Maps for Development Models	- SREP will finance the development of the Long-Term Geothermal Sector Strategy	Geothermal
Enabling Environment for Private Sector Participation	- SREP will finance a sector strategy that includes defining options for how geothermal assets can be developed leveraging the private sector, ensuring that future projects are bankable and building business skills. - The GoE is currently finalizing the Feed-in-Tariff Law. The law will be reviewed throughout to make it more attractive and fair. - Market development for clean, renewable energy-based products and services in the household and commercial segments, by providing targeted capacity building and financing to small and medium-sized enterprises	All RE Technologies but mainly Geothermal
Economic and Financial Barriers		
High risk associated with geothermal drilling	- SREP will finance the drilling stage, known as the riskier one in Geothermal Development.	Geothermal
High Cost of Renewable Energies Technologies	- SREP will provide capital buy-downs that will ultimately make expensive renewable energy sources more affordable. - SREP will stimulate local technology producers that will bring down overall costs through gains in economies of scale.	Geothermal and Wind
Lack of available finance	- SREP will leverage resources at a ratio of 1/10 and set the path for future replication.	All RE Technologies
Environmental and Social		
Continued Forest resources degradation	- SREP will contribute to the reduction of Forest Degradation through the financing of SMEs involved on the manufacturing and dissemination of improved cook stoves	NA
Gender Inequality	- The GoE and the SREP are keen in promoting gender equality by reducing the work overburden of women and girls through the provision of access to modern forms of renewable energies.	NA

36. These barriers not only reduce the size of the market but also reduce the economic potential by swelling the cost of the technology. The actual size of the market for renewable energy technologies to a greater extent depends on how well these barriers are addressed.

Awareness of the benefits and impacts of renewable energy technologies by final consumers and promoters, building technical capacity of local technicians and the market infrastructure, putting appropriate financing mechanism in place and providing an integrated barrier removal approach through policy supports will have a vital impact in the realization of the full size of the market for these technologies.

GOVERNMENT PLANS AND STRATEGY FOR THE SECTOR

37. ***The National Energy Policy.*** The first National Energy Policy was issued in March 1994 during the period of the Transitional Government of Ethiopia. This is still in force as the policy of the GoE. The policy document states the GoE's intentions in each of the sub sectors. Thus it aims to address household energy problems by promoting agro-forestry, increasing the efficiency with which biomass fuels are utilized, and facilitating the shift to greater use of modern fuels. Furthermore, the policy paper states that the country will rely mainly on hydropower to increase its electricity supply but it also mentions to take advantage of Ethiopia's geothermal, solar, wind and other renewable energy resources where appropriate. In addition it aims to further explore and develop oil and gas reserves. It also refers to the need to encourage energy conservation in industry, transport and other major energy-consuming sectors, to ensure that energy development is economically and environmentally sustainable. Providing appropriate incentives to the private sector is the other area the policy statements emphasize. The energy policy document is further elaborated by different sectoral policies and strategies like industrial, agricultural, etc polices and strategies.

38. The general objectives of the energy policy are:

- To ensure a reliable supply of energy at the right time and at affordable prices, particularly to support the country's agricultural and industrial development strategies adopted by the GoE.
- To ensure and encourage a gradual shift from the use of traditional energy sources to modern energy sources.
- To streamline and remove bottlenecks encountered in the development and utilization of energy resources and to give priority to the development of indigenous energy resources with a goal toward attaining self-sufficiency.
- To set general guidelines and strategies for the development and supply of energy resources;
- To increase energy utilization efficiency and reduce energy wastage; and,
- To ensure that the development and utilization of energy is benign to the environment.

39. ***The Growth and Transformation Plan.*** In line with the policy directives, the GTP, which is the current GOE development plan for the period 2010/11-2014/15 has set Ethiopia's vision which is:

> **"...to become a country where democratic rule, good-governance and social justice reign, upon the involvement and free will of its peoples, and once extricating itself from poverty to reach the level of a middle-income economy as of 2020-2023."**

40. The country's vision specifically in the economic sector includes:

> "...**building an economy which has a modern and productive agricultural sector with enhanced technology and an industrial sector that plays a leading role in the economy, sustaining economic development and securing social justice and increasing per capita income of the citizens so as to reach the level of those in middle-income countries**."

41. Concerning the energy sector, the GTP sets as its target during the plan period of an additional 8,000 MW energy generated from renewable energy resources. This plan aims to address both the domestic demand and the export of power to neighboring countries and beyond. The need to expand the transmission and distribution system is also emphasized in order to deliver the energy generation to the consumer in an efficient and reliable manner. The plan further envisages increasing the customer base of the power utility from the current level of 2 million to 4 million and the general access rate from 41% to 75%.[1] Regarding bio-fuel usage and production the plan targets to increase the bio-ethanol production and usage to 194.9 million liters and biodiesel usage to 1.6 billion litters. The number of ethanol to benzene blending facilities is also targeted to reach 8 and that of biodiesel - 72. It further aims at increasing the dissemination of alternative energy technologies in order to reduce effectively the deforestation rate and alleviate the burden of the widely dispersed rural settlers.

42. The strategic directions during the GTP period are the development of renewable energy, the expansion of energy infrastructure, and the creation of an institutional capacity that can effectively and efficiently manage such energy sources and infrastructure. During the GTP period, the gap between the demand for and supply of electricity will be minimized. The per capita consumption of electricity of households is expected to increase during the GTP period. Moreover it is planned to produce sufficient electricity for export. The electric power supply coverage will be increased through the ongoing rural electrification access program. The GoE will ensure a cost effective, high quality supply of energy, as well as energy efficiency and conservation. The regulatory framework will be effectively enforced.

43. In order to promote and realize the country's Green Development Strategy, ongoing initiatives to generate electricity from hydro power and the development of other renewable energy sources like bio fuels, solar and wind will remain the strategic direction during the GTP period. In addition new technological innovations will be utilized to ensure

[1] It is the ratio of the total households in electrified towns and villages to the total households in the country.

that the energy sector doesn't emit additional carbon-dioxide. To promote and sustain rural alternative energy development activities, efforts will be made to enhance the capacity and knowledge of regions, producers and consumers in this regard. The distribution of fuel wood saving materials and technologies throughout the country will be continued.

44. The key implementation strategy is capacity building in energy development and management. Thus the national electricity company will go through radical reform such that the national institutional capacity to generate power, construct the infrastructure and efficiently and effectively manage the power and infrastructure shows fundamental improvement. Other implementing strategies that will be employed to achieve the objectives and targets for the energy sector are strengthening organizational implementation capacity (the electric power company go through a complete restructuring process), increasing development of electric power generation and access to services, strengthening regulation of electricity providers so as to ensure a reliable service, expanding alternative renewable energy production, increasing emergency oil reserves, and ensuring protection of natural resources and enhancing community development. Gender and HIV/AIDS related issues will be mainstreamed in energy sector activities.

45. ***Climate Resilient Green Economy Initiative.*** The GoE has initiated the Climate-Resilient Green Economy (CRGE) initiative to protect the country against the adverse effects of climate change and to build a green economy that will help realize its ambition of reaching middle-income status before 2025. Under the leadership the Prime Minister, Meles Zenawi, the GoE has dedicated significant resources to the CRGE initiative, with more than 50 experts from 20 leading governmental institutions engaged in seven committees and directed by a cross-ministerial steering group.

46. As part of the CRGE initiative, Ethiopia has outlined a strategy to build its green economy. It follows a sectoral approach identifying and prioritizing initiatives that could help the country achieve its development goals while limiting the 2030 greenhouse gas (GHG) emissions to today's level.

47. The CRGE foresees to develop up to 25,000 MW of Ethiopia's generation potential by 2030. Of this hydro holds 22,000 MW, geothermal 1,000MW and wind 2,000MW. It is believed that the planned generation expansions will have developed demand within the country in the long term. In the short term various regional market potential assessment studies have equivocally indicated the presence of a market in Ethiopia's neighborhoods and beyond. Most of Ethiopia's neighbors' electricity expansion plans are significantly dominated with conventional thermal generations. The ever soaring fuel prices will therefore place Ethiopia's cheep renewable generation at an advantageous position in the market that is going to be created in the region when the ongoing interconnection projects are finalized. The replacement of conventional thermal generations having high GHG gas emission with zero emission renewable generations will entitle the importing countries to get additional benefits through carbon credits. As the pricing of the power exchange between countries depends on the benefit sharing scheme, Ethiopia could indirectly get

these benefits through the power purchase agreements that are going to be made with the importing countries.

48. In the formulation of the CRGE, since the rural energy usage will remain to be dependent on traditional fuel, specially for cooking purposes, large abatement of emission is expected through improving fuel efficiency and shifting fuels (from fuel wood to biogas etc) for cooking stoves. In the CRGE a program is anticipated aiming at scaling up the dissemination to 9 million stoves by 2015 and to 34 million stoves by 2030. The program, in addition to the emission reduction, is expected to increase the rural household income up to 10%, reduce deforestation and create an industry for the manufacturing of cook stoves.

49. In general four initiatives for fast-track implementation have been selected under the CRGE: (i) exploiting Ethiopia's vast hydropower potential; (ii) large-scale promotion of advanced rural cooking technologies; (iii) efficiency improvements to the livestock value chain; and (iv) reducing Emissions from Deforestation and forest Degradation (REDD). These initiatives will have the best chances of promoting growth immediately capturing large GHG emission abatement potentials, strengthening Ethiopia's leading role in sustainable growth, and attracting climate finance for their implementation. To ensure a comprehensive program, initiatives from all other sectors will also be developed over time into concrete proposals.

50. ***Nationally Appropriate Mitigation Actions of Ethiopia.*** Ethiopia's climate is likely to become more unpredictable in the coming years, with increased incidences of flooding and drought that may hamper economic development. But apart from the climate mishaps, the country stands to gain more by focusing on the opportunities accompanying the global change in the climate system. The country has identified its huge potential in mitigating sources of green house gas emission. The sectors have been identified and prioritized in a document known as Nationally Appropriate Mitigation Actions (NAMAs). The NAMA is already registered by the Secretariat of the United Nations Framework Convention on Climate Change as per the requirements of the Copenhagen Accord. The NAMA has identified some immediate priorities (including sectors on livestock, soil and crop, industry, transport, power, green cities and buildings) for the flow of available international climate finance for low carbon and resilient development. In order to build climate resilience, the NAMA's will seize the opportunities presented by low carbon technologies and invest in green industries. The NAMA foresees that by making the right investments, Ethiopia will be positioned to be competitive in a carbon-constrained economy.

51. ***Electricity Feed-in-Tariff Law.*** One way of encouraging the diversification of the power mix in the national grid and thus making power supply more reliable and less prone to be affected by weather and market conditions affecting a single resource is by including renewable energies, in addition to large hydro power, in the national grid. In light of the fact that most of these renewable energy technologies have costs at the onset that is comparatively large and are not thus far benefiting from large economies of scale, it is important to put in place a legal framework guarantying a level of tariff that will make

them financially and economically attractive to develop. To this end the GoE is at present in the process of developing a draft Feed-in-Tariff proclamation, is expected to pass into law during 2012, will facilitate the large scale deployment of these technologies, providing investment security and market stability for private investors in electricity generation from these resources.

52. ***Electric Power Generation Construction Program.*** Ethiopia has a potential to generate 45,000 MW of hydroelectric power. However, currently only 2,000 MW is generated. It is planned to increase this level of power generation four fold in the coming five years. Implementation strategies are to promote a mix of energy sources by developing renewable wind and geothermal resources, prevent power loss and promote proper utilization of energy, reduce unit cost of power generation investments and operation, and provide electricity at affordable prices.

53. ***Electricity Transmission Lines Construction Program.*** To ensure a reliable electricity supply and transmit the electric power efficiently and economically to consumers, construction of a reliable distribution and transmission networks is essential. To this end, due emphasis will be given in the Universal Electrification Access Program to construct new transmission lines and connect them to the national grid as economically as possible and to reduce power losses. Further implementation strategies are to minimize the cost of construction of transmission lines, improve control of power sources and construct additional transmission substations so as to achieve efficient power distribution.

54. ***The Power Distribution and Expansion Program.*** The plan will adopt implementation strategies to modernize the power distribution system with the aim of increasing service delivery efficiency, cost saving and reduction of power losses in the distribution system. Action will be taken to ensure availability of efficient, reliable, high quality and economical electricity services to consumers, improve power supply service quality, provide outreach facilities to new customers, and to reduce power interruptions and losses by expanding the network and maintaining distribution lines.

55. ***The Universal Electrification Access Program.*** The plan will adopt implementation strategies that provide access to electricity for rural towns and villages, commercial agricultural production, and irrigation pumping. The program will be executed in close collaboration with, and ensure participation of, local contractors and manufacturers, technical and vocational school graduates, and other stakeholders. Electricity is an essential part of the rural transformation agenda because it is an important input for businesses and productive enterprises in small to medium sized towns and as an input for agriculture, irrigation pumping, commercial agricultural production and processing. Equitable distribution of services to the rural economy agricultural and other sectors' development has a beneficial effect nationally.

56. ***The Rural Electrification Fund.*** The GoE under proclamation No. 317/2003 has established the Rural Electrification Fund (REF) to implement off-grid private sector-led rural electrification. The Rural Electrification Executive Secretariat is responsible for the implementation of the GoE's off-grid rural electrification program and objectives.

57. The general objectives of the Rural Electrification Fund are:

- To support rural socio-economic development through improving access to electricity for the purpose of productive economic uses and improving rural livelihoods including health, education, irrigation, agro-processing, clean water supply and security;

- Finance rural electrification projects to be carried out primarily by the private sector including cooperatives and local government and communities;

- Promote, facilitate and provide technical, operational and business development and management support services for rural electrification projects;

- Prepare an off-grid rural electrification master plan (with annually updated plans) and conduct feasibility studies to identify suitable RE projects, which will be implemented by the private sector (which includes NGOs, CBOs, co-operatives, municipalities/local governments and other entities).

58. ***The National Regulatory System to Ensure Conservation of Electricity and Energy Efficiency.*** Implementation strategies will seek to meet increasing demand for energy by encouraging private investors and state owned utility engaged in the sector. Actions taken to support this strategy include licensing applicants and granting certificates of competence to potential energy producers. A further approach is to ensure that reasonable tariff structures that are affordable are applied. Energy audit activities will involve establishment of energy efficiency management sections for selected consumers, particularly high energy consuming organizations.

59. A study of requests for annual tariff revision by developers will be carried out with the aim of establishing an economical and fair rate for electricity services, while at the same time encouraging investments and its recommendations will be implemented following agreement and endorsement by the responsible authorities. Energy conservation and mitigation of energy losses will be pursued for each economic sector. The measures to be taken will identify the most efficient energy consumption technologies, establish performance standards, implement and conduct regular inspection activities on electric utilities, prepare reports and take the corrective measures necessary.

60. ***The Electricity Legal Framework.*** Through the following proclamations and regulations issued,

- The Electricity Proclamation 86/1997;

- The Investment Proclamation 280/2002 and its amendment Proclamation 375/2003;

- The Electricity Operations Regulations 49/1999.

61. The GoE has set the groundwork for the participation of private sector investment in power generation. These legal documents allow and invite private sector investment in

power generation without any capacity limits, with one of the main prerequisite being reaching an off-take agreement (power purchase agreement) with the national grid operator, i.e. EEPCO. They may then be eligible for operation under the regulatory oversight of the EEA. In off-grid areas private investors may generate and distribute power to their own customers through mini grids.

62. ***Alternative Energy Development and Promotion.*** The plan is to develop the country's abundant renewable energy resources and technologies through adoption or innovation of new technologies. This strategy aims to produce prototypes and test the efficiency of energy sources and technologies based on consumer demand. Other alternative energy development and promotion initiatives are to work closely on energy resource identification and technologies with government agencies, NGOs and private companies and provide training for the business sector including manufacturers. Awareness within communities will be created and promoted. Demand for alternative energy technologies will be improved and loans arranged for manufacturers and consumers to install alternative technologies.

63. Although Ethiopia is endowed with a verity of energy resources, many of these resources have not yet been exploited. A study of efficient alternative energy resources and usages, and the means to encourage their development will be carried out. Attention will be given in the study to environmental protection and conservation. The study will involve collaboration between the federal government, regional states, private sector and other stakeholders. Application of improved alternative energy technologies will help minimize deforestation, reduce indoor air pollution that results in health problems and save the time women and children spend searching, collecting & transporting fuel wood. As a result, families will have more time for other productive work. By building the capacity for regional implementation agents and other stakeholders' alternative energy technologies and resources will become more widely available to users, increase sustainable energy use and benefit communities.

64. ***Capacity Building.*** Strengthen the on-going program to strengthen the technical and vocational skills of school graduates, and of manufacturing industries relevant to the energy sector, so as to build national capacity and reduce foreign currency needs, will be continued.

65. Other key national development policies that have impact on the energy sector are:

- The Rural Development Policy and Strategy;
- Environmental Policy;
- Science and Technology Policy;
- The investment Proclamation;
- The Water Resources Management Policy;

III. PROGRAM DESCRIPTION

SELECTION OF PROGRAMS FOR SREP FUNDING

66. The IP has identified the following candidate projects for consideration of SREP funding:

- Development of Aluto Langano Geothermal field
- Assela Wind Farm Project
- Clean Energy SMEs Capacity Building and Investment Facility
- Development of Tendaho Geothermal field
- Sor Small Hydro Electric Power Plant Expansion Project

67. With the plan to reach at least 10 % non-hydro renewable energy mix in the grid, a target has been set for contributions from other renewable energy sources. To this end the geothermal projects are included based on their readiness for implementation, since a lot of exploration work has been conducted at the above mentioned two geothermal fields. The wind power development will consider the whole cycle of development beginning with feasibility study, and its main purpose will be to help set the ground for the take-off of wind power development involving local engineering and technology development. The first phase of the Sor small hydropower project has been implemented and has been serving the local community since 1992. A feasibility plan for the expansion of the project is completed and thus ready for implementation. Dissemination of improved biomass cook stoves and other distributed renewable energy technologies (like solar lighting devices and solar home systems, institutional cook stoves, solar water heaters, biomass briquetting technologies, sustainably-produced charcoal) has been identified as a priority area for Ethiopia for reducing its carbon foot-print and also creating access to better energy services for the vast majority of Ethiopians, especially in the rural areas outside of grid coverage.

68. A brief description of the candidate renewable energy projects considered for the investment plan is as shown below (for more details refer to Annex 1):

Aluto Langano Geothermal Field Development

69. Geothermal power will help to diversify the Ethiopian energy mix and provide valuable base load capacity at low cost and with limited environmental impact. It is estimated that some 5 000 MW of resources are available, and the Government is seeking to develop 1 000 MW of this by 2030.

70. The geothermal potential within Ethiopia has long been recognized. Under a program that began in 1969, geo-scientific studies have been conducted in a number of Ethiopian fields and over sixteen areas have been identified to have geothermal resources suitable for electricity generation in the Ethiopian Rift Valley. From these areas deep drilling has been undertaken in Aluto Langano and Tendaho and detailed surface exploration has been nearly completed in four other areas. The rest ten areas are at a first stage of surface exploration.

71. At Aluto Langano, a pilot plant of 7.3 MW has been installed in late 1990's using some of the productive exploration wells drilled in 1980's. A feasibility study to expand the field to 75 MW by drilling of appraisal and production wells has been conducted in 2010 with the assistance of the Japanese Government. The study indicated that the expansion plan is feasible. Accordingly, preparations to drill four appraisal wells are on progress with the assistance of Japan and soft loan from the World Bank as well as contribution from the GoE. After this phase is completed the next phase of development would be the drilling of production wells and the installation of a power plant.

72. Under this project, SREP co-financing is being proposed to implement two components:

(i) Aluto Langano Geothermal Power Generation Project:

After the drilling of the appraisal wells is completed the next step of development would be the drilling of five production wells, three reinjection wells and the installation of a power plant. The production and reinjection wells are proposed to be drilled using SREP finance to insure the availability of steam capable of totally producing from a minimum of 35 MW to a maximum of 75 MW electrical energy. The production wells will be drilled using advanced technology, directionally down to a nominal depth of 2500 to maximize the output per well in the range of 5-10 MW. The proposed financing would serve to cover the costs of drilling consumables, expert advises and capacity building.

- Component 1 Summary:

  - Total capacity: allow the expansion of the capacity up to 75 MW
  - Total finance required: 229.2 million USD (24.5 million USD from SREP)
  - Implementation time horizon: 2012 – 2016

(ii) Design of a Long-Term Strategy for the Geothermal Sector.

As Ethiopia considers how to expand its geothermal capacity beyond the 75 MW at Aluto Langano, it will be important to explore and understand the options, including what has worked and why, and then outline a path forward for the country. Hence, the second component to be financed under SREP would involve development of a

sector strategy that focuses on clearly defining options for how geothermal assets can be developed, including leveraging the private sector strategically as a source of expertise, project manager, equipment supplier and, investor and financier. Furthermore, this piece will emphasize the need to ensure that future projects are bankable and that requisite business skills are built in relevant institutions.

- Component 2 Summary:

  - Total capacity: allow the expansion of the capacity up to 75 MW
  - Total finance required: 2 million USD (1.5 million USD from SREP)
  - Implementation time horizon: 2012 – 2013

Assela Wind Farm Project:

73. Ethiopia is endowed with a huge estimated potential of 100 GW technically feasible wind power. In the context of the Ethiopian power system wind power will play a vital complementary role with hydro power in that the natural cycle of wind energy availability is such that it increases in the dry season when the hydropower reservoirs are low in water, and it decreases in the wet seasons when the reservoirs are rapidly filling up with water. This will make wind power a crucial ingredient of the grid energy mix by improving the reliability of the system even in dry years.

74. The current plan is to have around 800 MW by 2015, with the first ever 2 wind farms in Ethiopia with a combined capacity of 171 MW already under construction. Wind power will thereafter continue to be developed as a significant component of the power system. The major obstacles thus far to the large scale deployment of wind power in Ethiopia are its comparative high investment and unit energy costs. To address this problem the GoE, in line with its strategy for the power sector as a whole, has set the objective of increasing the local value added in the engineering and technological inputs going into the development of wind farms, thereby ascertaining the long term future of large scale wind power development in Ethiopia.

75. SREP co-financing is being proposed to implement a wind power project that will demonstrate, through the development of local technological inputs and the significant reductions in unit costs thereby achieved, the economic, financial and technical feasibility and sustainability of large scale wind power development in Ethiopia. This project will clear the ground for future investments by demonstrating that wind power will be affordable within the context of Ethiopia. The project will be developed by EEPCO in the Assela region and will have an installed capacity of up to 100 MW.

76. SREP concessional finance will be used to (i) prepare a detailed feasibility study for a capacity of up to100MW in the Assela region, including installation of wind masts; (ii) prepare a full Environmental and Social Impact Assessment and a Resettlement Action Plan in accordance with MDB rules; and (iii) as a capital buy down to bring down the capital

expenditures that will minimize the stress on EEPCo's finance and will allow end users to benefit from current levels of electricity tariffs. EEPCO shall conduct a competitive bidding process for the procurement of an EPC contract in accordance with international standards, namely those of the MDBs.

- Summary:
  - Total capacity: 100 MW
  - Total finance required: 250 million USD (20 million USD from SREP)
  - Implementation time horizon: 2012 – 2016

Clean Energy SMEs Capacity Building and Investment Facility

77. Population pressure is expected to exacerbate an already serious biomass shortage problem in Ethiopia. The demand for wood products, especially fuel wood, is expected to increase at about the same rate as the population, at around 2.8 % annually. Without substantial mitigation measures, major fuel deficits are likely to result, eventually leading to "energy poverty". Also, inadequate supplies of fuel-wood and inefficient use directly impact on rural women's health and workload.

78. Despite the fact that 84% of the population of Ethiopia lives in rural areas, electricity supply from the grid is only expanded to 5,163 rural towns in the past few years. Dispersed demand (because of scattered settlement) and very low consumption level of electricity among rural consumers, limited grid electricity penetration to rural population, electricity expansion practices has been costly and compared to the demand, the supply is yet requires greater effort and investment in the area of electrification and hence, it is unlikely that all the rural households would be connected to the grid within the coming 5-10 years.

79. Given the expected rapid growth in demand - from population growth and economic growth - for modern cooking, lighting, electrification and other energy services offerings it will be important to ensure sustainable supply to meet this demand. This is the focus of the present project.

80. The overall objective of this facility is to support **market development for clean, renewable energy-based products and services in the household and commercial segments, by providing targeted capacity building and financing to small and medium-sized enterprises (SMEs).** Relevant SMEs are defined as companies selling 1) energy access devices (improved cook stoves, lighting devices, solar home systems), 2) efficient energy conversion systems for institutions (institutional cook stoves, solar water heaters, rooftop solar systems), and 3) modern fuels (biomass briquettes, sustainably-produced charcoal). Specifically, the project will build capacity and provide commercial financing that allow companies to develop new, professionalize existing and, ultimately, grow businesses that provide high-quality modern energy services in Ethiopia. The Project

will be divided in two phases: Phase I: Capacity building of market players: The project will focus on removing barriers to the development of a strong supplier base for energy products that help to meet the Government's energy access and GHG emissions priorities; Phase II: Financing of Market Players (SMEs): The project will help to increase access to financing for market players by providing both capital for establishing new and expanding existing manufacturing facilities, and working capital.

- Summary:
  - Total finance required: 12 million USD (4 million USD from SREP)
  - Implementation time horizon: 2012 – 2015

Tendaho Geothermal Field Development

81. The Tendaho Geothermal Field is located in Dubti Wereda (district), Afar egion in the Northeast part of Ethiopia, around 600 kilometers from the Addis Ababa. Three deep and three shallower exploratory wells have been drilled at Tendaho in 1990's. Initial estimates indicate a total of 100 MW that could be developed from the deep geothermal resource. The shallow wells are proven to be productive and the deep wells encountered high temperature but the permeability is not sufficient enough at the drilled levels to sustain commercial production. Additional studies indicated the deep wells were not deep enough to encounter the main reservoir. In order to study the feasibility of utilizing the discovered shallow reservoir and study the feasibility of further deep drilling, preparatory work has commenced with the assistance of French Development Agency (AFD). In addition UNEP will assist to conduct additional geo-scientific studies to locate sites for the proposed deep drilling.

82. In order to identify, evaluate and develop the deep reservoir in various phases the following activities shall be conducted: **Phase I - surface investigations** aimed at confirming past exploration results and to propose exploration drilling target; **Phase II - exploration and appraisal drilling** with drilling of three deep exploration wells for discovering and, with early success being encountered, testing the deep high temperature reservoir and drilling six appraisal wells aimed at the delineation and characterization of the full extent of the reservoir to provide information that would be required to determine the optimal conditions of its exploitation, on which basis a production drilling program and a power plant design could be conducted for phase III. From Phase II drilling results a power plant of 30MW will be installed using productive wells. **Phase III - production drilling and power plant installation** with drilling of production wells on the bases of the information in Phase II and installation of a power plant (70MW).

- Summary:
  - Total capacity: 100 MW
  - Total finance required: 319.6 million USD (10 million USD from SREP)

- Implementation time horizon: 2012 – 2016

Sor Small Hydro Electric Power Plant Expansion Project

83. With estimated potential at around 45000 MW, hydropower is abundant and since it is a clean one, has occupied the largest portion of the sectors investment plan. The upfront capital requirement is one of the identified barriers, which can prohibit the full exploitation of this resource. Local capacity building in the construction and manufacturing of some of the inputs to hydropower plants is expected to reduce both investment costs and scarce foreign currency requirement.

84. To date no conclusive study has been made, which estimates the total small, mini and micro hydro potential of the country. However, not a small portion of the 45,000 MW is expected to come from these renewable sources. If full exploitation of the country's hydropower potential is to be achieved, it can only happen when all types of resources are developed.

85. Currently there are three small hydro power plants operated by EEPCO having a total installed capacity of 7.5MW serving three separate mini-grids. The largest one is Sor SHEPP. The first phase of this plant was constructed in 1992, and since then it has been serving a separate 66kV mini-grid some 650km southwest of Addis Ababa. It was built as a run-of-river plant with two units of 2.5 MW. The electricity demand in the area has already reached 7.3 MW and has surpassed the plant's generation capacity. Diesel generations are being utilized to supplement the generation from the Sor SHEPP. A Feasibility study undertaken in 1992 had indicated the potential for the expansion of the Sor SHEPP by an additional 5MW. Another study conducted with the support of UNDP also came up with the same results. EEPCO therefore plans to realize this project with most of the resources derived locally, targeting the following benefits: reduce its operating costs; satisfy reliably the area's electricity demand; and enhance local capacity in the construction and manufacturing of inputs for hydropower plants so that it can be replicated in the future.

86. The planned development includes updating of the existing feasibility study; design and tender document preparation; installation of additional penstock and additional 5MW 3rd unit, construction of a rock fill dam, construction of annexed hydraulic structures (spillway, bottom out late and connection structure at the headrace tunnel) and finally refurbishment of the existing two units.

- Summary:

  - Total volume/capacity planned: 5 MW
  - Total finance required: 25.1 million USD (9 million USD from SREP)
  - Implementation time horizon: 2012 – 2014

EVALUATION OF CANDIDATE PROJECTS

87. All the projects indicated above meet the SREP investment criteria. Therefore, in the context of SREP, it is important to prioritize the projects as there are limited funds available under the program. The prioritization is based on the following major criteria: (i) Strategic relevance to the country's development; (ii) Gender development; (iii) Positive environmental impact; (iv) Potential to scale-up; (v) Cost effectiveness; (vi) Potential for new direct beneficiaries; (vii) Implementation readiness. The scoring suggested is three (3) for strong positive impact, two (2) for moderate impact and one (1) for low impact. Table 7 below presents an evaluation matrix that identifies the priority projects based on the above.

TABLE 7: EVALUATION MATRIX

#	Project Name	Criteria							Aggregate Points	Ranking
		Strategic Relevance for the Country's Development	Gender Development	Positive Environment Impact	Potential to Scale-up	Cost Effectiveness	Potential for New Direct Beneficiaries	Implementation Readiness		
1	Aluto Langano Geothermal Filed Development	3	1	2	3	3	2	3	**17**	**2**
2	Assela Wind Farm Project	3	1	2	3	3	2	2	**16**	**3**
3	Clean Energy SMEs Capacity Building and Investment Facility	3	3	3	3	3	3	2	**20**	**1**
4	Tendaho Geothermal Field Development	3	1	2	2	2	2	2	**14**	**4**
5	Sor SHEPP Expansion Project	3	1	3	1	1	1	3	**13**	**5**

88. Therefore the following programs were selected for SREP funding:

- Clean Energy SMEs Capacity Building and Investment Facility
- Aluto Langano Geothermal Filed Development
- Assela Wind Farm Project

89. The remaining projects are proposed to be funded from SREP reserve fund. These are:

- Tendaho Geothermal Field Development
- Sor SHEPP Expansion Project

90. SREP contribution to these programs will play a catalytic role in helping bring about transformational change. In playing a crucial role in the development of the first large scale geothermal power plant in Ethiopia, the program will help in proving the technical possibility and viability of developing the country's considerable geothermal resource potential further, thereby increasing future investment confidence. The wind power development program is expected to achieve the creation of a conducive environment for the development of local engineering and technology capacity in the wind sector in the country. The improved biomass cook stoves dissemination program and to a smaller extent the distributed solar technology dissemination program will build upon existing experience on the creation of a market for these technologies and will radically scale-up their implementation, which will continue to be led by local communities and the private sector.

ENVIRONMENTAL IMPACT ASSESSMENT GOVERNANCE SYSTEM

91. The GoE has adopted an Environmental Impact Assessment (EIA) Proclamation with the objective of predicting and determining the possible adverse impacts of a proposed development activity that may occur as a result of the design, setting, construction, operation, etc of development projects. The aim of the law is to assist development activities to mitigate and when possible avoid impacts and bring about the intended development.

92. Through this tool the GoE has set the procedures as well as the institutional set up of EIA governance. Hence, all those projects requiring an EIA shall undertake a study and avail it for review to the appropriate environmental agency. The agency will then undertake expert review and consult the public on the EIA report submitted for review. Finally, the agency either grants an approval or rejects the document or makes a conditional approval subjecting the project proponent to adduce additional information on the project. As Ethiopia enjoys a Federal Governance Structure, EIA study reports are normally submitted for review to the Regional state within the geographic scope of which the project is intended to be implemented. In such instances where the project boundary

goes across two or more regions or where the authority of issuing an operation license lies within the Federal government, the study reports shall be submitted to the Federal Environmental Protection Authority (EPA) pursuant to Article 6(2) of the environmental impact assessment proclamation. However, recent developments hold it that the Environmental Protection Authority has conferred this specific mandate to sector ministries. Accordingly, all projects will be scanned according to their sectoral specificity and are referred back to the sector mandated to regulate their implementation. Thus, for a geothermal energy project, the review of the EIA report shall be undertaken by the MoM, and for hydro-power projects, it is the Ministry of Water and Energy. However, the Environmental Protection Authority has retained its oversight power and hence it accepts quarterly reports on the performance of the sector ministries as it relates to the EIA delegated function.

93. According to Directive No. 2/ 2008, not all development projects would require an impact assessment. There is a list attached to the directive in order to determine which projects should undergo an impact study and which do not.

94. Accordingly, projects designed to generate power with a capacity of 10MW or more would require EIA study. Hence the development of the proposed projects under this investment plan – namely the Aluto Langano geothermal field and Assela Wind power development projects are among those development projects that would require an EIA study. In this case, the EIA studies of the above mentioned projects should be submitted to the MoM and MoWE respectively. The same is true for the development of off-grid renewables. Whether or not the activities would require an EIA will eventually be determined by the design, size, location etc. of each intended renewable energy development activity. The same procedure and institutional arrangement will follow when having the EIA report reviewed and approved.

IV. FINANCING PLAN AND INSTRUMENTS

SOURCES OF FINANCING

95. The total sources of financing for the execution of the investments envisaged under the IP equals USD 837.9 million, of which SREP is intended to finance up to USD 69 million including USD 19 million from the reserve fund (see Table 8 for details).

96. The GoE will mobilize finance for the renewable energy programs from a combination of government budgetary allocations, concessionary loans and grants, funds from international and bilateral development agencies, and local commercial banks. The GoE will act as a financier of last resort in case an unexpected financing gap arises.

TABLE 8: FINANCING MATRIX

SREP	#	Project	Total Cost	GoE	SREP	MDBs	Others
Initial Allocation	**1**	**Aluto Langano Geothermal Field Development**	**231.2**	**78.7**	**26.0**	**60.0**	**66.5**
	1.1	- Component I: Aluto Langano Geothermal Power Generation Project	**229.2**	78.2	24.5	60.0	66.5
	1.1.1	Phase I: Appraisal and Production Drilling	**93.0**	42.0	24.5	10.0**	16.5*
	1.1.2	Phase II: Power Plant and Transmission Line Construction	**136.2**	36.2	-	50.0+	50.0***
	1.2	- Component II: Design of a Long-Term Strategy for the Geothermal Sector	**2.0**	0.5	1.5	-	-
	2	**Assela Wind Farm Project**	**250.0**	**40.0**	**20.0**	**140.0**	**50.0++**
	2.1	Project Preparation Grant (feasibility study)	**2.0**	0.3	1.7	-	-
	2.2	Construction	**248.0**	39.7	18.3	140	50.0
	3	**Clean Energy SMEs Capacity Building and Investment Facility**	**12.0**	**-**	**4.0**	**4.0**	**4.0+++**
	3.1	Readiness - Project Preparation and Capacity Building	**0.4**	-	0.4	-	-
	3.2	Advisory Services and Capacity Building	**1.6**	-	1.6	-	-
	3.3	Financing Facility	**10.0**	-	2.0	4.0	4.0
SUB-TOTAL			**493.2**	**118.7**	**50.0**	**200.0**	**124.5**
SREP Reserve	4	**Tendaho Geothermal Field Development**	**319.6**	60.85	10.0	188.0	60.75
	5	**Sor SHEPP Expansion Project**	**25.1**	5.9	9.0	10.2	-
SUB-TOTAL			**344.7**	**66.75**	**19.0**	**198.2**	**60.75**
TOTAL			**837.9**	**185.45**	**69.0**	**398.2**	**185.25**
			100%	**22.2%**	**8.2%**	**47.5%**	**22.1%**

* It includes a USD 10 million from Government of Japan. The USD 6.5 million gap is expected to be closed by other donors. In case this amount is not secured, the GoE will come up with the amount.

** USD 10 million co-financing from the WB.

*** Following preliminary discussions between the GoE and the GoJ, the gap is expected to be closed by the GoJ (USD 50 million)

+ USD 50 million will be used to finance the construction of the Power Plant and is pending country's allocation under the next cycle of ADF and/or IDA. If the GoE chooses to increase its ADF and/or IDA allocation to the Project, the sources of financing can change in the future.

++ The USD 50 million gap is expected to be closed by other donors. In case this amount is not secured, MDBs in conjunction with the GoE will hold donor meetings to bring in other co-financiers. In case this proves to be unfeasible, the GoE will prioritize further ADF and/or IDA allocations to this project.

+++ USD 4 million are expected to be financed by local financial institutions.

97. Table 9 below presents the expected dates for MDB approval of Project Preparation Grants, when applicable, and Investment Projects. These dates are estimates and therefore indicative.

TABLE 9: INDICATIVE EXPECTED TIMELINE FOR MDB APPROVAL OF PROJECT PREPARATION GRANTS AND INVESTMENT PROJECTS

#	Project	SREP Allocation	Lead MDB	Expected Date for Completion of PPG Activities	Expected Date for Approval of Investment Project
1	Aluto Langano Geothermal Project	USD 26 million	AfDB	NA	Jan 2013
2	Assela Wind Farm Project	USD 20 million	AfDB	Jun 2014	Dec 2014
3	Clean Energy SMEs Capacity Building and Investment Facility	USD 4 million	IFC	Nov 2012	Mar 2013
4	Sor SHEPP Expansion Project[2]	USD 9 million	[TBD]	[TBD]	[TBD]

[2] The SOR SHEPP Expansion Project is included in the IP as a Reserve Project and it's materialization will depend on the approval, in due time, by the SREP Sub-Committee. In accordance with SREP Guidelines, Ethiopia is applying to a Project Preparation Grant to finance the update of an existing feasibility study and to perform the detailed design of the components to be installed.

V. ADDITIONAL DEVELOPMENT ACTIVITIES

98. The implementation of the IP encourages also any additional initiatives, over and above the ones already outlined, by actors of the sector like NGOs, the private sector and local community. Efforts will also continue to attract loans, grants and private finance from development partners, i.e. bilateral and multilateral lending institutions, commercial banks and the private sector for the large scale dissemination of various renewable energy technologies

99. Table 10 shows a summary of recent and ongoing projects and initiatives relevant not only to the Energy Sector as a whole but to the Renewable Energies sub-sector.

TABLE 10: RECENT AND ONGOING PROJECTS/INITIATIVES IN RE AND ENERGY ACCESS

#	Project/Initiatives	Description	Partner
1	Industries Energy Efficiency Program	Replacement of energy inefficient technologies	**WB**
2	Energy Efficiency Program	Replacement of inefficient electrical bulbs with CFLs.	**WB**
3	Nationwide Wind and Solar Energy Grid Based Master Plan Project	Wind and solar resource assessment and preparation of development master plan. The assessment will include a number of pre-feasibility studies	**China**
4	Universal Electricity Access Programme	To extend the national electricity grid to supply electricity to rural towns and villages and improve the national electricity access rate in order to promote socioeconomic development of rural areas.	**WB/AfDB/ BADEA/OPEC FID**
5	Energy Access Project	In addition to supporting expansion of electricity access through extension of the grid by EEPCo, the project provides energy access to locations remote from the grid by independent suppliers and communities. A further component involved the implementation phase of the Biomass components in increasing fuel wood supply by bringing about 302,000 hectares of natural forests under participatory community management and implementing about 384,000 hectares of agro-forestry schemes. A further sub-component will provide training in the production of efficient cook-stoves and produce about 320,000 cook-stoves. It is also supporting the rehabilitation and reinforcement of the	**WB/ EIB/ GEF**

		distribution networks in most of the urban areas, including Addis Ababa, in order to improve the quality and reliability of supply.	
6	Adama I Wind Power Project	Development of 51 MW wind farm at Adama site	**China**
7	Ashegoda Wind Power Project	Development of 120 MW wind farm at Ashegoda site	**AFD**
8	Energizing Development (EnDev)	Development of the Ethiopian energy sector focusing on renewables, in particular improved stoves & electrification (solar PV, micro-hydro)	**Germany/ Netherlands /Norway**
9	Bamboo as sustainable biomass energy: A suitable alternative for firewood and charcoal production in Africa.	Increase the use of bamboo as a source of energy thereby providing a more sustainable, environmentally friendly and economical option to firewood and wood charcoal	**INBAR**
10	National Household level Biogas Programme	Promote the production of biogas and its use for cooking and lighting in rural and peri-urban areas in 4 regional states in Ethiopia, among livestock rearing households with access to water. Promote the use of the slurry from the digesters as fertilizer in horticulture. Use a comprehensive approach, involving the private sector in construction and maintenance and ensuring proper quality control systems with government backing as well as access to credit	**SNV**
11	Community Managed Renewable Energy Programme	The project aims to improve access to essential services including quality health care, education and potable water in rural communities through increased access to solar energy services by promoting the use of Fuel Saving Stoves (FSS), solar power for local schools and health posts and solar powered water pumps.	**EC /Plan UK**
12	Support to Efficient Utilization of Alternative Energy Sources to Improve the Livelihood of Pastoral and Agro pastoral Communities in Southern Ethiopia.	To contribute to increase the access to affordable and sustainable energy through increased production, supply and efficient use of renewable energies in order to improve basic social services and livelihood in un-served rural areas of southern	**EC /COOPI**

		Ethiopia	
13	Integrated Approach to Meet Rural Household Energy Needs of Ethiopia	To contribute to economic prosperity, social well-being, environmental sustainability and climate change issues (and hence to contribute to MDGs) through increasing the use of RE and EETs solutions for improved access to sustainable and efficient energy in the rural and peri-urban areas	**EC /HoA – REC/N**

VI. IMPLEMENTATION POTENTIAL WITH RISK ASSESSMENT

100. ***National Level.*** The main foreseeable challenges include low implementation capacity, low national saving rate that is unable to support the investment needs, and the unpredictability of external financing. In addition, it is anticipated that global market price fluctuations could pose some challenges to effective implementation of the plan.

101. Other risks that may impede the implementation of the plan are listed as follows.

- Households and institutions might resist the acceptance of the new renewable energy technologies due to traditional and cultural reasons for which one may require adapting the technologies to be traditionally acceptable without compromising their efficiency. Strong promotion and awareness creation efforts are also required.

- Another major uncertainty is the extent and distribution of the existing biomass resources in each region. Substantial volumes of the resource must be available within and around villages for biomass-related technologies to be economically viable as domestic energy sources for the villages.

- There is a risk that the price for efficient lamps (LED) cannot be reduced sufficiently to make it affordable for a large part of the rural population. Carbon credits are required to mitigate this risk.

- Another potential risks is that end users will stop paying the loan, if the quality of the technology in use is poor and it does not function properly. Through quality management of each component of the program, it is designed that the risk will be mitigated by conducting close supervision during the various stages of the whole process. The other potential risk is that repayment of the loan will be delayed due to poor harvesting and effect of flood and drought. The mechanism of having a taskforce for loan repayment follow-up for the existing credit facilities will be adopted.

- Lack of training and maintenance facilities, inadequate technology development and adaptation capacity, weak technical expertise and limited participation of private sector are also some of the possible constraints that may have to be overcome in the course of implementing the plan.

102. Risk mitigation measures that address the foreseeable risks in the development process mentioned above include improvements in the tax administration system and broadening the tax base so as to increase domestic resource mobilization. The GoE, organizations and individuals will be encouraged to increase their savings to provide adequate resources for the country's investment needs. The favorable policy and administrative environment created will support effective utilization of the capacities of communities and the private sector as development partners in development and

governance. External finance resources will be mobilized and, where secured, will be effectively used for investment in priority areas. The contribution of local and international NGOs and CBOs in the implementation of the development plan will be strengthened.

103. Measures will also be taken to address capacity limitations by strengthening the implementation of the civil service reform program at all levels. Foreign exchange earnings will be increased by expanding export capacity, and substituting imports with competitive local products. Measures to guarantee sustainable and rapid agricultural and overall economic growth like scaling up of best practices will be taken as risk mitigation initiatives. Public expenditure management reforms to ensure stringent recurrent expenditures will be strengthened such that the limited available resources are efficiently and effectively utilized for productive purposes.

TABLE 11: PROGRAM LEVEL

	Technological / Resource Potential	Financial	Human resource
Clean Energy SMEs Capacity Building and Investment Facility	Low	Low	Low
Aluto Langano Geothermal Filed Development	Low	Medium	Low
Assela Wind Farm Project	Low	Medium	Medium
Tendaho Geothermal Field Development	Medium	Medium	Low
Sor SHEPP Expansion Project	Low	Medium	Low

104. Continued human capacity building at the level of program implementation and continuous improvements in the business models for the various technologies will help mitigate much of the risks enumerated above.

VII. MONITORING AND EVALUATION

105. To establish a basis for future monitoring and evaluation of the results of SREP funded activities, a results framework for the IP is presented below.

TABLE 12: SREP ETHIOPIA RESULTS FRAMEWORK

Results	Indicators	Baseline	Targets	Means of Verification	Responsibility for Collection	Data Source	Data Available (Y/N)
Project Outcomes and Outputs							
Increase access to energy by women and men	a) % change in number of project beneficiaries with access to energy services from RE (women/men)	16	80	Project M&E	Project Coordinator	EEPCo and MoWE	Y
Increased GWh of RE Energy Services	a) % change in GWh from RE	3528	4443	Country M&E	Project Coordinator	EEPCo and MoWE	Y
	b) # of jobs (women/men) in RE services created (project level)	0	500		Project Coordinator	MDB Completion Report	
	c) % savings in million tons of CO2	3	0		Project Coordinator	MoWE and EPA	Y
Decreased cost of energy from renewable sources	a) % change in USD cost /GWh of RE for project beneficiaries grid-connected	NA[3]	NA	NA	NA	NA	NA
Learning about demonstration, replication and transformation captured, shared in countries and across countries	a) Number and type of knowledge assets (e.g. publications, studies, knowledge sharing platforms, learning briefs, communities of practices, etc.) created	0	7[4]	Project M&E	Project Coordinator	MDB Appraisal Report	NA
	b) Number of non-SREP countries replicate SREP project approach (e.g. investment documents citing SREP pilot project documents)	0	[TBD]	CIF AU - Qualitative Assessment	Project Coordinator	EEPCo / MoWE	NA
	c) Evidence of use	[TBD]	[TBD]	Project M&E	[TBD]	[TBD]	[TBD]
New and additional resources for renewable energy projects	a) Leverage factor of SREP funding	0	1/10	Project M&E	Project Coordinator	Loan and Grant Agreements / Project Completion Reports	N
Catalytic Replication							
Increase in renewable energy investments	a) % of RE investment of total energy investment	98	100	Country M&E	Project Coordinator / MoFED	MoFED /Central Statistics Agency	Y

[3] The electricity tariff charged to end users is set by the Council of Ministers and no change is expected by adding the 175 MW to the grid contemplated by the Projects embedded in the IP.

[4] Among others, these will include: (i) Feasibility Studies; (ii) ESIAs; (iii) RAP; and (iv) a Long-Term Geothermal Sector Development, among others.

Strengthening enabling environment for RE production and use	a) Adoption of and implementation of low carbon energy development plans	1[5]	1	REN21 Global RE Status Report Qualitative assessment - MDBs	MoWE	MoWE	Y
	b) Enactment of policies, laws and regulations for renewable energy	0	3[6]	Country M&E	MoWE	MoWE	Y
Increased economic viability of renewable energy sector	a) % change of total energy sector employment working in RE (women/men)	0	33	Country M&E	MoWE / MoFED	MoFED / Central Statistics Agency	Y
Increased Energy Supply	a) Increase in % of total energy supply (TOE) from renewable sources in the power industry and in the energy sector	-	520 %	Country M&E	MoWE	MoWE / Energy Balance and Statistics Report	Y
Transformative Impact							
Energy supply and use by poor women and men in low income countries, to low carbon development pathways	a) % of population (rural/urban) consuming energy services from RE sources (Country level) (women/men)	16	80	Country M&E	MoWE / EEPCo	Country M&E	Y
	b) Level of household "energy poverty"	92 %	20 %	Country M&E	MoWE	Households Survey	N
	c) Change in the energy development index - EDI (per capita commercial energy consumption; per capita electricity consumption in the residential sector; share of modern fuels in total residential sector energy use; share of population with access to electricity)	0.017	[TBD]	Country M&E	Project Coordinator	IEA Annual Updates	Y

M&E Institutional Arrangements

106. The overall responsibility and oversight regarding the implementation of the SREP will lie with Ethiopia's Environmental Ministerial Council. SREP will be governed under the joint responsibility of the MoFED, the EPA, the MoM and the MoWE. The MoFED will be responsible for all matters related to finance. The EPA will be responsible for independent measurement, reporting and verification. The MoWE in collaboration with the MoM will be responsible for the implementation of the SREP at the national level. Figure 6 below provides the SREP Institutional setup.

[5] The Climate Resilient Green Economy strategy has been approved during 2011.

[6] These include: (i) the Feed-in-Tariff Law; (ii) the National Energy Policy; and (iii) Energy Law.

FIGURE 6: SREP INSTITUTIONAL SETUP

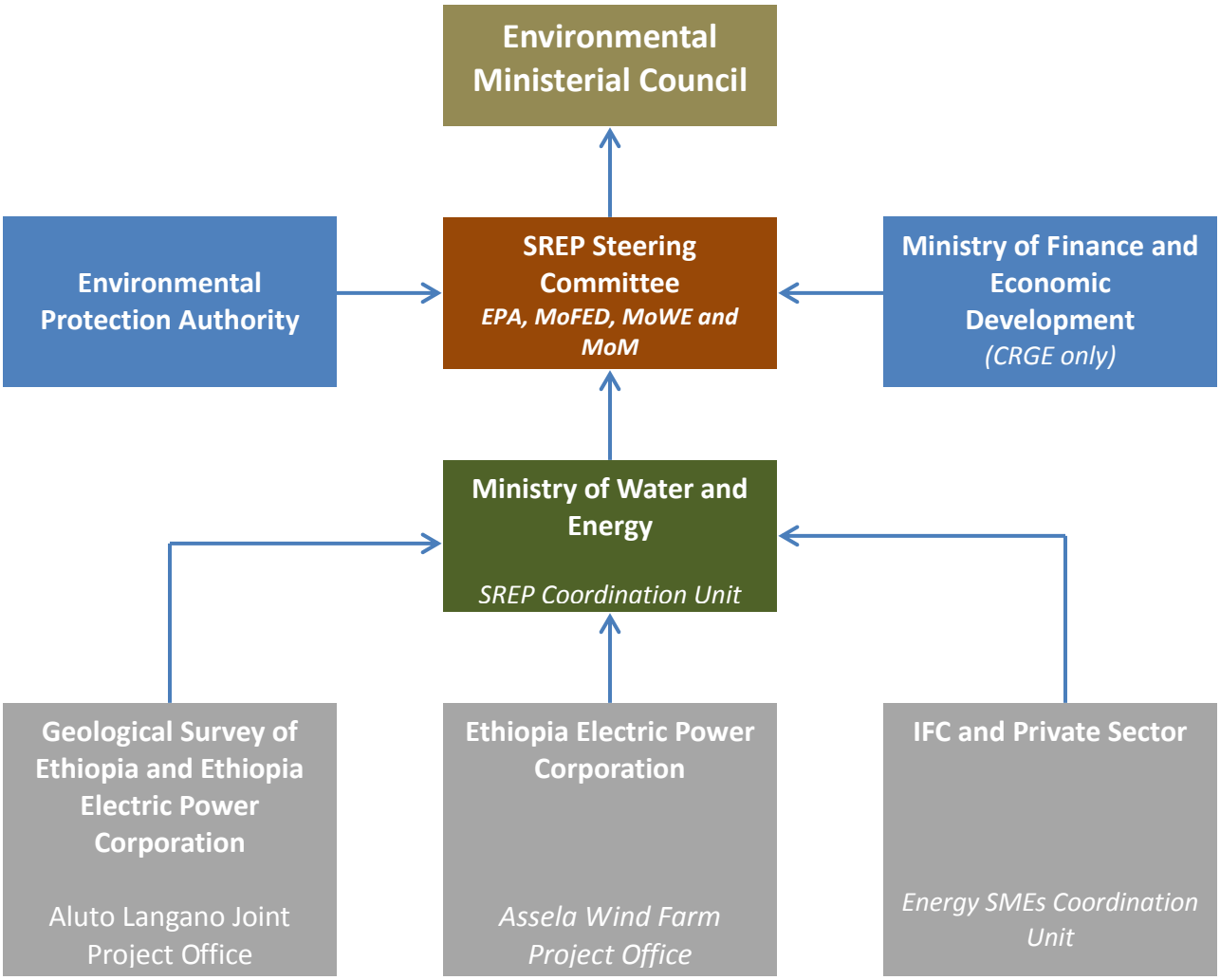


TABLE 13: M&E SYSTEM MANAGEMENT

Responsibility	Function
SREP Steering Committee	- Monitor or assess the catalytic replication indicators. - Manage the assessment of current M&E capacity and gap analysis in terms of baselines, targets, technology (IT support) and HR capacity. - Manage the progress reporting in implementing the IP. - Prepare progress reports on IP implementation to the Trust Fund Committees/Sub-Committees annually. - Monitor project/program implementation and request regular project performance updates in line with agreed procedures from the relevant government agencies and MDBs. - Define and implement a simple and effective system for managing and sharing knowledge (to include lessons learned and best practices) acquired through the SREP experience in Ethiopia.
SREP Coordination Unit	- Manage the M&E framework systems at the project level and ensure regular progress reporting and communication with all relevant stakeholders.
Specific Project Executing Agencies	- Manage the establishment of M&E systems for each individual project. - In conjunction with SREP Coordination Unit] report on progress, outputs and outcomes indicators on a regular basis.

Knowledge Management and Information Sharing

107. Sharing of information on best practices and lessons learned will be ensured at national and international levels. The objective is that methodologies used in Ethiopia, at the margin of the SREP IP, can be implemented by other local stakeholders or by international entities.

108. Dissemination activities of lessons learned and information sharing will be planned and designed during the project preparation phase to increase its impact. Therefore, the SREP Steering Committee will work closely with the executing agency of each project to ensure this is achieved. Among others, it is expected that all training materials used in the technical assistance as well as the outputs of the capacity building components are disclosed through appropriate platforms available to everyone interested.

VIII. ANNEXES

- Annex 1: Investment Projects
- Annex 2: Ethiopia Absorption Capacity
- Annex 3: Stakeholder Consultations
- Annex 4: SREP Co-Benefits
- Annex 5: Independent Review and Feedback from the SREP National Commission and MDBs
- Annex 6: MDB Request for Payment of Implementation Service Costs and Request for Project Preparation Grant.

ANNEX 1: INVESTMENT PROJECTS

Project:	Aluto Langano Geothermal Field Development	**Total Cost:**	USD 231.2 million
Responsible MBD:	Component I: AfDB Component II: IFC	**SREP Allocation:**	USD 26 million

Problem Statement

1. The GoE has put in place its Growth and Transformation Plan (GTP) to radically develop the Ethiopian economy. The plan targets double digit GDP growth for the period 2011 – 2015 and corresponding expansion of the country's infrastructure. A radical growth in the provision of electricity is one of the cornerstones of the plan, targeting not only the growth of electricity infrastructure but also using it as a platform for creating and sustaining the growth of engineering industries in the country. The GTP targets to reach 10 000 MW installed electricity generating capacity by 2015 from its level of 2 000 MW in 2010, with large hydropower constituting the largest share, but also bringing in wind and geothermal power into the energy mix to play a vital role in meeting demand with a high degree of reliability. Geothermal power will help to diversify the Ethiopian energy mix and provide valuable base load capacity at low cost and with limited environmental impact. It is estimated that some 5 000 MW of resources are available, and the Government is seeking to develop 1 000 MW of this by 2030. Hence, in addition to the GTP, geothermal power development has been included in its Nationally Appropriate Mitigation Actions (NAMA) and its Climate Resilient Green Economy plan (CRGE). The CRGE plan envisages the development of over a thousand MW from geothermal by 2030.

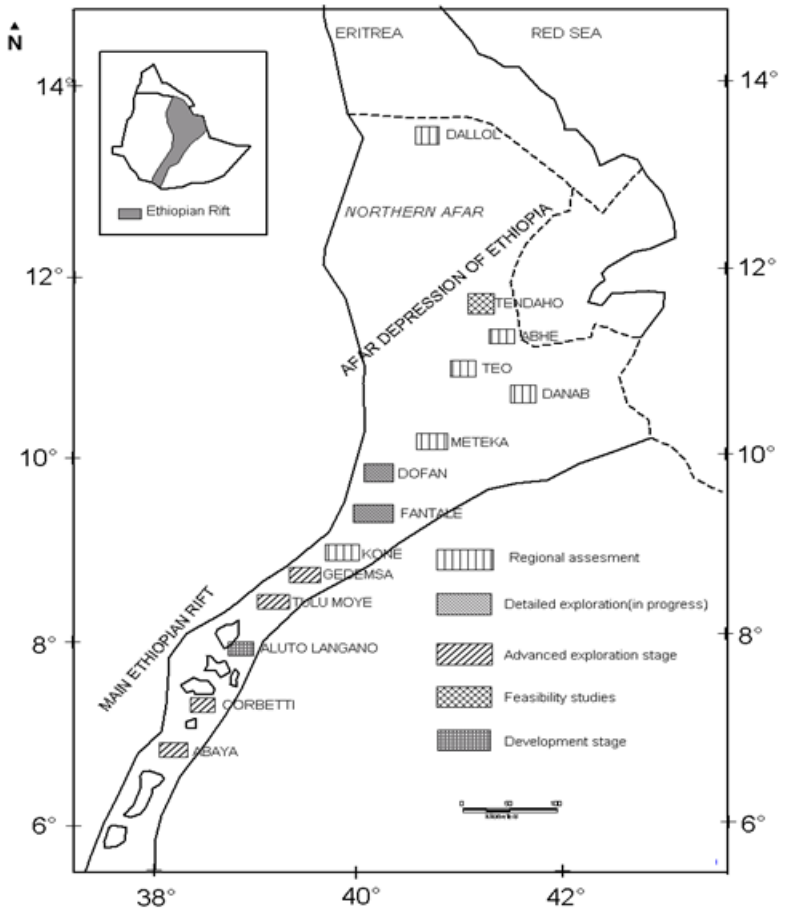
2. Geothermal development has various stages of activities and mainly includes: (i) planning; (ii) surface exploration; (iii) exploration drilling; (iv) appraisal drilling and feasibility/design; and (v) production drilling and Power plant and transmission line construction.

3. The planning aspects of geothermal projects consist of: (i) Review of existing information on a prospect; (ii) Detailed surface exploration (Geology, Geochemistry, Geophysics); (iii) Exploration drilling and well testing (a minimum of 3 wells); (iv) Appraisal drilling (4 - 6 wells) and well testing; (v) Feasibility studies; (vi) Production drilling, power plant design, environmental impact assessment and reservoir evaluation; (vii) Power station construction and commissioning; and (viii) Reservoir Management and further development.

4. The planning includes sourcing for funds right from project identification to power station commissioning. Planning and implementation takes about 5-6 years if financing is readily available. From the experience of geothermal resource development in various parts of the world, it has been learnt that: (i) timely financing of the projects is very critical; (ii) Some of the exploration wells could be used to run pilot plants to generate some power while decisions for further development were being considered; (iii) staged development has an advantage of making early use of the existing wells thus reducing early expenditure and producing revenue to take the project forward and build confidence in the resource; (iv) appraisal drilling should not be stepped out too far apart from the discovery exploration well. Such step-out wells might destroy confidence in the prospect by being unproductive.

5. The geothermal potential within Ethiopia has long been recognized. Under a program that began in 1969, geo-scientific studies have been conducted in a number of Ethiopian fields and over sixteen areas have been identified to have geothermal resources suitable for electricity generation in the Ethiopian Rift Valley. From these areas deep drilling has been undertaken in Aluto Langano and Tendaho and detailed surface exploration has been nearly completed in four other areas. The rest ten areas are at a first stage of surface exploration.

Figure: Location of Geothermal Prospects in Ethiopia



6. The Ethiopian Electric Power Corporation (EEPCo) has included geothermal power generation in its strategic plan (2011-2018). This includes: (i) the expansion of geothermal power capacity to 75 MW at Aluto Langano by 2015, (ii) the development of Tendaho to 100MW, and (iii) the development of additional 275 MW from other four prospects by 2018 (see table below). This Plan also calls for the building up of experience in running geothermal power plants to ensure the reliable availability of both capacity and energy based on that resource, to contribute to the improvement of its generation mix and reliability of supply.

Table: Geothermal Power Development Plan in Ethiopia by 2018

#	Prospect Area	Estimated Initial Output (MW)	Estimated Completion Time (Revised)
1	Aluto Langano	75	2015
2	Tendaho	100	2018
3	Corbetti	75	2018
4	Abaya	100	2018
5	Tulu Moye	40	2018
6	Dofan Fantale	60	2018
	TOTAL	**450**	

The above proposed geothermal projects in Ethiopia for SREP are at various levels of development:

- At Aluto Langano, a pilot plant of 7.3 MW has been installed in late 1990's using some of the productive exploration wells drilled in 1980's. A feasibility study to expand the field to 75 MW by drilling of appraisal and production wells has been conducted in 2010 with the assistance of the Japanese government. The study indicated the expansion plan is feasible. Accordingly, preparations to drill four appraisal wells are on progress with the assistance of Japan and soft loan from the World Bank. After this phase is completed the next phase of development would be the drilling of production wells and the installation of a power plant.
- Three deep and three shallower exploratory wells have been drilled at Tendaho in 1990's. The shallow wells are proven to be productive and the deep wells encountered high temperature but the permeability is not sufficient enough at the drilled levels to sustain commercial production. Additional studies indicated the deep wells were not deep enough to encounter the main reservoir. In order to study the feasibility of utilizing the discovered shallow reservoir and study the feasibility of further deep drilling, preparatory work has commenced with the assistance of French Development Agency (AFD). In addition UNEP will assist to conduct additional geo-scientific studies to locate sites for the proposed deep drilling.
- At Corbetti, Abaya and Tulu Moye, detailed surface explorations have been completed which indicated the existence of an attractive resource. In early 2011 the three areas were licensed to the private sector for development. Currently, a private Iceland-based company is in discussions regarding a Power Purchase Agreement (PPA) with EEPCo for power generated from the field at Corbetti. The effort of the private sector will be assisted by the government at various levels as part of the effort in establishing an enabling environment for the private sector.
- At Dofan Fantale work to complete surface exploration, in order to locate sites for deep drilling is being conducted by the government

Objective and Proposed Transformation

7. Despite significant potential and several advantages over other sources of power (higher availability, not affected by droughts, etc), only a fraction of the resource has been harnessed so far. The main reasons are for the slow progress are: (i) geothermal was not given priority due to the least cost development strategy of the country in the past which has focused on hydro; (ii) technical knowhow limitations in geothermal as compared to hydro; (iii) the risks associated during the exploration phase in geothermal to invest the available limited financial resources; (iv) lack of appetite by the private sector to invest in risky drilling operation during the exploration phase of

geothermal; and (iv) lack of a clear approach on the part of the GoE to sectoral development. However, in recent times the GoE has shifted its policy of relying in a single source of electric power (hydro) to secure energy in the country and geothermal sector development is receiving support, and sees the role of the private sector as increasingly important.

8. Under this project, SREP co-financing is being proposed to implement two components:

(iii) Aluto Langano Geothermal Power Generation Project; and

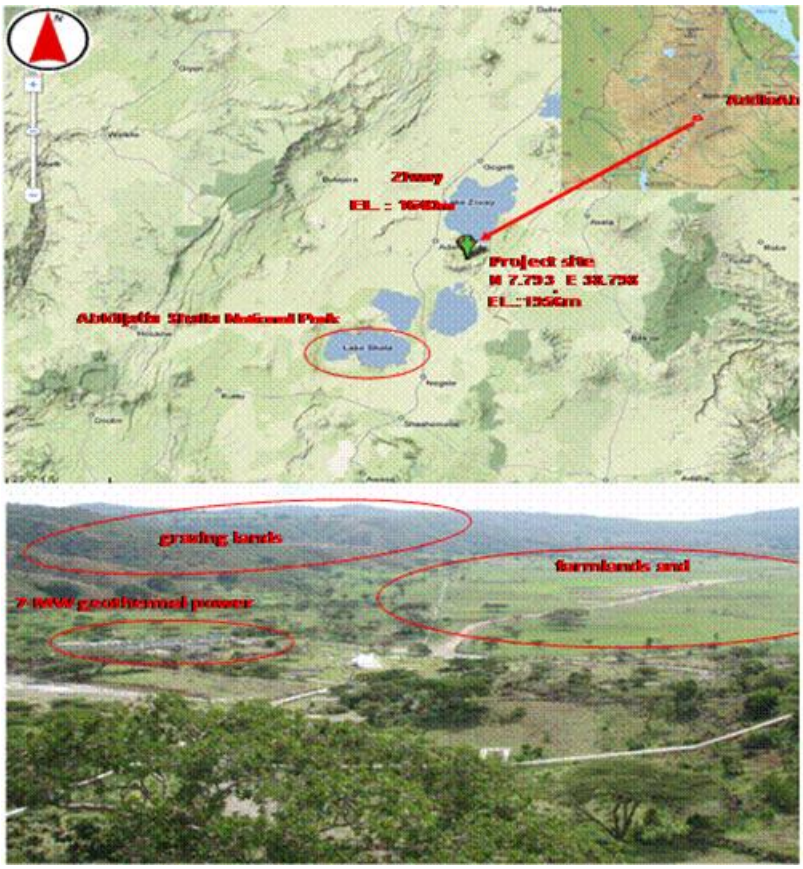
(iv) Design of a Long-Term Strategy for the Geothermal Sector.

9. The project will bring closer the realization of the GoE's goal of attaining around 75 MW of geothermal generation capacity by the year 2015 and 1 000 MW by 2030.

10. **<u>Component 1: Aluto Langano Geothermal Power Generation Project.</u>** The Aluto-Langano Geothermal field is located in the Lakes District, Ethiopian Rift Valley, about 220 Km South of Addis Ababa (see figure below). From the various geothermal fields in Ethiopia, the Aluto Langano Geothermal Power Expansion is given first priority. The main reasons for this are: (i) the level of work so far conducted at Aluto is the highest (ii) the chances of success are relatively high as compared to the others, (iii) feasibility studies conducted has proven positive, and (iv) there is an already ongoing project for the expansion of the field and hence the implementation readiness' at Aluto for SREP financing is high.

- At Aluto Langano, a pilot plant of 7.3 MW was installed in late 1990's using some of the productive exploration wells drilled in 1980's. A feasibility study to expand the field to 75MW by drilling of appraisal and production wells was conducted in 2010 with the assistance of the Government of Japan. The study indicated the expansion plan is feasible. Accordingly, preparations to drill four appraisal wells are on progress with the assistance of Japan, soft loan from the World Bank and the Ethiopian Government Contribution (See Table 2).
- After the drilling of the appraisal wells is completed the next step of development would be the drilling of ten production wells, three reinjection wells and the installation of a power plant. The production and reinjection wells are proposed to be drilled using SREP finance to insure the availability of steam capable of totally producing from a minimum of 35 MW to a maximum of 75 MW electrical energy.
- The production wells will be drilled using advanced technology, directionally down to a nominal depth of 2500 meters to maximize the output per well in the range of 5-10 MW. The proposed financing would serve to cover the costs of drilling consumables, expert advises and capacity building.

Figure: Location Map of Aluto Langano and the Project Area



11. **Component 2: Design of a Long-Term Strategy for the Geothermal Sector.** Currently, GoE is using two routes for the development of the country's geothermal potential, namely full value chain involvement of EEPCo in exploration and production (Aluto Langano) and use of concessions (Corbetti). In other countries, different options are used to bring online geothermal power; for instance, in Kenya, the Geothermal Development Corporation is responsible for exploration and steam development, which is considered to be the riskiest part of the geothermal value chain. It sells the steam on to private players who then lead (design, build, operate and finance) the power generation phase. There are of course advantages and disadvantages to each option. As Ethiopia considers how to expand its geothermal capacity beyond the 75 MW at Aluto Langano, it will be important to explore and understand the options, including what has worked and why, and then outline a path forward for the country. Hence, the second component to be financed under SREP would involve development of a sector strategy that focuses on clearly defining options for how geothermal assets can be developed, including leveraging the private sector strategically as a source of expertise, project manager, equipment supplier and, investor and financier. Furthermore, this piece will emphasize the need to ensure that future projects are bankable and that requisite business skills are built in relevant institutions be it EEPCo, GSE or MoWE.

Implementation Readiness

12. **Component 1: Aluto Langano Geothermal Power Generation Project.** Currently a significant move has been made by the government to: (i) speed up geothermal development including work to expand the Aluto Langano Geothermal field to 75 MW is under progress in collaboration with the development partners; (ii) work to progress the Tendaho Geothermal field to 100MW is in place; and (iii) detail surface explorations are being carried out in a number of other prospects to advance them to the feasibility level. To assist the execution of the program, two deep drilling rigs, most of the scientific equipments required and trained human power in the various geothermal disciplines are locally available. Government institutions implementing the proposed projects are the Geological Survey of Ethiopia and the EEPCo. The two institutions have formulated a Joint Project Office to implement the Aluto Langano Project. The work to drill four appraisal wheels is in progress and the required finance for the job has been secured. The next phase of the steam field development by drilling of Production wells is proposed to be implemented using SREP, WB, GoJ and GoE's finance to pave the way for the installation of the power plant, that will be co-financed by the MDBs.

13. **Component 2: Design of a Long-Term Strategy for the Geothermal Sector**. There is strong support from the MoWE to explore alternative options for sectoral expansion and involvement of the private sector therein, not just as a project developer but also as a critical stakeholder that can bring financing to the table under the right circumstances.

14. This component it to be implemented and executed by the IFC. A criterion for IFC's advisory activities is that the counterpart be a private sector entity. In this case, the entity for which the Geothermal Sector Strategy will be developed is the national government/ministerial institution. As such, the SREP National team agreed with MDBs during and after the Joint Mission to have IFC implementing and executing the component 2 while component 1 will be implemented by the Joint Project Office, working in close collaboration with the MoWE, MoM and EEPCO as the key stakeholders for this work, as well as taking into consideration the perspectives of local private players.

15. The main tasks of this component will be to:

- Define and perform a detailed assessment of options for geothermal sector development, including benchmarking and extensive leveraging of international approaches to and associated results in managing upfront risks;

- Assess options in the Ethiopian context, identifying advantages and disadvantages of each approach for various local stakeholders;

- Detail a portfolio of bankable projects for Ethiopia and how these would be developed based on the various options available to meet the goal of 1,000MW on line by 2030;

- Define core institutional and organizational capabilities required and create an action plan for developing requisite business skills and execution capacity within relevant institutions (MOWE, EEPCo, GSE) including risk management (both technical and country risk) and working with development banks and securing finance. This component may result in the

establishment of additional support entities to support the delivery on Ethiopia's new geothermal strategy;

- Provide targeted input on an appropriate regulatory framework.

Rationale for SREP Financing

16. SREP financing will be instrumental in both delivering on the generation component and in preparing an in-depth study identifying and providing options to the GoE on how to move onwards in the development of geothermal energy.

- From the experience of geothermal resource development in various parts of the world, it has been learnt that timely financing of projects is very critical. For Aluto Langano Geothermal Generation Project, even though the financial requirement for the appraisal drilling is secured, the finance for the next phase of the steam field development (Production drilling) is not yet readily available. This will bring about the Production drilling to be stepped out too far apart from the appraisal well drilling. Such step-out wells might destroy confidence in the prospect by being unproductive. The Proposed SREP financing would serve to fill this gap and thus insure the continuity of the project building thereby the confidence of the public / private sector towards geothermal development

- By eliminating the inherent financial gaps, 75 MW of installed renewable and base-load capacity will be brought on line. Moreover, the lessons that can be derived from the Project experiences (e.g. type of drilling, geothermal plant type, etc.) can provide for a more robust platform for knowledge exchange and learning for EEPCo, GSE and MOWE, to be applied to other fields that they may be developed in the future..

17. Importantly, by financing the Geothermal Sector Development Strategy, SREP financing will bring a valuable new perspective on involvement of the private sector in this space longer-term, leveraging international best practice on where they can best be involved along the value chain.

18. IFC, as an implementing and executing agency, will work in accordance with its own rules and guidelines. IFC has in place extensive procurement and operational guidelines designed to manage governance, environmental, social and health & safety risks. IFC will apply its normal Global and Regional Quality Review Processes during the Project Design stage and it's Rules for Procurement of Consultants during the Request for Proposal and procurement stages. IFC will also use its Guidelines for Financial Oversight during the project implementation stage.

Result Indicators

19. The result indicators for this project are:

- Power capacity installed and connected to the grid from Aluto Langano in MW;

- Savings in Green House Gas emissions in tons per year;

- Project to benefit from the Clean Development Mechanism;
- Increased penetration of geothermal energy in Ethiopia's energy mix in %;
- Transmission Lines constructed in km;
- Number of jobs created during steam exploration, construction and operations (men/women);

Indicative Financing Plan

20. The proposed SREP allocation is approximately USD 26 million and would be provided in the form of a concessional loan or grant (to be determined by the MDBs in due time and in accordance with SREP – Financing Modalities). The indicative financing table is presented below.

Table: Indicative Financing Table (in USD million)

#	Activity	Total Cost	GoE	SREP	MDBs	Others
Component I: Aluto Langano Geothermal Power Generation Project						
1	Appraisal Drilling and Feasibility Study	30.0	10.0	-	10.0	10.0
2	Production Drilling	56.0	32.0	24.0	-	-
3	Well Head Equipment	6.0	-	-	-	6.0
4	Technical and Scientific Capacity Building	1.0	-	0.5	-	0.5
5	Power Plant	133.0	33.0	-	50.0	50.0
6	Transmission Line	3.2	3.2	-	-	-
Component II: Design of the Long-Term Strategy for the Geothermal Sector						
7	Study	2.0	0.5	1.5	-	-
	TOTAL	**231.2**	**78.7**	**26.0**	**60.0**	**66.5**

Project Schedule

21. The following table provides an estimation of the implementation timetable.

Table: Schedule for the Geothermal Power Projects.

#	Activity	# of Months	2012	2013	2014	2015	2016
1	Component II	**15**					
2	MDB Approval of SREP Allocation	**8**					
3	Detailed Feasibility Study	**15**					
4	Appraisal and Approval of MDB co-financing	**12**					
5	Power Plant Construction	**22**					
6	Power Plant Commissioning	**2**					

Project:	Assela Wind Farm Project	**Total Cost:**	USD 200 million
Responsible MBD:	AfDB	**SREP Allocation:**	USD 20 million

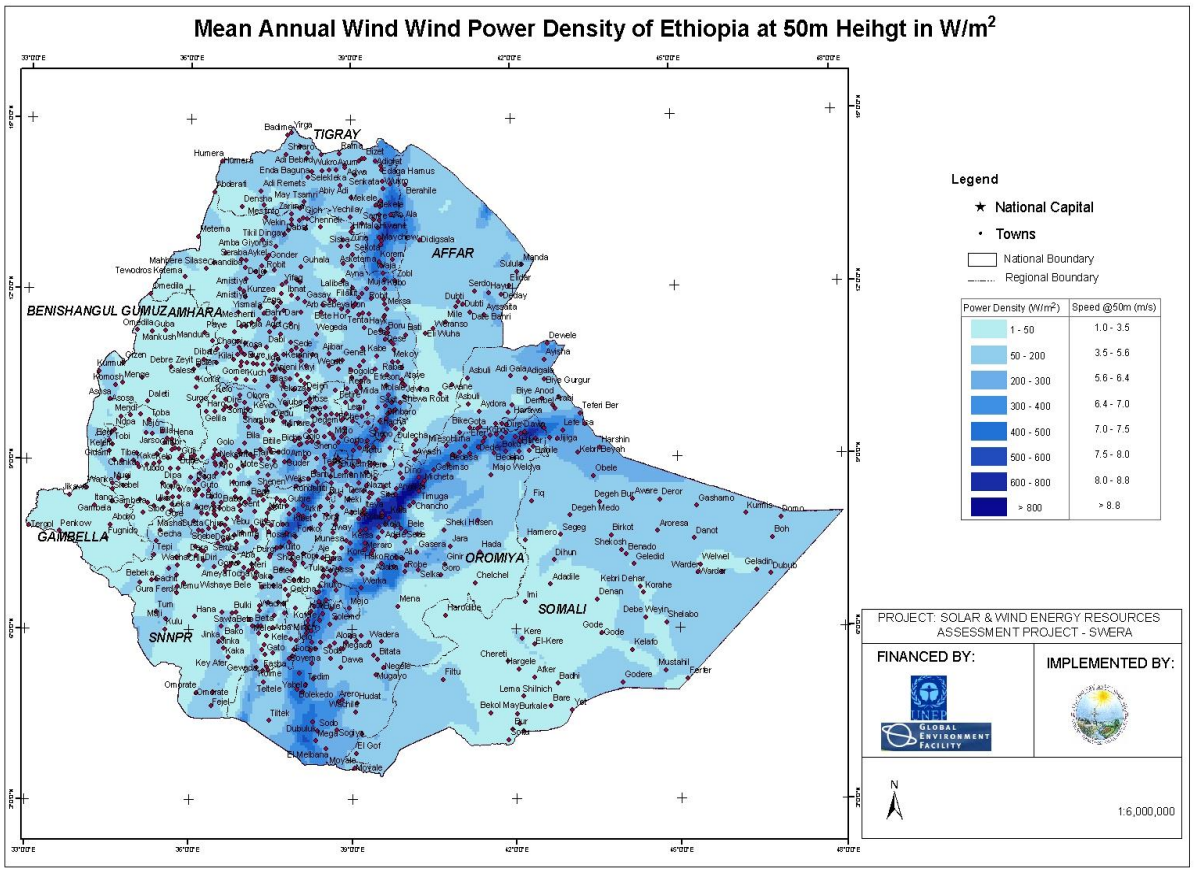
Problem Statement

1. The GoE has put in place its Growth and Transformation Plan (GTP) to radically develop the Ethiopian economy. The plan targets double digit GDP growth for the period 2011 – 2015 and corresponding expansion of the country's infrastructure. A radical growth in the provision of electricity is one of the cornerstones of the plan, targeting not only the growth of electricity infrastructure but also using it as a platform for creating and sustaining the growth of engineering industries in the country. The GTP targets to reach 10 000 MW installed electricity generating capacity by 2015 from its level of 2,000 MW in 2010, with large hydropower constituting the largest share, but also bringing in wind and geothermal power into the energy mix to play a vital role in meeting demand with a high degree of reliability. Regarding wind power, Ethiopia is endowed with a huge estimated potential of 100 GW technically feasible wind power. In the context of the Ethiopian power system wind power will play a vital complementary role with hydro power in that the natural cycle of wind energy availability is such that it increases in the dry season when the hydropower reservoirs are low in water, and it decreases in the wet seasons when the reservoirs are rapidly filling up with water. This will make wind power a crucial ingredient of the grid energy mix by improving the reliability of the system even in dry years.

2. The current plan is to have around 800 MW by 2015, with the first ever 2 wind farms in Ethiopia with a combined capacity of 171 MW already under construction. Wind power will thereafter continue to be developed as a significant component of the power system. The major obstacles thus far to the large scale deployment of wind power in Ethiopia are its comparative high investment and unit energy costs. To address this problem the GoE, in line with its strategy for the power sector as a whole, has set the objective of increasing the local value added in the engineering and technological inputs going into the development of wind farms, thereby ascertaining the long term future of large scale wind power development in Ethiopia.

3. At the moment, there is an exhaustive and detailed wind resource assessment under development that is expected to be completed by the end of 2011.

Figure: Geographic distribution of wind resources of Ethiopia (excluding designated areas)



Source: Ethiopian Solar and Wind Energy Resource Assessment (SWERA) Project, Final Report, 2007, UNEP/GEF

4. Assela is found in the Eastern part of the Great Rift Rift Valley in the Oromiya region and is located in south east direction from the capital city at a distance of 155 km from Addis Ababa, with altitude elevation from 2300m-2800m above sea level with an Asphalt road from Addis Ababa and Djibouti port. Based on the SWERA wind atlas map, the Assela region shows an annual average wind speed greater than 8.8 m/s and wind power density greater than 800 W/m2 @ 50m height above sea level.

Objective and Proposed Transformation

5. SREP co-financing is being proposed to implement a wind power project that will demonstrate, through the development of local technological inputs and the significant reductions in unit costs thereby achieved, the economic, financial and technical feasibility and sustainability of large scale wind power development in Ethiopia. This project will clear the ground for future investments by demonstrating that wind power will be affordable within the context of Ethiopia. The project will be developed by EEPCO in the Assela region and will have an installed capacity of

up to 100 MW. It will be targeting a level of local technological input that is expected to guarantee the overall reduction in unit energy cost for the project as well as for future wind power projects by helping create local industries for the manufacture and supply of wind power technology components, obtaining in this way gains in economies of scale.

6. The project brings closer the realisation of the GoE's goal of attaining around 800 MW of wind power generation capacity by year 2015, and 2000 MW by 2030. Thus, by laying the foundation for the growth of local wind industries, the position of wind energy in the renewable energy mix of the country will be secured and made sustainable, which will be difficult to accomplish otherwise. SREP concessional finance will be used to (i) prepare a detailed feasibility study for a capacity of up to100MW in the Assela region, including installation of wind masts; (ii) prepare a full Environmental and Social Impact Assessment and a Resettlement Action Plan in accordance with MDB rules; and (iii) as a capital buy down to bring down the capital expenditures that will minimize the stress onEEPCo's financial and will allow end users to benefit from current electricity tariffs. EEPCO shall conduct a competitive bidding process for the procurement of an EPC contract in accordance with international standards, namely those of the MDBs.

Implementation Readiness

7. Wind power is expected to fill any gap in electricity generation before the major hydropower projects that are under development come on line towards the end of the 2010 – 2015 planning period. Two wind power projects, one 120 MW at Ashegoda and another of 51 MW at Adama, are already under construction and around 600 MW additional wind capacity is needed according to the plan. With the two projects under construction EEPCO is building its capacity in wind power expertise. The project being proposed is highly anticipated and will fit in the plan.

Rationale for SREP Financing

8. SREP financing will be instrumental in bringing down the overall project cost and thus help launch a project that will ultimately make wind power affordable for the country in the long term. This is expected to be achieved through reductions in the cost of the project's technology inputs, which a share are expected to be locally sourced and likely cheaper. It is worth mentioning that given the landlocked status of Ethiopia, transportation costs of component with significant dimensions pose a substantial financial hurdle that bring the costs of an already expensive technology even higher. In addition to cost savings the project will also an important part of its expenditures in local currency thereby conserving the country's foreign currency earnings, which will otherwise be under huge pressure if the country is to rely on imported technology inputs to develop significant levels of wind power.

Result Indicators

9. The result indicators for this project are:

- The capacity of wind turbines installed and connected to the grid in MW;
- Share of local versus external inputs achieved in %;

- Savings in Green House Gas emissions in tons per year;
- Project to benefit from the Clean Development Mechanism;
- Increased penetration of wind energy source in %;
- Transmission lines constructed in km;
- Number of local jobs created during construction and operation.

Indicative Financing Plan

10. The proposed SREP allocation is approximately USD 20 million and would be provided in the form of a concessional loan or grant (to be determined by the MDBs in due time and in accordance with SREP – Financing Modalities). The indicative financing table is presented below.

Table: Indicative Financing Table (in USD million)

#	Activity	Total Cost	GoE	SREP	MDB	Other
1	Project Preparation Grant (feasibility study)	2	0.3	1.7	-	-
2	Development Costs	15.5	3		12.5	
3	EPC (Wind Turbine Generators, civil and electromechanical works)	215	34	18.3	112.7	50
4	Substation	10	1.5		8.5	
5	Transmission Line	7.5	1.2		6.3	
	TOTAL	**250**	**40**	**20**	**140**	**50**

Project Schedule

11. The following table provides an estimation of the implementation timetable.

Table: Tentative Schedule for the Assela Wind Power Project.

#	Activity	# of Months	2012	2013	2014	2015	2016
1	Project Preparation Grant Disbursement	**3**					
2	Procurement Process	**7**					
3	Wind Resource Assessment	**18**					
4	Detailed Feasibility Study	**18**					
5	Project Appraisal and Approval by MDBs	**6**					
6	Construction	**24**					
7	Wind Farm Commissioning	**2**					

SCALING UP RENEWABLE ENERGY PROGRAM IN LOW-INCOME COUNTRIES **Project Preparation Grant Request**			
1. **Country/Region**:	Ethiopia	2. **CIF Project ID#**:	(Trustee will assign ID)
3. **Project Title:**	Assela Wind Farm Project		
4. **Tentative SREP Funding Request (in USD million total) for Project at the time of Investment Plan submission (concept stage):**	***Loan:***	***Grant:*** USD 20 million	
5. **Preparation Grant Request (in USD):**	***Grant:*** USD 1.7 million	***MDB:*** AfDB	
6. **National Project Focal Point**:	Mr. Gosaye Mengistie Abayneh Director Energy Studies of the Ministry of Water and Energy gosayea@yahoo.com		
7. **National Implementing Agency (project/program):**	EEPCo		
8. **MDB SREP Focal Point and Project/Program Task Team Leader (TTL)**:	***Headquarters-CIF/SREP Focal Point:*** Mafalda Duarte	***TTL:*** Solomon Asfaw	

9. **Description of activities covered by the preparation grant:**

The Project Preparation Grant will serve to (i) perform a detailed wind assessment in the Assela Region by installing 4 wind masts; (ii) hire a consultancy company to perform a detailed technical feasibility study; (iii) hire a consultant to develop a detailed Environmental and Social Impact Assessment and a detailed Resettlement Action Plan (if needed) in accordance with the AfDB rules and procedures.

10. **Outputs:**

Deliverables	**Timeline**
(i) 4 wind masts installed and collecting wind data	2013 – 2014
(ii) Technical Feasibility Study	2013 – 2014
(iii) ESIA and RAP	2013 – 2014
For more details please consult the schedule presented in the concept note.	

11. **Budget (indicative):**

Expenditures[7]	**Amount (USD million)**
- Consultants	1.0
- Equipment (4 wind masts)	0.3
- Travel/transportation	0.1
- Others (admin costs/operational costs)	0.4
- Contingencies (max. 10%)	0.2
Total Cost	**2.0**
Other contributions:	
• Government	0.3
• MDB	-
• Others (please specify)	-

[7] These expenditure categories may be adjusted during project preparation according to emerging needs.

12. **Timeframe**

Following IP's endorsement and consequent approval of this PPG, the MDB in charge is expecting to finalize the procurement process and disbursement of the funds earmarked herein during the first quarter of 2013. The installation of the wind masts and data collection is expected to start soon after and last for a period of at least 12 months. At the same time, a team of consultants is expected to be hired by EEPCo, as executing agency, in accordance with MDB rules and finalize the drafting of the detailed ESIA and RAP by the time the data collection is concluded. Therefore, the activities funded with this PPG are expected to be concluded during the 3rd quarter of 2014.

13. **Other Partners involved in project design and implementation**[8]:

Individual consultants or consultancy companies will be hired through competitive process.

14. **If applicable, explanation for why the grant is MDB executed:**

N/A

15. **Implementation Arrangements** (incl. procurement of goods and services)**:**

In executing the PPG, the Procurement and Fiduciary function will be ensured by EEPCo. The funds will be channeled by the AfDB which has a field office in Ethiopia with Procurement and Financial Management staff. Procurement of goods and services will be done in accordance with the AfDB rules (or national procedures if validated by the MDB implementing the Grant) and under the guidance of the local experienced staff.

[8] Other local, national and international partners expected to be involved in design and implementation of the project.

Project:	Clean Energy SME Capacity Building and Investment Facility	**Total Cost:**	USD 12 million
Responsible MDB:	IFC	**SREP Allocation:**	USD 4 million

Problem Statement

1. The GoE strongly believes that access to diverse, reliable, affordable and clean energy is critical for sustainable growth. One of the Strategic directions in the Growth and Transformation Plan (GTP 2011-2015) is the up grading and distribution of wood saving stove technologies which will be continued though out the country. It is also clearly indicated in the sectoral GTP plan (MoWE) that different solar technologies will be disseminated.

2. On the cooking and heating side, population pressure is expected to exacerbate an already serious biomass shortage problem in Ethiopia. The demand for wood products, especially fuel wood, is expected to increase at about the same rate as the population, at around 2.8 % annually. Without substantial mitigation measures, major fuel deficits are likely to result, eventually leading to "energy poverty". Also, inadequate supplies of fuel-wood and inefficient use directly impact on rural women's health and workload. In the commercial sector, large numbers of restaurants, hotels and government institutions also use traditional charcoal or wood stoves. The efficient use of energy resources is critical for environmental sustainability and enhanced quality of life. Increased use of improved cookstoves can minimize deforestation, reduce indoor air pollution that creates health problem and, additionally, contribute on saving working time of women and children which is caused by searching, collecting and transporting wood fuels; this latter creates spare time for families to use for other productive activites. It can also significantly reduce the cash expenditures of low income families and operating costs of institutions (from commercial businesses to social services organizations, such as schools and clinics) on cooking and heating fuels.

3. On the electrification side, despite the fact that 84% of the population of Ethiopia live in rural areas, electricity supply from the grid is only expanded to 5,163 rural towns in the past few years. Dispersed demand (because of scattered settlement) and very low consumption level of electricity among rural consumers, limited grid electricity penetration to rural population, electricity expansion practices has been costly and compared to the demand, the supply is yet requires greater effort and investment in the area of electrification and hence, it is unlikely that all the rural community would be connected to the grid with in the coming 5-10 years. Unelectrified households typically rely on expensive and polluting kerosene to meeting their lighting needs. Yet, modern alternatives exist; these might include solar lamps or solar home systems. Such alternatives can reduce spending as well as provide much higher quality lighting services.

4. The GoE has launched two initiatives to address these energy access concerns: 1) a Rural Cook Stoves Investment Plan, as part of the Climate Resilient Green Economy (CRGE) Strategy, aiming to disseminate 9 million improved cook stoves (ICS) by 2015, and 34.2 million by 2030 in rural area, and 2) an Off-Grid Rural Electrification Strategy that provides opportunities for an increased participation of both the public and private sector, as well as cooperative communities in the supply of solar energy products to un-electrified rural population.

5. However, neither of the current efforts focuses specifically on creating a market for modern energy products or services provided by the private sector. Given the expected rapid growth in demand - from population growth and economic growth - for modern cooking, lighting, electrification and other energy services offerings in the residential and commercial sectors, there

is scope for companies to produce and sell quality products at scale. Developing this market for sustainable energy products made or distributed locally by SMEs is the focus of the present project.

Objective and Proposed Transformation

6. The overall objective of this SREP component is to support **market development for clean, renewable energy-based products and services in the household and commercial segments, by providing targeted capacity building and financing to small and medium-sized enterprises (SMEs)**. Relevant SMEs are defined as companies selling 1) energy access devices (improved cookstoves, lighting devices, solar home systems), 2) efficient energy conversion systems for institutions (institutional cookstoves, solar water heaters, rooftop solar systems), and 3) modern fuels (biomass briquettes, sustainably-produced charcoal). Specifically, the project will build capacity and provide commercial financing that allow companies to develop new, professionalize existing and, ultimately, grow businesses that provide high-quality modern energy services in Ethiopia. The Project will be divided in two phases:

- Phase I: Capacity building of market players: The project will focus on removing barriers to the development of a strong supplier base for energy products that help to meet the Government's energy access and GHG emissions priorities - by providing:

    - *Access to market intelligence* - developing demand data on how much people are currently spending to meet household, institutional or commercial energy needs, what they would be willing to spend on alternative, clean, renewable energy-based products and services.

    - *Business plan development* - helping entrepreneurs with promising ideas for new or the scale-up of existing businesses to translate these into proposals that will attract loans from lenders

    - *Technology appropriateness* - helping to provide the latest information on or to develop modern technology options that could be of interest to the target segments in Ethiopia

    - *Management training for SMEs* - Building the skills of businesses to operate professionally, particularly book-keeping, development of bankable cash flows, human resource management and marketing, as these are all critical for accessing finance. This may also include advising on establishment of small industrial clusters to take advantage of natural synergies between manufacturers of individual product components

    - *Training of lenders* - helping local commercial banks to better assess the risks associated with lending to SMEs serving the residential, institutional and commercial markets

- Phase II: Financing of Market Players (SMEs): The project will help to increase access to financing for market players by *providing both capital for establishing new and expanding existing manufacturing facilities, and working capital*. This will be achieved by establishing a financing facility that offers risk capital, channeled via local banking intermediaries. SREP

funds will be used to leverage - ideally on a 1:4 basis - capital from local commercial banks by taking the highest risk burden, thus encouraging them to lend to SMEs on acceptable commercial terms. The exact usage of the SREP financing - i.e. will it be structured as a risk sharing facility or a loan guarantee - will be determined during the project preparation stage. Above and beyond the first loss, risk will be shared between IFC and local commercial banks on a ratio to be determined in due time.

Implementation Readiness

7. MoWE has a good general understanding of the market for energy services in Ethiopia, including of many of the players and their needs, both in terms of skills and financing. While historically GoE has not explicitly developed SMEs ability to serve this market, it is committed to working closely with IFC and Ministry of Trade and Industry to deliver this programme.

8. A number of companies are already active in the manufacturing of improved cook stoves. Many of these firms emerged following the Government of Ethiopia's rural cook stoves programme, and are serving both these and urban markets. They are expected to only increase in number given the GoE's commitment to rolling out a massive improved cook stoves programme. Local entrepreneurs are increasingly entering the briquettes business, and are currently building small-scale networks for the supply of biomass residues for conversion and sale in niche areas.

9. In the lighting area, a few dozen players are presently active in the solar lantern and solar home system distribution markets in Ethiopia. The same is true for solar heating products and services, where there is growing evidence of some hotels and hospitals being interested in these products. A Solar Association exists, representing many of these businesses.

10. Finally, several conversations have been held between DFIs and local banking players that are eager to develop products to serve the SME sector, in particular companies providing to climate-friendly energy access options, as they believe there could be potential to scale over time.

Rationale for SREP Financing

11. There are currently only a handful of truly professional producers and/or resellers (SMEs) of modern energy products for cooking, heating and lighting in Ethiopia. While many companies exist and are serving the market, they often do not fully understand how to grow and efficiently meet the needs of their target customers, what levers can be pulled to increase profitability, and how to operate a well-functioning business. They are generally not aware of the latest technology developments, and which customers might be interested in acquiring them - at what price - if they were available in Ethiopia. As a result of this combination of factors, entrepreneurs can typically not access credit or are forced to front between 200 - 300 percent collateral. Companies thus end up producing fairly low quality goods and remain small-scale. When large numbers of high-quality products are required (e.g. cooking devices) to meet government or donor contracts, they often end up being imported.

12. This is a chicken-and-egg situation, which is not currently being addressed by existing programmes. The project will therefore be transformative by putting into place the key elements needed for a sustainable market for modern energy in Ethiopia. While the Government is already focusing on stimulating demand through consumer awareness and national targets for improved

cookstoves, the SREP funds will help create a solid Supplier Base and provide the Access to Finance needed for small and medium sized manufacturing and distribution businesses to grow sufficiently to meet demand.

Results Indicators

13. The results indicators for the project are:

- [Number] of SMEs manufacturing and selling energy devices, and capital from local banks
- [% share] of SMEs headed by women
- [%] Annual growth in sales
- [hectares per year] of fuel wood saved
- [litres per year] of kerosene replaced
- [tons per year] savings in GHG emissions

Indicative Financing Plan

14. The exact needs and split of resources between capacity building and financing for SMEs will be based on the outcome of the project preparation activities. This will include the scope of energy technologies to be covered, the characteristics and potential number of SMEs to benefit from the facility, the size of funding that they should be provided with and on what terms, how the financing facility will be structured, and the type of support that local lenders will need in order to effectively identify and perform due diligence on SMEs applying for loans from the financing window.

15. The indicative Financing Table is presented hereunder.

Table: Indicative Financing Table (in USD million)[9]

#	Activity	Total Cost	GoE	SREP	IFC	Other Private sector
1	Project Preparation (Scoping Study)	0.4	-	0.4	-	-
2	Advisory Services Capacity Building	1.6	-	1.6	-	-
3	Financing Facility	10.0	-	2.0	4.0	4.0
	TOTAL	**12.0**	**-**	**4.0**	**4.0**	**4.0**

[9] Given the Private Sector nature of the Project, the final breakdown of financing will be determined during appraisal. The main objective is to minimize IFC's participation in order to avoid crowding out of local private sector financing.

16. Following preliminary discussions with local commercial banks, it is expected that the SREP USD 2 million allocation will leverage additional USD 8 million. SREP funds will be used to provide a first-loss capital layer (the "SREP Participating Loan") above which the IFC would commit a pro-rata share of additional financing capacity. Additional capital from local financial institutions would also be raised either on a senior basis or pari-passu with the MDB as local market appetite is developed.

17. As an illustration given in the table above, if IFC procures USD 4 million as capital commitment from its side and an additional USD 4 million in the form of senior participating loans in its Financing Facility, the leverage of the Facility exceeds the 4:1 SREP guidance, as measured by the total financing mobilized by the SREP donor funds. The realized leverage of the Financing Facility when implemented is subject to change and highly dependent on several factors such as the investment appetite of local financial institutions, the financial strength of the Partner Banks, and the viability of their target portfolios.

Project Schedule

18. The following table provides an estimation of the implementation schedule.

Table: Tentative Implementation Schedule

#	Activity	# of Months	2012	2013	2014	2015
1	Readiness – Assessment study (project preparation grant activity)	**8**	|||		
2	IFC appraisal and approval of SREP co-financing	**9**	|||		
3	Capacity Building	**39**	|||		
4	Financial Closure	**12**	|||		
5	Disbursement and Financing Facility Implementation	**36**	|||		

SREP Project Preparation Grant Request			
16. **Country/Region**:	Ethiopia	17. **CIF Project ID#**:	(Trustee will assign ID)
18. **Project Title:**	Clean Energy SMEs Capacity Building and Investment Facility		
19. **Tentative SREP Funding Request (in USD million total) for Project at the time of Investment Plan submission (concept stage):**	***Loan:*** USD 2 million	***Grant:*** USD 2 million	
20. **Preparation Grant Request (in USD):**	***Grant:*** USD 400,000	***MDB:*** IFC	
21. **National Project Focal Point**:	Mr. Gosaye Mengistie Abayneh Director Energy Studies of the Ministry of Water and Energy gosayea@yahoo.com As soon as the executing agency is defined, a Project Focal Point will be designed.		
22. **National Implementing Agency (project/program):**	Not Applicable		
23. **MDB SREP Focal Point and Project/Program Task Team Leader (TTL)**:	***Headquarters-CIF/SREP Focal Point:*** Joyita Mukherjee, Senior Operations Officer, jmukherjee1@ifc.org	***TTL****:* Pepukaye Bardouille, Senior Global Product Specialist, pbardouille@ifc.org	
24. **Description of activities covered by the preparation grant:**			

The Preparation Grant will be used to hire national and international consultants who would carry out the following activities:

- Identify the key barriers faced by SMEs manufacturing and distributing clean energy technologies - notably cook stoves, solar lanterns, solar home systems, solar water heaters - in Ethiopia
- Identify the market potential for such technologies for households and commercial enterprises
- Develop potential pipeline of high-potential clean energy SMEs in Ethiopia
- Review past experience (local and international) on capacity building and financing of clean energy SMEs and draw lessons for future interventions in Ethiopia
- Recommend appropriate interventions, technologies and implementing mechanisms related to SME capacity building and financing with adequate justification that could be supported using the SREP. Specifically, define the structure of a Clean Energy SME Capacity Building and Investment Facility
- Identify necessary institutional structure and champions (from both the public and private sectors) for such interventions and indicate their specific roles within SREP implementation
- Review and assess availability of funds from different sources and possibility of leveraging funding for SREP program from private sector and other development partners
- Assist in carrying out consultation workshops with all stakeholders including private sector, financial institutions, as needed to inform project design.

25. **Outputs:**

The expected outputs would be the following deliverables:

Deliverables	**Timeline**
(1) Clean energy market assessment and SME pipeline	July 2012.
(2) Recommendation on SME capacity building facility and Investment Facility structure	October 2012.
(3) Financial closure of SME Investment Facility	December 2012.

For more details please consult the schedule presented on the previous page.

26. **Budget (indicative):**

Expenditures[10]	**Amount (USD million)**
- Consultants	300,000
- Equipment	-
- Workshops/Seminars/Surveys	20,000
- Travel/transportation	50,000
- Others (admin costs/operational costs)	-
- Contingencies (max. 10%)	30,000
Total Cost	**400,000**
Other contributions:	
• Government	-
• MDB	-
• Others (please specify)	-

10 These expenditure categories may be adjusted during project preparation according to emerging needs.

27. **Timeframe**

Submission of program preparation grant request: March 2012.
Hiring of consultants and commencement of study: May 2012.
Completion of the study: October 2012.
Financial closure of Investment Facility: December 2012.
Submission of Program document for SREP Sub-Committee Approval: January 2013.
Expected Board/MDB Management[11] approval date: March 2013

28. **Other Partners involved in project design and implementation**[12]:
MoWE, Ministry of Trade and Industry, Local partner banks.

29. **If applicable, explanation for why the grant is MDB executed:**

The preparation grant will be used to identify opportunities for private sector engagement in developing and financing clean energy SMEs in Ethiopia. The IFC has a comparative advantage in this regard given its focus on the private sector and its decades of experience in catalysing investments, often in SME financing, in the developing world. The IFC is participating in the SREP in both Nepal and Honduras and would use the experience from these regions in Ethiopia. IFC has strong knowledge management and lessons learned components in their projects which will allow for the sharing of information.

Furthermore, the IFC is a global player in the testing of climate resilient investments in the private sector and is therefore well positioned to undertake the following proposed activities under this PPG.

Given the above, IFC will implement the preparation grant using its own processes and procedures.

30. **Implementation Arrangements** (incl. procurement of goods and services)**:**

This program will be implemented by the IFC in close collaboration with the World Bank, the African Development Bank, MoWE and Ministry of Trade and Industry. In addition, the program will form collaborations with private sector entities, government agencies and other relevant stakeholders as required.

The procurement of goods and services will follow IFC's procurement guidelines.

11 In some cases activities will not require MDB Board approval.

12 Other local, national and international partners expected to be involved in design and implementation of the project.

ANNEX 2: ETHIOPIA ABSORPTIVE CAPACITY

1. ***Macroeconomy.*** Ethiopia's Sovereign Debt Distress level has fallen to low risk as per the 2010 Joint World Bank-IMF debt sustainability framework for low-income countries. The monetary policy of the country has continued to be geared towards containing inflationary pressure and ensuring price stability. As a result, annual average general inflation dropped to 5.4 percent in September 2010 from 18.7 percent in the same period of 2009. The inflation rate is projected to remain in single digit in response to cautious monetary policies combined with the assumption of moderate commodity price increases in the global market. Inflation rate in the long-run is assumed to be around 6 percent

2. Despite the challenges of being one of the world poorest countries, Ethiopia has good prospects for growth as suggested by the IMF, which forecasts points for Ethiopia Real GDP to growth at a rate of 8% per year over the next five years. According to the GoE, the Ethiopian economy is expected to sustain the previous years' rate of GDP growth which was 11% during the last 5 years.

3. In order support its growth, Ethiopia has managed to attract more foreign investment which has increased from less than USD 820 million in 2007/08 to more than USD 2 billion in the first half of 2010/11 fiscal year. The World Bank's 2011 "Doing Business" report ranks Ethiopia's overall business environment as better than the likes of Brazil and India.

4. ***Technical and Managerial Aspects.*** The electricity public utility EEPCo has a long track record of implementing generation, transmission and distribution projects, from the small through to mega projects. The GoE is currently working to overhaul EEPCo to make it a world standard service provider. The other institution that will have a significant role in the implementation of the IP is the GSE. It also has over the years built a strong capacity in terms of professionals and equipment in the exploration of geothermal fields. It is expected that these institutions will be capable of undertaking the projects proposed in the IP. Other institutions involved in the implementation of the IP, i.e. MoFED, MoWE and EPA, have well established relationships and experience in working together with international bilateral and multilateral development partners. Certain activities to be financed under SREP will highly contribute to improve the capacity of the executing agencies, an example is the capacity building component to financing institutions under Project #3.

5. In conclusion, the expected fast economic growth will lead to rapid rise in energy demand, which has been observed in recent years (e.g. 30 % electricity demand rise for 2009/10 period) and thus will trigger the need to scale up all previous efforts at the provision of clean and sustainable energy to the country. As a consequence, the investment needs for the continuous development of the sector are huge and in addition to the current available financing. Based on this context, and anchored on the strong institutional capacity of the government agencies that will be involved in the implementation of SREP resources,

Ethiopia has sufficient absorptive capacity to successfully implement the projects embedded in the IP.

ANNEX 3: STAKEHOLDERS CONSULTATIONS

1. The Stakeholders' Consultation Workshop organized by the MoWE between 20th and 21st October, 2011. Consultations were held with key stakeholders in the country, including national institutions/authorities, development partners, civil society organizations (CSOs), local communities and private sector representatives. The workshop was aimed at supporting the GoE in prioritizing and validating the investment projects in the IP through a wide consultation and dialogue process with all interested stakeholders. During the workshop, the SREP National Team presented the draft IP and a proposed set of criteria for selecting the individual projects to be supported by SREP.

2. Workshop participants welcomed the SREP program and the array of activities included in the draft IP. The proposed project selection criteria were overall validated, despite a few suggestions for improvement from some participants. In addition, some participants put forward the inclusion of a number of additional activities in the IP. The SREP National Team has taken note of all the comments received and will take them into consideration in finalizing the IP

3. The State Minister of Water and Energy, H.E. Ato Wondimu Tekle, welcomed on behalf of the Federal Democratic Republic of Ethiopia all participants to the workshop. H.E. Ato Wondimu Tekle emphasized that Ethiopia is one of the fastest growing economies in Africa. Ethiopia's recent track record demonstrates that real GDP grew more that 11% over the last 7 consecutive years. Furthermore, H.E Ato Wondimu Tekle stated that in order for Ethiopia to meet the existing high electricity demand growth in the country, currently estimated at 32% per annum, and to export electricity to its neighboring countries, Ethiopia will have to reach an installed capacity of 10 GW in the coming four years. The State Minister emphasized as well that Ethiopia aims at increasing the dissemination of renewable energy technologies and increasing access to modern energy sources in order to reduce the current deforestation rate and mitigate carbon emission.

4. The first session focused on: (i) the role of SREP within the context of the country's growth and energy initiatives and, (ii) the selection of projects and programs to be supported by SREP.

5. The IP and the project concepts within the plan fit in the broader context of Ethiopia's energy and low emissions growth strategy, particularly with regards to Ethiopia's 5-year Growth and Transformation Plan (GTP). The GTP, one participant noted, emphasizes investment mainly in large hydropower. While large hydropower is critical in Ethiopia's energy mix, the GTP commits to diversifying the energy mix and highlights geothermal and wind as promising and abundant renewable energy sources. Another aspect raised during the discussion was the linkages between the National Energy Law, the GTP and other green growth initiatives and their potential to support transformative initiatives.

6. The conversation transitioned into a discussion on the selection of programs to be supported by the SREP and the process for determining the selection. Participants highlighted a number of technologies which would benefit from SREP support including biofuels, solar home systems and small hydro power plants. A number of participants suggested that the dissemination of cook stoves project could be expanded to support a larger rural electrification or energy access. Questions were also raised about the methodology used for assigning rankings to the projects and suggested this might be revisited or more information could be shared on how the ranking system was derived.

7. There was a recognition that given the limited resources provided through SREP, only three of the eight projects initially identified by the government for SREP support could ultimately be included in the investment plan.

8. To conclude the first session, it was noted by the SREP National Team that the proposed projects were only concepts at that stage and that it will keep its options open and explore including other technologies and combining different concepts into one project. The Follow-up Meeting was held based on this notion

9. The afternoon session part of the Consultative Workshop was dedicated to the formation of two working groups: (i) civil society and development partners; and (ii) Private Sector Representatives. These groups held brainstorming sessions towards the SREP and its contribution to the development of Renewable Energies in Ethiopia.

10. The second day of the workshop was dedicated to the continuation of the breakout sessions, presentations by each group of their findings.

11. The first group focused on the role of the private sector in supporting renewable energy investments and the role of the GoE in creating an enabling environment for private sector participation. Usually, the role of private sector is limited (i) to the drafting of studies, design, and construction of power facilities; and (ii) rural energy development. Some barriers in the medium and large power development exist for the engagement of private sector participation.

12. In regards to specific investments, participants questioned the transformative impact of the geothermal project without private sector engagement suggesting that without private sector participation it may be difficult to scale up the geothermal industry moving forwards. The government expressed a commitment to bringing in the private sector in the future once the viability of geothermal is demonstrated. Off-grid rural electrification projects were also identified as an opportunity to engage the private sector.

13. The GoE also requested input from stakeholders on proposed allocation of resources. In doing so, the SREP National Team said that the allocations have not been finalized and may changes based on the consultations.

14. The second group focused on perceived barriers faced by the private sector and its participation in the Ethiopian Energy Sector. A number of ongoing activities sponsored by

the MoWE and its partners plus the contribution of SREP to mitigate overcome these barriers were presented.

15. The GoE emphasized that the development of Renewable Energies in the country will continuous to be done by the public sector, due to strategic orientations, but opens the way for private sector participation in the sub-sector of Geothermal Development. One good example is the active role Reykjavik Geothermal currently has in the development of the geothermal potential in Ethiopia.

16. The main barriers identified were (i) lack of access to competitive commercial financing; (ii) capacity and Human resources constraints; (iii) a number of provisions of the Feed-in Tariff Law currently being developed; (iv) lack of technology transfer; and (v) lack of capacity building in the dissemination of cook stoves and solar systems.

17. Concerning the access to finance, Ethiopian private companies put stress on the high collateral demanded and high interest rates as well as short tenors. One of the possible SREP contributions would be to finance a Line of Credit or a Revolving Fund. In terms of Human Resources Constraints, namely lack of engineers, the MoWE has signed recently an MOU with six Ethiopian Universities to train more students, especially in the priority identified areas, while stimulating on-job training experiences. The Feed-In Tariff Law is currently under public consultations and the MoWE is gathering all comments and suggestions by the actors involved in the sector. As of now, it includes an upper limit of 300 MW and a project limit of 40MW. In case the feed-in tariff is not high enough, SREP could finance a subsidy to EEPCo to fill the gap between the approved feed-in tariff and the commercial viable tariff that makes IPPs financially sustainable. With respect to the lack of technology transfer, the GoE stated that it is the country intention to stimulate local industries in the development of Wind technology by creating a cluster that with time will be expected to compete with other international players. Finally, the lack of capacity building the dissemination of cook stoves and solar systems is expected to be mitigated with Project 3, as one of the principal activities of this project is to train local producers in building such cook stoves. More details will be available on Project 3 Concept Note. The following comments were made:

- There is a bias in favor of hydroelectricity and other renewable energy sources should not be discouraged. The government already focused on all renewable energy resources in its GTP target
- The projects should consider the shortest possible way for channeling funding to the final beneficiaries
- What the weighing of the individual criteria would be
- Measuring scale-up potential in terms of percentage rather than absolute numbers of MW
- Measuring potential for increase in direct connections in terms of new direct beneficiaries
- The importance of ensuring that the criteria include the gender aspect as well.

18. The final day of the workshop explored the ways NGOs, bilaterals and other partners could support the SREP and the broader energy objectives of the government. The bilaterals and NGOs stressed that they have substantial experience implementing rural energy projects and could build capacity and share experiences in implementing such projects. The German bilateral, GIZ, for example, has significant experience in training and building capacity for rural renewable energy projects in Ethiopia, but also could leverage its successful experience in Bangladesh working with Grameen Bank.

19. The national team expressed interest to leverage the capacity building experience of the NGO community and bilaterals and explore microfinance opportunities. It was stressed that the government would seek to incorporate the suggestions provided by the group in the SREP investment plan but also into its national energy strategy.

Table 1: Agenda

Day 1			
Item	Activity	Time	Responsible
1	Registration of Participants	08:30 – 09:00	MoWE
2	Welcoming Statement	09:00 – 09:10	Ato Gosaye Mengistie Abayneh, Energy Study and Development Director, MoWE
3	Remarks by MDBs	09:10 – 09:20	Representative of AfDB
4	Opening Speech	09:20 – 09:40	H. E. Ato WondimuTekle, State Minister for Water and Energy
5	Presentation on SREP, the Draft IP and Investment Priorities – Ato Sahele Tamiru, from the National Team	09:40 – 10:30	Moderated by Ato Gosaye Mengistie Abayneh
	Coffee Break	10:30 – 11:00	
6	Discussion	11:00 – 12:30	Moderated by Ato Gosaye Mengistie Abayneh
	Lunch Break	12:30 – 14:00	
7	Breakout Sessions • Group 1: Private Sector Representatives, Development Partners • Group 2: Civil Society Representatives,	14:00 – 15:30	Participants

	Development Partners		
	Coffee Break	15:30 – 16:00	
8	Breakout Sessions continued	16:00 – 17:00	Participants
Day 2			
Item	Activity	Time	Responsible
1	Registration of Participants	08:30 – 09:00	MoWE
2	Breakout Sessions continued • Group 1: Private Sector Representatives and Development Partners • Group 2: Civil Society Representatives and Development Partners	09:00 – 10:30	Participants
	Coffee Break	10:30 – 11:00	
3	Plenary meeting – Group Presentation, Discussion and Wrap-up	11:00 – 12:30	Moderated by Ato Gosaye Mengistie
	Lunch Break	12:30 – 14:00	

Table 2: List of Participants

#	Name	Institution
1	Wondimu Tekle	MoWE
2	Gosaye Mengistie Abayneh	MoWE
3	Wonwossen Sintayehu	EPA
4	Nesru Shifa	MoWE
5	Getachew Beyene	MoWE
6	Belaynesh Birru	MoWE
7	Bezuneh Tolcha	MoWE
8	Selam Kidane	EPA
9	Anteneh Wolde	MoWE
10	Tesfaye Alemayehu	MoWE
11	Abreham Abay	MoWE
12	Beide Melake	MoWE
13	Meron Tefera	MoWE

14	Senait Gebru	MoWE
15	Hilina Getachew	EPA
16	Asress W.Giorgis	MoWE
17	Dereje Derbew	MoWE
18	Wossenu Areda	MoWE
19	Sahele Tamiru Fekede	MoWE
20	Solomon Kebede	MoM
21	Abebe Tadesse	MoFED
22	Hundie Melka	Geological Survey of Ethiopia
23	Mulugeta Asege	EEPCo
24	Mulatu H. Mariam	EEPCo
25	Daniel Mulatu	EEPCo
26	Kebede Walelu	EEPCo
27	Solomon Abebe Asfaw	AfDB - Ethiopia
28	Leandro Azavedo	AfDB
29	Joanta Green	AfDB
30	Sebastien Delahaye	AfDB
31	Elena Ferreras	AfDB
32	Pepukaye Bardouille	IFC
33	Yusuf Ali	WB
34	Federico Querio	WB – SREP Coordination Unit
35	Jamison Donovan	CIF Admin Unit
36	Ben Green	DFID – UK
37	Stefan Reimening	Wind Energy PPP
38	Samson Tsegaye	Solar Energy Foundation
#	**Name**	**Institution**
39	Hilawe Lakew	Solar Energy Development Association Ethiopia
40	Tizazu Yerdaw	Stove producer
41	Filippo Archi	Italian Development Cooperation
42	Bayu Nebsu	Echnoserve E.T. Plc.
43	Martha Mailu	Climate Change Forum - Ethiopia
44	Joachim Gaube	GIZ
45	Michel Cat	EU Delegation to Ethiopia
46	Lata Tnoy	GIZ
47	Markos Melaku	RG
48	Abiy Tamerat	ERG
49	Mersha Argaw	Embassy of Norway, Addis Ababa
50	Ababu Anage	UNDP
51	Nebiyu Assefa	Alphasol Modular Energy Plc
52	Takele Mekonnen	Ethiopian Electricity Agency
53	Katrine Vestbostad	Counselor / Regional Energy Adviser – Embassy of Norway
54	Mollalign Abebe	Ethiopian Electricity Agency
55	Sophie Rech	AFD
56	Fana Abay	dVentus
57	Zewge Alemu	dVentus
58	Belanyneh Gizaw	Ethiopian Electricity Agency
59	Phomolo Maphosa	SNV
60	BartJan van Beuzekom	GIZ
61	Kibrom Tadesse	Forum for Environment

62	Alemayehu Zeleke	GIZ-ECO
63	Abonesh Tesema	GIZ (Stove producer)
64	Yayehyirad Abate	Embassy of Netherlands

ANNEX 4: SREP CO-BENEFITS

1. During the last five consecutive years the country has registered GDP growth rate in double digits. The country's GTP for the next five years envisages keeping this growth rate and transforming from agricultural led economy to industrial led economy. To support the plan a huge development plan in terms of infrastructure construction including in the energy sector is approved by the GoE. Scale-up of renewable energy use will be a major input to sustain the current growth rate.

2. SREP financing would be instrumental in demonstrating the potential and viability of the selected renewable energy technologies for the provision of clean and renewable energy in the country by financing and leveraging investments and consequently significantly reducing the current barriers to entry, while concurrently increasing energy access to the community, boosting economic and social development and reducing GHG emissions.

3. Ethiopia is highly reliant on hydro power for electricity generation, which increases its vulnerability to drought. Consecutive droughts have led to power shortage and electricity rationing in a number of occasions. The acute supply deficit in times of drought has led the country to opt for emergency diesel generation at great cost to the national budget. Diversification of energy supplies with renewable energy using SREP financing would help the country to reduce its vulnerability to the uncertainties of climate change and global energy markets. A key development impact would be the increase of electricity generated which will go a long way in not only increasing population access to energy, but also creating more energy security for the country which is in general reliant on hydro power. There is bound to be direct spillover effects from additional renewable energy development such as job creation, which will over the long term fuel economic growth. To sum up, developing diversified renewable energy resources in Ethiopia will diversify the electricity generation mix, displace marginal fossil-fuel plants, create more energy security, increase population access to a basic necessity and create jobs.

4. The proposed various renewable energy developments would also encourage investors to invest in the country, ultimately creating more job opportunities. As a result it will effectively enhance the income of the society, reduce production costs and increase the purchasing power of the consumer and by extension contributes to poverty reduction efforts of the GoE both at local and national level. Improved economy and availability of sufficient social services due to the development will rapidly change the way of life of the society.

5. ***Environmental Protection.*** Because of the country's historical poor access to modern electricity, the majority of the rural population is highly reliant on cow dung, fire wood and kerosene stove for house hold energy. This has created extensive pressure on forests and has resulted in significant indoor pollutions. The use of diversified renewable energy resources will increase the sustainable and affordable energy access to the rural

poor and thus helps to reduce deforestation and forest degradation and promote sustainable management of forests and the ecosystem in general.

6. ***Socio-Cultural Aspects.*** The dissemination of renewable energy technologies will produce the desired effect of raising the living standard of the target population if they, in addition to lighting, can be used in an income-generating manner. This involves the setting up of flourmills, cottage industry and the like. The program is expected to change the quality of life for the better. The resulting advantage of uplifting the local economy may take some time to materialize, and its impact could be measured in the medium and long term.

7. ***Employment Opportunities and Income Generation.*** These projects connect together the twin problems of lack of access to modern energy services in Ethiopia and the lack of employment opportunities for rural youth, through the creation of renewable energy entrepreneurs. Modern renewable energy technologies are gaining acceptance in Ethiopia but their contribution to the overall energy balance is still insignificant, and their potential to create new job opportunities, especially for youth, is largely untapped.

8. Renewable energy entrepreneurship development is still in its infancy, and has been recognized as one of the priority areas that could stimulate both demand for renewable technologies and the opportunity to enhance youth employment. A number of activities have been taking place in Ethiopia. More and more universities and colleges have integrated renewable energies in their curriculum and have been graduating hundreds and thousands in the past few years in Ethiopia. In addition the Ministry of Education has been preparing the TVET curriculum together with MoWE that will be implemented in the coming few years. This is believed to bring about the link of renewable energy with employment opportunities, training programs on entrepreneurship development and development of micro-financing plans.

9. Improved stoves dissemination in Ethiopia in the past already showed to involved over 25,000 individuals mostly women, creating jobs and business opportunities for both urban and rural poor, boosting involvement of the local supply chain.

10. SREP Projects are expected to create value through their contribution to energy security, environmental sustainability and human health. Because renewable energy development can free up financing from oil importation and consumption, there is a great potential to contribute to the GTP by creating job opportunity and certainly generating income that could change the life style of the youth in rural Ethiopia.

11. The SREP supported programs are expected to involve over 20,000 unemployed youth of which over 75% are expected to be women.

12. ***Gender Equality.*** Women are both producers and procreators and they are also active participants in the social, political, and cultural activities of their communities. Economic development in Ethiopia is unthinkable without the participation of women. In some economic sectors women even constitute a proportionally larger group of the labour force than men.

13. It is estimated that over 15 million households rely on traditional biomass for cooking in Ethiopia. In both rural and urban communities, it is women and girls who cook and spend time near the fire. Providing clean energy for cooking through the use of RETs will significantly reduce the disproportionate health burden of indoor air pollution on women. RETs dissemination through the SREP supported programs could significantly reduce women's burden and kitchen drudgery.

14. In rural societies of Ethiopia, women shoulder all the household activities and take care for the family. Some activities, such as firewood collection, water fetching as well as grinding grains are extremely time and energy consuming for women.

15. Projects within the SREP supported programs are seen as a means towards development rather than an end by themselves, which will be successful provided other complementary projects are enhanced. The dissemination of 9 million improved stoves improves kitchen air pollution and the health of women and children. Small/micro hydro power could allow the establishment of grinding mills, dissemination of solar lanterns could replace some 3 million kerosene lanterns, and these are just some points. The availability of electric power will facilitate and enhance the effectiveness of health initiatives in the proposed mostly rural areas and in general the programs will contribute to the wellbeing of the entire community through the improvements of women's life. In addition the programs will be screened to insure that gender-sensitive strategies and indicators are developed. Monitoring and evaluation will be gender sensitive. Gender strategies for the programs include raising the awareness of both women and men on the issues of improved stoves and the Ethiopian cooking issues and empowering women both technically and economically

16. In this regard, the Ministry of Water and Energy (MoWE) through its Women and Youth directorate will monitor the performance of the SREP supported programs as regards to its gender issues.

17. ***Institutional and Capacity Building.*** One of the most important goals of the program is to build local institutional and management capacities of the beneficiaries, be they the community or the national utility corporation. The local people will be offered technical assistance and will be trained in the management, operation and maintenance of the relevant RETs.

18. ***Low Carbon and Growth.*** By eliminating the financial and technological barriers, reducing upfront capital costs and engaging the private sector, SREP will be breaking major obstacles to selected renewable energy development in Ethiopia thus ensuring replicability and the sustainable development of the country' abundant renewable energy natural resources and potential. This will contribute to the achievement of the Green Growth Strategy of the country, specifically achieving zero net carbon emission by 2025. Moreover, the lessons that can be derived from the program experiences can provide for a more robust platform for knowledge exchange and learning.

ANNEX 5: INVESTMENT PLAN REVIEW

[To be included after the External Independent Review]

ANNEX 6: MDB REQUEST FOR PAYMENT OF IMPLEMENTATION SERVICE COSTS AND REQUEST FOR PROJECT PREPARATION GRANT

SCALING UP RENEWABLE ENERGY PROGRAM IN LOW-INCOME COUNTRIES **MDB Request for Payment of Implementation Services Costs**			
1. **Country/Region**:	Ethiopia / Addis Ababa	2. **CIF Project ID#**:	(Trustee will assign ID)
3. **Project Title:**	Aluto Langano Geothermal Power Generation Project **(Component I)**		
4. **Request for project funding (USD million):**	*At time of country program submission (tentative):* USD 24.5 million (Component I)	*At time of project approval:*	
5. **Estimated costs for MDB project implementation services (USD million):**	*Initial estimate - at time of Country program submission:* USD 475.000 *Final estimate - at time of project approval:*	*MDB:* AfDB *Date:* 22.11.2011	
6. **Request for payment of MDB Implementation Services Costs (USD million):**	X First tranche: USD 200.000 ☐ Second tranche:		
7. **Project/program financing category:**	a - Investment financing - additional to ongoing MDB project ☐ b- Investment financing - blended with proposed MDB project X c - Investment financing - stand-alone ☐ d - Capacity building - stand alone ☐		
8. **Expected project duration** (no. of years):	The SREP allocation is expected to be approved by the end of 2012 / early 2013 and the Power plant is expected to start operation by late 2016.		
9. **Explanation of final estimate of MDB costs for implementation services:**	***If final estimate in 5 above exceeds the relevant benchmark range,*** *explain the exceptional circumstances and reasons:*		
10. **Justification for proposed stand-alone financing in cases of above 7 c or d:**			
SCALING UP RENEWABLE ENERGY PROGRAM IN LOW-INCOME COUNTRIES **MDB Request for Payment of Implementation Services Costs**			

1. **Country/Region**:	Ethiopia / Addis Ababa	2. **CIF Project ID#**:	(Trustee will assign ID)
3. **Project Title:**	Ethiopia Geothermal Sector Development Strategy **(Component II)**		
4. **Request for project funding (USD million):**	*At time of country program submission (tentative):* USD 1.5 million (Component II)	*At time of project approval:*	
5. **Estimated costs for MDB project implementation services (USD million):**	*Initial estimate - at time of Country program submission:* USD 200.000 *Final estimate - at time of project approval:*	*MDB:* IFC *Date:* 22.11.2011	
6. **Request for payment of MDB Implementation Services Costs (USD million):**	X First tranche: USD 100.000 ☐ Second tranche:		
7. **Project/program financing category:**	a - Investment financing - additional to ongoing MDB project ☐ b- Investment financing - blended with proposed MDB project ☐ c - Investment financing - stand-alone ☐ d - Capacity building - stand alone X		
8. **Expected project duration** (no. of years):	The Ethiopian Geothermal Sector Strategy is expected to be ready by mid 2013.		
9. **Explanation of final estimate of MDB costs for implementation services:**	***If final estimate in 5 above exceeds the relevant benchmark range,*** *explain the exceptional circumstances and reasons:*		
10. **Justification for proposed stand-alone financing in cases of above 7 c or d:**			

The vast majority of SREP funding for the Aluto Langano Project will be channeled towards capital investments. This investment will be directed towards public sector activities led by EEPCo since the funding will help to cover the costs of drilling production wells at the Aluto Langano site, to be owned and operated by EEPCO.

However, the GoE recognizes the importance of bringing in private sector expertise and financing resources in to the energy sector, in particular, geothermal. To date there is one player involved in developing a geothermal site at Corbetti. But a more systematic approach to private sector involvement in the appropriate parts of the geothermal value chain will be critical if the GoE is to reach its goal of 1,000 MW of geothermal capacity added to its power system by 2030. A Geothermal Sector Strategy will ultimately help decision-makers in Ethiopia to thoughtfully consider a range of options for blending public and private resources (financing, operatorship, ownership) for the long-term development of this energy source. Additional benefits are:

- **Deep knowledge development:** During the process of developing the strategy, the consultants will actively work to knowledge key sub-national agencies and other relevant entities of the geothermal sector from a "10,000 foot" perspective; to date, MoWE, MoM and EEPCO have focused on developing their technical skills-sets in their respective institutions. Taking a global perspective of "the state of the art of technology", "what has been tried", and "what has worked and why". As such, the outcome will be both a strategic "document" and a deeper understanding within the practitioner network.

- **Set-up for Scaling:** Gaps in the current institutional structure and arrangements will be identified early on, and can be plugged in parallel to the development of priority resources. Based on the experience of EEPCO with Aluto Langano production drilling activities, of the private involvement in Corbetti PPA activities, and the overall sector strategy development project, within 3 years, it is expected that Ethiopia will have identified and addressed key issues and will be well-positioned to begin developing additional fields

SCALING UP RENEWABLE ENERGY PROGRAM IN LOW-INCOME COUNTRIES **MDB Request for Payment of Implementation Services Costs**			
1. **Country/Region**:	Ethiopia / Addis Ababa	2. **CIF Project ID#**:	(Trustee will assign ID)
3. **Project Title:**	Assela Wind Farm Project		
4. **Request for project funding (USD million):**	*At time of country program submission (tentative):* USD 20 million	*At time of project approval:*	
5. **Estimated costs for MDB project implementation services (USD million):**	*Initial estimate - at time of Country program submission:* USD 475.000 *Final estimate - at time of project approval:*	*MDB:* AfDB *Date:* 22.11.2011	
6. **Request for payment of MDB Implementation Services Costs (USD million):**	☐First tranche: USD 200.000 ☐ Second tranche: USD 275.000		
7. **Project/program financing category:**	a - Investment financing - additional to ongoing MDB project ☐ b- Investment financing - blended with proposed MDB project X c - Investment financing - stand-alone ☐ d - Capacity building - stand alone ☐		
8. **Expected project duration** (no. of years):	The Assela Wind Farm is expected to start operations by the end of 2016.		
9. **Explanation of final estimate of MDB costs for implementation services:**	***If final estimate in 5 above exceeds the relevant benchmark range,*** *explain the exceptional circumstances and reasons:*		
10. **Justification for proposed stand-alone financing in cases of above 7 c or d:**			
NA			

SCALING UP RENEWABLE ENERGY PROGRAM IN LOW-INCOME COUNTRIES **MDB Request for Payment of Implementation Services Costs**			
1. **Country/Region**:	Ethiopia / Addis Ababa	2. **CIF Project ID#**:	(Trustee will assign ID)
3. **Project Title:**	Clean Energy SMEs Capacity Building and Investment Facility		
4. **Request for project funding (USD million):**	*At time of country program submission (tentative):* USD 4 million	*At time of project approval:*	
5. **Estimated costs for MDB project implementation services (USD million):**	*Initial estimate - at time of Country program submission:* USD 300.000 *Final estimate - at time of project approval:*	*MDB:* IFC *Date:* 22.11.2011	
6. **Request for payment of MDB Implementation Services Costs (USD million):**	xFirst tranche: USD 150,000 ☐ Second tranche:		
7. **Project/program financing category:**	a - Investment financing - additional to ongoing MDB project ☐ b- Investment financing - blended with proposed MDB project X c - Investment financing - stand-alone ☐ d - Capacity building - stand alone ☐		
8. **Expected project duration** (no. of years):	The Assessment Study is expected to be completed by end of 2012 and the Capacity Building and Financing Facility will be available for a duration of 3 years thereafter.		
9. **Explanation of final estimate of MDB costs for implementation services:**	***If final estimate in 5 above exceeds the relevant benchmark range,*** *explain the exceptional circumstances and reasons:*		
10. **Justification for proposed stand-alone financing in cases of above 7 c or d:**			
NA			