



## SCALING-UP RENEWABLE ENERGY PROGRAM IN ETHIOPIA

### JOINT MISSION

### *Aide-mémoire*

Addis Ababa – 17<sup>th</sup> to 28<sup>th</sup> October 2011



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## I. INTRODUCTION

1. The objective of the Scaling-up Renewable Energy in Low Income Countries Program (SREP) - one of the three programs under the Strategic Climate Fund (SCF) - is to test and implement low carbon strategies in the energy sector to address climate change. SREP is aimed at demonstrating the social, economic, and environmental viability of low carbon development pathways in the energy sector. It seeks to create new economic opportunities and increase energy access through the production and use of renewable energy. The SREP program will enable Ethiopia to initiate the process to achieve a transformational change that will lead the country towards a low GHG emission development and more diversified energy mix. This will be made possible by harnessing mainly the geothermal and wind potential of the country. The SREP will also target remote areas with distributed energy technologies to achieve significant increases in modern energy access to the population.

2. Since October 2010, various activities were conducted by the national team with support from the Multilateral Development Banks (MDBs). These were: (i) a visit to Washington made by the Environmental Protection Authority (EPA) between November 6 to 12, 2010 to attend the first SREP pilot country meeting; (ii) a scoping mission composed by the African Development Bank (AfDB), the World Bank (WB) and International Finance Corporation (IFC) was held in Addis Ababa in February 2011 that was joined by Development partners, Department For International Development (DFID), Japan International Cooperation Agency (JICA), the Norwegian Agency for Development Cooperation (NORAD), the United Nations Development Program (UNDP), United Nations Industrial Development Organization, (UNIDO) and the United Nations Environment Program (UNEP)

3. In February 2011, the MDBs made a first mission (scoping mission) led by the GoE to discuss the aim of the SREP program, its benefits and the modalities of its implementation in the country. The Scoping Mission identified relevant ministries, other development partners, and key stakeholders who should interact during the Joint Mission, consolidated necessary documentation and held preliminary consultations with key stakeholders. The Scoping Mission agreed with the GoE on the scope of assistance needed for the preparation of the SREP Investment Plan (IP).

4. The MDBs and the SREP National Team participated between 30th August and 2nd September in Technical Mission to discuss and agree on: (i) the prioritization of Projects to be included in the SREP Ethiopia Investment Plan (IP); (ii) overall GoE financing strategy and MDB co-financing opportunities; and (iii) the timeline for completion of SREP Phase Activities. Based on the agreement reached during the Technical Mission, the Joint Mission was proposed to be held between 18th and 28th October, 2011.

5. The Joint Mission was led by the SREP national focal point, Mr. G. Abayneh, Director Energy Studies of the Ministry of Energy and Water (MoEW) and Mr. Wondwossen, Head of Legal Department of the Environmental Protection Authority. From the MDBs' side, under the leadership of the AfDB, the team was led by Mr. Solomon Asfaw, Senior Energy Officer; the World Bank (WB) team led by Mr. Yusuf Ali, Power Engineer; and the International Finance Corporation (IFC) team led by Ms. Pepukaye Bardouille, Global Product Specialist, jointly supported the SREP National Team.

6. J. Green, S. Asfaw and L. Azevedo from the AfDB plus P. Bardouille from IFC and Y. Ali from the World Bank attended the entire mission. S. Delahaye from the AfDB attended the mission between the 20<sup>th</sup> and 24<sup>th</sup> October, while E. Ferreras, also from the AfDB attended the mission between 22<sup>nd</sup> and 27<sup>th</sup> October. R. Elahi, B.Rezaian, E. Felix Dwumfour and R. Kitchlu, all from the WB attended the mission on 18<sup>th</sup> October.

7. F. Querio from the WB SREP Coordination Unit attended the mission between the 18<sup>th</sup> and 22<sup>nd</sup> of October, while J. Donovan from the CIF Admin Unit attended the mission between the 18<sup>th</sup> and 24<sup>th</sup> of October. Mr. Ben Green, Deputy Leader from the Low Carbon Development Team from DIF, attended the mission between 17<sup>th</sup> and 22<sup>nd</sup> October.

8. The main objectives of the Joint Mission were: (i) conduct national stakeholders consultation (workshops and multiple meetings with stakeholders) to discuss the investment priorities proposed by the SREP National Commission; (ii) assist the SREP National Commission in finalizing and validating the identified investment priorities; (iii) support the write up of the IP and the design of the various program/projects' concept notes that will lead to the implementation of the SREP IP under Phase 2; (v) initiate the work related to the IP environmental, social and gender mainstreaming; and (vi) develop the Monitoring & Evaluation (M&E) framework for the IP.

9. The mission expresses its appreciation to the GoE, local stakeholders (national institutions, civil society organizations, private sector representatives) and development partners for their involvement and interest shown in the SREP and the quality of the discussions.

## II. MISSION ACTIVITIES

10. In accordance with the TORs of the Joint Mission, the following activities have been undertaken: (i) discussions with the SREP National Team on the development of the IP; (ii) consultations with private sector representatives, civil society stakeholders, and development partners to gather their inputs on the IP and validate the investment priorities; and (iii) visit to the Aluto Langanu Geothermal Site and Adama Wind Site.

### Discussions with the SREP National Team

11. The Joint Mission had a number of discussions with the SREP National Team on the strategic priorities of the Renewable Energy development in the Ethiopia embedded in the IP. The latest version of the IP submitted to the MDBs ahead of the Joint Mission formed the basis of discussions. The Joint Mission provided advice and support on (i) the SREP Programming and Financial Guidelines; (ii) how to strengthen the IP in terms of environment, social and gender mainstreaming and more widely in terms of format and contents; (iii) the drafting of the Monitoring & Evaluation Framework; (iv) structuring of the investment proposals and the capacity and technical assistance components; (v) drafting an updated timeline for the conclusion of Phase I Activities; (vi) and outlined a timetable for implementation and execution of Projects which will be included in the Project Concept Notes.

12. In addition, it was discussed that in order to gain the endorsement of the SREP Sub-Committee, the IP must clearly demonstrate and describe its expected transformative impact on the power sector and other national-scale outcomes. This was especially discussed in regards to the transformative impact that would result from the delivery of investment projects, especially taking into account the low level of involvement from the private sector under the current version of the IP. The Joint Mission advised about the convenience to engage the private sector in the development of the wind and geothermal sub-sectors, as well as the possibility to leverage additional funds from the private sector provided the corresponding barriers are addressed. Nonetheless, it is worth mention that the Public sector is the major player in the sector, especially in the medium and large scale development. The private sector usually participates as EPC and in off-grid rural energy development.

### Stakeholders Consultations

13. In the Stakeholders' Consultation Workshop organized by the MoWE between 20<sup>th</sup> and 21<sup>st</sup> 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 GoE in prioritizing and validating the investment projects in the IP through a wide consultation and dialogue process with all 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.

14. 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. Summary of the Workshop consultations is provided in Annex I.

### **Follow-up Meeting on the Workshop**

15. The MDBs held a meeting with SREP National Team members on 24th October to discuss the outcomes and suggestion drawn from the workshop held the week before. The objective of this meeting was (i) discuss and agree on the screening criteria to be used in order to prioritize the interventions under the IP; (ii) structure the investment projects to be included in the IP and respective capacity building, technical assistance and other activities; (iii) the sources of financing; and (iv) how to maximize private sector participation under the current situation. The meeting was an occasion for the Joint Mission to stress the importance of the expected transformational impact of SREP and its expected leveraging effect. The MDBs have stressed that SREP funds should be used to mitigate additional risks associated with renewable energy technologies and remove financial and institutional barriers. Moreover, the MDBs highlighted to the SREP National Team members that both ADF and IDA allocations are prioritized until the end of 2013, which could pose problems concerning the MDBs co-financing share of the proposed projects. However, given the proposed schedule for implementation and execution of the envisaged Projects, this will not be a problem as both the AfDB and the WB are expecting to tap into funds that will be prioritized in the next cycles of each sovereign financing window.

### **Site Visit**

16. On October 22nd, the SREP Joint Mission visited the Aluto Langano Geothermal Pilot Plant Site and Facility, owned and operated by EEPSCO. We were accompanied on the visit by colleagues from MoWE, Ministry of Mines, and EEPSCO. Following a presentation on the history and planned future development of the field, we visited both the current generation plant and the site of appraisal well drilling. The site has been under development for some 25 years, and a 7MW plant was installed in the mid 1990s. The plant is currently operating at 3-5MW due to technical issues but mainly due to lack of operational know-how at the time the plant began operating. Nonetheless, the site has significant potential for expansion. The GoE currently has two drilling rigs that will be used for this expansion, one is operational while the other needs overhauling before it will be able to operate. Exploration is complete, and the next stage will be the resource development by starting the drilling of appraisal and production wells. They are expected to begin generating power in the coming 3-4 years. The GoE is prioritizing the development of Aluto Langano in its energy strategy and, accordingly, in the SREP. It is expected that the field will be expanded to 75MW at a cost of USD 230 million. The Government of Japan and the World Bank has committed each USD 10 million for the appraisal drilling phase, while the GoE has committed USD 10 Million in kind. As part of the SREP, the GoE is requesting the funding of the production drilling wells, on the order of USD 20-25 million. However, there remains a very significant gap in funding before the field can be fully exploited, and the GoE will continue to seek resources to close this gap.

17. The Joint Mission proceeded then to the Adama Wind Farm, currently being constructed by Hydrochina. The total capacity of the Wind Farm is 51 MW, of which 15MW are expected to be commissioned by December 2011, while the remaining by June 2012. The Project's Total Cost is USD 117 million and is being financed by the China Ex-Im Bank (85%) and the GoE (15%). The technology has been produced by Hydrochina but is certificated by

Goldwind, a German company operating in the sector. Each turbine is designed to have an individual capacity of 1.5MW.

**Figure: Geothermal and Wind Project Site Pictures**



18. **Visit to dVentus.** On the 27th October, members from the AfDB visited dVentus Technologies PLC<sup>1</sup>, a privately owned company with a vision of becoming a leading wind turbine manufacturer and supplier of key components in Ethiopia. In 2005, dVentus established a Research and Development Center in Ethiopia to develop electro-mechanical products (e.g. generators, motors, power electronics and control components) for clean energy and transportation technology. dVentus has successfully developed and manufactured off-shore products such as 125KW, 1MW, and 2.5MW Permanent Magnet Generators, Power Convertors, and Electric Vehicle Accessory Drives. dVentus today has localized capability to design and manufacture small scale generators and electronics for clean technology. The company's plan is to scale-up local manufacturing of wind turbine generators, develop local supply chain, training local personnel for manufacturing, installation, operation and maintenance, and is committed to create products that are innovative, advanced, efficient, reliable and affordable to convert and produce electrical energy.

19. dVentus has a global market outreach and an experienced engineering team that has over 25 years of global experience and contribution to innovative solutions on motors, generators, electronic drives, controls and systems. Using state of the art design, analysis, building and testing tools, dVentus provides competitive products and have succeeded in supporting customers through the following:

- Advanced Engineering
- Turnkey Product Development
- Prototype & Production
- Global Sourcing and Manufacturing

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<sup>1</sup> <http://www.dventus.com/>

### III. KEY FINDINGS

#### Ownership

20. The GoE has demonstrated full ownership and strong commitment to scaling-up renewable energy in order to improve the country's energy mix, to boost economic development and to address climate change issues, such as droughts that have the potential to affect the country high hydro resources in the future. As agreed during the Scoping Mission, the SREP National Team has prepared a comprehensive draft IP to this end. In developing the IP the SREP National Team has reached out to a wide range of stakeholders. It has invited about 57 stakeholder organizations to the Stakeholders' Consultation Workshop to discuss strategic priorities for renewable energy development. This has contributed to improving the relevance of the IP and also has helped strengthen the technical aspects of the activities included in the IP. There will be an additional public consultation of the draft final IP on a Government's website, most likely in EPA's and/or MoWE's website.

#### Strategic Priorities for the IP

21. The first draft of the IP had identified a list of eight possible investment activities to be included in the IP. Even though the proposals were aligned with the SREP Programming Guidelines, it was agreed that the IP needed to include a reduced number of projects to minimize transaction costs, by financing a small number of projects with significant scale-up potential, rather than a high number of small projects. Based on that, the screening criteria suggested by the SREP National Team for selecting the interventions that have the most potential to effect transformational change were widely accepted by the MDBs and by the stakeholders. The following criteria was used to prioritize the interventions:

- **Strategic Relevance to the Country's Development.** The Government recognizes that there is a need for increasing power generation and meeting demand for electricity to keep up with the GDP growth estimates and the country's objective of becoming a middle-income country by 2025. The GoE explained that presently, the Public Sector is playing the major role in the development of the Power Sector in Ethiopia.
- **Gender Equality Promotion.** Improving the gender equality in Ethiopia, mainly in rural areas, is one of the objectives of the SREP National Team, as women and girls are the main responsible for collecting firewood, leaves, cooking, and fetching water. All these activities are producing an overburden on women both in terms of time use and workload, as well as other negative impacts in term of health and access to income generation activities or education. This will be captured by the off-grid energy access project, the scale-up to a national level of a pilot project financed by the WB and whose results were quite promising; as well as including at least 50% of the workers to be women. The IP is aligned with gender equality policies of the country.
- **Positive Environmental Impacts.** The country policies encourage energy conservation in industry, transport and other major energy-consuming sectors to ensure environment sustainability. Furthermore, the envisaged projects will contribute to significant savings in GHG emissions and will reduce deforestation through the dissemination of improved cook stoves, solar home systems, institutional photovoltaic panels, solar cook stoves, water heaters and of solar lanterns.
- **Potential to scale-up.** The geothermal and wind project are in line with the country's strategy and will help the GoE to tap into sources of energy not yet significantly developed and with considerable potential, which at the same time will contribute to diversify the country's energy mix.

- **Cost Effectiveness.** The GoE intends to maximize the local manufacturing industries, on a competitive basis, especially wind power generation facilities. While this may not necessarily be the most cost effective solution in the short run, it has high potential to bring significant gains in economies of scale in the medium and long-run and therefore transform the Ethiopian energy industry.
- **Implementation Readiness.** At the moment there is a substantial number of available feasibility studies and 35MW of steam reserves proven for exploration of geothermal energy. Moreover, 120 MW in the North of the country 51 MW in the central area of wind energy is currently under construction. These wind farms will be owned and operated by EEPCo. This wind farm has the potential to prepare EEPCo to absorb further wind capacity into the system. This is expected to streamline the development of the Assela Wind Farm project with major local component to be partially financed by SREP.

## Screening of the Proposed Investments

22. In accordance with screening criteria mentioned above and the strategic priority of the GoE in the sector, three interventions were identified that have the greatest potential for transformational effect in Ethiopia energy sector. The first intervention is targeted at increasing the capacity of the Aluto Langano Geothermal Field from 7 MW to up to 75 MW. The second intervention will target the development of a 100 MW wind farm in the Assela region, which preliminary studies have shown a huge potential (wind patterns are very similar to the ones of the Adama region). This project intends to build the capacity of local wind manufacturing industry. The third intervention encompasses market development activities to promote the dissemination of improved cook stoves, and solar PV and lanterns in rural areas of Ethiopia.

23. The GoE is considering the involvement of Private Sector Companies in the development of the country's geothermal potential. Proof of that is the presence of Reykjavik Geothermal in the development of the Corbeti site. Consultations with the GoE and this particular company reveal an increasing openness from the MoWE and EEPCo in privatize private participation in the energy sector. In line with it, the SREP envisages to finance, as part of a Project Preparation Grant under the Aluto Langano Project, the development of a sector strategy that includes defining options for how geothermal assets can be developed, including leveraging of private sector participation, ensuring that future projects are bankable and building business skills. The study shall identify barriers to foreign direct investment in the energy sector and suggest mitigation remedies to achieve such objective as well as prepare the local authorities to engage in negotiations with private companies at the level of PPA negotiations and launching of competitive bidding processes for the award of concessions.

## Structuring of the SREP Investments

24. The Table below sets out a preliminary financing plan for the projects embedded in the IP. The total cost is currently estimated at USD 536 million, of which SREP is expected to finance up to USD 50 million. These funds would leverage additional financing from the MDBs and other development partners in a 1/10 ratio.

**Table: Indicative Sources of Finance**

#	Project	Total Cost	GoE	SREP	MDBs	GEF	Others
1	AlutoLangano Geothermal Project	230	59	26	95**	-	50*
2	Assela Wind Farm Project	250	40	20	140	-	50
3	Off-Grid Energy Access Project	56	8	4	25	5	14
	<b>TOTAL</b>	<b>536</b>	<b>107</b>	<b>50</b>	<b>260</b>	<b>5</b>	<b>114</b>

\* It includes GoJ USD 10 million ongoing financing

\*\* It includes WB USD 10 million ongoing financing.

25. **Aluto Langano Geothermal Project.** The Joint Mission agreed that SREP will support the financing of the continuous development of the Aluto Langano Geothermal Site, which is expected to reach a total capacity of 75 MW. The project is owned by EEPCo. This field currently is operating as a pilot project at 5MW capacity and, following the SREP investment, is expected to be brought to a total capacity of 75MW. The total project cost is estimated at USD 230 million, of which: i) USD 93 million for Phase A - Resource Development (drilling of 3 appraisal and 1 reinjection well, plus feasibility studies and, at the production stage, 10 production wells and 3 reinjection wells); and ii) USD 137 million for Phase B - Power Plant and Transmission Line Construction.

26. SREP funds of USD 26 million will be used to support the development of production wells (USD 24.5 million) and under a PPG, the development of a sector strategy that includes defining options for how geothermal assets can be developed, including leveraging the private sector, ensuring that future projects are bankable and building business skills (USD 1.5 million).

27. The overall Aluto Langano project is currently supported by GoE (USD 10 million for appraisal well drilling, and USD 32million in-kind support for production well drilling), Government of Japan (USD 10million for consulting services and technical support), and the World Bank (USD 10 million for appraisal wells).

28. MDBs and Government of Japan’s co-financing is expected to come at the later stage of Phase II to fill the gap in the design and construction of the Power Plant.

29. **Assela Wind Farm Project.** It has been agreed that SREP would support the financing of the Wind Farm Project in the Assela region. The project will be executed by EEPCo and will include a Project Preparation Grant to finance upfront (i) detailed feasibility study including installations of wind masts; and (ii) a full ESIA and RAP. The Project has a total estimated cost of USD 250 million.

30. SREP funds will be used to finance the activities under the PPG (USD 1.7 million) and as a capital buy-down to put less stress on EEPCo’s financials and ultimately lead to affordable supply of electricity to end users. Even though EEPCo will be the owner of the Project, and the GoE intends to stimulate the local wind industry, an international competitive bidding process for the procurement of the EPC contract will be launched. The execution of the activities under the PPG is expected to start at the end of 2012, when the procurement plan is fully implemented. The MDB in charge will seek for board approval during the year of 2014.

31. **Off-Grid Energy Access Program.** The Joint Mission agreed to include in the IP the Off-Grid Energy Access Program in Ethiopia. The objective of this program is to establish a sustainable approach to expanding the population’s access to renewable energy technologies, electricity, and improving the quality and adequacy of electricity and clean stoves, thus supporting broad-based economic development. The program will comprise two components: (i) supporting a market-based approach to cook stoves dissemination, namely covering needs assessments, testing and development of stoves, training of entrepreneurs, capacity building of the Ministry, and

regional energy bureaus, market trials and awareness raising; and (ii) financing a portion of GoE's PV energy projects. The total GoE program costs are estimated at USD 56 million, of which USD 7 million will be used to disseminate 9 million cook stoves and USD 49 million will be used to finance 150,000 PV systems. SREP will contribute a total of USD 4 million to the Off-Grid Program, USD 2 million each for the cook stoves and PV components.

### **Possible Synergies with the Global Environment Facility (GEF)**

32. The GoE has implemented a cook stoves dissemination project funded by the World Bank, which ended in June 2011. Based on the high success of the project, the GoE is considering scaling it up with the support of SREP funds and adding dissemination of solar systems (off-grid energy access project). The objective is to disseminate around 9 million improved stoves in the next five (5) years and more than 150,000 solar systems. The cost of this project is currently estimated at USD 56million.

33. It is expected that this project will be implemented by the MoWE through Regional Energy Bureaus. The core strategy of dissemination of stoves (rural/urban) is the central role taken by the private sector in production and dissemination of the stoves in all regions. For dissemination in rural areas, both the private sector (rural artisans) and owners or users (mass demonstrations to household members, both men and women) will be involved. A number of Microfinance Institutions (MFIs) have been identified and will provide up-front financing to these manufacturers. It is noted that cook stoves are adapted from one region to another in respect to the availability of raw material and the cooking habits and uses.

34. Discussions during the public consultations in respect to the IP have shown that the project that is currently proposed within SREP could be up scaled in order to reach more beneficiaries with additional improved cook stoves to the expected 9 million (which will bring the rate of access to 80% of the total households).

35. The MDBs had a brainstorming meeting with members of the National Team to discuss synergies between this project and the GEF in particular. The MoWE and EPA will follow up with the GEF Focal Point in Ethiopia and his team in order to seek GEF funding for this project.

36. In general, the Joint Mission noted that further information and data is needed in order to ensure that the appropriate financing instruments are used in this project.

### **Monitoring and Evaluation Framework**

37. The SREP National Team and the MDBs established a basis for future monitoring and evaluation of the results of SREP funded activities, a preliminary results framework for the IP is presented in Annex II.

38. The SREP National Team will implement appropriate institutional arrangements for assigning functions and responsibilities for managing the integration of M&E systems. The institutional settings to do so will be thoroughly detailed in the IP. The M&E system development will be managed by the entity that oversees coordination of the SREP in a country.

### **Environmental and Social Impact Assessment**

39. The net environment and social impact of the projects included are positive but special consideration has to be put in place when implementing such projects, so that any adverse impact on the environment and other social issues are adequately mitigated. Some of these issues are to be determined by preparing an Environmental and Social Impact Assessment (ESIA) before starting any physical implementation of such projects. If the ESIA

reveals that there will be Project Affected Peoples and household will have to be relocated to a different area then a Resettlement Action Plan will have to be prepared.

40. Based on the co-financiers, the projects could be subjected to different disclosure policies. For example, if a project is financed by the WB and the AfDB, then the ESIA and the RAP of a project will have to be consulted by the local people and then disclosed publicly 120 days prior to presenting such project for MDB Board approval.

41. The mainstreaming of environmental and social issues will be captured in more detail as the IP continues to be developed.

## Gender Mainstreaming

42. The IP is targeting increases in energy access that aim to create more time and physical energy that can be used to enhance quality of life and productive work, to improve health and education and to provide both women and men with opportunities in Ethiopia for income earning, access to education, participation and decision-making. The IP has the objective to be gender-responsive energy financing.

43. Gender-responsive energy financing can contribute to basic human rights and economic efficiency, and has, as well, power to transform gender inequalities and ensure more efficient and sustainable solutions. Poor rural women and men generally lack access to energy-efficient services that avoid degrading the ecosystem or contributing to environmental change. Rural households typically rely on biomass for cooking and heating. Given that women usually prepare food, their decisions regarding cooking fuels and efficiency can alter carbon emissions. (NORAD, 2010).

44. Poor women and men in Ethiopia cannot afford commercial forms of energy, such as electricity and gas. Instead, they use typically wood or charcoal as their main energy sources.

45. Women's related heavy workload has been called "The Real Rural Energy Crisis." (NORAD, 2010). This is the case in Ethiopia, where women are facing critical challenges, especially those living in poverty and/or dependent on small-scale agriculture and the collection of water and fuel from their local environment to meet their daily needs. Around 78.6% households are depending in collected firewood to meet their needs in rural Ethiopia plus 5 % are purchasing it (urban is 14.8% for collected and 38.2% purchased).

46. Energy access has an important meaning for women and girls in Ethiopia as they are the main responsible for the provision of energy for household use, including gathering fuel. They carry heavy loads on their backs and travel long distances (according to the Gender Affairs directorate of Ministry of Water and Energy, and the Ministry of Women children and Youth Affairs). They also are forced to collect inferior fuels in the form of bushes, twigs, roots, and crop residues, all of which translate into longer preparation and cooking times. They are as well exposed to gender based violence like rape, beating and abduction by men, as well as exposure to unwanted pregnancy and HIV/AIDS infection.

47. The more time spent on collection and preparation, the less time spent pursuing more productive activities, such as education or income generation activities. Cooking, as well as an exclusive domain of women in Ethiopia has many effects on their health (exposure to heat, indoor air pollution and frequent accidents). The "Development and Change Package of Ethiopian Women" done by the Ministry of Women's Affairs is stating "rural women are burdened, programs shall be designed to alleviate this burden, by promoting rural energy technology that benefits families at the kebele level, and by introducing time and energy saving modified appliance and ensure women that women have access to these technologies".

48. Access to modern forms of energy through the SREP Program, for lighting, grinding, cooking, heating and others can give both women and men more time and physical energy for productive work with less time needing

to be spent on basic subsistence activities. Less time spent on basic subsistence activities for women in both rural and urban areas, coupled with access to energy services is crucial for more efficient and productive agriculture and for other income-generating activities both within and beyond the household.

49. More efficient productive work and savings in both energy and health expenditures can improve household economies and also improve access to education and the empowerment of girls who are mainly in charge of collecting firewood. Among the 4<sup>th</sup> reason for not attending school, the fact of having too many domestic activities (according to a Gender Survey done by Population Council and UNFPA in 2010), is impeding the school attendance for girls. Nearly 13% of girls are not attending school in urban areas and 17,8% in rural areas because of overburden work activities.

50. Access to light, can also increase the access to night school and studying. Educated and empowered women and men are better equipped to take an active part in society, to be efficient and productive actors and to influence decision-making processes in households and society that can improve economic efficiency and the wellbeing of all. Access to energy may increase income generation activities, for women in both rural and urban areas. Access to employment in the case 50% of workers employed are women for construction purposes in the three projects, can have an important impact. Even if women in Ethiopia are highly involved in construction and building activities, and we can see women participating in road and infrastructure construction, most of the women are involved in non-paid activities. Nearly 36% of women never worked for pay (gender survey 2010). Enhancement of Women's economic empowerment is the first main component of the Ethiopian Women's Development Program 2011-2015 (Women Affairs Ministry).

51. The projects included in the IP will have many positive side effects that may be difficult to measure (reducing exposure to gender based violence, improvement of child health and nutrition, decrease maternal mortality rate, among others).

52. The IP projects should/will consider women's specific needs, obstacles and resources in order to insure the marketing strategy would not fail and facilitate the creation of a market (for the cook stoves and solar lamps dissemination project), as well as better way of delivering tailored mechanisms in the regions.. Some indicators will be proposed (number of women accessing cook stoves and cook stoves disseminated, reductions in time burden and workload, access to income generation activities). On time reduction, UN Women will support CSA next year for a study on time use in Ethiopia. A Baseline study (gender diagnostic or analysis) is recommended, to assess the situation. Some potential synergies with other partners involved on gender equality promotion in Ethiopia such as the UN Women and other UN Agency, have been explored. UN Women will be potentially interested in participating in the program (through their integration and interfaces at the region and community level).

53. The Gender Directorate of the Ministry of Water and Energy should be actively involved in the Program and communication with the Women Affairs Ministry should continue.

## **IV. NEXT STEPS**

54. The SREP National Team confirmed its intention to submit the SREP Investment Plan for approval at the SREP Sub-Committee meeting in March 2012. The table below summarizes the actions and the timeline required to complete SREP Programming Phase I Activities, as agreed between MDBs and the SREP National Team.

**Table: Timeline and Actions for Completion of SREP Programming Phase I Activities**

#	Action	Timeline	Responsible Entity
1	Joint Mission	18 <sup>th</sup> – 28 <sup>th</sup> October	SREP National Team / MDBs / Other stakeholders
2	MDBs to draft and obtain signature of the JM's <i>Aide Memoire</i> . Report to be published on the CIF's website.	By end November	MDBs / MoWE / EPA
3	SREP National Team to include the JM findings on the IP (MDBs will continue to cooperate in the improvement of the Project Concept Notes)	Mid-November	SREP National Team with collaboration from the MDBs
4	MDBs to finalize in cooperation with the SREP National Team the M&E framework	Mid-November	SREP National Team with collaboration from the MDBs
5	MDBs to provide feedback on the last version of the IP / SREP National Team to address comments if any.	End-November	SREP National Team with collaboration from the MDBs
6	CIF Admin Unit to engage External Reviewer	Early December	CIF Admin Unit / AfDB
7	Beginning and completion of the <u>External Independent Review</u>	Early January	Independent Reviewer / SREP National Team
8	Online Consultations of the IP	Early January	SREP National Team
9	Create final draft IP based on feedback received from the External Review and MDBs Internal Review. Create and include Responses Matrix in the IP and submit it to the CIF Admin Unit	13 <sup>th</sup> February	SREP National Team
10	<b>IP's Endorsement by the SREP Sub-Committee</b>	<b>7<sup>th</sup> March (tentative)</b>	<b>SREP National Team / SREP SC</b>

55. The MDBs in conjunction with the SREP National Team revised the timeline and actions for completion of SREP programming phase I activities. It has been stressed that the final version of the IP needs to be posted online 5 weeks prior to the SREP Sub-Committee Meeting. Despite the fact that the timeline is aggressive, it builds in room, should a deadline slip. The SREP National Team is expected to submit the IP to the CIF Admin Unit on the **13<sup>th</sup> February 2012**, three weeks and two days ahead of the tentative SREP Sub-Committee.

## V. ANNEXES

### Annex I: Stakeholders Consultations Workshop Summary

The stakeholder workshop was organized by the Ministry of Energy and Water at the premises of the MoWE between the 20<sup>th</sup> and 21<sup>st</sup> of October. The attendees included renewable energy experts, representatives from private sector organizations, financial institutions, civil society organizations and development partners. Table 1 and Table 2 present the Agenda and the List of Participants respectively.

The State Minister of Water and Energy, his 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 than 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 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.

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.

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.

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.

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

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.

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

The first group focused on the role of the private sector in supporting renewable energy investments and the role of the government in creating an enabling environment for private sector actors. The energy sector in Ethiopia this is to extreme. The private sector is participating. However the role is limited in construction design and study and in rural energy development. A number of barriers preventing private sector entry exist and include the following which were identified during the session: this also has to be seen from large and medium power development

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.

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

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.

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.

The main barriers identified were (i) lack of access to competitive commercial financing; (ii) Capacity and Human Resources Constraints; (iii) Some 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.

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.

In prioritizing the projects to be embedded in the IP, the participants suggested the following potential criteria.

- Potential for climate change mitigation
- Sustainability
- Social inclusion
- Number of jobs / enterprises created
- Contribution towards achieving MDG targets
- Carbon offset

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.

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.

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**

<b>Day 1</b>			
<b>Item</b>	<b>Activity</b>	<b>Time</b>	<b>Responsible</b>
1	Registration of Participants	08:30 – 09:00	MOWE
2	Welcoming Statement	09:00 – 09:10	Ato Gosaye Mengistie, 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 Wondimu Tekle, 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
	Coffee Break	10:30 – 11:00	
6	Discussion	11:00 – 12:30	Moderated by Ato Gosaye Mengistie
	Lunch Break	12:30 – 14:00	
7	Breakout Sessions <ul style="list-style-type: none"> <li>Group 1: Private Sector Representatives, Development Partners</li> <li>Group 2: Civil Society Representatives, Development Partners</li> </ul>	14:00 – 15:30	Participants
	Coffee Break	15:30 – 16:00	
8	Breakout Sessions continued	16:00 – 17:00	Participants
<b>Day 2</b>			
<b>Item</b>	<b>Activity</b>	<b>Time</b>	<b>Responsible</b>
1	Registration of Participants	08:30 – 09:00	MOWE
2	Breakout Sessions continued <ul style="list-style-type: none"> <li>Group 1: Private Sector Representatives and Development Partners</li> <li>Group 2: Civil Society Representatives and Development Partners</li> </ul>	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**

<b>#</b>	<b>Name</b>	<b>Institution</b>
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1	Jamison Donovan	CIF Admin Unit
2.	Ben Green	DFID – UK
3.	Federico Querio	WB – SREP Coordination Unit
4.	Stefan Reimening	Wind Energy PPP
5.	Samson Tsegaye	Solar Energy Foundation
6.	Hilawe Lakew	Solar Energy Development Association Ethiopia
7.	Tizazu Yerdaw	Stove producer
8.	Solomon Abebe Asfaw	AfDB - Ethiopia
9.	Leandro Azavedo	AfDB
10.	Joanta Green	AfDB
11.	Wondimu Tekle	MoWE
12.	Gosaye Mengistie	MoWE
13.	Filippo Archi	Italian Development Cooperation
14.	Bayu Nebsu	Echnoserve E.T. Plc.
15.	Nesru Shifa	MoWE
16.	Martha Mailu	Climate Change Forum - Ehtiopia
17.	Joachim Gaube	GIZ
18.	Getachew Beyene	MoWE
19.	Belaynesh Birru	MoWE
20.	Mulugeta Asege	EEPCo
21.	Michel Cat	EU Delegation to Ethiopia
22.	Lata Tnoy	GIZ
23.	Yusuf Ali	WB
24	Markos Melaku	RG
25	Abiy Tamerat	ERG
26	Mersha Argaw	Norway Embassy, Addis Ababa
27	Bezuneh Tolcha	MoWE
28	Selam Kidane	EPA
29	Anteneh Wolde	MoWE
30	Tesfaye Alemayehu	MoWE
31	Abreham Abay	MoWE
32	Beide Melake	MoWE
33	Mulatu H.mariam	EEPCo
34	Abebe Tadesse	Ministry of Finance and Economic Development
35	Meron Tefera	MoWE
36	Senait Gebbru	MoWE
37	Ababu Anage	UNDP
38	Hilina Getachew	EPA
39	Nebiyu Assefa	Alphasol Modular Energy Plc
40	Takele Mekonnen	Ethiopian Electricity Agency
41	Mollalign Abebe	Ethiopian Electricity Agency
42	Pep Baidouille	IFC
43	Sebastien Delahaye	AfDB
44	Asress W.Giorgis	MoWE
45	Sophie Rech	AFD
46	Hundie Melka	Geological Survey of Ethiopia

47	Fana Abay	dVenetus
48	Zewge Alemu	dVentus
49	Dereje Derbew	MoWE
50	Wossenu Areda	MoWE
51	Belanyneh Gizaw	Ethiopian Electricity Agency
52	Phomolo Maphosa	SNV
53	Solomon Kebede	Ministry of Mines
54	Daniel Mulatu	EEPCo
55	BartJan van Beuzekom	GIZ
56	Kibrom Tadesse	Forum for Environment
57	Alemayehu Zeleke	GIZ-ECO
58	Abonesh Tesema	GIZ (Stove producer)
59	Yayehyirad Abate	Netherlands Embassy, Ethiopia
60	Sahele Tamiru Fekede	MoWE

## Annex II: SREP Ethiopia Preliminary Results Framework

Results	Indicators	Baseline	Targets	Means of Verification	Responsibility for Collection	Data Source	Data Available (Y/N)
<b>Project Outcomes and Outputs</b>							
Increase access to energy by women and men	a) % change in number of project beneficiaries with access to energy services from RE (women/men)	[TBD]	[TBD]	Project M&E	Project Coordinator	EEPCo and MoWE	Y
Increased GWh of RE Energy Services	a) % change in GWh from RE	[TBD]	[TBD]	Country M&E	Project Coordinator	EEPCo and MoWE	Y
	b) # of jobs (women/men) in RE services created	0	[TBD]		Project Coordinator	MDB Completion Report	N
	c) % savings in million tons of CO2	[TBD]	[TBD]		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 <sup>2</sup>	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 <sup>3</sup>	Project M&E	Project Coordinator	MDB Appraisal Report	N
	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	N
	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
<b>Catalytic Replication</b>							
Increase in renewable energy investments	a) % of RE investment of total energy investment	0	[TBD]	Country M&E	Project Coordinator / MoFED	Central Statistics Agency	N
	b) % of private sector RE investments of total energy investments	[TBD]	[TBD]		Project Coordinator / MoFED	Central Statistics Agency	N
Strengthening enabling environment for RE production and use	a) Adoption of and implementation of low carbon energy development plans	1 <sup>4</sup>	1	REN21 Global RE Status Report Qualitative assessment - MDBs	MoWE	MoWE	Y
	b) Enactment of policies, laws and regulations for renewable energy	0	3 <sup>5</sup>	Country M&E	MoWE	MoWE	N

<sup>2</sup> The electricity tariff charged to end users is set by the Council of Ministers and no change is expected by adding the 170MW to the grid contemplated by the Projects embedded in the IP.

<sup>3</sup> Among others, these will include: (i) Feasibility Studies; (ii) ESIA's; (iii) RAP; (iv) a Long-Term Geothermal Sector Development. [To be updated]

<sup>4</sup> The Low Carbon Energy Development Plan has been approved during 2011.

<sup>5</sup> These include: (i) the Feed-in-Tariff Law; (ii) the National Energy Policy; and (iii) Energy Law.

Increased economic viability of renewable energy sector	a) % change of total energy sector employment working in RE (women/men)	[TBD]	[TBD]	Country M&E	MoWE / MoFED	MoFED / Central Statistics Agency	Y
	b) Cost of renewable energy USD/MWh compared to cost of fossil fuels USD/MWh over time	[TBD]	[TBD]	Country M&E	Project Coordinator	EEPCo	Y
Increased Energy Supply	a) Increase in % of total energy supply (TOE) from renewable sources in the power industry and in the energy sector	[TBD]	[TBD]	Country M&E	MoWE	MoWE / Energy Balance and Statistics Report	Y
Improved respiratory health of women, men, girls, and boys	a) Prevalence of Acute Respiratory Infections (ARI) (in children under 5 years) (rural/urban)	[TBD]	[TBD]	Country M&E and WDI	Project Coordinator	MoH / Project's ESIA / Central Statistics Agency	Y
<b>Transformative Impact</b>							
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)	[TBD]	[TBD]			Country M&E	
	b) Level of household "energy poverty"	[TBD]	[TBD]			Households Survey	
	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)	[TBD]	[TBD]			Project Coordinator	IEA Annual Updates