



Aide-Mémoire

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23rd-28th June, 2019

Kampala, Uganda
(Confidential)

Aide-Mémoire for Expert Level Visit to Uganda for Pre-Feasibility Study of Solar Pumps, Rooftop and Mini-Grid Projects by International Solar Alliance Secretariat held from 24-28 June, 2019.

Venue: Kampala, Uganda

Aide-Mémoire

Expert Level Visit for Pre-Feasibility Study of Solar Pumps, Rooftop and Mini-Grid Projects by International Solar Alliance Secretariat

June 24th, 2019 to June 28th, 2019

A. Background/ Introduction of the Mission

During 24th June, 2019 to 28th June, 2019, ISA led Expert team visited Republic of Uganda, hereafter referred to as the Host Country, for pre-feasibility study of demand submitted to ISA Secretariat for Solar Pumping Systems under the call for Expression of Interest (EoI) from ISA vide number *No. 23/61/2017/NFP/R&D*. This Aide-Memoire (AM) summarizes the outcome of stakeholders' meetings with the expert team (as detailed in the Annex-1 to this document) as well as agreements reached therein. The AM was discussed in the wrap-up meeting on 28th June, 2019, chaired by As agreed, this AM shall be a point of reference for future planning as well as implementation of the programme.

B. Overall Status of the Programmes

1. Programme for Solar Water Pumping Systems

The Host Country has submitted a demand for 30,000 Solar Pumping Systems against the call for Expression of Interest from ISA. In response to the demand aggregation submitted by the Government of the Host Country, ISA Secretariat has engaged consultants from KPMG India for feasibility study of the projected demand as well as analysis of institutional capacity of stakeholders in the project and division of responsibility thereof. Country templates have been prepared by the consultants, surveying the institutional and policy framework in the Host Country as well as potential deployment of solar energy-based applications in agriculture and electricity sectors. The Country Templates have been shared with the National Focal Point and the Embassy of the Host Country in India with the expectation that it would provide the Government of Host Country, an opportunity to plan relevant meetings with various stakeholders during the visit as well as gather the requisite data in the pre-visit to enable a pre-feasibility study. Additionally, ISA is conducting a price discovery bids through Energy Efficiency Services Ltd for 272,579 Solar Pumping Systems based on aggregated demand from 22 Member Countries as of December 31st, 2018. It is expected that there shall be a significant reduction of price through demand aggregation. A brief overview of the tender document is annexed below in Annexure 4.

2. Programme for Solar Mini-Grids

The host country is prioritising solar water pumping systems and structure of solar water pumps and after the implementation of these systems the host country will join the ISA's programme on solar mini grid. This has not been shared considering the preference of the country for solar water pump systems. To discuss various business models of solar mini grid projects, ISA Secretariat has engaged consultants from PwC for the possibility of solar

mini grid projects as well as analysis of institutional capacity of stakeholders in the project and division of responsibility thereof. Data collection templates have been prepared by the consultants to aggregate the demand, the institutional and policy framework in the Host Country as well as potential deployment of solar mini-grids for access to electricity. The Country templates have been shared with the National Focal Point. ISA expects NFP to gather the required information to estimate the demand of mini grid and also coordinate with the rural electrification agency for the required policy and regulatory framework in the country for implementation of such projects.

3. Programme for Solar Rooftop

The host country is prioritising solar water pumping systems and structure of solar water pumps and after the implementation of these systems the host country will join the ISA's solar rooftop programme. To discuss various business models in rooftop solar projects, ISA Secretariat has engaged consultants from PwC to discuss the possibility of the rooftop projects under the present scenario of electricity as well as the analysis of institutional capacity of stakeholders. Country templates have been prepared by the consultants for collating the demand of solar rooftop electricity generation and required policy framework in the Host Country. Demand of the solar rooftops for off-grid applications, access to electricity and home lighting systems is also need to be aggregated. The Country Templates have been shared with the National Focal Point and the Embassy of the Host Country in India. ISA expects NFP to gather the required information to estimate the demand of Solar rooftop and also coordinate with the concerned departments as well as with the rural electrification agency for the required policy and regulatory framework in the country for implementation of such projects.

4. Programme for E-mobility and storage

The host country is prioritising solar water pumping systems and structure of solar water pumps and after the implementation of these systems the host country will join the ISA's storage and E-mobility programme. Delegation from ISA Secretariat discusses briefly the various ongoing programmes in the area of storage and E-mobility and possible areas where Uganda can engage with the members of ISA. Discussions were undertaken on the importance of storage with regard to off-grid electrification and how suitable interventions may be undertaken going forward. NFP, Uganda, expressed the interest in implementation of E-mobility solutions and suitable discussions may be undertaken going forward.

C. Key Discussions

1. Consultative workshop on ISA country framework (24th June 2019)

- i. One day consultative workshop on ISA country framework was organized in Kampala which was hosted by MEMD and MOFA. The workshop was well attended by the relevant stakeholders including officials from government, the academicians, industry players and funding agencies. The detailed list of attendees is as per annexure 1. The key objective of the workshop was to sensitize the stakeholders in Uganda on the focus areas of ISA, update on the activities that have been undertaken, share the proposed roadmap going forward and detail out areas wherein involvement of Uganda shall be required to take forward the implementation of various programmes. A number of

- interactive sessions were held wherein presentations were delivered on the various subjects and queries of the stakeholders were considered and to an extent addressed.
- ii. The honourable director, MEMD highlighted and emphasised the need to develop a country framework for the ISA programme. It was mentioned about the focus of Uganda to achieve 30% of energy needs from solar and that the country looks forward to financial and technical benefits from association with ISA. It was highlighted that with an average solar radiation of 5.64 kWh/m²/day, Uganda has tremendous potential for solar applications and thus the current focus is to exploit solar energy and policy framework within the RE policy, 2007 which already exists in the country. Mentioning about the issue of electricity access with about a quarter of country only having access to electricity, he said that solar could possibly address this challenge.
 - iii. Need was emphasised for harnessing the potential of solar water pumps to increase the yield of food in the country considering there are areas of food shortage despite abundant solar energy and the solar water pumps being a high priority area for the country. A request was also made to provide the 30,000 pumps as grant or through soft loan.
 - iv. Discussions were also held around the relevance of solar rooftop and mini-grids for Uganda electricity sector, the evolution of business models in the solar rooftop sector, the potential models in the mini-grid sector, the possible models for implementation in Uganda and the challenges foreseen for implementation.
 - v. Member, REA, Uganda mentioned that business models in mini-grids are still in the pilot stage in the country and are challenged by sustainability. There are high tariffs and thus the subsidy requirements and therefore the anchor load based model may be considered for adoption.
 - vi. It was also mentioned that Uganda is reaching to the surplus electricity status after the commissioning of two new hydro power projects, therefore for the next 5 years, no new generation capacity will be added to the grid. The focus of the Government will be towards the increase of electricity demand. Hence the solar rooftop and mini grid based generation projects can only be taken up in off grid mode.
 - vii. A presentation was also made on the ISA STAR centers and it was requested to the Government of Uganda to suggest the most suitable university to host it. A discussion around various universities was held. The most prominent ones are Soroti, Busitema and Makerere University.
 - viii. Main outcomes from the stakeholders workshop are:
 - a) ISA in Uganda will have a taskforce having NFP, MEMD, MoFA and representatives from ministry of Finance, Planning & Economic Development, Water and Environment and Agriculture, Animal Industry and Fisheries.
 - b) Separate discussions shall be undertaken of National Task Force for feasibility of solar water pumps.
 - c) REA will consider programme level approach for solar off grid applications in their rural electrification plan.

2. Technical consultative workshop on ISA Country Framework (25th June 2019)

Consultations with ministries, including MEMD, MWE, MAAIF and MOFA, universities and industry players were undertaken to further understand the scope for solar applications in Uganda specifically solar water pumps, solar rooftops and mini-grids. Discussions were also held on the National Task Force to be established for ISA activities in Uganda.

i. Solar water pump

- a) MEMD shall be the nodal agency, coordinating with Ministry of Finance, Planning & Economic Development, MOFA, MAAIF, MWE, MOLG and other relevant stakeholders. The MEMD shall be supported at the district and local level by the local bodies and officers of the relevant Ministries.
- b) NFP will provide the basis of determination of demand for 30,000 solar water pumps once the modalities of implementation are clearly defined.
- c) The pumps will be installed across the country and the agro-ecological zones will determine the required pumps
- d) The target group of solar water pumps to be procured under the ISA programme will be small farmers, typically those not using irrigation.
- e) GoU and ISA will further explore plans for solar pumps post financing tie-ups. In case there is a requirement of only 20,000 pumps, the 10,000 pumps could be substantiated with other applications like community drinking, schools and health centres.
- f) By 2040, Uganda has a target of 1.5 million ha of land to be under irrigation. For implementation of the same a proper plan is required. Considering only 0.5% of the irrigation potential is realized, there is scope for solar water pumps.
- g) Government of Uganda (GoU) has a national development plan (NDP) III and the discussion on solar applications should be a part of the NDP III.

ii. Solar Rooftop and mini grid applications

- a) Typically standalone solar systems are required for cooking and water heating purpose.
- b) Independent standalone solar rooftops are also deployed by Uganda telecommunications, by health centres for refrigeration and air conditioning and by schools.
- c) The grid connected rooftops are not installed considering power surplus situation.
- d) REA is developing off-grid policy identifying areas for mini-grid and rooftop.
- e) Currently there is a plan for RE strategy and plan for 2022 where grid will reach and where grid will not reach.
- f) ISA can support GoU in development of roadmap for solar which can consist of solar off-grid including solar home systems, street lights, refrigeration, cold storage etc.
- g) Currently there is no provision for being producer and distributor of energy of the same.
- h) Currently there is no policy for solar rooftop in Uganda and GoU is working towards it.

- i) If tariffs of mini-grids are lower than the main grid supply, then GoU may consider mini-grids considering the need for stable power.
- iii. Setting up of National Task Force
 - a) There may be a cell established which could be functional without the task force and the task force may be called for as required.
 - b) The task force shall be constituted by GoU. A draft structure and roles for members of the task force have been shared with GoU and the GoU shall revert on the same. The Terms of Reference for the National Task Force are to be finalised.
 - c) Government of Uganda wants to have a framework to be put up which could be implementable for the country to see physical progress on implementation of solar applications.

3. Ministerial Consultations (25th June and 27th June)

ISA Expert team met with Stakeholder Ministries/Regulatory bodies (List of Ministerial/Regulatory Consultations provided in Annex 2 to the AM document) for assessment of institutional capacity, division of responsibility and coordination for successful implementation of the project as well as exploring implementation models and financing avenues to be deployed for the project.

i. Consultation with the officials of the Ministry of Energy and Mineral Development

- a) Current status of Power Generation capacity, Actual Electricity generation, Transmission and Distribution infrastructure- Uganda has a total installed electricity generation capacity of 1,167 MW. Hydropower stations accounted for 88% of installed capacity, followed by cogeneration, thermal (heavy fuel oil stations used as stand-by sources), and solar. As of now around 27% population has access to grid based electricity.
- b) Current status of Grid-Connected as well as off-Grid Solar and Renewable Energy installations – There are 50 MW of solar projects that are connected with the grid. For new solar projects, a tariff of below 8 cents/kWh is proposed. The information for off-grid projects is currently not available.
- c) Details of Current Solar Programme/Projects: Ongoing/In pipeline: Under the EU fully funded project, 10,000 home lighting systems are to be provided.
- d) Benchmark costs (based on current programme) for solar pumps/rooftops/ mini-grids: UGS 71 million for 5 HP solar pumps
- e) Projected demand for programmes other than those for which demand has been submitted against the call for EoI: Solar pump demand for 30,000 has been submitted.
- f) Policy support for Solar and Renewable Energy: Country has a national renewable energy policy 2007 which is currently under review. There is no separate solar policy available. It is proposed to develop a solar roadmap for the country.

- g) Regulatory and Financial Support to Solar Energy: Uganda energy credit Capitalisation Company for financing and providing end user loan to the customers. United Nations Capital Development Fund (UNCDF) and DfID are providing sale based grants.
- h) Nomination of Technical institutions for Capacity Building: Nomination process is underway. Soroti, Busitema and Makerere Universities are being considered.

ii. Consultations with Ministry of Finance, Planning & Economic Development

- a) Finance for Solar PV systems: Benchmark cost (Based on Current programmes) prevailing in the country for Solar: Uganda Shillings 2,200/W of panel
- b) Water irrigation budget: **The details will be provided by MAAIF.**
- c) Project pipeline for Finance: **There a number of projects under ACDP, IDB, Agricultural Value Chain Project, FIEFCO projects.**
- d) Multilateral and bilateral policies: National Irrigation Policy**
- e) Number of Multilateral and bilateral agreements supporting solar: **Only one agreement was signed with Ms Nexus Green Uganda Ltd.**
- f) Current budget provisions for solar: **The details will be provided by MAAIF.**
- g) Is there any budgetary allocation for NDC: **To be provided**
- h) Nomination of Technical institutions for Capacity building: Capacity building will be at various levels like technicians, engineers, farmers.

iii. Consultations with Ministry of Agriculture, Animal Industry and Fisheries (MAAIF)

- a) Details of the demand submitted by the host country:
 - (i) Project location and capacities of the pumps:
 - a. The locations are mainly in the selected districts in (Western), eastern, North, North East, West Nile, Part of Central and all cattle corridor districts.
 - b. 1HP, 2hp, 5Hp, 7.5Hp, & 10Hp depending on origin, quality, make and country of origin
 - (ii) Logistics and costs for transportation: **These are to be included in the budget and unit costs of the product and after sales services**
 - (iii) Proposed timeline for implementation of individual projects: **Immediate (FY2019/20) but other are within the next 2yrs and 5 years**
 - (iv) Agriculture Budget: **Ugx 1.1Tn**
 - (v) Irrigation area covered/Type of Irrigation system/Crops Irrigated/ Budget for Irrigation/ Average plot size:
 - a. **5% coverage.**
 - b. Mainly Drip, sprinkler and combination, etc
 - c. Mainly Pastures, Horticulture, Citreous, Maize, Coffee, Tea, Sugarcanes, Bananas, Rice, Dairy and Fish
- b) Nomination of Technical institutions for Capacity Building: Capacity building will be at various levels like technicians, engineers, farmers and bankers.

iv. Consultations with Ministry of Water and Environment (MWE)

- a) Total Water resources (surface and ground) and their distribution: Data has been received.
- b) Irrigation potential (total and harnessed); Type(s) of Irrigation systems: 0.5% of total irrigation potential is harnessed.
- c) Is there any budgetary allocation for NDC: **To be provided**
- d) Nomination of Technical Institutions for Capacity Building: Capacity building will be at various levels like technicians, engineers and farmers.

v. Consultations with Ministry of Local Government (MOLG)

- a) Rural Development policies and indicators: Not discussed
- b) Nomination of Technical institutions for Capacity building: Capacity building will be at various levels like technicians, engineers, farmers and bankers.

vi. Consultation with Regulatory authorities, relevant government departments

- a) Regulatory framework in the Electricity Sector: Institutions in the power sector
 - (i) Ministry of Energy and Mineral development – Policies
 - (ii) Rural Electrification Agency – Extension and distribution of electricity
 - (iii) Electricity Regulatory Authority – licenses and permits
 - (iv) Uganda Investment Authority – Investment license – license obtainable in one day
 - (v) Uganda Revenue Authority – Taxes collection
 - (vi) Uganda Energy Credit Capitalization Company :- provides vendor loans and end-use credit for solar systems, biogas systems, electricity connection etc
 - (vii) Transmission and Generation companies
 - (viii) Independent power producer – Private Sector led power generation project
- b) Tariff structure: In accordance with the Electricity Act 1999, Cap 145, Uganda Electricity Transmission Company Limited, the holder of System Operator license was designated by the Electricity Regulatory Authority to publish standardized tariffs for sales to the grid of electricity generated by renewable energy systems of up to a maximum capacity of 20MW. The tariff structure has been shared.
- c) Procedures/Timelines for setting up of Solar Projects: Worldwide the time frame for power project depends on availability of capital for the project and availability of land.

vii. **Outcome of the Meeting(s)**

Items on Agenda Discussed	Findings/ Observations	Recommendations	Official/ Agency responsible
Ministry of Energy and Mineral Development			
Solar rooftop	No grid connected generation is planned. Off grid applications shall be explored.	The planning for procurement from off-grid applications may be initiated.	MEMD / REA
Solar mini grid	The mini grid program has not been signed by GoU.	The GoU, considering low levels of electricity access may initiate the involvement in mini-grid programme.	REA
ISA Star Center	The selection of university is underway. The options are Soroti, Busitema and Makerere University	The nomination of the university may be shared at the earliest.	GoU / MEMD
Financial model for implementation of solar water pumps	No financing is available from the government. There are certain aid agencies which provide funding and loan guarantees.	Government of Uganda may explore the financing arrangement from MFIs. Further a new scheme of solar water pump for irrigation may be developed for implementation by MAAIF. The scheme may be on cost sharing basis by department (20%), soft loans by bank (60%) and farmer contribution (20%).	MEMD

Items on Agenda Discussed	Findings/ Observations	Recommendations	Official/ Agency responsible
Financing data on the existing funding schemes for solar and solar water pumps.	Financial model to be decided basis on the financing arrangement of the solar pumps.	None	MEMD
Ministry of Finance, Planning & Economic Development			
Budgetary provision for solar programmes.	Finance ministry will share budgetary provision for relevant ministries based on the request from these ministries.	None	Ministry of Finance, Planning & Economic Development
Ministry of Agriculture, Animal Industry and Fisheries (MAAIF)			
Basis for demand estimation of 30,000 pumps.	Basis has been shared.	None	MAAIF
Data regarding the cropping, farm holding and requirement of solar pumps.	Required data has been shared.	None	MAAIF
Ministry of Water and Environment (MWE)			
Data on irrigation techniques, existing projects and solar irrigation based projects deployed.	Required data has been shared	None	MWE
Ministry of Local Government (MOLG)			
Development of scheme for local capacity building for solar appliances.	No particular existing scheme.	Local capacity building for solar appliances should be undertaken.	MOLG

Items on Agenda Discussed	Findings/ Observations	Recommendations	Official/ Agency responsible
Development of solar based community and local development plan.	REA has plant for off-grid electrification. However no specific programme with budgetary allocation for solar based projects exists.	Engagement of local community should be undertaken for development of programmes.	MOLG
Regulatory authorities, relevant government departments			
Off-grid solar rooftop and mini-grid solutions deployed in the rural areas including tariff determination methodology.	Off-grid solar solutions are deployed by Uganda telecommunications, by health centres for refrigeration and air conditioning and by schools with the tariff to retail consumers being subsidised.	Uganda may consider deployment of suitable models to lower the tariff for mini-grids in rural areas.	MOLG

4. Consultations with Multilateral Development Banks/Development Financial Institutions/ Bilateral Institutions

i. Findings:

- a) The following MDBs, DFIs and BIs have a presence in Uganda:
 - (i) AfDB
 - (ii) World Bank
 - (iii) GIZ
 - (iv) DfID
 - (v) JICA
 - (vi) USAID
 - (vii) EXIM Bank
- b) ISA Expert team met with the GIZ and JICA as listed under the Annexure -3 to the AM document for assessment of activities being undertaken by the agencies in the area of solar energy in the country.
- c) JICA has recently initiated exploring of renewable opportunities in Uganda and they shall assess the needs and requirements of solar energy projects. The initial assessment is encouraging and JICA shall explore the possibility of financing the solar projects going forward.
- d) GIZ is working in the areas of mini-grids and has launched two projects 'Promotion of Mini-Grids in Northern Uganda' and 'Promotion of Mini-Grids for

Rural Electrification’ in the area. GIZ going forward may undertake more projects in Uganda.

- e) EXIM Bank is willing to fund solar energy based projects and if request is received from Government of Uganda, suitable financing shall be provided.
- f) The meetings with other institutions have to be undertaken.

ii. Agenda of the Meetings

- a) Financial infrastructure and Modalities:
- b) Project(s) in Progress and their implementation model(s)
- c) Institutional Framework for implementation of Externally funded projects
 - (i) Institutions to Engage
 - (ii) Challenges faced/Ease of Doing Business

The information mentioned in the agenda above still has to be gathered while connect has to be established with other MDBs, DFIs and BIs.

5. Consultations with Inter-Governmental Institutions

i. Findings

- a) The following Inter-Governmental Institutions have a presence in Uganda:
 - (i) EACREEE
 - (ii) GGGI
 - (iii) UNDP
 - (iv) UNCDF
- b) The meetings with these institutions have to be undertaken.

ii. Agenda of the Meetings

- a) Role of these institutions in the host country and projects underway
- b) Institutional support provided by them to externally funded projects

The information mentioned in the agenda above still has to be gathered while connect has to be established with the Inter-Governmental Institutions.

D. Components of Action

1. Implementation agencies involved

- i. Ministry of Energy and Mineral Development (MEMD), Government of Uganda
- ii. Ministry of Finance, Planning & Economic Development, Government of Uganda
- iii. Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), Government of Uganda
- iv. Ministry of Water and Environment (MWE), Government of Uganda
- v. Ministry of Local Government (MOLG), Government of Uganda
- vi. Ministry of Foreign Affairs (MoFA), Government of Uganda

2. Role of Implementation agencies

No.	Name of agency	Role
1.	Ministry of Energy and Mineral Development (MEMD)	Nodal ministry for coordination and implementation of solar related projects.

No.	Name of agency	Role
2.	Ministry of Finance, Planning & Economic Development	Mobilise and approve the financing for solar related projects in Uganda
3.	Ministry of Agriculture, Animal Industry and Fisheries (MAAIF)	Assess the requirements for solar pumps and monitor the implementation of the projects.
	Ministry of Water and Environment (MWE)	
4.	Ministry of Local Government (MOLG)	Supporting in implementation and monitoring of projects in the rural areas.
5.	Ministry of Foreign Affairs (MoFA)	Coordination between the Government of Uganda, private sector and ISA.

3. Financing of Projects

- i. Implementation Model to be adopted
 - a) Government Funded
 - b) PPP
 - (i) Private Sector Participation
 - (ii) Cooperative institutions
 - c) OPEX
 - d) CAPEX
 - e) Entrepreneurship based
- ii. Financing Options
 - a) Grant Based
 - b) Grant-Debt Hybrid
 - c) Debt Based

The above suggested options have already been discussed Government of Uganda and NFP. They shall deliberate further for the appropriate model and modalities. For any further information required in the model, ISA shall support Government of Uganda and NFP. ISA will also facilitate the structuring of the model with the financial partners basis the requirement and decision by Government of Uganda.

4. Skill Development/Capacity building of implementing agencies, local system integrators, consumers (Farmers for Solar Pumping Systems)

i. Consultations with Ministries

- a) Capacity building is required for technicians, bankers and academicians in the area of solar based applications.
- b) Awareness amongst farmers with regard to solar applications and business models is also required for the uptake of these appliances.
- c) ISA may support the capacity building programmes and awareness creation initiatives for solar applications through iSTAR-Cs and ISA partner.

ii. Consultations with academic institutions

- a) The ISA delegation interacted with Soroti, Busitema and Makerere University on the possible involvement of these institutions under iSTAR-Cs’ programme. A visit was also undertaken to Busitema University to understand the expectations of the university and the infrastructure availability for capacity building.
- b) Expectations of ISA from iSTAR-Cs’ and possible support to iSTAR-Cs was also shared.
- c) ISA shall share concept note and consent form for iSTAR-Cs and. Government of Uganda shall identify the iSTAR-Cs.
- d) Mobilisation support shall be done from foundations, multilateral banks and ISA partners such as AfDB, UNDP, GIZ, JICA for iSTAR-Cs.

iii. Consultation with Local Industrial Associations

iv. Consultations with MDBs/DFIs and inter-governmental organisations

- a) Capacity building has been discussed with JICA and GIZ and it is a part of their ongoing programmes. The detailed discussions with these programmes for capacity building plans have to be further undertaken.
- b) ISA shall approach the MDBs/DFIs and inter-governmental organisations for capacity building programmes through NFP.

5. Information to be provided by the host country to ISA Secretariat

Information Needed	Agency responsible	Status
Water irrigation budget	MAAIF	Data required
Project pipeline for Finance	MAAIF	Received, details required
Multilateral and bilateral policies	MAAIF	Received, details required
Number of Multilateral and bilateral agreements supporting solar	MAAIF	Received, details required
Current budget provisions for solar		Data required
NDC budget		Data required
Irrigation area covered/Type of Irrigation system/Crops Irrigated/ Budget for Irrigation/ Average plot size	MAAIF	Received, clarification required
Possible areas for involvement of private sector with ISA	USEEA	Data required

6. Compliance Norms

- i. Environmental and Social Norms
 - a) Environmental Impact Assessment (EIA)
 - b) Social Impact Assessment (SIA)(where applicable)

- ii. Technical Standards
- iii. Grievance Redressal Mechanisms

The current scope of the mission does not cover the above mentioned norms and the same may be covered during future visits.

7. Details and Agenda of next Review Visit

This will be mutually discussed between Government of Uganda and ISA Secretariat and accordingly finalised.

8. Summary of Agreed Actions

No.	Agreed Action	Organisation/ Institution Responsible	Estimated Timeframe	Budgetary provision
1.	To expedite the acceptance of the amended framework agreement by Government of Uganda and to formally submit to the depository, i.e. Ministry of External Affairs, Government of India (GoI).	Government of Uganda (GoU)	To be decided by GoU	No financial requirement.
2.	Participation and consent of Uganda to participate in all five programmes of ISA and nominate a country representative for each of the five ISA programmes.	Government of Uganda	1 month	No financial requirement.
3.	ISA to share office memorandum and ToR.	ISA	2 weeks	No financial requirement.
4.	Creation of National Task Force for Solar (NTFS) with Hon'ble Minister of Energy as Chair & NFP as Convener under Article 2 and Article 3 of the Framework Agreement.	Government of Uganda	3 months	GoU will allocate the necessary budgetary provisions, if required.
5.	Solar roadmap for Uganda: a. Sharing of format for solar roadmap. b. National solar roadmap shall be got developed by the GoU.	a. ISA b. Government of Uganda c. Government of Uganda	a. 2 weeks b. 6 months c. 6 months	a. No financial requirement b and c. GoU will allocate the necessary budgetary

No.	Agreed Action	Organisation/ Institution Responsible	Estimated Timeframe	Budgetary provision
	c. Completion of draft solar roadmap by involving different agencies such as REA, private investor associations such as USEA, agricultural department, water department, academic institutions and other relevant stakeholders and referring to implementation plans, strategic plan, Uganda Vision plan 2040, local community plan and other relevant plans.			provisions. Alternatively GoU may explore technical assistance (TA) from Multilaterals/ Bilaterals / Inter-governmental organisations present in Uganda such as GIZ, AfDB, JICA, DfID, GGGI, and UNDP.
6.	Government of Uganda will share the investment policy to attract investments in solar energy and this may also be integrated in the solar roadmap which is being developed.	Government of Uganda	2 weeks	No financial requirement.
7.	Development of new solar schemes in association with other government departments like health, education, irrigation, sanitation, agriculture, rural development, local bodies and others and industry associations.	Government of Uganda	Ongoing basis	GoU will allocate the necessary budgetary provisions, if required.
8.	To explore the sources for financing of 30,000 solar pumps either through: a. Government of Uganda's funds.	Government of Uganda and ISA	Ongoing basis	GoU with various options suggested.

No.	Agreed Action	Organisation/ Institution Responsible	Estimated Timeframe	Budgetary provision
	b. Through soft loans from bilaterals like EXIM bank, AfD/GIZ/DfID/JICA/ USAID c. Multilateral soft loans/technical assistance from multilateral such as AfDB, World Bank d. Grant from UNIDO and UNDP and private investors through CAPEX/ RESCO mode.			
9.	Post price discovery of 30,000 solar pumps and finalising modalities of financing as above, facilitate through EESL the deployment of pumps in Uganda in coordination with NFP in Uganda.	Government of Uganda and ISA	6 months	GoU with various options suggested.
10.	Preparation of pre-feasibility report for deployment of solar pumps in Uganda.	Government of Uganda and ISA	2 months	Technical assistance provided by ISA and local logistic support by GoU.
11.	a. Sharing of iSTAR-Cs' concept note and consent form. b. Identification of iSTAR-Cs and providing the basic infrastructure. c. Mobilise support from foundations, multilateral banks and ISA partners such as AfDB for iSTAR-Cs.	a. ISA b. Government of Uganda c. Government of Uganda and ISA	a. 2 weeks b. 1 month c. 1 year	a. No financial requirement. b. GoU for basic infrastructure requirement. c. Mobilisation of support from foundations, multilateral banks and ISA partners such as AfDB by GoU and ISA.

No.	Agreed Action	Organisation/ Institution Responsible	Estimated Timeframe	Budgetary provision
12.	Infopedia: a. Structure for country profile for infopedia to be provided to NFP. b. Country profile for uploading on infopedia. c. Sharing of best practices and videos on solar energy in Uganda to be uploaded on infopedia.	a. ISA b. Government of Uganda c. Government of Uganda	a. 4 months b. Ongoing basis c. Ongoing basis	a. No financial requirement. b. No financial requirement. c. No financial requirement.
13.	Mobilise best practices teams including industrial delegation to Uganda from host country and other member countries.	ISA	3 months	Host country and industrial delegation will bear their own cost. Local logistic support will be provided by GoU.
14.	a. Office memorandum with ToRs on Task Force on International committee of chambers of industry and business (ICCIB) to be shared with GoU. b. Nomination of business/ industry association such as to be member of the task force.	a. ISA b. Government of Uganda / USEA	a. 1 month b. 3 months	a. No financial requirement. b. No financial requirement.
15.	a. Identification of foundations that will strengthen the NFPs by building their capacities to deliver their role vis-à-vis ISA. b. Identification of foundations in Uganda to support in developing solar projects/ community based	a. ISA b. Government of Uganda and ISA	a. 3 months b. To be filled	a. No financial requirement. b. No financial requirement.

No.	Agreed Action	Organisation/ Institution Responsible	Estimated Timeframe	Budgetary provision
	projects and also build the capacity of NFP			
16.	Financial assistance to NFP for better coordination of ISA programme and activities.	ISA	3 months	To be decided.
17.	<p>Participation in Assembly/ outreach event/ capacity building programmes:</p> <p>a. Invitation for participation in the ISA Assembly (Delhi NCR, 30th October to 2nd November 2019), RE-Invest (Delhi NCR, 30th October to 2nd November 2019), and SunWorld (Peru, Lima, 12-14 November 2019).</p> <p>b. Invitation for participation in other outreach events such as COP-25 and World Future Energy Summit 2020.</p> <p>c. Invitation for training under Master Trainers Programme, ISA fellowship for Master's Degree and other relevant programmes.</p>	<p>a. ISA b. ISA c. ISA</p>	<p>a. 2 months b. Ongoing basis c. Ongoing basis</p>	<p>a. To be decided on case to case basis. b. To be decided on case to case basis. c. To be decided on case to case basis.</p>

Annexure 1

List of Participants in Stakeholder consultative Workshop

No.	Name and Designation of Participating Delegate	Parent Institution	Current function(s) of the institution	Inputs suggested, if any, for ISA country programme	Role to be played by Parent institution in implementing ISA programme	Contact information for official liaison for Parent institution and ISA Secretariat
1.	Auma Julian	W.Water Works Ltd.	Provider of Solar Water Pumps, Pumping Solutions & Pumps Accessories for commercial, agricultural & community water problems in Uganda.	Explore further opportunities for private sector to engage with ISA.	Possible participant for implementation of solar water pump programme.	w.waterworksug@gmail.com
2.	Luzze Rashid	CEFA (Clean environment for Uganda)	Provide training and consultancy in smart agriculture, fish farming and clean cook stoves.		Possible participant for implementation of solar water pump programme.	
3.	Esther Nyanzi	UNREEEA	Umbrella organisation of six member associations to avail a platform for consolidating the renewable energy and energy efficiency private sector wing as well as improving its business environment.	Possible financing availability for solar programmes in Uganda.	Possible partner for implementation of solar programmes.	enyanzil@unreeea.org
4.	Joseph Okolowe	KCCA (Kampala Capital City Authority)	Responsible for the operations of the capital city of Kampala.			Okolong2014@gmail.com

No.	Name and Designation of Participating Delegate	Parent Institution	Current function(s) of the institution	Inputs suggested, if any, for ISA country programme	Role to be played by Parent institution in implementing ISA programme	Contact information for official liaison for Parent institution and ISA Secretariat
5.	Seboula Simon	MEMD	Nodal ministry for implementation of RE related projects in Uganda.		Nodal ministry for coordination and implementation of solar projects.	s.sebowa@yahoo.com
6.	Ochiling Julius	MEMD	Nodal ministry for implementation of RE related projects in Uganda.	Considerations and modalities for the ISA solar programmes in Uganda.	Nodal ministry for coordination and implementation of solar projects.	j.ochieng@energy.go.ug
7.	Sarien Nyangoma	MEMD	Nodal ministry for implementation of RE related projects in Uganda.		Nodal ministry for coordination and implementation of solar projects.	
8.	Kalule Eddie	MEMD	Nodal ministry for implementation of RE related projects in Uganda.		Nodal ministry for coordination and implementation of solar projects.	
9.	Kimbowa S. Emmy	USEA	Independent non-profit association dedicated to facilitating the growth and development of solar energy business in Uganda and East African region.		Possible partner for implementation of solar projects.	chairman@useaug.org

No.	Name and Designation of Participating Delegate	Parent Institution	Current function(s) of the institution	Inputs suggested, if any, for ISA country programme	Role to be played by Parent institution in implementing ISA programme	Contact information for official liaison for Parent institution and ISA Secretariat
10.	Nabukenya Winnie	MEMD	Nodal ministry for implementation of RE related projects in Uganda.		Nodal ministry for coordination and implementation of solar projects.	
11.	Percival Egau	Soroti University	One of the nine public universities and degree-awarding institutions in the country.	Sharing of consideration for association of academic institutions with ISA.	Possible i-STARC	egaupc@gmail.com
12.	Wafula Wilson	MEMD	Nodal ministry for implementation of RE related projects in Uganda.	Being NFP, provided inputs for implementation of various ISA programmes in Uganda.	Nodal ministry for coordination and implementation of solar projects.	
13.	Munjamja Hatmi	MEMD	Nodal ministry for implementation of RE related projects in Uganda.		Nodal ministry for coordination and implementation of solar projects.	
14.	Kassy Inne Atim	MEMD	Nodal ministry for implementation of RE related projects in Uganda.		Nodal ministry for coordination and implementation of solar projects.	

No.	Name and Designation of Participating Delegate	Parent Institution	Current function(s) of the institution	Inputs suggested, if any, for ISA country programme	Role to be played by Parent institution in implementing ISA programme	Contact information for official liaison for Parent institution and ISA Secretariat
15.	Wasswa Joseph	MWE	The Ministry has overall responsibility of the development, managing, and regulating water and Environment resources in Uganda	Shared the irrigation provisions in the country and key considering for implementation of solar water pumps.	Support in implementation of solar water pumps programme in the country.	
16.	Augustine M. Tsongo	MEMD	Nodal ministry for implementation of RE related projects in Uganda.		Nodal ministry for coordination and implementation of solar projects.	
17.	Owiny Marvin	ERA	Statutory Body to regulate the Generation, Transmission, Distribution, Sale, Export and Import of Electrical Energy in Uganda	Inputs on development of models to reduce the retail tariff for consumers.	Coordination agency for determination of tariff and approval of solar based projects.	owinymarvin@gmail.com
18.	Daniel Olinga	ERA	Statutory Body to regulate the Generation, Transmission, Distribution, Sale, Export and Import of Electrical Energy in Uganda		Coordination agency for determination of tariff and approval of solar based projects.	d.olinga@era.or.ug

No.	Name and Designation of Participating Delegate	Parent Institution	Current function(s) of the institution	Inputs suggested, if any, for ISA country programme	Role to be played by Parent institution in implementing ISA programme	Contact information for official liaison for Parent institution and ISA Secretariat
19.	Ivan Tim Owya	Soroti University	One of the nine public universities and degree-awarding institutions in the country.	Shared possible areas for possible collaboration between academic institutions and ISA.	Possible i-STARC	ologyivan@gmail.com
20.	Kilama George	Busitema University	A leading agricultural university in Uganda.	Shared possible areas for possible collaboration between academic institutions and ISA.	Possible i-STARC	gkilama69@gmail.com
21.	Balisenguka	MEMD	Nodal ministry for implementation of RE related projects in Uganda.		Nodal ministry for coordination and implementation of solar projects.	
22.	Lubowa Alex	MEMD	Nodal ministry for implementation of RE related projects in Uganda.		Nodal ministry for coordination and implementation of solar projects.	
23.	Tammsuza K Ammis	MEMD	Nodal ministry for implementation of RE related projects in Uganda.		Nodal ministry for coordination and implementation of solar projects.	

No.	Name and Designation of Participating Delegate	Parent Institution	Current function(s) of the institution	Inputs suggested, if any, for ISA country programme	Role to be played by Parent institution in implementing ISA programme	Contact information for official liaison for Parent institution and ISA Secretariat
24.	Elisha Lingoloabi	UECCC	Responsible for coordinating funding from the Ugandan government, international development partners and the private sector, to invest in renewable energy infrastructure in Uganda, with emphasis on the promotion of private sector participation		Possible funding agency for implementation of solar projects.	elugolobia@ueccc.or.ug
25.	Okanya Boniface	MAAIF	Overseer of the Agricultural sector where it formulates, reviews and implement national policies, plans, strategies, regulations and standards and enforce laws, regulations and standards along the value chain of crops, livestock and fisheries	Shared information on agriculture system in the country and requirements from ISA's programme.	The ministry will support in demand assessment and implantation of solar water pumps programme.	Okanya.boniface@yahoo.com

Annexure 2

Ministerial Consultation Agenda

List of Ministerial Consultations	Date of Meeting	Agenda Discussed	Role of Ministry/Agency in the implementation of projects	Future Course of Action
Ministry of Energy and Mineral Development	24 th , 25 th , 27 th June	Various activities and arrangements for implementation of ISA programmes.	The mandate of the Ministry of to Establish, Promote the Development, Strategically Manage and Safeguard the Rational and Sustainable Exploitation and Utilization of Energy and Mineral Resources for Social and Economic Development.	To support GoU in various relevant activities as mentioned above.
Ministry of Finance, Planning & Economic Development	24 th , 25 th , 27 th June (No direct meetings were undertaken and discussions were undertaken by NFP and other ministries on their behalf).	The budgetary provisions for solar and irrigation projects in Uganda and possible financing options for the projects under ISA's programme.	Formulation of economic and fiscal policies, and mobilize resources for the implementation of government programs.	To support GoU in various relevant activities as mentioned above
Ministry of Agriculture, Animal Industry and Fisheries (MAAIF)	27 th June	Details of agriculture and basis of estimation of 30,000 solar pumps.	The Ministry is the overseer of the Agricultural sector where it formulates, reviews and implement national policies, plans, strategies, regulations and standards and enforce laws, regulations and standards along the value chain of crops,	To support GoU in various relevant activities as mentioned above.

List of Ministerial Consultations	Date of Meeting	Agenda Discussed	Role of Ministry/Agency in the implementation of projects	Future Course of Action
			livestock and fisheries.	
Ministry of Water and Environment (MWE)	24 th , 25 th , 27 th June	Details on irrigation in Uganda.	Has the overall responsibility of the development, managing, and regulating water and Environment resources in Uganda	To support GoU in various relevant activities as mentioned above.

Annexure 3

Agenda of Consultations with MDBs/DFIs/UNDP/Regional Intergovernmental organisations

List of Consultations	Date of Meeting	Agenda Discussed	Role of Ministry/Agency in the implementation of projects	Future Course of Action
JICA	24 th June 2019	Solar related projects being funded in Uganda.	Funding agency	<ul style="list-style-type: none"> a. Discussion on information and details on possible programmes as mentioned above. b. Create synergies between the activities of JICA and ISA programme in Uganda.
GIZ	24 th June 2019	Mini-grids' projects being financed in Uganda	Funding agency	<ul style="list-style-type: none"> a. Discussion on information and details on possible programmes as mentioned above. b. Create synergies between the activities of GIZ and ISA programme in Uganda.
EXIM bank	24 th June 2019	Financing of solar projects in Uganda	Financing agency	<ul style="list-style-type: none"> a. Discussion on information and details on possible programmes as mentioned above. b. Create synergies between the activities of EXIM Bank and ISA programme in Uganda.

Annexure 4

International Competitive Bid for Solar PV Water Pumping Systems – Summary

1. Overview

ISA is facilitating an International Competitive Bid for the aggregate demand submitted by the member countries through Energy Efficiency Services Limited (EESL) for price discovery. The bid encompasses installation of SPV pumping systems in consonance with global performance and design standards and competitive prices in the member countries along with opportunity for extended comprehensive maintenance contracts with the suppliers. EESL has been mandated with the management and implementation of the bidding process spanning preparing bid documentation, opening and evaluation of the bids. Moreover, EESL would also be providing project management consultancy (PMC) services to the buyer through structuring of the programme, provisioning of best practices handbooks etc.

2. Structure of the Bid

The bid document establishing clear division of responsibility among different stakeholders, that is – EESL, the implementing agency; Member country, the buyer; Bidder, the supplier.

Scope of Work

The Bid provides a choice to the host country between two service options –

- (i) Service 1, which encompasses supply, installation and commissioning of complete system at buyer’s site with a warranty of 5 years
- (ii) Service 2, which encompasses the entire scope of service 1 and additionally requires the supplier to provide the comprehensive maintenance service for 5 years, which shall be operationalised through remote monitoring as well as biannual visits by vendors to the project site as well as service centres in the host country.

The bidder has been assigned full responsibility for packaging, forwarding, transportation, supply and any breakage/losses under both the service options. Further, bidder is to be held liable for any manufacturing defect and any cost and time overruns.

3. Responsibility division

Responsibility division among bidder and buyer is presented in Table below.

Responsibility	Part A	Part B	Part C	Part D
Packing	Bidder	Bidder	Bidder	Bidder
Loading on Truck (Carrier) with Insurance	Bidder	Bidder	Bidder	Bidder

Export-Custom Clearance	MC	Bidder	Bidder	Bidder
Carriage to Port of Export	MC	Bidder	Bidder	Bidder
Unloading of Truck in Port of Export	MC	Bidder	Bidder	Bidder
Loading Charges in Port of Export	MC	Bidder	Bidder	Bidder
Carriage to Port of Import	MC	Bidder	Bidder	Bidder
Unloading Charges in Port of Import	MC	MC	Bidder	Bidder
Loading on Truck (Carrier) in Port of Import	MC	MC	Bidder	Bidder
Carriage to place of destination	MC	MC	Bidder	Bidder
Insurance	MC	MC	Bidder	Bidder
Imports Custom Clearance	MC	MC	Bidder	Bidder
Import Taxes	MC	MC	Bidder	Bidder
Transport from destination port to site	MC	MC	Bidder	Bidder
Installation & Commissioning	MC	MC	Bidder	Bidder
Repair and Maintenance for 5 years	MC	MC	MC	Bidder
MC=Member Country				

Wherein, Part A, B, C, D denote different price packages according to services provided by the bidder.

4. Conditions of Contract

- (i) International suppliers have been held liable for all taxes, stamp duties, license fees outside purchaser’s country
- (ii) All supplied goods are insured in freely convertible currency against loss or damage incidental to manufacture/acquisition, transportation, storage, delivery.

- (iii) Buyers are allowed to buy from open market at bidder's expense, in the contingency that product delivered is damaged. Warranty shall continue to be applicable from manufacturer.
- (iv) Member countries have been provided a 20 % leeway on the bill of quantity (BoQ) as well as change in target location, whether within the state or across states with additional burden of transportation charge for change in location.
- (v) Timeline of 120 days has been set for delivery of equipment to destination country's port from date of issuance of Letter of Award (LoA) with installation and commissioning within 180 days. A penalty of 0.5 % of the value of delayed equipment installation up to 10 % of total has been set for every week's delay. Moreover, in the event of delay, country may order the delayed quantity from another bidder who has matched the price for delayed supply.

5. Price Bid evaluation

Price quote for all the, above, mentioned packages will be invited and techno-commercially suitable bidders with lowest price, L1 for a particular pump size shall be determined based on the aggregate price of all relevant packages within the chosen service. That is, for service one price of package A, B, C will be aggregated and for Service two price of all packages will be aggregated.

The implementing agency, EESL, has retained the right to split the total order among multiple bidders other than L1 based on price bid hierarchy, provided non-L1 bidders match L1 price. Thus, the member country can be assured of L1 price from every vendor.

6. Technical Bid Evaluation

The bid document has set qualifying standards for the bidders based on their financial strength, experience in solar PV and Solar Pumping System industries (both quantity of supply and installations considered). Moreover, the bid document includes IEC standards and requirement of certification to be produced by the bidders to establish their technical bona fides to participate in the bidding process.

7. Additional Responsibility of the Bidder

The bidder has been mandated to establish a project office/regional office/depot store within the country within four weeks of issue of Letter of Award (LoA). The office shall ensure adequate human resources for logistical support, service coordination. Further, the bidder has been held responsible for ensuring end-of-life management of supplied equipment either directly or indirectly. Bidder shall also submit a sim monthly performance report to the buyer along with a yearly report to EESL/ISA.



Minutes of Meeting
ISA/M.01/WD.01
24-28 June, 2019
Kampala,
(Confidential)

Uganda

Minutes of Meeting for Expert Level Visit to Uganda for Pre-Feasibility Study of Solar Pumps, Rooftop and Mini-Grid Projects by International Solar Alliance Secretariat held from 24-28 June, 2019.

Venue: Kampala, Uganda

Minutes of the meetings

Expert Level Visit for Pre-Feasibility Study of Solar Pumps, Rooftop and Mini-Grid Projects by International Solar Alliance Secretariat

June 24th, 2019 to June 28th, 2019

A. Background

The International Solar Alliance (hereinafter referred to as “ISA”) is a treaty based inter-governmental organization which was launched on 30 November 2015, in Paris, France, with Headquarters in India (UN Registration No. 54949). ISA is established to collectively address key common challenges to the scaling up of solar energy in its Member Countries. Uganda is one of the founding members of ISA.

ISA has been framing various Programmes in order to implement various solar application in the Member Countries. All the Programmes of ISA are member driven. Currently there are 5 ISA programme viz. 1) Scaling Solar Applications for Agricultural use 2) Affordable Finance at Scale 3) Scaling Solar Mini Grids 4) Scaling Rooftop Solar and 5) Scaling Solar E-mobility and Storage.

Team under ISA Secretariat visited Uganda from 23rd June 2019 to 29th June 2019. The team consisted of members from ISA, PWC and KPMG (details provided in Annexure I).

The objectives of the Mission were:

- 1) To create awareness of ISA Programme and its activities among all the important Ministries/ Departments and other stakeholders in Uganda under the guidance of Mr. Wilson Wafula, the National Focal Point (NFP) of ISA in Uganda
- 2) To compile the required information and interact with officials to carry out pre-feasibility studies for implementation of demand of 30,000 number of Solar Water Pumping Systems, given by Uganda against the call for Expression of Interest issued by the Secretariat of ISA.
- 3) To discuss and understand the possibilities of solar rooftop and mini-grid projects in Uganda.
- 4) Discuss regarding iSTAR center & capacity building of officials & agencies in Uganda on various Solar Applications.

Apart from the above main objectives, the ISA mission wanted to understand and gather information on the existing energy scenario of Uganda including renewable energy activities, agriculture/ irrigation infrastructure and various policies/ regulations in the country, which will help ISA to assist Uganda in developing country programme to scale up solar applications.

NFP had prepared the schedule of the meetings in the form of two full day’s workshop with various concern officials and dignitaries of the Government of Uganda. List of participants from various Ministries / Departments such as MEMD, Ministry of Finance, Planning & Economic Development MWE, MOFA, MAAIF, along is attached as Annexure II. Date wise meeting details are as following:

B. Date of the meeting - 23rd June 2019

Agenda – Dinner meeting with Indian Ambassador to Uganda

Venue – Royale Imperial Hotel, Kampala

The ISA team was invited on a dinner meeting hosted by the Ministry of Energy and Mineral Development and was attended by Ugandan High Commissioner to India H.E Ms. Grace Akello and the Indian High Commissioner to Uganda H.E Mr. Ravi Shankar, along with the officials from MEMD including the NFP. Over dinner, informal discussions were held on the possible options for scaling up of solar based applications in the country and how Uganda can effectively leverage the ISA platform to fulfill its requirements. Key messages from the discussion around the scenario of finance, energy and agriculture were:

1. Ugandan electricity is largely hydro based and with two upcoming hydro projects, country will be power surplus from the generation perspective. However considering the low levels of access to grid, especially at rural level, significant demand for solar based applications exists.
2. There is requirement for solar based pumps for irrigation and community services, considering the erratic nature of rainfall.
3. Government of Uganda (GoU) is less inclined to take debt for social projects considering the existing significant debt for infrastructure projects but agriculture sector remains a top priority.
4. There are large agriculture dependent business groups in Uganda that can spearhead the implementation of solar pumps in the country.
5. Possibility of farmer contribution in pump costs is minimal.
6. Shakti pumps from India has proposed to supply solar pumps in the country by getting buyer's credit.

C. Date of the meeting – 24th June 2019

Agenda – One day consultative workshop on ISA country framework

Venue – Royale Imperial Hotel, Kampala

One day consultative workshop on ISA country framework was organized in Kampala which was hosted by MEMD and MOFA. The workshop was well attended by the relevant stakeholders including officials from government, the academicians, industry players and funding agencies. The key objective of the workshop was to sensitize the stakeholders in Uganda on the focus areas of ISA, update on the activities that have been undertaken, share the proposed roadmap going forward and detail out areas wherein involvement of Uganda shall be required to take forward the implementation of various programmes. A number of interactive sessions were held wherein presentations were delivered on the various subjects and queries of the stakeholders were discussed.

The session wise details are as follows:

1. Welcome address by Commissioner, Ministry of Energy and Mineral Development

The Commissioner welcomed the ISA delegation and the stakeholders highlighting the objective of the workshop. He mentioned that the key agenda of the workshop is to know about ISA and the purpose is for ISA to know about Uganda and put a framework to work together towards the benefits that can be realized from the platform. He emphasized on the need to come out with actionable

items during the course of visit of ISA delegation, which could be taken forward for the programme level implementation.

2. Key note speech by Director, Ministry of Energy and Mineral Development

The honorable Director highlighted the objective of the visit of the delegation that is to develop a country framework for the ISA programme. While giving a brief background about the energy sector, he mentioned about the focus of Uganda to achieve 30% of energy needs from solar and that the country looks forward to financial and technical benefits with association with ISA. He mentioned that with an average solar radiation of 5.64 kWh/m²/day, Uganda's has tremendous potential for solar applications and thus the current focus is to exploit solar energy and policy framework within the RE policy, 2007 which already exists in the country. Mentioning about the issue of electricity access with about a quarter of country only having access to electricity, he said that solar could possibly address this challenge.

He specifically emphasized on the potential of solar water pumps to increase the yield of food in the country considering there are areas of food shortage despite abundant solar energy and the solar water pumps being a high priority area for the country.

3. ISA Presentation by Member, ISA delegation

The presentation was initiated with an audio video sharing the objective with which ISA has been established and the path taken by ISA since its inception including the various areas where ISA has been involved. The presentation post the audio video shared the key focus areas of ISA, the interventions that have been undertaken and the focus areas of the ISA going forward. Private sector participants were interested to know the modalities under which they can participate in the ISA programmes. It was discussed that the ISA framework currently is inter-governmental and ISA would also like to engage with private sector. A task force on business association with ISA exists between India and France and a request has been made for other countries to participate. Further price discoveries of solar applications is being enabled where in private sector can participate. A platform is being created (Infopedia) where private sector can provide solutions. Multi-lateral banks under the ISA programme shall be supporting the private sector by covering the risks faced by the private sector.

Participants were curious to know the possible role of ISA around the quality related aspects of solar equipment's and projects. It was informed that ISA is trying to establish a solar technology resource centre in each country with a goal to set solar standardization. ISA is also consulting the private players for setting up the standards for the solar pumps' bid and a request has been made to all the member countries for the same. However, member countries of Africa are of the view that standards set for India are also good for Africa. The IEC standards are being considered which are of the best quality. Further the standards are being set in discussion with NISE, manufacturers and other experienced industry professionals.

4. Progress of Uganda's engagement with ISA

Engagement of Uganda with ISA platform was presented including the number of trainees from Uganda trained and the progress with regard to other programmes. The expectations of Uganda from the ISA platform were also shared as a part of the presentation. Uganda has submitted a request for 1,500 solar water pumping projects on the pilot demonstration basis. A request was

also made to provide the 30,000 pumps as grant or soft loan. However, MEMD's strategy is to demonstrate the functioning of the 1,500 pumps before opting of other technologies.

5. Review of the demand aggregation by Member, ISA delegation

Details on the total demand received from various countries for solar pumps, solar rooftop and solar based mini-grids was shared including the process followed for the demand aggregation and the structure for country level task force which shall take the implementation of the various activities under the taskforce.

6. Scaling Up Solar applications for agricultural use (SSAAU) by Member, ISA delegation

A detailed presentation was delivered providing introduction to SSAAU, the focus areas, overview of solar pump technology, business models for solar pump deployment, details on demand aggregation for solar water pumps and potential impact of solar water pumping programme. Deliberations were held around the solar pumping projects among the participants. It was informed that currently no subsidy or aid is proposed. The financing for solar pumps needs to be suitably worked out. An appropriate financing framework in consultation with the country task force and the multilateral financing agencies has to be worked out to decide on the possible financing model. On the methodology of demand aggregation, ISA mentioned that the countries where the demand is less, bid has been invited by aggregating demand of such countries. In case one country is a laggard in implementation of the programme, suitable follow up will be done with the country task force to speed the implementation of solar pumps.

7. Scaling Up Solar rooftop and Mini-grids by Member, ISA delegation

The presentation deliberated the relevance of solar rooftop and mini-grids for Uganda electricity sector, the evolution of business models in the solar rooftop sector, the potential models in the mini-grid sector, the possible models for implementation in Uganda and the challenges foreseen for implementation.

Project officer from REA, Uganda mentioned that business models in mini-grids are still in the pilot stage in the country and are challenged by sustainability. There are high tariffs and thus the subsidy requirements and thus the anchor based business may be considered to be adopted.

Members of ISA delegation mentioned that CAPEX model is the initial model to be adopted for solar rooftop (SRT) and to spur the growth subsidy is required. RESCO model starts with the government since there is a surety of payment.

Major discussion took place around the supply and demand scenario in Uganda and in its context relevance of solar rooftop and mini-grid projects. It was deliberated that the commercial interests of the stakeholders need to be addressed for the system to work. The rooftop owners could be given lease rent for installation of SRT systems. The question around the theft of equipment also found its way in the discussion. The model for solar appliances involves joint ownership by the community members, limiting the options for theft. Further technological innovations such as anti-locking nuts limit the possibility of theft. On the anchor load, certain other productive usages apart from telecom towers, such as a flour mill, oil expeller could also work as the anchor load.

8. ISA iSTAR centres by Member, ISA delegation

The presentation provided an overview of various online (infopedia) and offline resources to be provided to the ISA members to enable the growth of solar technologies. An overview of ongoing

training programmes and the respective funding agencies and corporate partners was all provided. An MoU has been signed for facilitation of setting up of institution, between ECREEE and ISMA for regulation of standards. On the infopedia, participants were informed that it will have following counters:

- i. Country counter with user name and password access
- ii. Best practices video
- iii. Interactive section for discussions between secretariat, NFP and other stakeholders
- iv. Details on offline programmes for learning

Various deliberation around the training of officials under the ISA programmes took place. ISA informed about the facilities in India for training on various facets of solar energy. NISE is undertaking training programs for the past 40 years and have the required training infrastructure, making the training programme cost effective. Further the modalities of sending ISA experts to member country is in progress and a request has been received from Uganda and Sudan. Under the Equinox programme 'Ask for experts', the ISA member countries will host the foreign experts and the cost shall be borne by the ISA secretariat. With the partners of ISA such as World Bank, study tours have been requested for ministers in the member countries. Even in India the training is provided by Indians as well as German trainers providing training in India. iSTAR (Solar Technology Application and Resource)-Centres to be established will also help in training in Uganda. University of Soroti has radiation of 6.03 kWh/m²/day. Other universities including Busitema are also interested in setting up STAR-Cs. iSTAR-Cs should be regional based to be able to be accessible by all the farmers. The centre should be ready to accept the programmes with focus on bankers, engineers and farmers. The test lab should also be there in iSTAR-C.

The workshop was brought to a close with concluding remarks by the Commissionaire MEMD, Uganda and Program Director, ISA.

Note –

- i. Director's speech is attached as Annexure II
- ii. List of participants is attached as Annexure III
- iii. All the presentations of the session are attached as Annexure IV

9. Key takeaways and action points

Following key action points were agreed:

- i. ISA in Uganda will have a taskforce having NFP, MEMD, MoFA and representatives from various ministries such as Finance, Planning & Economic Development, Water and Environment and Agriculture, Animal Industry and Fisheries etc.
- ii. Uganda will require financing for 1,500 solar pumps and after these will be scaling up for 30,000 SWPs.
- iii. Government of Uganda will work on the solar water pump programmes on priority and can participate in the rooftop, mini grid and street lighting programmes on a phased basis as well.
- iv. During the workshop, there was expression of interest for production line for manufacturing and assembly for solar technologies need to be established in the country to serve the region and suitable planning for the same may be undertaken.

D. Date of the meeting – 25th June 2019

Agenda – Programme for technical consultative workshop on ISA country framework

Venue – Royale Imperial Hotel, Kampala

Consultations with ministries, including MEMD, MWE, MOFA, MAAIF, Universities, USEA and industry players were undertaken to further understand the scope for solar applications in Uganda specifically solar water pumps, solar rooftops and mini-grids. List of participants is attached as Annexure IV. Discussions were also held on the National Task Force to be established for ISA activities in Uganda. Following are the key discussions undertaken around solar water pumping, solar rooftop & Mini-grid and setting up of National Task Force:

1. Solar Water pumps

- i. MEMD shall be the nodal agency, coordinating with Ministry of Finance, Planning & Economic Development, MOFA, MAAIF, MWE, MOLG and other relevant stakeholders. The MEMD shall be supported at the district and local level by the local bodies and officers of the relevant ministries.
- ii. MEMD has in the past also coordinated with health and education departments for various programmes.
- iii. Uganda currently has a National Irrigation policy for areas of 100 hectares and above and is also exploring the irrigation provisions for areas less than 100 hectares.
- iv. Two cropping seasons are there in Uganda dependent on the rainfall, March to June and August to December with crops such as rice, maize, beans and millets grown in both the seasons. However the rainfall during March to June is more consistent while rain is inconsistent during August to December, when the irrigation shall be required.
- v. Medium size farms with size between 500 ha to 1000 ha and large size farms greater than 1000 ha have a combined 6 number of irrigation systems in the country which are mainly surface based drip irrigation.
- vi. Small size farms have a total of 58 drip and sprinkle based irrigation systems which are driven by solar.
- vii. Diesel based pumps are rarely used in the country.
- viii. Pump utilization is typically for 4 days in a week.
- ix. The underground water has not been exploited much in the country and wherever it has been, it has been largely through hand pumps.
- x. Water table depth is 50 meters on an average but it varies significantly in the country and in some areas can also be greater than 100 metres.
- xi. For medium scale farms, in total 6 cooperatives are there. Small farmers typically do not form cooperatives but they form water usage groups. In total 8 water usage groups with 15 farmers each are present in Uganda.
- xii. The target group of SWP to be procured under the ISA programme will be small farmers, typically those not using irrigation.
- xiii. For determination of demand of 30,000 SWPs, the NFP did not engage with the stakeholders considering lack of clarity on the source of funding for installation of pumps and thus the modalities are not clear.
- xiv. The pumps will be installed across the country and the agro-ecological zones will determine the required pumps.

- xv. Going forward a plan shall be prepared for implementation of the pumps once the financing for SWPs is clear and the same shall be shared with the ISA secretariat.
- xvi. There is a need for training to be provided along with the supply of pumps.
- xvii. Some districts have plans for irrigation in their districts and the pumps could be distributed at the district level.
- xviii. GoU needs to clarify on the expectations from ISA with regard to 30,000 SWPs.
- xix. After the ISA mission, the high commissioner of Uganda to India shall write to MoFA to share the developments on the ground with regard to ISA activities with the ISA Secretariat.
- xx. Government of Uganda (GoU) has a national development plan (NDP) and the discussion on solar applications should be a part of the NDP.
- xxi. In case there is requirement of less quantity of pumps in agriculture than as envisaged, GoU may utilize balance quantities of solar pumps for other applications like drinking water for communities.
- xxii. Further, 30,000 solar water pumps are initial assessment and the demand may go up post successful implementation to as high as 1, 00,000 pumps or more.
- xxiii. By 2020, Uganda has a target of 1.5 million ha of land to be under irrigation. For implementation of the same a proper plan is required. Considering only 0.5% of the irrigation potential is realized, there is huge scope for SWPs.
- xxiv. Agriculture is a focus areas for economic growth and thus SWP could not be ignored considering irrigation is a requisite for growth of the agriculture.
- xxv. The decision regarding areas where SWPs will be implemented is sovereign decision of the GoU.
- xxvi. Most of the irrigation requirement (almost 90%) is from the ground water and hence submersible pumps would be the preferred option.
- xxvii. Currently water is pumped to tanks for 1 h.a. of land and water is provided to farmers on rotation basis.
- xxviii. The water requirement is typically 10-25 m³/hr and the size of the pumps required shall be varying. The efficiency of the pumps to be supplied shall be required.
- xxix. The pumps are supplied in Uganda generally from Italy, China and India.
- xxx. Gravity based irrigation is majorly deployed for 1,500 ha of plots which are rent out to smaller farmers and water is provided as per the demand.
- xxxi. For small scale farmer groups' raising money is a challenge. For such farmers, irrigation systems are provided by the government or the NGO
- xxxii. The medium and large scale farms use loans through line of credit from AfDB for installation of irrigation systems.
- xxxiii. The pumps supplied are paid in three phases, advance, installation and post commissioning. The pumps typically have a warranty for 3 years.
- xxxiv. With regard to the funding agencies, UK export finance (for 920 solar pumps), World Bank and GIZ are already providing loan based support in the country.
- xxxv. Uganda credit Capitalization Company can provide finance directly to the farmers or to the solar companies. The duration of the loan is 2-3 years with interest rate of 10-15% on reducing balance basis.

- xxxvi. Currently there is no subsidy for SWPs in Uganda but in the past subsidy has been provided for solar applications.
 - xxxvii. The challenges with regard to existing solar water programmes have not been significant. The challenges have been with regard to lack of interconnection, manpower availability and ability of the pumps to deliver sufficient power. Further land fragmentation is also a challenge.
 - xxxviii. Import of solar panels is not taxed, but the import of pumps is taxed. The USEA (Uganda Solar Energy Association) shall be lobbying for tax exemption for pumps.
 - xxxix. With regard to awareness amongst the farmers, there is not much awareness with regard to solar pumps and there is need to create awareness regarding the technology and the business models.
 - xl. There is a need to look at affordability, intense awareness creation, natural farming, training for pump maintenance to technicians and at the farm level,
 - xli. The pumps should not be given to the farmers for free and farmer should pay 10-20% of the pump cost for them to take care of pumps.
 - xlii. The commercial banks provide credit at around 24% for RE projects.
 - xliii. GoU can look at commercial farmers which have big pumps and require more water. However ISA shall not interact directly with the private players.
 - xliv. ISA could help create awareness, improve the affordability, create standardization and enable setting up of production lines without compromise on quality.
 - xlv. The reports in following areas will be shared by MWE:
 - a. Solar irrigation experience
 - b. The water level availability
 - c. The farming techniques
2. Solar rooftop and mini-grids
- i. Typically standalone solar applications are required for cooking and water heating purpose.
 - ii. Independent standalone solar rooftops are also deployed by Uganda telecommunications, by health centres for refrigeration and air conditioning and by schools.
 - iii. The grid connective rooftops are not a priority at this stage considering power surplus situation.
 - iv. REA is developing off-grid policy identifying areas of mini-grid and rooftop.
 - v. Currently there is a plan for RE strategy and plan for 2022 where grid will reach and where grid will not reach.
 - vi. ISA can support GoU in development of roadmap for solar which can consist off-grid including Solar Home System, street lights, cooling etc.
 - vii. Currently there is no net metering policy in the country.
 - viii. There is a need to increase demand for electricity in Uganda.
 - ix. There are mini-grid projects in the country through support from GIZ and WWF, however if cheaper mini-grids can be developed, then GoU may work on mini-grids considering the need for stable power.
3. Setting up of National Task Force
- i. There may be a cell established which could be functional under NFP.

- ii. The National Task Force shall be constituted by GoU. A draft structure and roles for members of the task force have been shared with GoU and the GoU shall revert on the same.
- iii. There is need to have a framework for the Government of Uganda to scale up solar energy programmes in the country.

Note – List of participants is attached as Annexure V

E. Date – 26th June 2019

Agenda – Visit to Busitema University and Tororo Solar North Power Plant

Venue – Busitema University and Tororo

The ISA delegation along with NFP Uganda, High Commissioner of Uganda to India and other members of MEMD and MoFA undertook field visits to Busitema University and Tororo solar power plant to further understand the possible implementation of activities under the ISA framework.

1. Busitema University

Busitema University (BU) is one of the eight public universities and degree-awarding institutions in the country. BU has its focus on the instruction of agricultural sciences, agricultural mechanization, irrigation and agribusiness. It is one of the first multi campus universities established by law in Uganda. The university has total 6 campuses in 6 towns and has undertaken a number of programmes which have been a part of the national, regional and international plan.

With a grant from Government of Egypt, 4 MW grid connected solar plant is planned to be built on the university campus.

Considering the university is an agricultural and engineering university and having proper infrastructure & labs, it has been proposed by NFP Uganda, for setting up Centre of Excellence (CoE) in the University for the SWP programme.

Following were the key points discussed during the deliberations of the ISA delegation with the professors of the university including the VC and the dean:

- i. The training programmes to be provided by the university would be at three levels:
 - a. Phase I: Vocational training
 - b. Phase II: National CoE
 - c. Phase III: Regional CoE
- ii. The concept of STAR-Cs is at an evolving stage. These are planned to be set up as center of excellence for solar energy. Initially the iSTAR-Cs may start with undertaking training programmes approved by the National Council of Higher Education.
- iii. The availability of existing facilities without requiring upfront investment is preferred for having iSTAR-Cs.
- iv. The institutions will be partnership based institutions wherein the ISA can support to develop the curriculum, which can be approved by the National Council of Higher Education.
- v. Some of the partners of ISA such Schneider foundation, Signify and Tata foundation are supporting in establishment of STAR-Cs. These could provide solar equipment, training curriculum and training faculties.

- vi. ISA through its financial partners such as AfDB, DFID, World Bank, UNDP, and GIZ will assist to set up iSTAR-C.
- vii. The testing and certification facility for Uganda could be set up in the university.
- viii. The university needs to explore how it can integrate capacity building for solar energy applications in the existing programmes.
- ix. Initially 2-3 academic staff of the university could be trained under the master trainer programme.
- x. Further Surya-Mitra training for technicians over 3 months, for persons nominated by the university could be done in India.
- xi. ISA has also launched an award for young scientists.
- xii. A fellowship programme also exists in IIT Delhi wherein nominations could be made by the university.
- xiii. The concept note of ISA for STAR-Cs should be shared with the Commissioner, MEMD.
- xiv. Going forward following are the next steps proposed:
- xv. ISA will share the concept note and consent page for STAR-Cs with Commissioner, MEMD and the same shall be shared by him with the university.
- xvi. Based on the proposal of the university routed through NFP, the further activities shall be undertaken by ISA.

2. Tororo solar north power plant

10 MW grid connected solar power plant has been set up in Tororo, Uganda in September 2017 and injects electricity into the grid, receiving a FiT of USD 0.16/kWh. The power generated is sold directly to Uganda Electricity Transmission Company Limited for integration in the national electricity grid. Since its commissioning the plant has injected close to 30 MUs in the grid, which is around 17 MUs annually. The plant is majority owned by Italy headquartered, Building Energy SpA. The team visited the plant to understand the layout and functioning of the various aspects of the plant such as O&M, generation monitoring, grid interaction and security. A total of 50 MW of grid connected solar PV plants have been installed in Uganda including the Tororo plant. The initial two plants of 10 MW each were commissioned with FiT of USD 0.16/kWh and followed by 10 MW and 20 MW respectively at the FiT of USD 0.11/kWh. As per the new directive, FiT should be less than USD 0.08 /kWh for new plants.

Note – List of participants is attached as Annexure VI

F. Date – 27th June 2019

Agenda – Discussion on the way forward and preparation of Aide Memoire and consultation with Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and Soroti University

Venue – Office of the Ministry of Energy and Mineral Development, Kampala

A meeting of ISA delegation with NFP, MAAIF, KCCA, MEMD, and High Commissioner of Uganda to India was held at the MEMD office. The objectives of the meeting was to deliberate on the outcome of various consultations from the previous three days and prepare the draft aide memoire for approval of GoU and ISA. During the discussion, it was agreed by the representative of MAAIF that required information on the modalities of solar pump project like basis of 30,000 number of pumps, method of selection of beneficiaries, irrigation area, type of irrigation, budget etc. will be

provided. MAAIF has identified pilot districts to implement solar pump project, however these numbers may significantly go up as the programme is implemented in various phases. GoU and ISA will work together with financial partners to arrange the financing for the initial 30,000 solar pumps. It is proposed that it will be GoU's responsibility to tie up the resources and financing. ISA will facilitate the discussions with financial partners. It was also agreed that initial demand of the 1500 solar pump pilot project on grant basis will not be pursued with ISA as it is not a financing institution. However, the focus collaboration of ISA and GoU will remain on the 30,000 solar pump project.

Since GoU has only signed the solar water pump programme of ISA, representative of MAAIF and High Commissioner of Uganda to India emphasized on consideration of other programmes of ISA simultaneously. MAAIF was of the view that various public buildings like hospitals, schools, community buildings, and Government offices can be connected with solar rooftop or/and mini-grid as the case may be to have better electricity access and security. There have been incidences where due to power failure at the hospital patients have lost their lives. Based on these deliberations among the ISA delegation, MAAIF, MEMD and the NFP, it was agreed that GoU will participate in all five ISA programmes. However, the first priority for GoU will remain the solar water pump programme.

A draft aide memoire was prepared, discussed and shared with the stakeholders and it was agreed to finalize it the next day. This final draft document will be sent to the higher authorities for their review, consent and approval. NFP informed that aide memoire shall require approval from legal and the concerned ministries due to financial implications of the agreement. After the approval from GoU, this document will be sent to ISA Secretariat. It will be signed after the ISA Secretariat accepts the final version of the document as approved by GoU. NFP, however agreed to sign the minutes of the meetings.

Note – List of participants is attached as Annexure VII

G. Date – 28th June 2019

Agenda – Discussion and Finalization of Minutes of Meetings and draft Aide Memoire

Venue – Office of the Ministry of Energy and Mineral Development, Kampala

Place – Kampala

Date - 28th June 2019

Mr. Wafula Wilson
NFP ISA, Govt. of Uganda

H.E. Ms. Grace Akello
High Commissioner of Uganda to India

Mr. Rakesh Kumar
ISA Mission Director

Annexure I: ISA Team

S.No.	Name	Designation	Organisation
1.	Mr. Rakesh Kumar	Programme Director	International Solar Alliance
2.	Mr. P C Sharma	Deputy Director	International Solar Alliance
3.	Mr. Shishir Seth	Senior Consultant	International Solar Alliance
4.	Mr. Vibhash Garg	Director	PWC on behalf of ISA
5.	Mr. Harshit Nayyar	Senior Consultant	KPMG on behalf of ISA

Annexure II: Director's speech**Annexure III: List of participants on 24th June 2019****Annexure IV: Session presentations****Annexure V: List of participants on 25th June 2019****Annexure VI: List of participants on 26th June****Annexure VII: List of participants on 27th June 2019****Annexure VIII: List of participants on 28th June 2019**