

SREP UGANDA

INVESTMENT PLAN



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November 2015



Presentation Outline

- 1. Country Profile**
- 2. Energy Sector Overview**
- 3. Renewable Energy Agenda**
- 4. Rationale for SREP**
- 5. Financing Plan, Results Framework & Program Implementation Structure**
- 6. Conclusion**



1. Country Profile



Country Profile

❖ Geography

Uganda is a landlocked country located in Eastern Africa that borders the countries of Democratic Republic of the Congo, Kenya, Rwanda, South Sudan, and Tanzania.

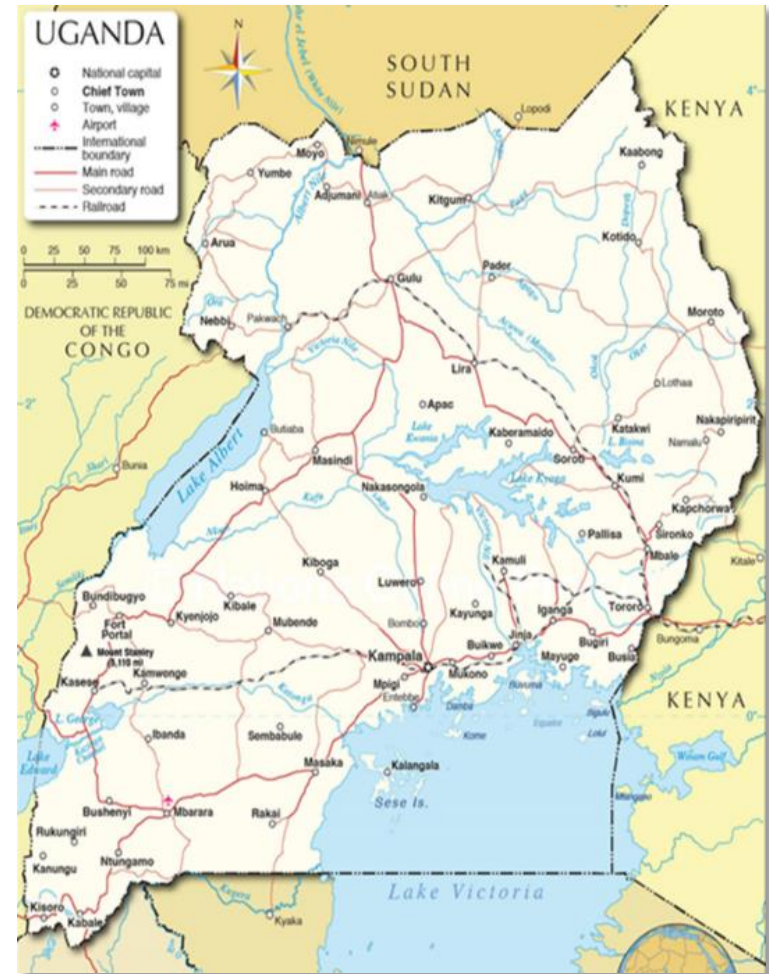
❖ Population

34.9 million, 70% in rural areas. Growth rate: **3.4%**.

❖ Economy

GDP growth stands at an average of 5%, reducing to poverty from 56% in 1992/93 down to 19.7% by 2012/13.

- Average GDP growth is about 5%.
- GDP per capita: **572 USD**.



GDP COMPOSITION

Industry
27%

Services
50%

Agriculture
23%



Uganda National Vision 2040

Vision: Transforming Uganda from an agrarian society to a modern and prosperous country within 30 years.

- ❖ Increasing electricity access to **80%** by 2040.
- ❖ Investing in
 - Least cost power generation,
 - Promotion of Renewable Energy & Energy Efficiency, and
 - Expanding transmission and distribution infrastructure.
- ❖ Consider
 - The rural communities with decentralised energy approach, and
 - The urban population that is also growing.





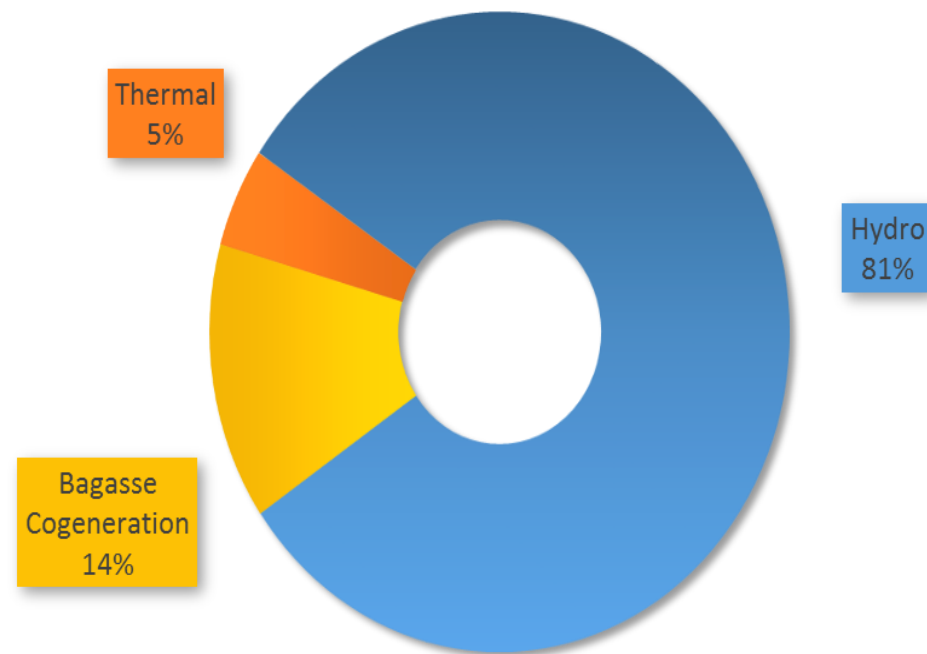
2. Energy Sector Overview



Electricity Supply & Demand

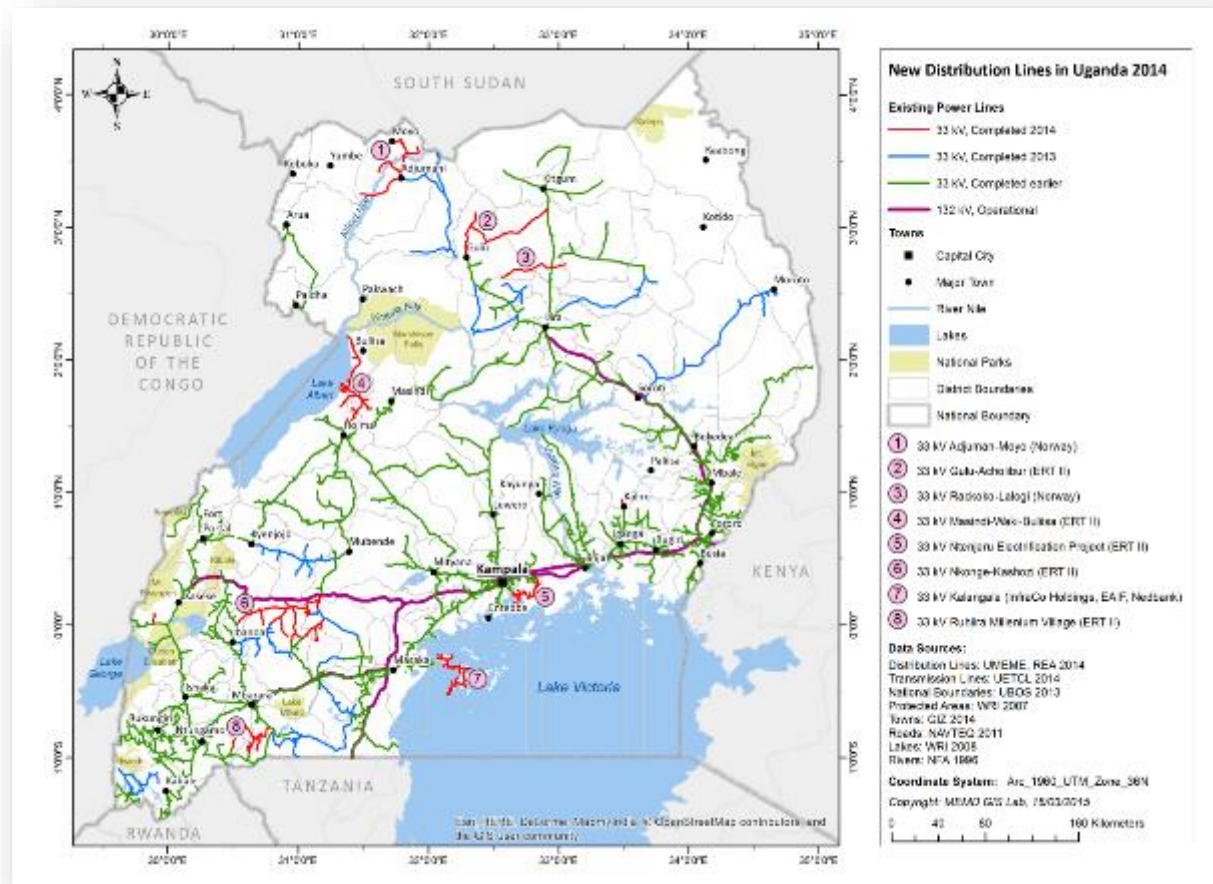
- ❖ Installed power generation capacity up to 873.7MW – mainly by hydro.
- ❖ Access to electricity is one of the lowest in Africa – National 17%, Rural 7%.
- ❖ Per capita electricity consumption low at 100 kWh p.a. (Kenya: 155 kWh, Ghana: 300 kWh, South Africa: 4,694 kWh).
- ❖ Demand growing fast at **9%** annually (shortages are expected in 2016).
- ❖ Peak domestic demand reached 508MW in 2014.

Electricity Generation Source



Uganda Transmission & Distribution Infrastructure

Uganda transmission infrastructure is growing fast.



Policy & Strategy Framework

Uganda already has the core policy and strategy documents in place to promote renewable energy investments.

Electricity Act, 1999: Provided for the establishment of an Electricity Regulatory Authority and the liberalisation and unbundling of the electricity sector.

Energy Policy, 2002: “Meeting the energy needs of Uganda’s population for social and economic development in an environmentally sustainable manner.”

Renewable Energy Policy, 2007: Increasing the use of modern renewable energy and introduced standardize PPA, implementation agreement & FiT.

Rural Electrification Strategy and Plan 2013-2022: The target is to increase rural electrification to 26% by 2022

SE4ALL Action Agenda, 2014: Support Uganda aim in achieving the SDG with its 3 objectives (i) providing universal access to modern energy, (ii) doubling the global rate of improvement in energy efficiency, and (iii) doubling the share of renewable energy in the global energy mix by 2030.





3. Renewable Energy Sector Overview



Renewable Energy Potential

Potential is significant beyond hydropower, and includes biomass, solar, geothermal and wind.

Potential

Hydro	Large hydro (2000MW), mini hydro (200MW)
Biomass	460 million tonnes of biomass standing stock with a sustainable annual yield of 50 million tons
Solar	5.1 kWh/m ² of solar energy
Geothermal	450 MW
Wind	Preliminary data from weather stations has shown high wind speed in the Karamoja Region



Renewable Energy Potential Cont'd

RE is key to addressing some of the challenges in the sector and country at large.

- ❖ Diversifying the energy mix
- ❖ Mitigating climate vulnerabilities
- ❖ Meet the country's energy needs
- ❖ Improve energy access
- ❖ Reduce environmental pressures
- ❖ Create “green” jobs



Strategies for Increasing Generation Capacity

The country is already prioritizing RE investments to meet its power generation needs

Various projects are undertaken to increase generation capacity with the most notable ones being the ongoing projects of HPP Karuma (600MW), Isimba HPP (183MW).

Global Energy Transfer Feed in Tariff (GET FiT) Program: Additional payments per kWh above and beyond the regulated REFIT tariffs: Fast track up to 15 small scale renewable energy generation (1MW-20MW) promoted by private developers with a total installed capacity of 125 MW projects.

GET FiT Solar Facility involves a reverse auction approach where ERA determines the rate and GET FiT would offer the gap payments to the tariffs tendered to the successful bidders. 2 firms were successful - 2 X10 MW.

GET FIT Installed Capacities by Technology

Renewable Energy	Capacity (MW)
Hydropower ≤ 20MW	80.2
Biomass	1
Bagasse	26.9
Solar PV	20
Total	128.1



Barriers to Renewable Energy Development



- ❖ Resource availability data records for some RE technologies;
- ❖ High up-front cost of new technologies;
- ❖ Limited long-term funding opportunities;
- ❖ Lack of experience in technologies beyond hydro.





4. Rationale for SREP in Uganda



Rationale for SREP Funding

Program Objectives

- ❖ Highly catalytic in supporting the GoU in meeting the country's targets set in the SE4ALL Action Agenda, Uganda's Vision 2040 and Renewable Energy Policy.
- ❖ Hard investments and soft support to overcome the identified barriers.
- ❖ Replicate innovative approaches that have proven successful in other SREP pilot countries.
- ❖ Support consolidation of sectoral regulatory frameworks.

Rationale

- ❖ Diversify RE technologies in energy mix;
- ❖ Increase energy access and availability;
- ❖ Increase investor confidence; and
- ❖ Further improve the country's policy framework for renewables.



Selection of the Priority Renewable Technologies for SREP

- ❖ The SREP National Task force and MDBs during a joint mission undertook a detailed and transparent process cutting across all SREP criteria and National criteria to prioritize the technologies.

- ❖ Results of the priority areas for investment:
 - Geothermal
 - Solar PV off grid
 - Solar PV on grid with net metering
 - Wind



SREP – Investment Projects

Project

1

**Development of
130MW of
Geothermal in
Uganda**

*Executed by:
AfDB/IFC and GRD*

Funded by:

SREP:	USD	33.8m
MDBs:	USD	70.0m
PS:	USD	230.0m
GoU:	USD	7.0m
DPs/Others:	USD	48.0m

Project

2

**Decentralized
Renewables
Development
Program**

*Executed by:
AfDB and RED/REA*

Funded by:

SREP:	USD	9.4m
MDBs:	USD	14.6m
PS:	USD	0.0m
GoU:	USD	2.1m
DPs/Others:	USD	0.0m

Project

3

**Wind Assessment
and Pilot Wind
Farms**

*Executed by:
AfDB and RED*

Funded by:

SREP:	USD	6.8m
MDBs:	USD	14.0m
PS:	USD	230.0m
GoU:	USD	5.4m
DPs/Others:	USD	14.0m

Project 1 : Development of 130 MW of Geothermal

- ❖ Eastern Africa region known to have abundant geothermal potential,
- ❖ High entry costs followed by relatively cheap electricity production,
- ❖ Potential estimated at 450MW in areas of Kibiro, Katwe-Kikorongo, Panyimur and Buranga,
- ❖ Creation of Geothermal Resource Department at MEMD,
- ❖ Studies undertaken for the last 20y financed by Iceland (ICEIDA), UNDP, OPEC, IAEA, JICA and Germany:
 - geochemical and geological investigation in Katwe, Buranga and Kibiro
 - airborne geophysical surveys while Transient Electro Magnetic studies to measure conductivity of subsurface rocks were conducted



Project 2 : Decentralized Renewables Development Program

Decentralized Mini-Grids

- ❖ Develop an off-grid master plan for the electrification of islands across Lake Victoria to determine priority investments; and
- ❖ Design and construct at-least 10 mini-grids in different islands where impact can be maximised.

Decentralized Urban Small-Scale Solar PV with net metering

- ❖ Install 10x25KW solar PV rooftop in national buildings around Kampala, Jinja, Mbale and Entebbe to test this technology before a scale-up for private sector; and
- ❖ Develop regulations, legislation, standards, strategy and investment guidelines.



SREP Uganda Investment Plan



Project 3 : Wind Assessment & Pilot Wind Farms

Wind mapping exercise

- ❖ Procure & install 6 wind measurement equipment; and
- ❖ Establish wind speed database.

2 pilot wind farms at the most promising site

- ❖ Conduct feasibility study to select 2 suitable sites;
- ❖ Package and implement 20MW demonstration wind farm; and
- ❖ Support capacity building/training of local workers/engineers.



SREP Uganda Investment Plan



SREP – Expected Results

- ❖ Annual electricity output increase from renewable energies in GWh,
- ❖ Annual increase in public and private investment in Uganda in USD,
- ❖ Increase in installed capacity in MW,
- ❖ Number of jobs created for men and women, businesses and community services benefiting from increased grid penetration,
- ❖ GHG emissions saved,
- ❖ Energy access in remote rural locations such as isolated islands in Lake Victoria,
- ❖ Diversify energy mix,
- ❖ Replication of the projects,
- ❖ Number of sites with good wind regimes and wind maps in the Karamoja region,
- ❖ Attract private sector investment in taking the lead on the scale up of the technology.





5. Financing Plan, Results Framework & Program Implementation Structure



Financing Plan

Funding Sources

- SREP – Uganda IP is USD 455.1 million.
- CIF/SREP contribution is USD 50.0 million
(22.50 grants and 27.50 concessional loans)

Indicative Financing Table (million USD)

PROJECTS	GoU	SREP	MDBs	PS	DPs/ Others	Total
1. Development of 130 MW of Geothermal	7.0	33.8	70.0	230.0	48.0	388.8
2. Decentralized Renewables Development Program	2.1	9.4	14.6	0.0	0.0	26.1
3. Wind Assessment & Pilot Wind Farms	5.4	6.8	14.0	0.0	14.0	40.25
Total	14.5	50.0	98.6	230.0	62.0	455.1

Amended Results Framework

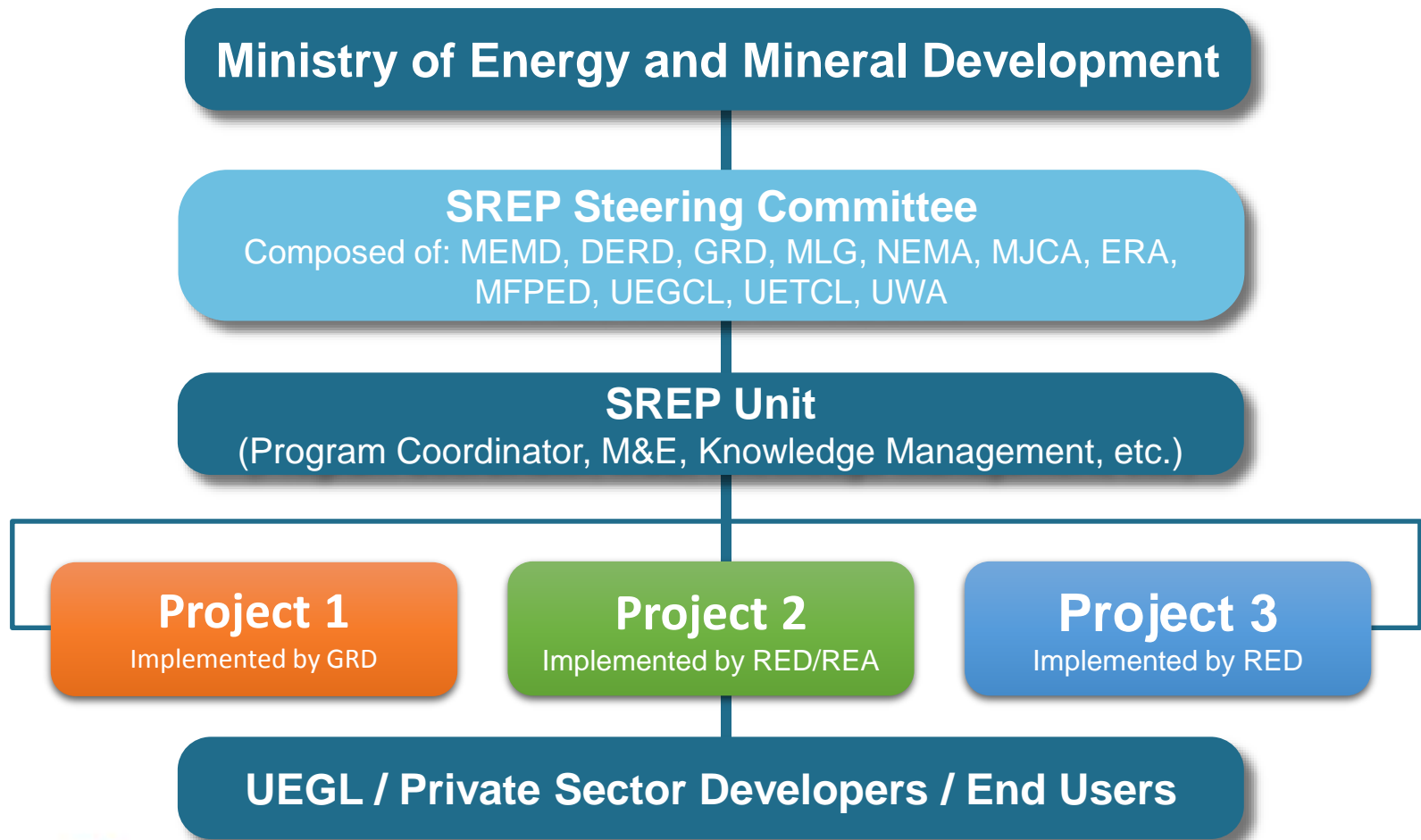
Result	Indicators	Baseline	Targets	Means of Verification
SREP Transformative Impacts				
Support low-carbon development pathways by reducing energy poverty and/or increasing energy security	National measure of energy poverty	MEPI ^a = 0.87 (Access rate of 13% in 2010) Electricity used in 2010: 75kWh per capita	MEPI ^a = 0.1 (Access rate of 80% by 2040) Electricity used: 462 kWh per capita by 2020	Country-based reporting using household survey data
	Electricity output from renewables in GWh per year	na	877.73 GWh per year	Utilities companies and MEMD
	Increased annual public and private investments (\$) in targeted subsector(s) per country	na	USD 455 million By 2025	National M&E



Amended Results Framework

Result	Indicators	Baseline	Targets by 2025	Means of Verification
SREP Programme Outcomes				
Increased supply of renewable energy	Increased annual electricity output (GWh) as a result of SREP interventions.	na	Project 1: 797.16 Project 2: 1.73 Project 3: 78.84	SREP Projects' M&E systems
Increased access to modern energy services.	Increased number of women and men and businesses and community services benefitting from improved access to electricity as a result of SREP interventions.	na	Project 1: 520.000 Project 2: 5.000 Project 3: 30.000	SREP Projects' M&E systems
New and additional resources for renewable energy projects.	Leverage factor: US\$ financing from other sources compared to SREP funding.	USD 50 million	USD 405 million	SREP Projects' M&E systems
Avoided GHG emissions	Avoided GHG emissions (tons CO ₂ e per GWh) as a result of SREP interventions.	0	163.000 tons CO ₂ e per year once SREP projects are operational.	SREP Projects' M&E systems

Program Implementation Structure



6. Conclusion



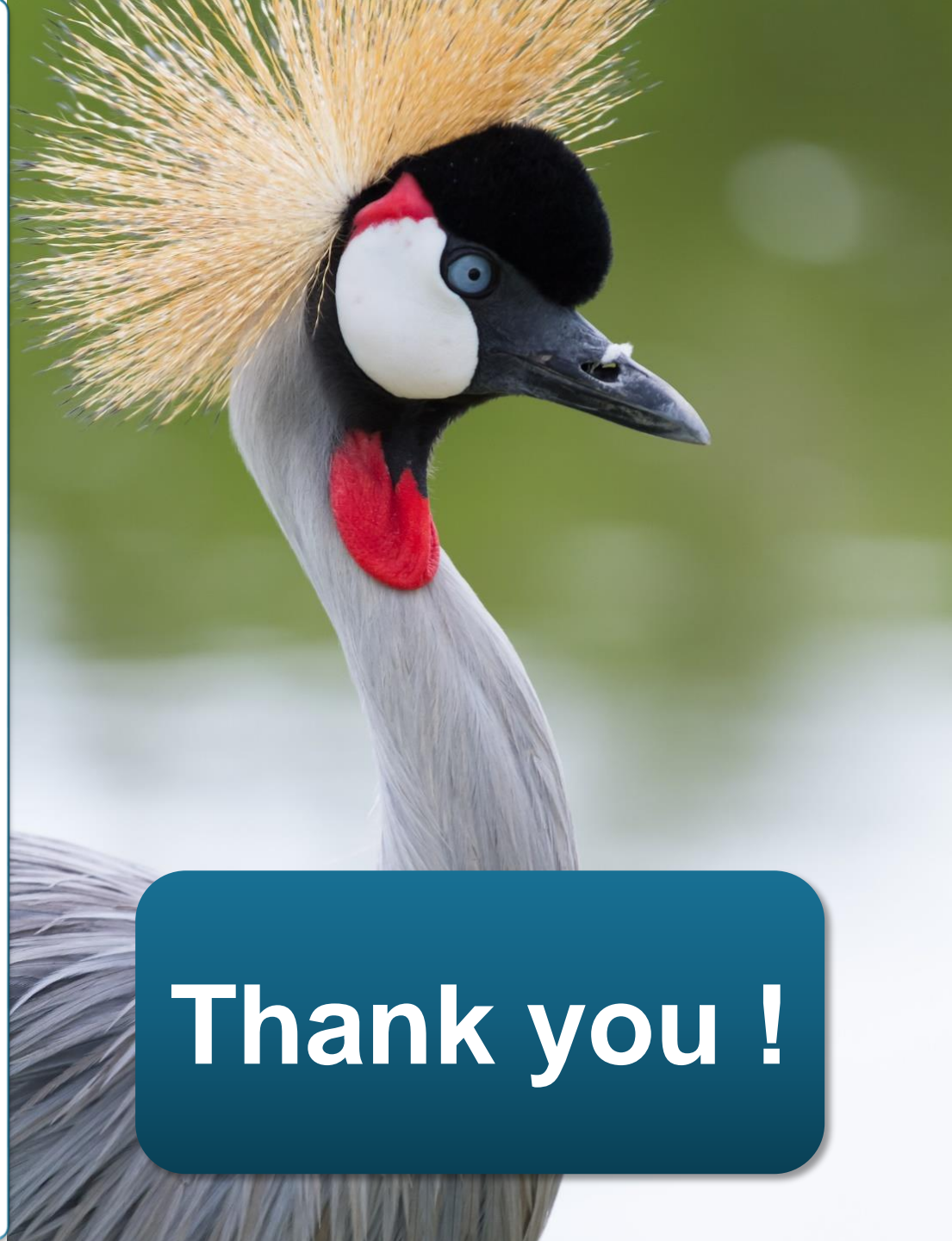
Conclusion

- ❖ Uganda is endowed with abundant renewable energy resources which are fairly distributed throughout the country.
- ❖ This endowment of renewable energy resources has the potential to help the country diversify its energy mix by making the system less exposed to climate vulnerabilities affecting its hydro resources and meeting a considerable share of its energy needs.
- ❖ Uganda's efforts in diversifying the energy mix as we increase generation capacity can benefit from the SREP support
- ❖ Through SREP seed funding of USD 50 million, an overall investment of USD 455.1 million will raise electricity generation from low carbon RE technologies by 151 MW.
- ❖ CIF / SREP funding will catalyze venturing in hitherto uncharted territories, in particular geothermal unique to the Eastern Africa region.

Your support will help us move towards the vision of transforming our country.



SREP UGANDA INVESTMENT PLAN



Thank you !