AFRICA CLIMATE RESILIENT INFRASTRUCTURE SUMMIT (ACRIS)

APRIL 27TH-29TH 2015

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Ministry of Electricity, Dams, Irrigation and Water Resources

The Republic of South Sudan

Introduction

In July 2013, the Ministries of Electricity and Dams, and Water Resources and Irrigation were merged and renamed the Ministry of Electricity, Dams, Irrigation and Water Resources with the following Mandate:

To carry out duties, functions and roles pertaining to electricity and water with the objective of providing sustainable, cost-effective, reliable and affordable Electricity and Water services to the People.

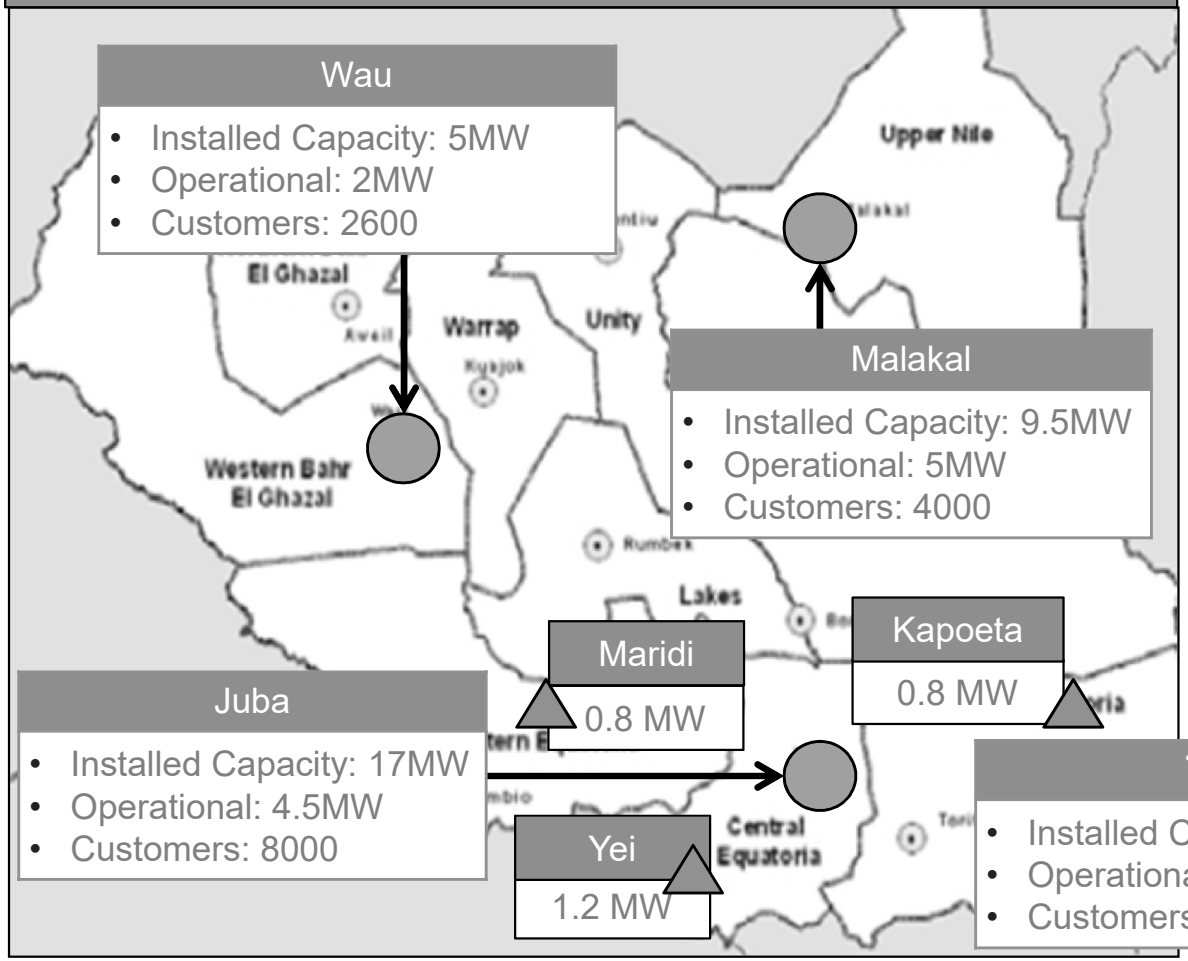
Climate-Ready and Investment-Ready Projects in the Electricity Sector

Overview of Energy Supply in RSS

- Only 1% of the population has access to electricity power, which is based on thermal generation; the country with the most underdeveloped energy sector in the region;
- 99% of the households rely on biomass, e.g. firewood and charcoal;
- 83% of the population live in rural areas;
- The Country is rich in minerals and hydropower potential that can be harnessed to generate clean and affordable electricity to provide basic services to the citizens and cheap power to meet development needs; and
- In view of the above, the current sources of energy have environmental degradation effects and subsequent climatic implications.

Existing decentralized grids based on diesel generation

Isolated Distribution Networks & Mini-Grids



Wau
- Installed Capacity: 5MW
- Operational: 2MW
- Customers: 2600

Malakal
- Installed Capacity: 9.5MW
- Operational: 5MW
- Customers: 4000

Juba
- Installed Capacity: 17MW
- Operational: 4.5MW
- Customers: 8000

Maridi
0.8 MW

Kapoeta
0.8 MW

Yei
1.2 MW

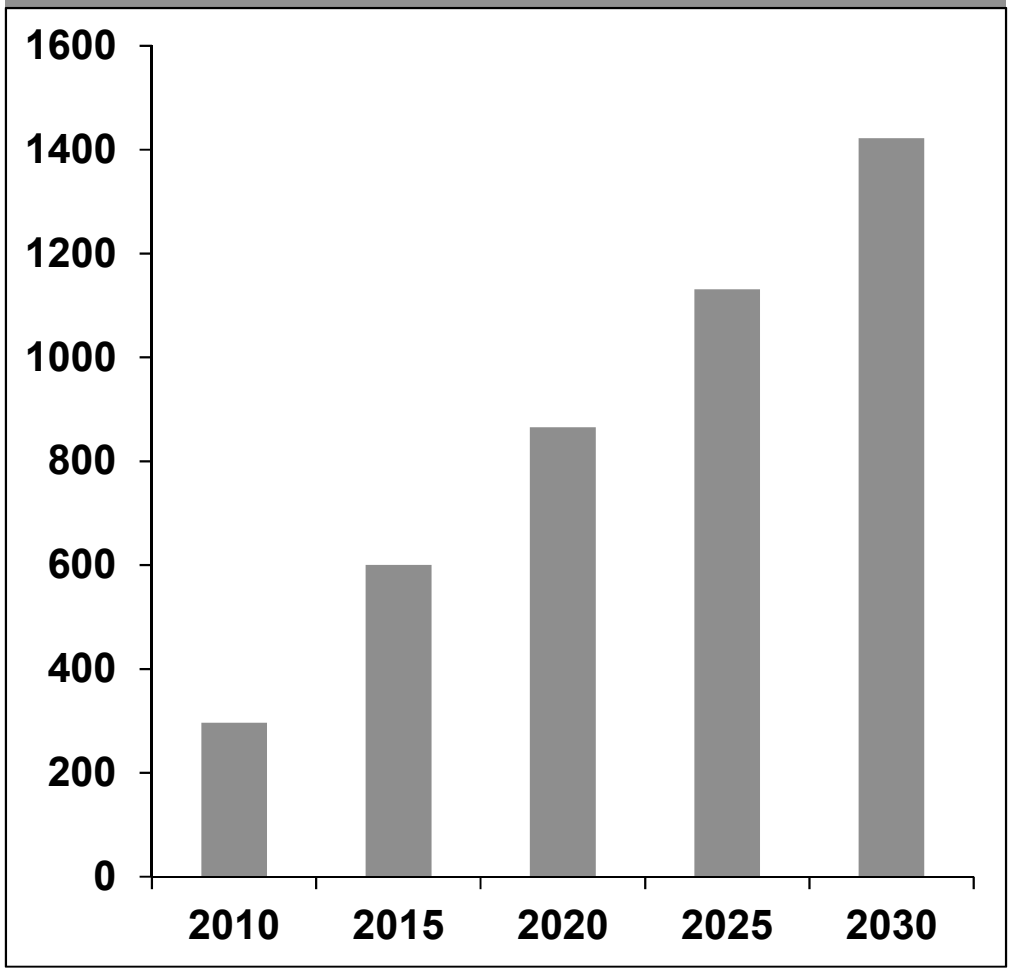
Total
- Installed Capacity: 30MW
- Operational: 22MW
- Customers: 22,000

Current Electrification

- No interconnected transmission grid, electricity sector composed of:
  - Commercial center networks: Juba, Malakal, Wau and Renk
  - Rural mini-grids: Yei, Kapoeta, Maridi
- Customers are upper-income residential and some business
- Industry and business rely on self-generation with diesel generators
  - Remaining population rely on firewood / biomass for energy
- Renewable energy supply is not yet tapped

Demand for accessible and affordable electricity

Expected Electricity Demand in South Sudan (MW)



Demand for Access

- Growth of electricity sector suppressed by supply, not demand
- Demand for electricity expected to increase 7-8% per annum based on economic growth rates
- Per capita electricity consumption is 1-3 kWh

Demand estimated at 300 MW today is expected to rise to 1400+ MW by 2030

Main Objectives of the Electricity Sector

- Increase **generation capacity** through implementation of planned projects and proposed new sources of power generation
- Mobilize **financial resources for electricity** projects, to accelerate economic activities such as mining and industry
- Develop, expand, and reinforce generation and **distribution networks** in the state capitals
- Build new **transmission lines** and substations (National Grid)
- Invest in regional interconnection, including the **East Africa Power Pool (EAPP),** to access wider power market
- Support rural electrification by **off-grid renewable** energy sources, e.g. solar, wind and mini-hydro

Government priorities will be achieved through collaboration with development partners (WB & AfDB), effective private sector participation, public private partnerships and public sector initiatives in accordance with national master plan

Planned climate resilient Projects (Hydropower)

S/No	Name	Estimated Capacity	Estimated Cost
1	Grand Fula	890 MW	1,474 MUSD
2	Beden	540 MW	1,392 MUSD
3	Lakki	410 MW	480 MUSD
4	Shukole	235 MW	500 MUSD
5	Sue Multipurpose Dam	10.4 MW	1,300 MUSD
6	Kinyeti mini-hydro	1.95 MW	27 MUSD

Feasibility studies on these projects have been completed

Off-Grid and other Renewable Energy Opportunities

- The Government encourages the use of solar power, especially in rural areas
- South Sudan experiences approximately 12 hours of sunshine per day all year round
- Solar radiation is 4.0 – 6.0 KWh/m²/day
- There is a potential for small-scale Photo-voltage (PV) installations to serve schools, health centres, irrigation projects and businesses
- There is a potential for larger scale solar-thermal power plants
- Given favourable conditions for agricultural production, there is significant potential for combined food production and biomass-based power generation projects in various parts of the country
- The Government is hoping to attract investors to restart 2 large-scale sugar and co-generation projects at Melut and Mangalla; and a large-scale oil-palm mill and co-generation plant at Nzara
- The Government is also interested in proposals for urban waste-to-power projects in Juba and other major towns

The Ministry plans to diversify power generation sources, with specific focus on renewable energy, to reduce dependency on thermal power generation.

Climate-Ready and Investment-Ready Projects in the Water Sector

Overview of Water Resources in South Sudan

- South Sudan is endowed with huge reserves of fresh water resources; but these are unevenly distributed across the territory and vary substantially between years and seasons;

- Very many communities continue to suffer from the adverse effects of seasonal flooding and draught as a result of inadequate water resources management infrastructure and mechanisms;

- There is a need to mitigate resources-based conflicts related to water by increasing spatial and timely availability and distribution of water; and

- Also, South Sudan has to develop its water resources to unleash the country's irrigation potential and contribute to income generation and food security.

Examples of Climate Resilient Projects/Programmes

- To minimize inter-communal conflict, the Ministry has been coordinating interventions pertaining to water harvesting and storage (haffirs, water barriers, valley tanks, pans and micro/mini dams) since 2005; and there has been continuous improvement of the design for safe and integrated utilization and management.

- The improvements included introduction of proper fencing, tap stands or hand pumps, solar/generator pumping system, elevated water tank and cattle troughs raising cost to **US$1.2 million per facility**.

- The emphasis being that the water use need to be multipurpose, e.g. for livestock watering, horticulture, aquaculture and humans with treatment at household level.

- These combined water facilities call for robust management & sustainability arrangements; and increasing of their numbers.

Examples of Climate Resilient Projects/Programmes

- Construction of Water embankments/dykes in flood prone areas to safeguard livelihoods (farmlands, pasturelands & assets)

- In support of agricultural production/productivity, the Ministry has embarked on preparation of Irrigation Development Master Plan (IDMP), in collaboration with MAFCRD, MLFI and JICA.

- IDMP will continuously provide information on hydrometeorology and other engineering aspects pertaining to water control and delivery infrastructure at some farming, aquaculture, forestry and livestock projects'/schemes' sites.

- The government has planned for more safe water supply projects and improved sanitation facilities in various locations under the Kigali Action Plan (KAP), so as to help in conserving water, both quantity and quality wise.

- Establishment of hydro-meteorological observation system with support of IGAD and NBI.

Partnership Opportunities with development partners & potential investors

Studies

- Completed feasibility studies for 8 state capitals' water supply and sanitation systems
- Ongoing process for feasibility studies on water and sanitation infrastructure projects in different parts of the country

Ongoing Projects

- Implementation of the expansion of Water Master Plan in the capital city
- Upgrading and expansion of additional urban water supply system in some major cities
- Assessment of water harvesting structures for sustainable livelihoods and peace building

Concluding Remarks

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- For energy security in the EA Region to take shape, adequate financial and political support must be provided to enable implementation of national development programs;

- Recognizing the need of climate resilient infrastructure as well as the high potential of renewable energy and irrigation in the country, RSS will pursue regional cooperation, regional integration and partnership with the private sector.

- The electrification plans and water services related projects of RSS will mainly be successfully achieved through the support of development partners (in form of grants, soft loans, etc), effective private sector participation and PPP; and

- A regulatory framework and institutional reform is being tackled; and the private sector is encouraged to invest in the envisaged infrastructure projects through PPPs and BOOTs.

Thanks for Listening