APPROACHES TO UTILITY RESILIENCE: CREATING AN ENERGY SECTOR THAT IS PREPARED FOR THE UNEXPECTED

JUNE 2020
UGANDA

Located in East Africa

Approx. 242,872 Sq. Km

GDP Per Capita FY2018/19 – USD 878

34.63 Million people (2014 census)
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6 EMERGING OPPORTUNITIES
NATIONAL ELECTRICITY GENERATION STATUS

National Installed Capacity: 1,182MW

- Solar Power Plants: 4%
- Solar Diesel Hybrid: 1%
- Cogeneration Power Plants: 8%
- Thermal Power Plants: 8%
- Small Hydropower Plants: 10%
- Bujagali Hydropower Plant: 21%

Total number of Hydropower Dams in Uganda is 43

- Large Dams (>20MW): 10
- Small Dams (<20MW): 34

563 MW – 48% UEGCL's Market Share
## GOVERNMENT ELECTRICITY SUB-SECTOR TARGETS

<table>
<thead>
<tr>
<th>Development indicator</th>
<th>Baseline Performance as at 2020 NDP II</th>
<th>NDPIII Target 2025</th>
<th>Vision 2040</th>
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</thead>
<tbody>
<tr>
<td>Per capita electricity consumption (kWh)</td>
<td>272</td>
<td>578</td>
<td>3,668</td>
</tr>
<tr>
<td>% of population with access to electricity</td>
<td>22%</td>
<td>60%</td>
<td>80%</td>
</tr>
<tr>
<td>Installed capacity (MW)</td>
<td>1252 (563 UEGCL)</td>
<td>3,500</td>
<td>41,738</td>
</tr>
<tr>
<td>Estimated Uganda’s Population [Million]</td>
<td>40.24</td>
<td>46.8</td>
<td>71</td>
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UEGCL ASSET PROFILE - LOCATION

River Nile - Longest in the world. 6,695Km

Nalubale (180MW) + Kiira HPP (200MW)

Isimba HPP (183MW)

Nyagak III HPP (5.5MW)

Muzizi HPP (45MW)

Karuma HPP (600MW)

Nalubale (180MW) + Kiira HPP (200MW)
ENERGY DIVERSIFICATION EXPLOITS

- **Solar**
  - Country Potential estimated at 1000 MW
  - Exploring Solar/Hydro Hybrid Potential of 50MW plant in Hoima

- **Geothermal**
  - Potential of about 450 MW
  - Well testing has began under the Ministry of Energy.

- **Thermal**
  - UEGCL to take over 50 MW Namanve Thermal Plant in 2020.
DOUBLE CRISIS

COVID ‘19

MAINTAIN SOCIAL DISTANCING

COVID-19

FLOODS

1st Global Lockdown in recent history

Highest Lake Victoria level since 1964 and Flooding within East Africa
Lake Victoria rose by about one meter.
Incident on 14th April 2020. 180MW Station switched off for about 10-15 days due to severe clogging of trash racks.
Floods are regional, however, impacts are largely localized in different parts of the affected countries
UGANDA: LOCATION AND KEY DATA

UGANDA’s ENERGY SECTOR

UEGCL COMPANY PROFILE

COVID’19 AND HIGHEST WATER LEVEL SINCE 1964

PANDEMIC IMPACT AND PROPOSED FUTURE RESILIENCE MEASURES

EMERGING OPPORTUNITIES
COVID ‘19 has had more severe impact on business than the floods because of its global impact. Therefore, in order to increase resiliency, the actions that need to be implemented for COVID’19 are focused more on the business processes and not just the operation of the physical assets.
IMPACT AND RESILIENCE – HUMAN RESOURCES

IMPACT

- Categorization of staff into essential and non-essential - Mild worry about Job security, personal reflection on careers, low staff engagement, KPI’s not met
- Staff not prepared to work from home – coping new work routines – “organically” built, a number of parameters on performance contracts will not be met
- Quarantined staff at site – no suitable substitute for family social connections
- Possible reduction on disposable income of staff over time → hike public transport fares, imported household goods, extended families responsibilities etc. after lockdown
- Extra effort and cost needed by management to keep staff morale who are working on sites.

RESILIENCE

- Multi-Skilling of staff to increase flexibility within work teams
- Lean / flatter Organization structures to enable quick decision making – Prioritizing of tasks
- Review succession plans frequently
- Encourage peer-to-peer collaborations for problem solving amongst staff.
- Promote alternative working schedules
- Build a strong staff coaching culture amongst managers to encourage self-initiative for staff to sustain productivity when working from home
**IMPACT**

- Low collection by Distribution companies
- Increase in commercial losses – theft of power
- Declining National Energy Demand (20% less) – short term
- Forex Exchange losses on P&L due Panic by investors (we have a huge borrowing in US Dollars for our Projects)

**RESILIENCE**

- Allow for annual contingency budgets to prepare for emergencies. However, impact may outstrip any contingency budgetary provision.
- A cost effective mechanism to hedging has to be found. Suitable for businesses operating commercially
- Support the installation of Post paid systems and strengthen SCADA systems for power distribution to reduce on commercial losses
- Shareholders loans to be converted into currency which has less sensitivity to Forex movements – in our case Shillings. Plus, convert Debt to Equity
- Last resort, Government subsidy. Review of relevant laws and Government Policies to cater for such in the future.
IMPACT AND RESILIENCE – CAPITAL PROJECTS

**IMPACT**
- Delay in completion of projects.
- Absence of key supervisory staff may lead to shoddy works.
- Increased costs due to extension of time.
- Potential claims from Contractors due to delay in approvals.
- Potential impact on ability to repay loans + revenue collection due to project delays.
- Diversion of finance due to crisis funding needs.

**RESILIENCE**
- Improve Contingent planning by increasing contingencies in contracts for time and costs.
- Making bridge financing arrangement to address crisis periods.
- Improving design robustness to address crises.
- Developing multi skilled project management professionals.
- Improving adaption of procurement laws and guidelines within Crisis management.
- Allowing for more tail end risks in tariff modelling.
IMPACT AND RESILIENCE – PLANT OPERATIONS

IMPACT

- Reliability of Power Generation became an important KPI - customers at home expect power due to work and children being at home
- Increased spinning and grid system reserves due to decline in demand
- Temporary accommodation of essential staff, all subcontractors and security at site due to lockdown and curfew.
- Increase in O&M expenditure on Covid’19 PPE
- Fully reliant on local capacity to operate, maintain and deal with emergencies on power plants

RESILIENCE

- Conduct drills for such extreme events so as to develop practical mitigation measures for continued operations
- Adoption of Remote Operations
- Update of Emergency Preparedness Plans
- There is need to have local capacity to supply cheap and easy to get materials to build quick, safe and decent temporary structures
- Have a current record of the available redundant logistical and equipment capacities available from other Utilities or Government agencies to quickly build synergies during a crisis time
Cyber security – due to increase in remote working and reliance on digital channels

Increased demand on the business to facilitate working from home – Airtime, data bundles

Embraced online meetings, collaboration and email use

Reduction in the use of printing paper

ICT has become a core business enabler and facilitator of business continuity

Embrace on a future proof digital transformation and process automation journey

Embed Information Security across all business processes and accelerate staff sensitization on cyber security

Support Business Continuity processes, remote operations and set up disaster recovery options

Increase uptake of mobile device management (MDM) for enhanced security of mobile devices

Enhance data encryption for both data at rest and data in transit coupled with robust data backup regimes
Force Majeure by Contractors and Concessionaire

Increase in emergency actions taken by management which increases the risk of litigation from staff and suppliers.

Review Insurance adequacy of Policies on business interruption if site operations stop due Covid’19. We anticipate insurers to review exclusions due to global pandemics.

Risk of increased in the number of Contract Variations as regular O&M Contractors have to cater for Covid’19 PPE and increased logistical costs of supplies.

IMPACT AND RESILIENCE - LEGAL

- Risk analysis on insurance exclusions
- Review and coordinate properly all the Force Majeure events in the different contracts such that there is no net penalty onto the business due to one or more contractor force majeure occurring
- Risk appetite review and adjust mitigation
- Optimize Employee contractual benefits for staff working from home

IMPACT
- Force Majeure by Contractors and Concessionaire
- Extension of project completion schedules -> Variation orders -> Claims -> dispute resolution, renegotiating of contracts for expatriates
- Increase in emergency actions taken by management which increases the risk of litigation from staff and suppliers.
- Review Insurance adequacy of Policies on business interruption if site operations stop due Covid’19. We anticipate insurers to review exclusions due to global pandemics
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RESILIENCE
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Due to economic downturn, there is Talent available on the Market → human capital reinforcement e.g from the tourism and hotel industry

Previous untested staff abilities have been demonstrated → enhanced team work, leadership

New areas of research of how businesses can cope with fast changing risks

An opportunity to make a global overhaul of the Traditional models of management to enhance organizations ability to cope with fast changing environment

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<td>Flattening of Organization structures to enable quick decision making</td>
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<tr>
<td>Embracing digital platforms and social media as mainstream tools for work</td>
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<tr>
<td>Increased inter Organizational alliances</td>
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<td>Environmental Benefit such as Reduction on printing paper and reduced carbon footprint with people working from home.</td>
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THANK YOU