ASSESSMENT OF NUCLEAR POWER INFRASTRUCTURE DEVELOPMENT IN UGANDA USING INPRO METHODOLOGY.

By

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Country Profile

Location: East Africa

Total Area: 241,038 km^2

Area covered by water: 36,330 km^2

Capital: Kampala

GDP growth rate: 6.80%

Population: 37.58 million

Total Installed Capacity: 851.53 MW

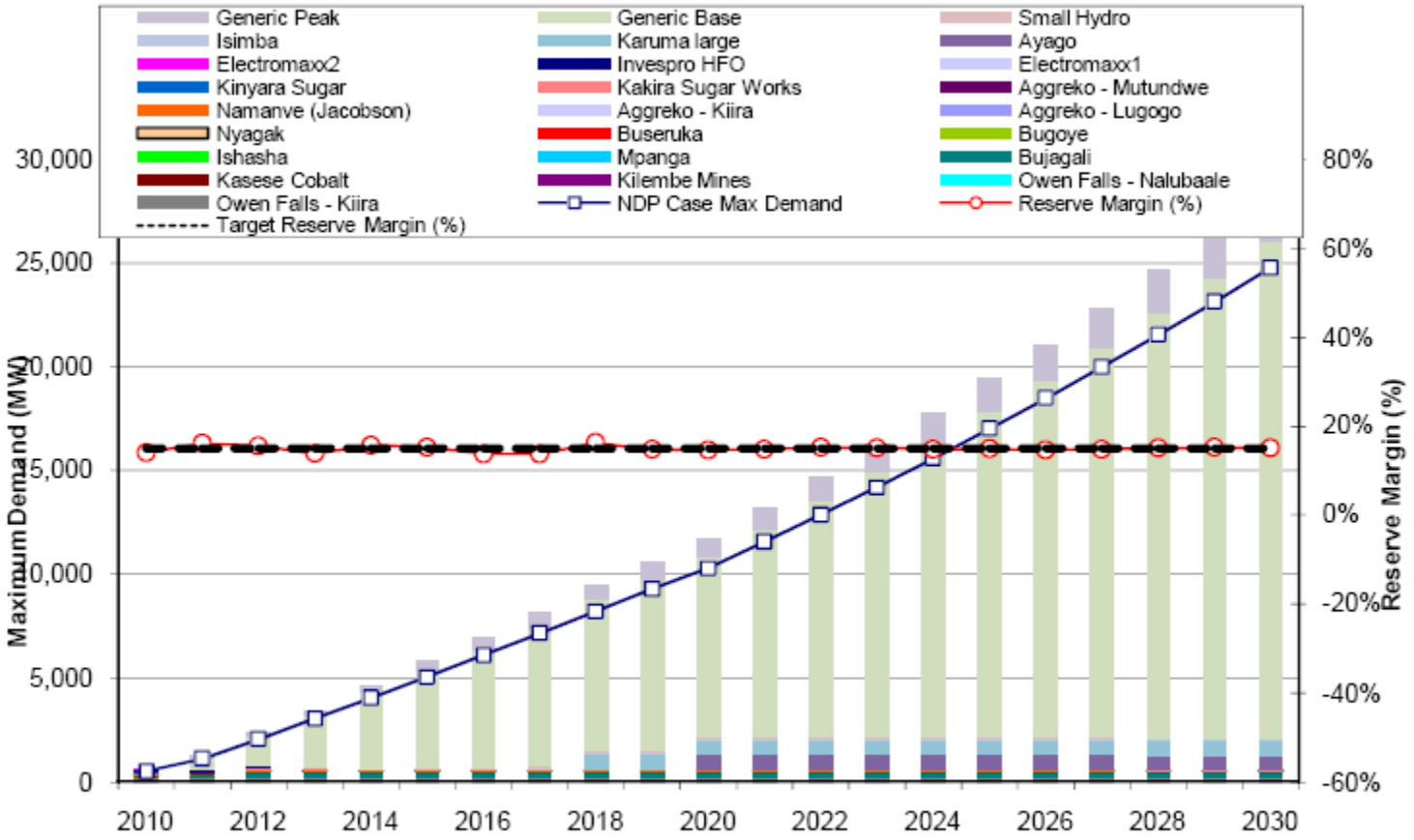
Electricity consumption: 150 kwh/capita

Access to national electric grid: 15%

Vision 2040 target: 41,738 MW

Sources: UBOS, 2013, World Bank, Uganda Vision 2040, National Budget Framework Paper 2014/15 -2018/19

Proposed Generation Plan-NDP1 Scenario



Source: PSIP 2010

Status of Nuclear Power Infrastructure Development

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Legal and Institutional Infrastructure

Criteria	Status
Legal aspects	-**Electricity generation, transmission, import, export, sale and distribution** - Electricity Act, 1999. -**Radiation protection** - Atomic Energy Act, 2008 and Atomic Energy Regulations, 2012. -**Environmental protection** - National Environmental Act, 1995. -**Occupational safety and health** - Occupational Safety and Health Act, 2006. **- Water Regulation** – Water Act, 1997. -**Compensation of workers** - Uganda Workers' Compensation Act, 2000. -**International Instruments:** Party to NPT.

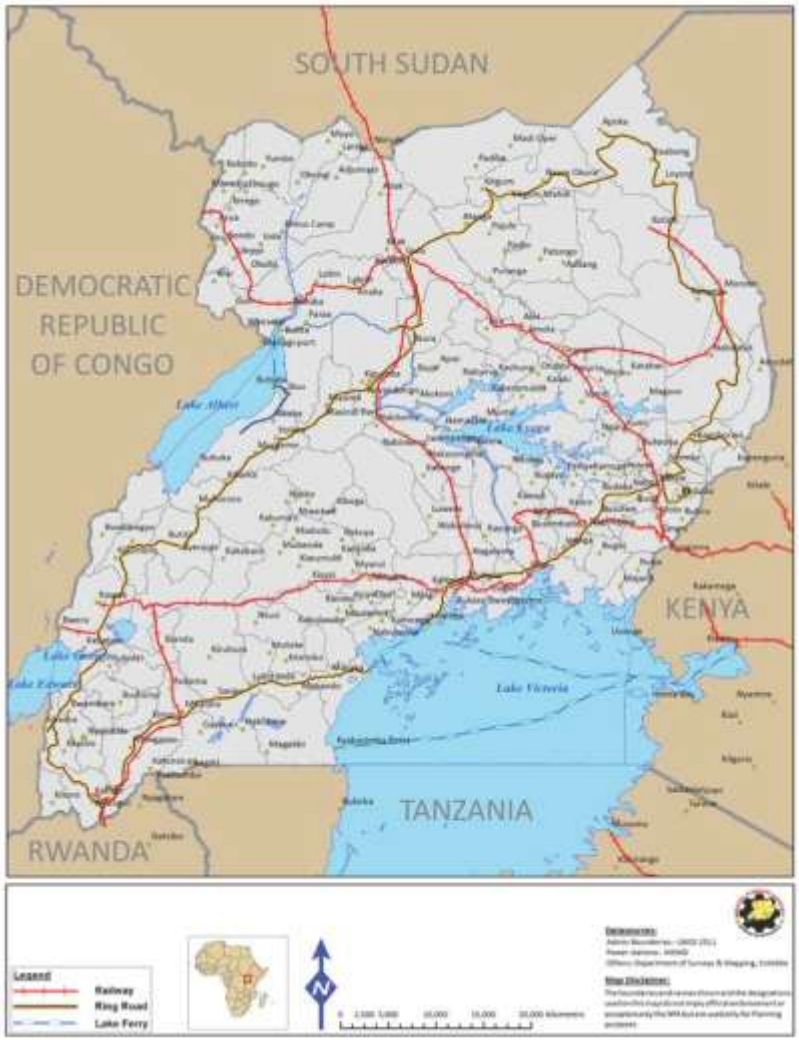
Legal and Institutional Infrastructure..

Criteria	Status
Institution	**Safety:** Atomic Energy Council, National Environmental Management Authority, Occupational Safety and Health Department, Ministry of Gender, Labour and Social Development. **Security:** Security Organisations. **NEPIO:** Nuclear Energy Unit, Ministry of Energy and Mineral Development. -**Education and Training:** Universities, Technical Colleges and Vocational Institutes. -**Electricity Secto**r-Electricity Regulatory Authority, Electricity Disputes Tribunal, Uganda Electricity Generation Company Limited, Uganda Electricity Transmission Company Limited, Uganda Electricity Distribution Company Limited.

Industrial and Economics Infrastructure

Criteria	Status
Funding of infrastructure	-Funds for training core staff, establishing basic infrastructure such as laboratories, offices, and general operations provided in Medium Term Expenditure Framework (MTEF) for the Financial Years 2013/14 - 2015/16. -Development of financing plan for nuclear power projects is planned.
Size of nuclear facility	-Generation capacity planning for 2014 -2040 being conducted. -Survey of nuclear fuel cycle services to meet planned capacities is also seriously being considered.
Siting	-Siting criteria based on EPRI Siting Guide 1006878, NG-T-3.7 and S433 draft safety guide is in place. - Laboratory with Advanced ArcGIS.10.2 is established to surveying potential sites. -Data collection and preliminary analysis ongoing.
Support infrastructure	- Local industrial survey is planned.

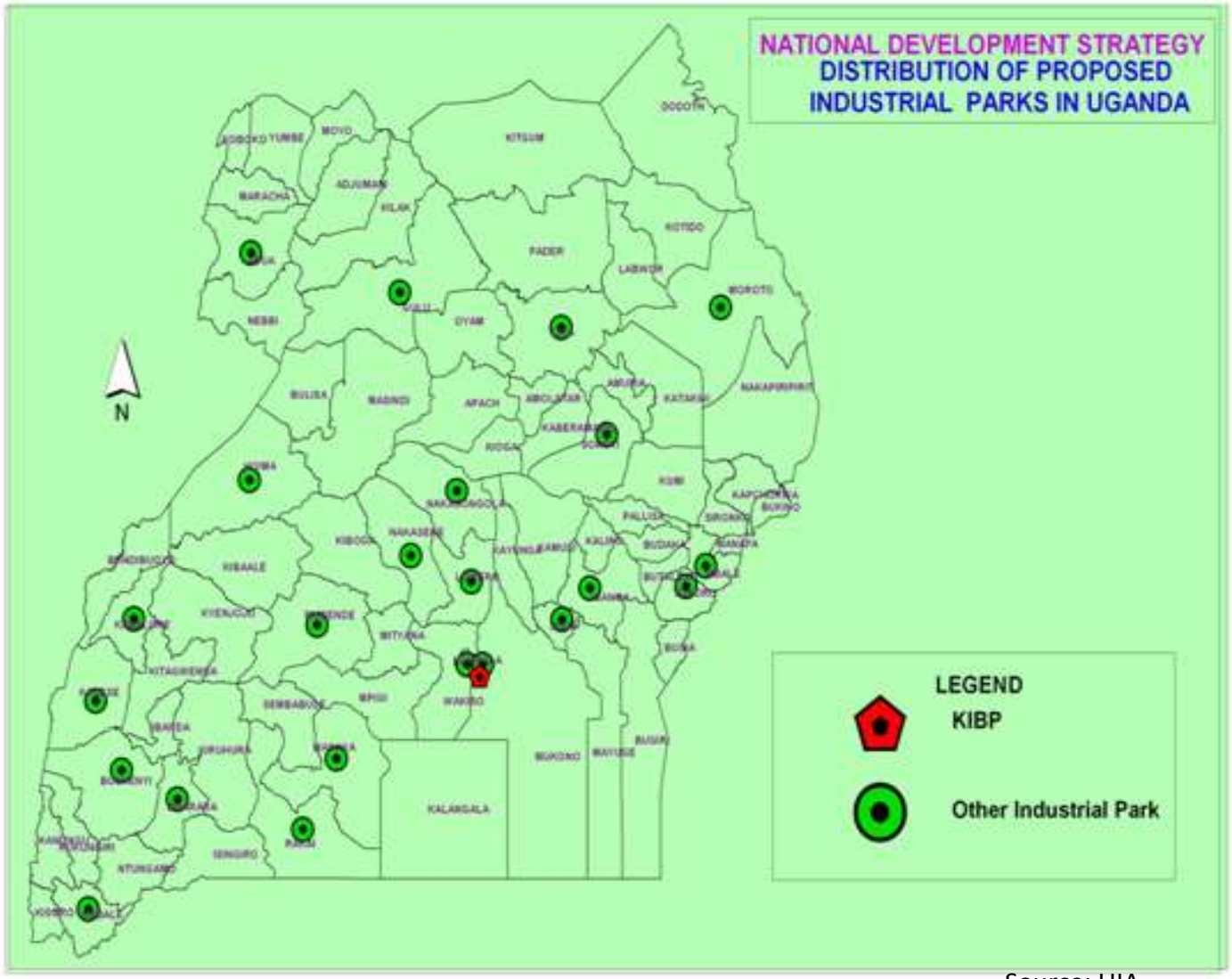
Industrial and Economics Infrastructure



Standard Gauge Railway (SGR) connecting:
-Regional Cities,
-Special Function Cities,
-Neighbouring Countries.

Source: Vision 2040

Industrial and Economics Infrastructure



Source: UIA

Political Support and Public Acceptance

Criteria	Status
Public information	-Recruitment and training of Communication Specialist and establishment of a Nuclear Information Centre are planned. Public awareness carried out regularly in Universities.
Public participation	Working groups comprising of members from different MDAs have been formed to implement the strategy on introduction of nuclear power.
Survey of public acceptance	Survey of public acceptance is planned.
Policy support	-Uganda Vision 2040 identifies nuclear energy as an option for meeting the energy deficit. -NDP 2010 – 2015 provide for specialised training of human resources in nuclear energy. -Draft strategy on introduction of nuclear power describes strategic actions for addressing the key infrastructure issues.
Political, environment and Investor risk	-Studies on management of radioactive waste are ongoing.

Human Resources

Criteria	Status
Human resources	**-Non-graduate workforce-** Skilling Uganda, 2011-2020 targeting BTVET to create employable skills and competencies relevant in the labour market instead of educational certificates. -**Non-nuclear graduate workforce-** 6 Public Universities and 31 Private Universities. -**Nuclear graduate workforce** – Training abroad in the medium term with support from development partners. -**Atomic Energy Council** has 12 Radiation Protection Officers. **-Nuclear Energy Unit** has seven post graduates in nuclear fields. -**Working Groups** to make use of existing local expertise. -**Korean experts** through KOICA to transfer skills to local experts. -Human resource needs assessment and eventual preparation of human resources development plan is seriously being considered.

Minimization of Infrastructure

- Survey of suitable NES is being conducted.
- Most probable NES will be NPP for electricity generation.
- This will be selected from available proven reactor technology depending on their:
  - Safety
  - Economics
  - Environmental impact
  - Efficiency
  - Waste generation
  - Proliferation resistance

Regional and International Arrangements

Criteria	Status
Option to reduce institutional infrastructure	-Observer to International Framework for Nuclear Energy Cooperation. -Considering participation in African Network for Nuclear Power Infrastructure Development.
Options to reduce industrial infrastructure	- Atomic Energy Regulations, 2012 requires return of spent radiation sources to country of origin. -Member of Eastern Africa Power Pool (EAPP) for power trade.
Options to reduce social political infrastructure	- Approaches to nuclear infrastructure development are based on IAEA standards and international best practices.
Option to reduce human resources	-Member of AFRA and AFRA-NEST -Working with experts from South Korea through KOICA. -Engaging International constancy firms -Use of Government experts in other MDAs.

Conclusions

- Uganda is considering nuclear power as an option for meeting future electricity needs.
- The country has suitable conditions for nuclear power development.
- Efforts towards development of nuclear infrastructure exist.

Thank You