



For Sustainable Development

Energy Sector GIS Working Group

Achievements and Initiatives

The **10**TH

**UTILITIES GIS CONFERENCE,
KAMPALA-UGANDA**

21st of September 2023

Venue: Hotel Africana



A decorative graphic in the top-left corner consisting of a network of interconnected nodes and lines, with some nodes highlighted in blue. The background of the slide is a bright, hazy landscape with a line tower and power lines visible on the right side.

Outline

- About the ESGWG
- Member's Achievements and Initiatives
- Various Solutions
- Way Forward

About the ESGWG

GIS experts from **UETCL, REP, UMEME, UEGCL, UEDCL, MEMD and GIZ** agreed on common mapping standards and developed a common geo-database for the Energy Sector in Uganda.

Formed during the Joint Planners Meeting for the Energy Sector in **2011**.

This is the 10th Year of the ESGWG Utilities GIS Conference





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Mandate

- Owner of the distribution system 33kV and below.
- Monitor the concessions
- Distribution business

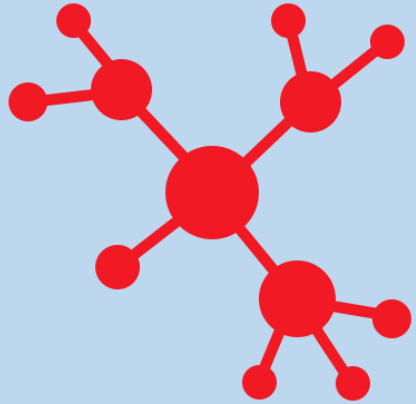


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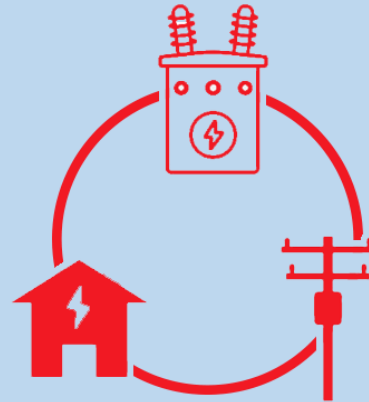
GIS Applications in UEDCL



Network
Monitoring and
Management



Customer
Service Support



Assets
Management and
Monitoring



Field Operations
Support



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GIS Applications in UEDCL

- In line with the mandate
 - Managing the distribution network assets register
 - Maintenance Support
 - Planning support
 - Data analytics And decision support

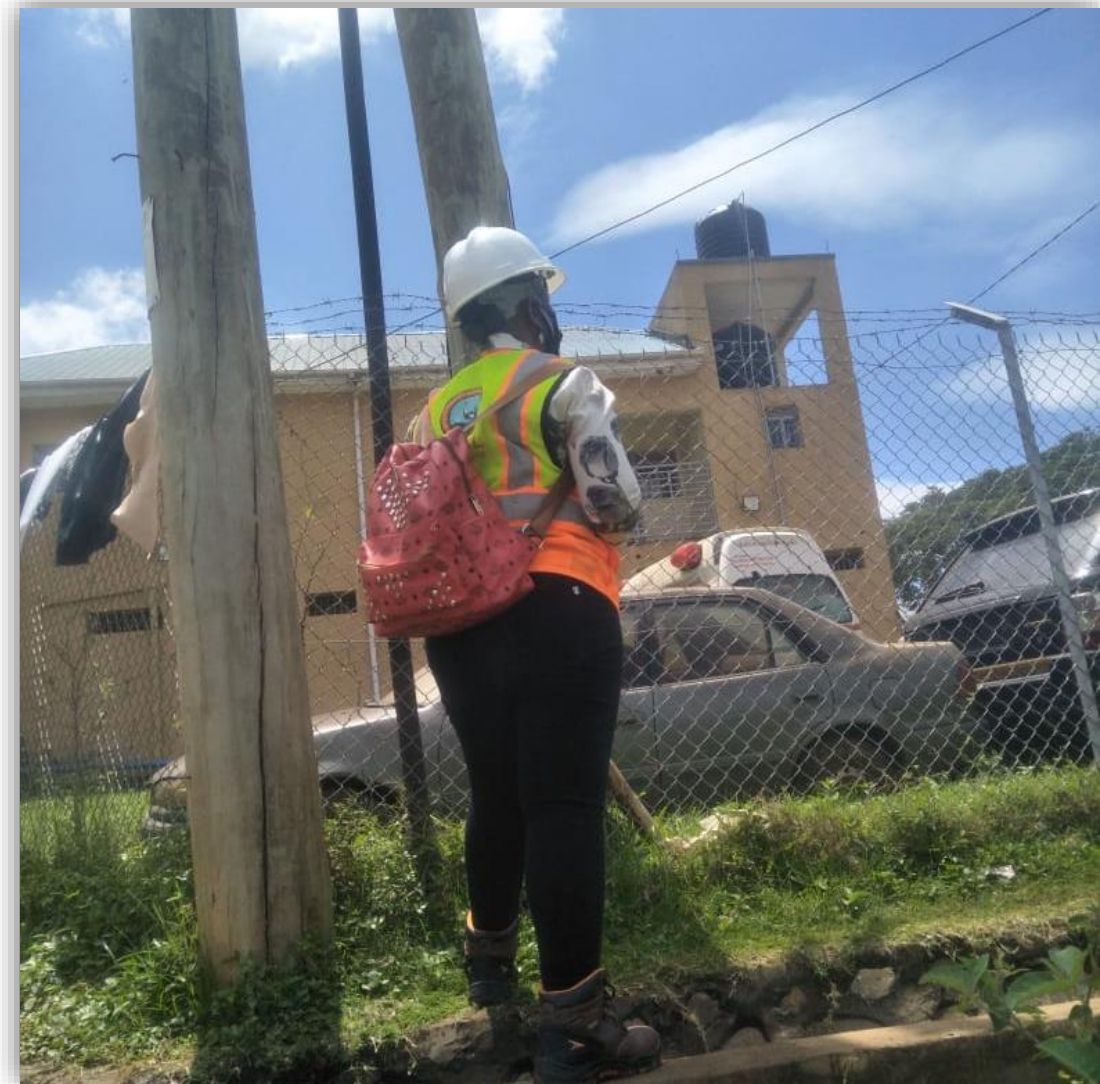
Managing the distribution network assets register

Achievements

- Fixed assets Data capture and update
- Successful Integration with Sun Systems



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Planning Support

- Data support
- Visualization
- Coordination and collaboration support with other agencies ie. ERA, Umeme, Wenreco etc
- Surveys

Project Identification

- From the UEDCL Investment Plan
- Adhoc Applications from Ministry, Public etc from Projects and Planning Sections.

Preliminary Data Acquisition

- Desk/Screen Survey

Logistics

- Route planning
- Vehicle/Fuel Requisitions
- Subsistence

Field Survey

- Field Exercise to Survey Proposed route

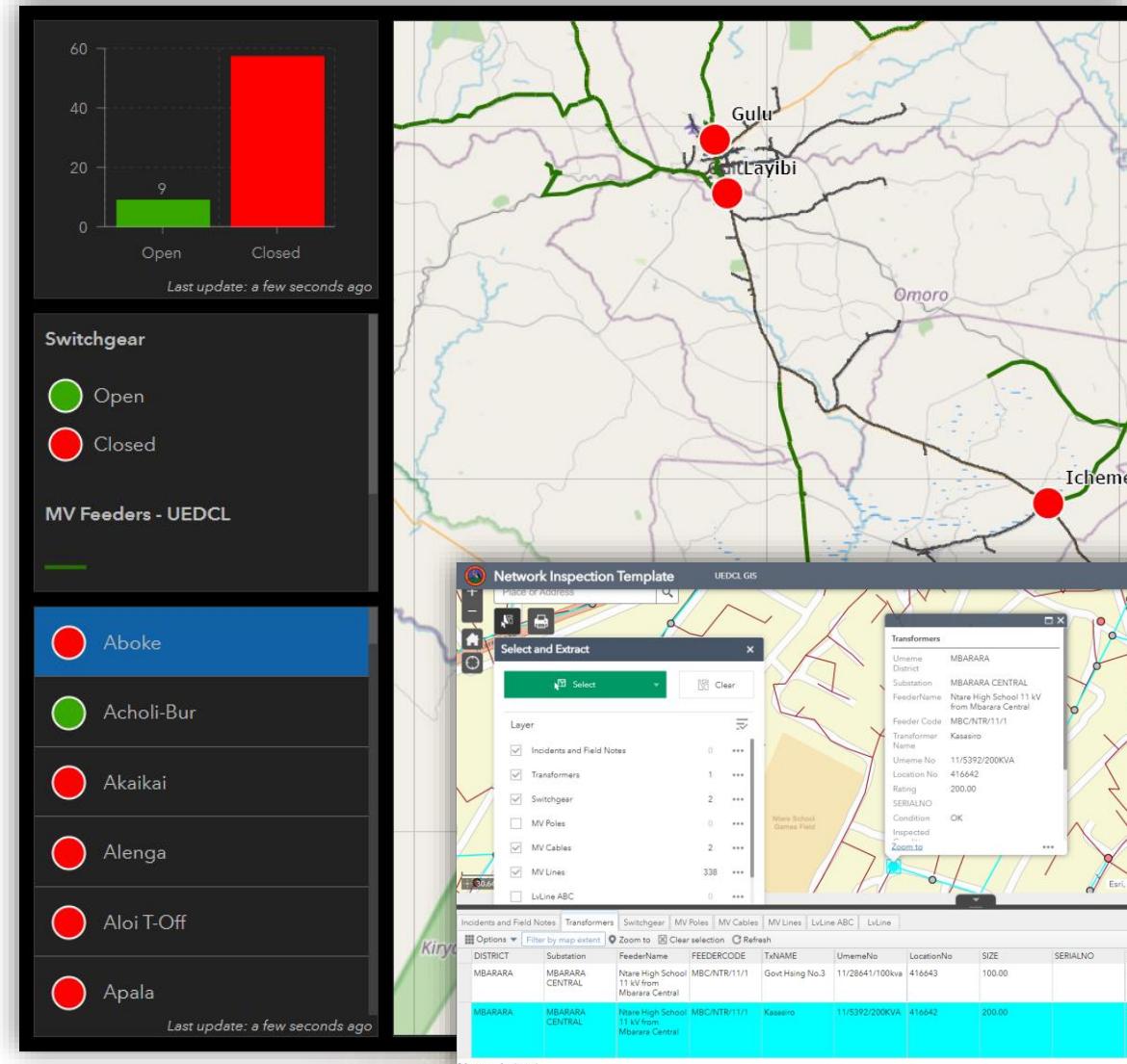
Drawings and Publication

- Data Analysis
- GIS Map of the Route

Network Monitoring and Management

Achievements

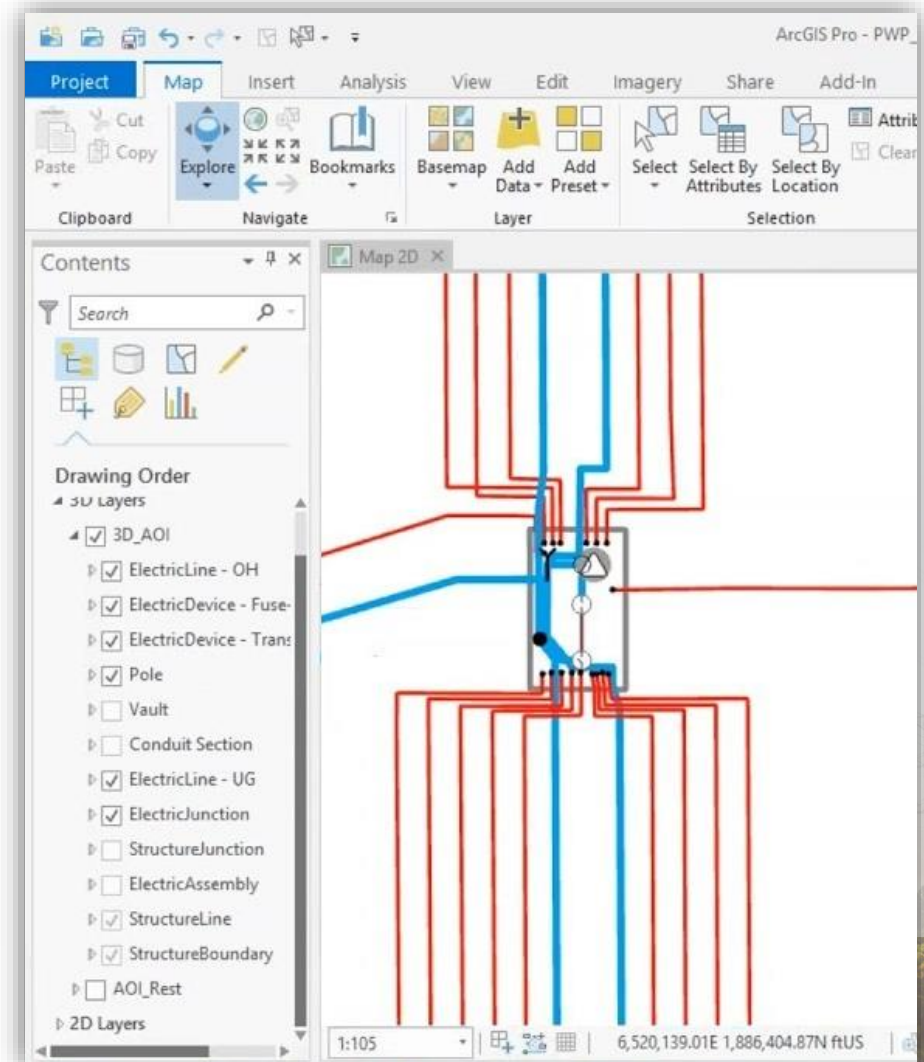
- SCADA Integration.
- Inspection and State
- Network refurbishment planning and execution.
- Transformer Monitoring*





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Utility Network Data Model



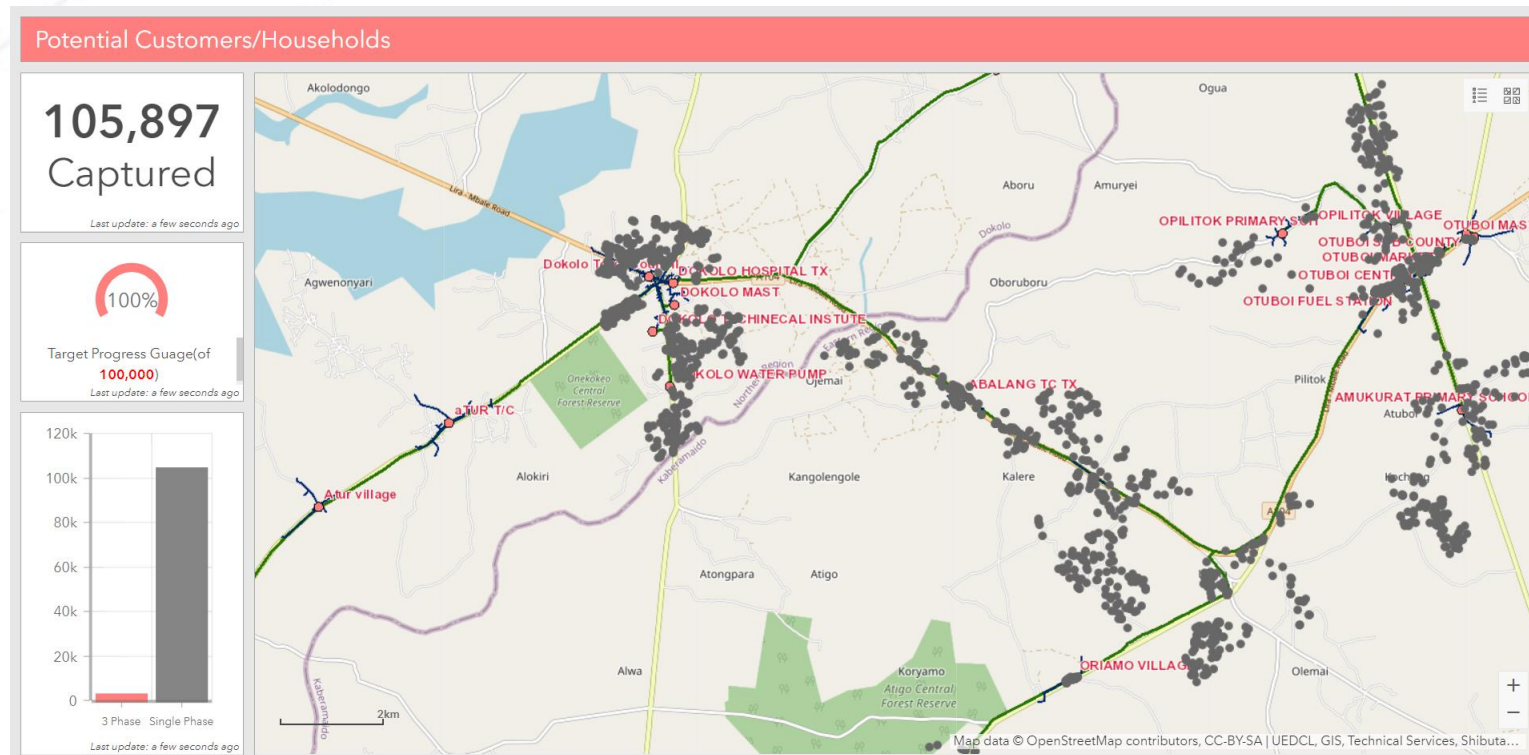
Lighting up your world

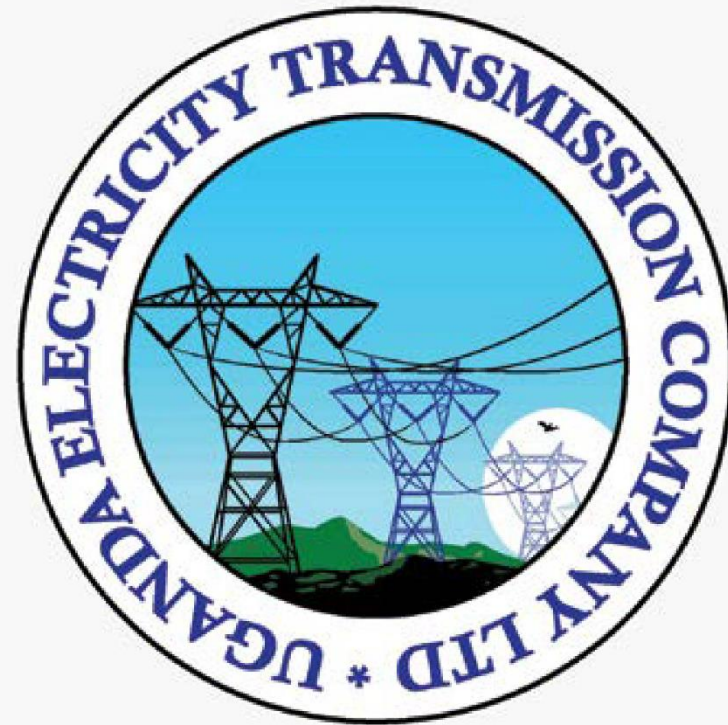
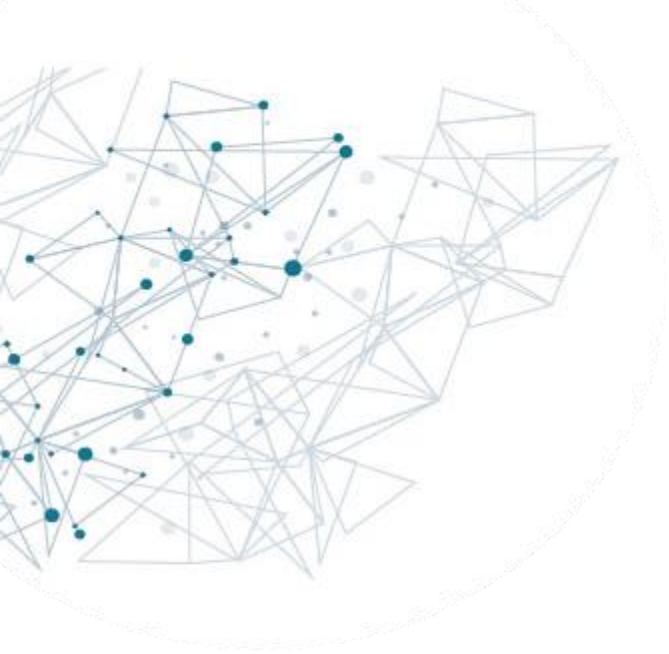


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Data Analytics and Decision Support

- Load flows
- Demand determination and analysis





UETCL

Transmitting power for development





Background

- UETCL has a lot of information about the grid which spans from the time Uganda commissioned its first transmission infrastructure to date. This information is critical in the electricity transmission for sustainable Regional development through buying, selling and transmitting quality bulk power.
 - The information in consideration above is about assets which are located in different geographical locations. As a way of storing information about different locations in relation to their location UETCL management found it fit to do a feasibility study phase 1 in 2009 and went ahead to do an implementation of baseline installation in phase 2 in 2016, phase 3 is pending.



GIS In UETCL

In 2009 UETCL carried out its **Phase I** of GIS implementation, the main task at hand was assessing the feasibility of GIS in UETCL, as well as having a pilot run of the system within the planning section.

In 2015 UETCL carried out its **Phase II** of GIS implementation, the main task at hand was rolling out the system at an enterprise level through setting up a GIS portal and data collection for existing transmission infrastructure at the time.

Phase III



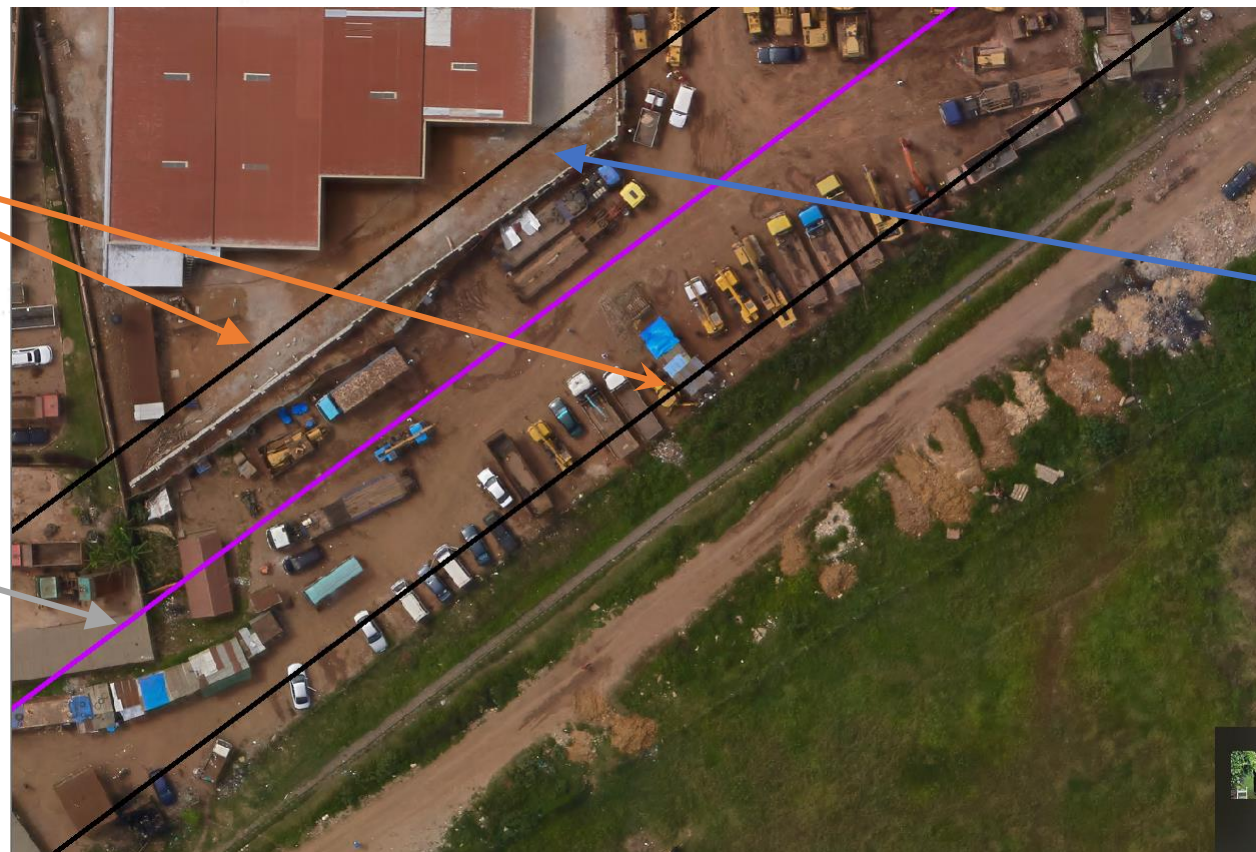
Application of GIS in UETCL

- Analysing wayleaves encroachment
- Workforce Management
- Monitoring wayleaves acquisition status
- Grid asset verification
- Rapid Valuation

Analysing wayleaves encroachment



Wayleaves extent



T-Line

Part of building with in wayleaves



Workforce Management

gis.uetcl.com/portal/apps/workforce/#/projects/48c5455576924b8d013b0522b6850d3/dispatch/assignments

Booking.com Amazon.com eBay Facebook YouTube

📷 🗨️ ▶️ ❤️ ⬇️ ☰

My Projects > Grid Management

Resources JJ Joel

Assign Filter by type, location or ID + Assignments

Status Due Priority Assignee Sort

6 assignments

- PAP Updates
Uetcl, Kintu, Nakasero, Kampala
Critical | 1 month ago **EN**
- PAP Updates
GNA: WATHUM ALFRED
2 days **JJ**
- Grid Maintenance
Purongo, Nwoya
Medium | 1 month ago **JJ**
- Grid Maintenance
Jetex Forex Bureau
Critical | 1 month ago **JJ**
- PAP Updates
Okollo, Madi-Okollo, Arua
High | 1 month ago **JJ**
- PAP Updates
GNA: THORACH LABAR
High **JJ**

Assignments

Workers

Clustering

ZOMA KILION

Esri, © OpenStreetMap contributors, HERE, Garmin, USGS | SGIS A

AWUJA ANI
POWERED BY
esri

Transmitting power for development



Way Forward

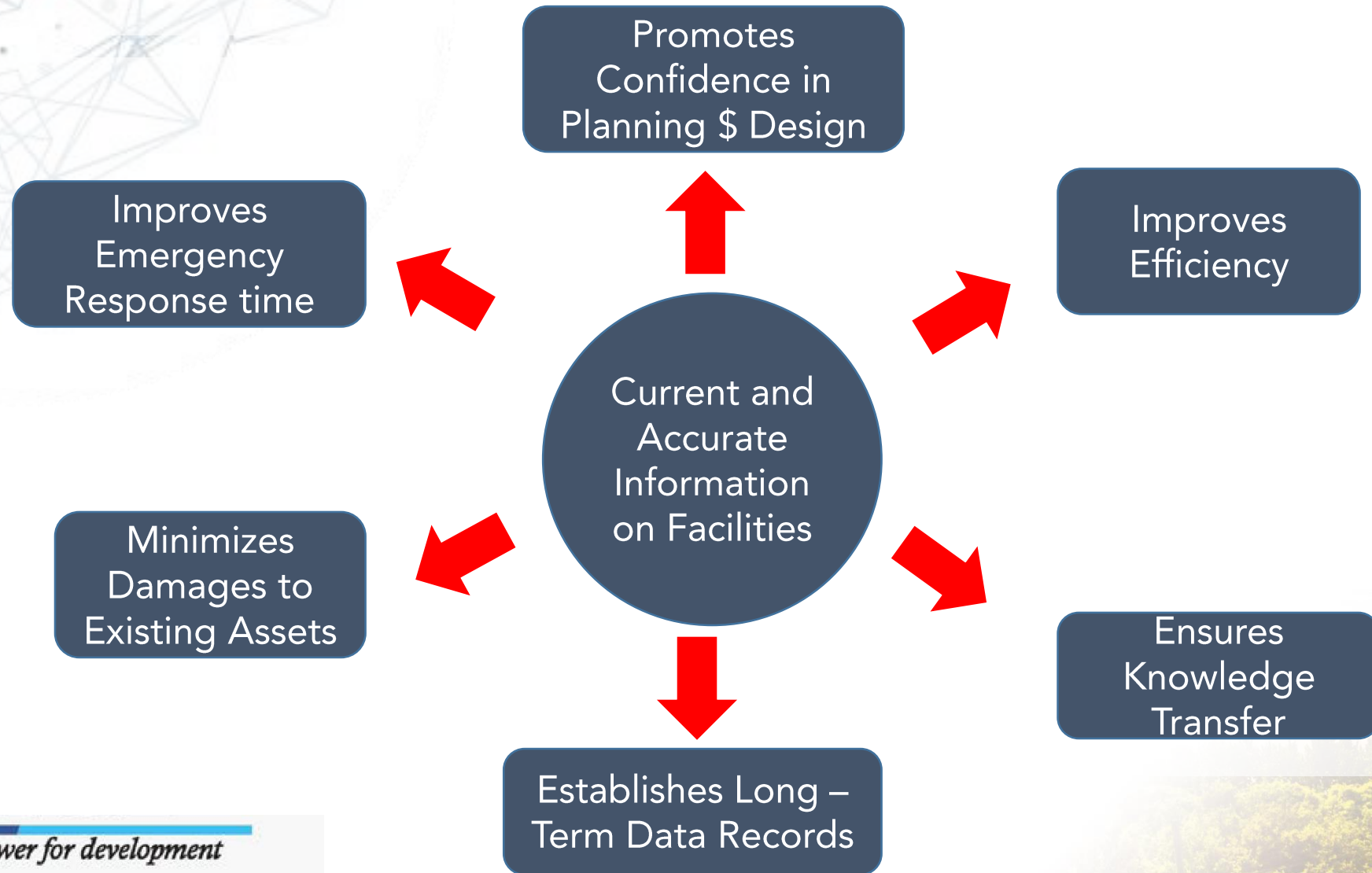
Change the Process of As Built Documentation

What is an As Built

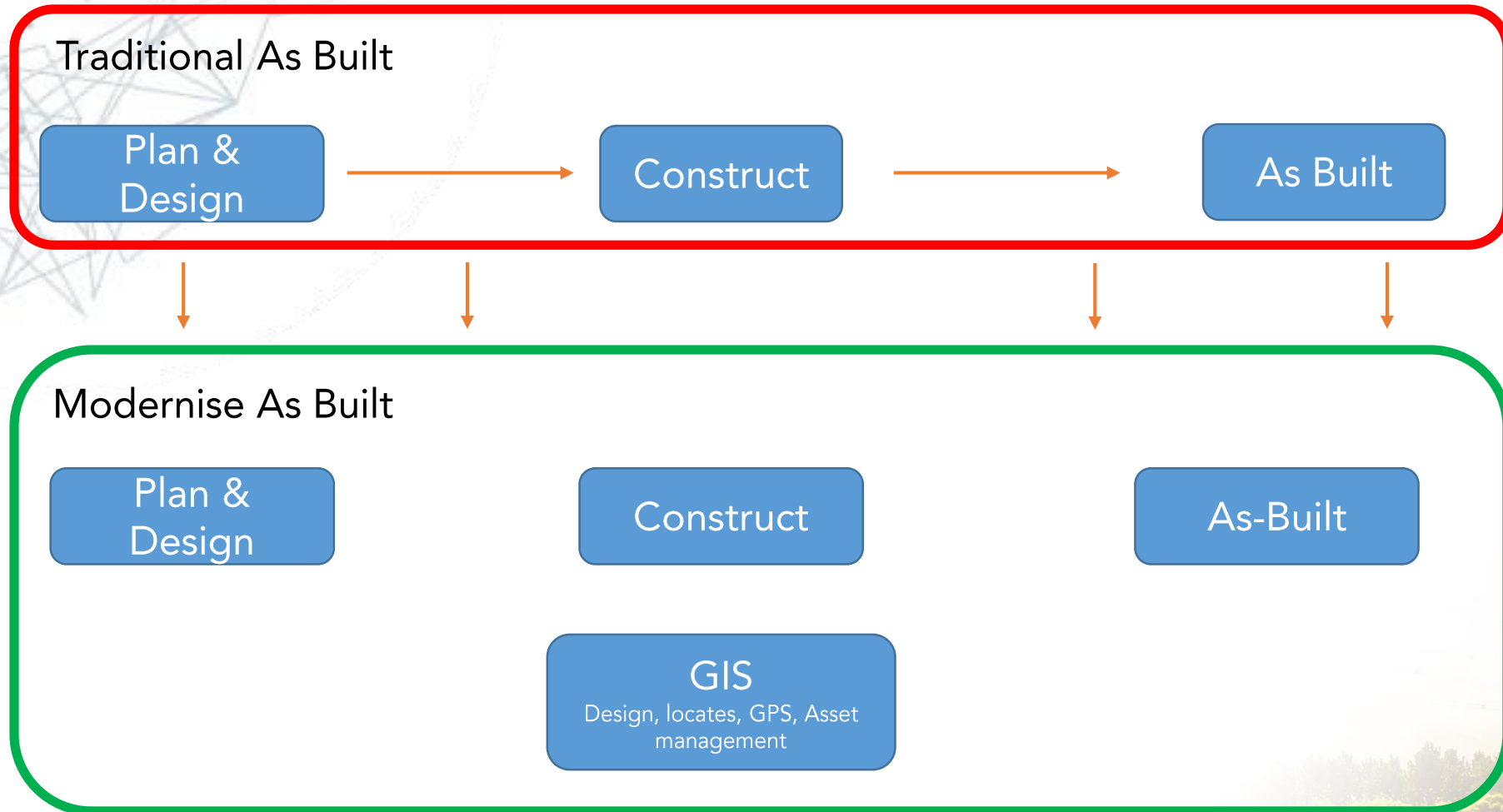
An as-built drawing is a revised drawing created and submitted by a contractor after a construction project is finished. They contain any changes made from the initial drawings during the construction process, and provide an exact rendering of the building and property as it appears upon completion.



Why UETCL Needs As Built Drawings



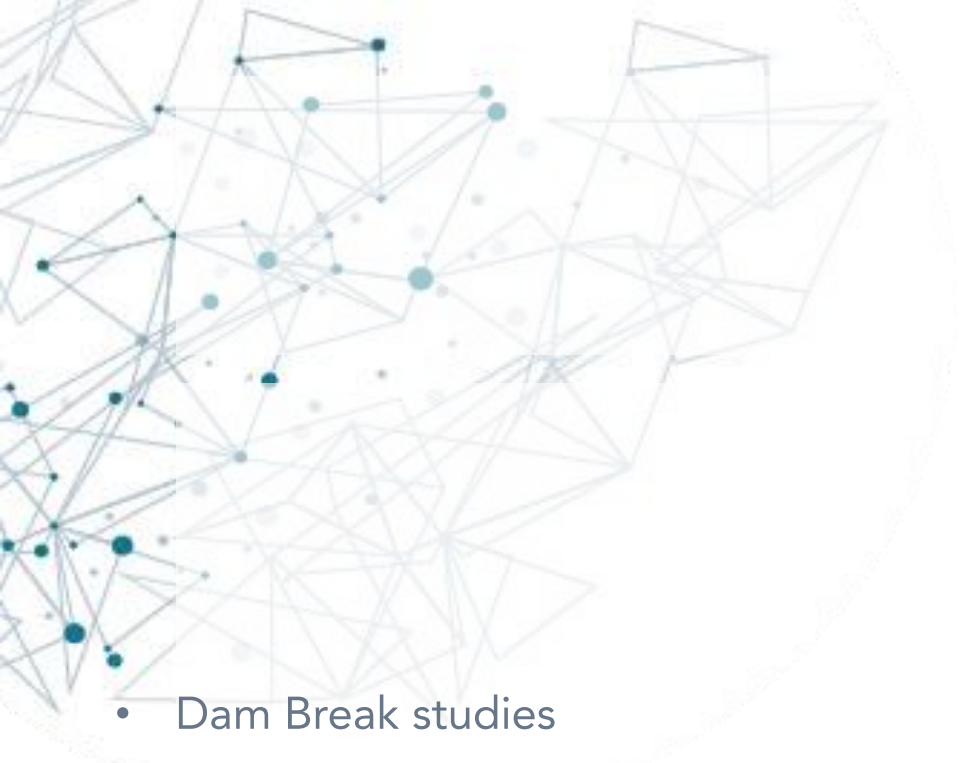
Review As Built Documentation



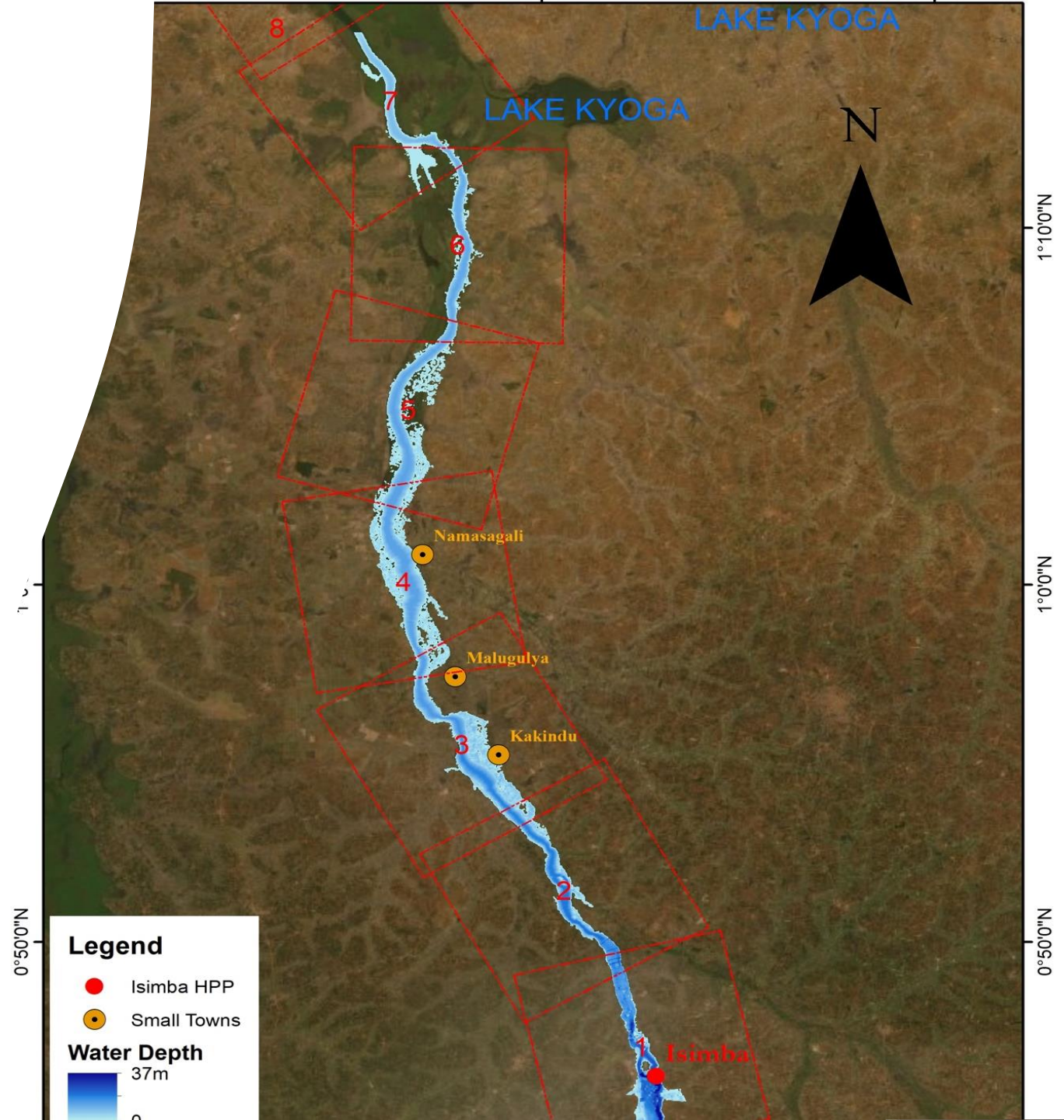


UEGCL
Generating for Generations





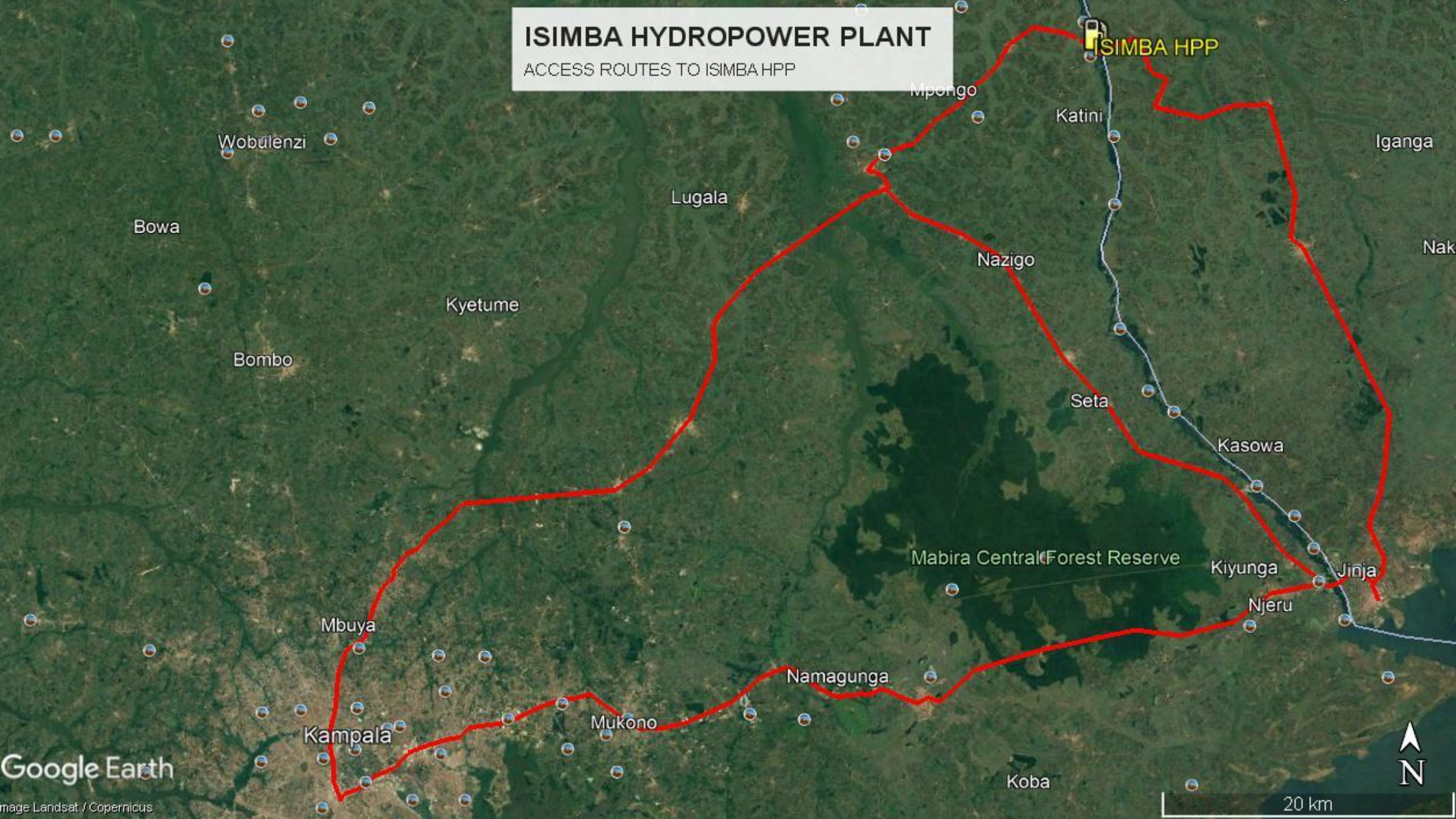
- Dam Break studies
- -Naluubale/Kira Breach scenario
- -Bujagali Breach scenario
- - Isimba Breach scenario



ISIMBA HYDROPOWER PLANT

ACCESS ROUTES TO ISIMBA HPP

ISIMBA HPP





From Kayunga

Main Gate

Staff Quarters

Road Bridge

From Jinja/Kamuli

Substation

Power House Control Room

Spillways

Helipad

ISIMBA HYDROPOWER PLANT

AERIAL VIEW OF ISIMBA HPP

Google Earth

Image © 2022 CNES / Airbus

500 m





PETROLEUM AUTHORITY OF UGANDA

GIS and You For Sustainable Energy



Introduction

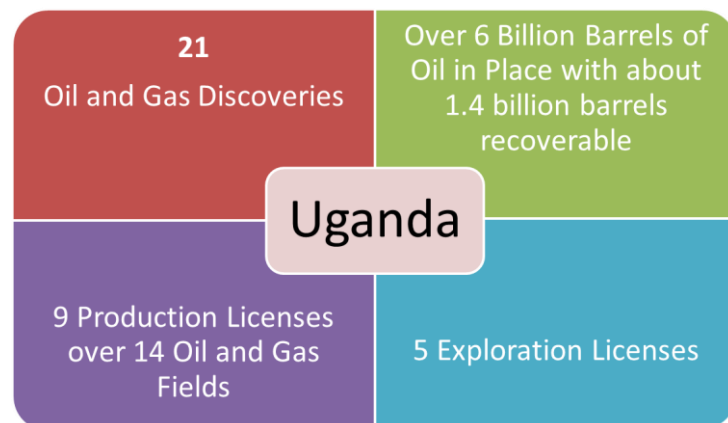
Vision

- To be a Leading Petroleum Regulatory Agency.

Mission

- To regulate and monitor the petroleum sector in order to create lasting value for society and contribute to Uganda being a sound investment destination.

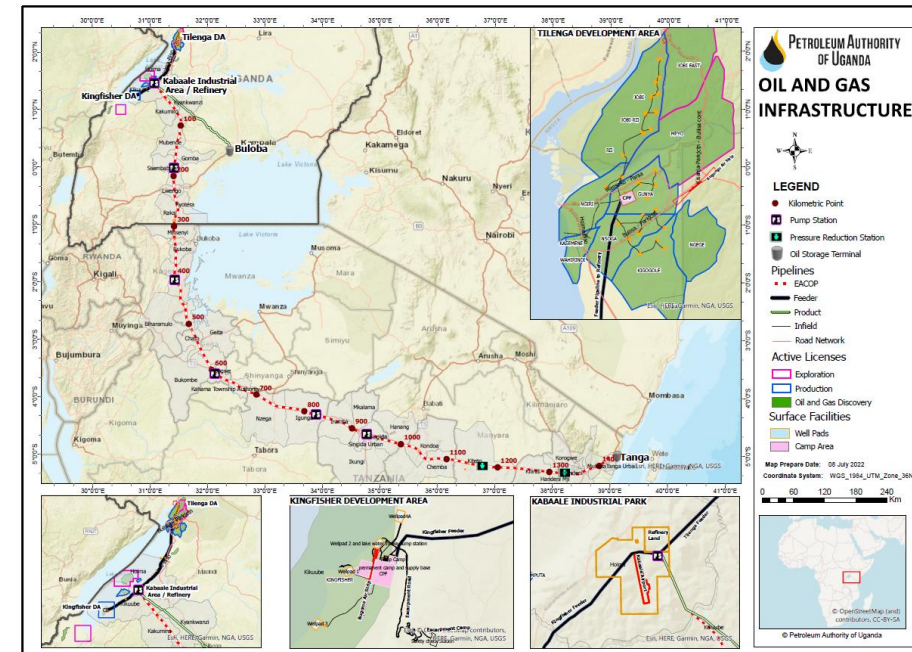
Oil and gas sector Overview



Development Projects

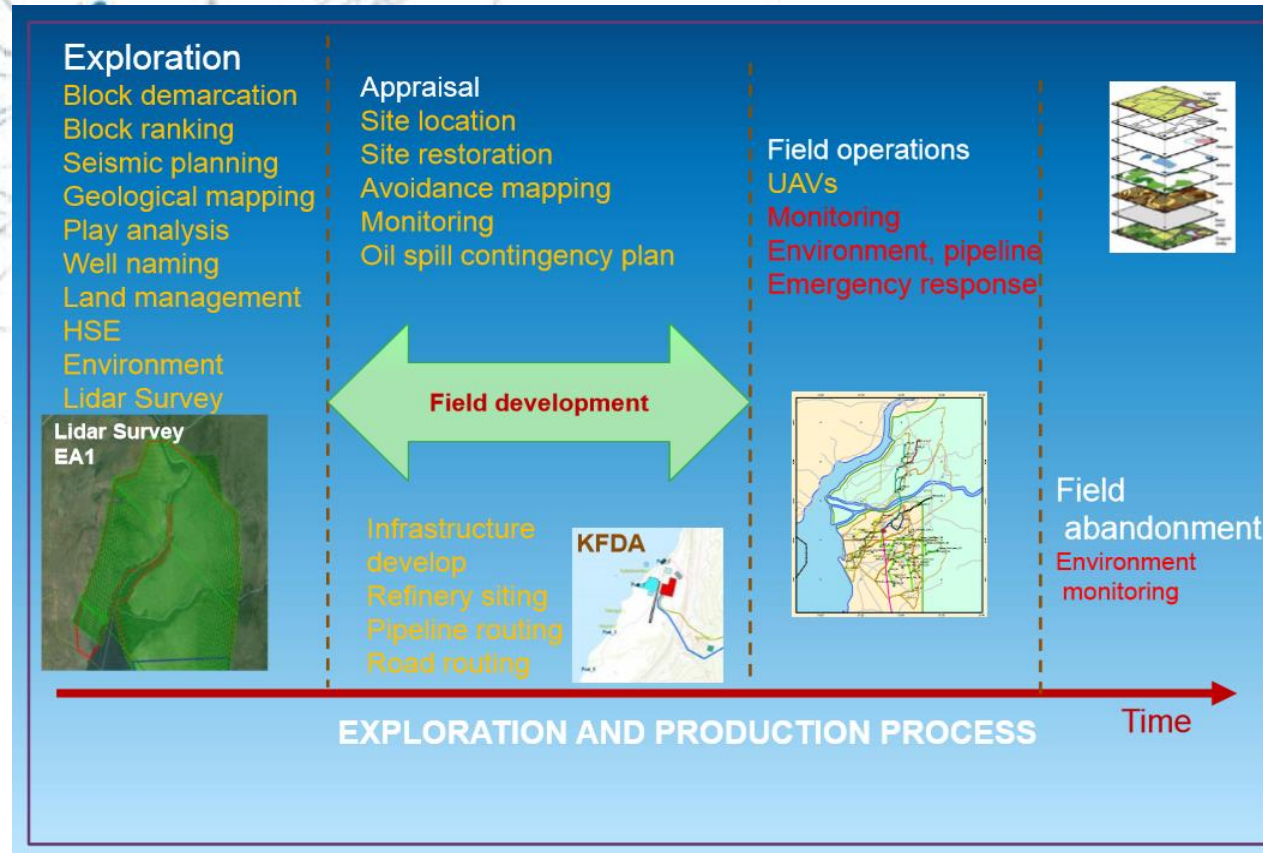
❖ Currently drilling

- **Tilenga Project -by TotalEnergies** (31 well pads, 426 wells)
- **Kingfisher Project – by CNOOC** (4 well pads, 31 wells).
- **The EACOP** -1443Km long pipeline, starting at Kabaale in Hoima to a marine storage terminal at Tanga, in Tanzania.



- **The Refinery Project** Capacity- 60,000bpd refinery in Hoima Kabaale Industrial Park (KIP) on approx. 30sq.km.

GIS Across The Entire Petroleum Value Chain



By maintaining data about prospects, discoveries, fields, license area, infrastructure, pipelines, the PAU uses GIS for

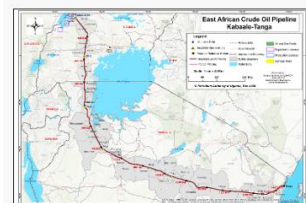
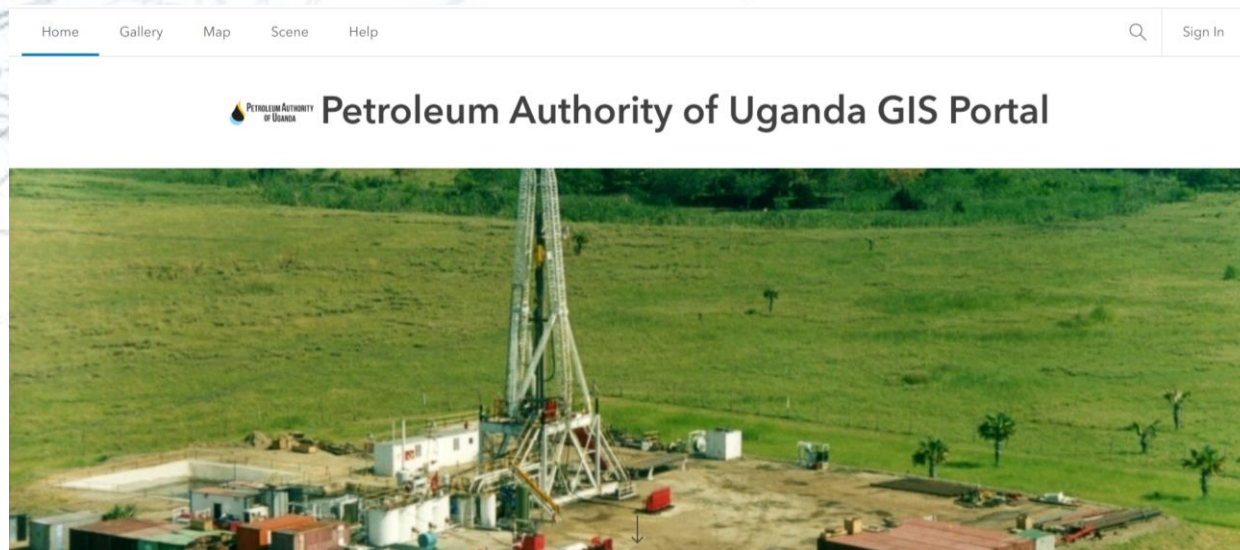
- Environmental impact assessment e.g., wildlife ranging patterns
- Decision making e.g., application of surrender
- Field maps and field navigation solutions
- Emergency response and spill management Plan among others

- PAU uses ArcGIS software to ensure efficient upstream & midstream petroleum data management.

Check Out Our Map Resources

GIS MAP PORTAL

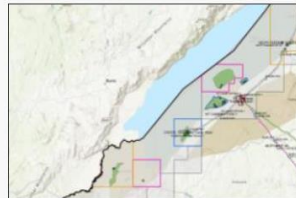
<https://paumaps.pau.go.ug/portal>



PDF
East Africa Crude Oil Pipeline (...)
The map of the East Africa Crude oil Pipeline Route from Kabaale - Hoima, in Uganda to the



PDF
TILENGA
Map showing planned infrastructure for the Tilenga Development Project



Feature Layer
PAUFactMap_WFL1
oil and gas operations



Feature Layer
Oil Roads
Critical oil roads of Uganda

Oil and Gas Data- E&P FACTSITE

<https://facts.pau.go.ug/>

Name	Value
PAUID	31
License Name	PL-06/2016 (TotalEnergies: Ngiri Field)
Effective Date	2016-08-30
Expiry Date	2036-08-30

Thank You



**PETROLEUM AUTHORITY
OF UGANDA**

+256 313 231 600 www.pau.go.ug ed@pau.go.ug

[@PAU_Uganda](#) [Petroleum Authority of Uganda](#)

Head Office: Petroleum House, Plot 21-29 Johnston Road, P.O.Box 833, Entebbe, Uganda

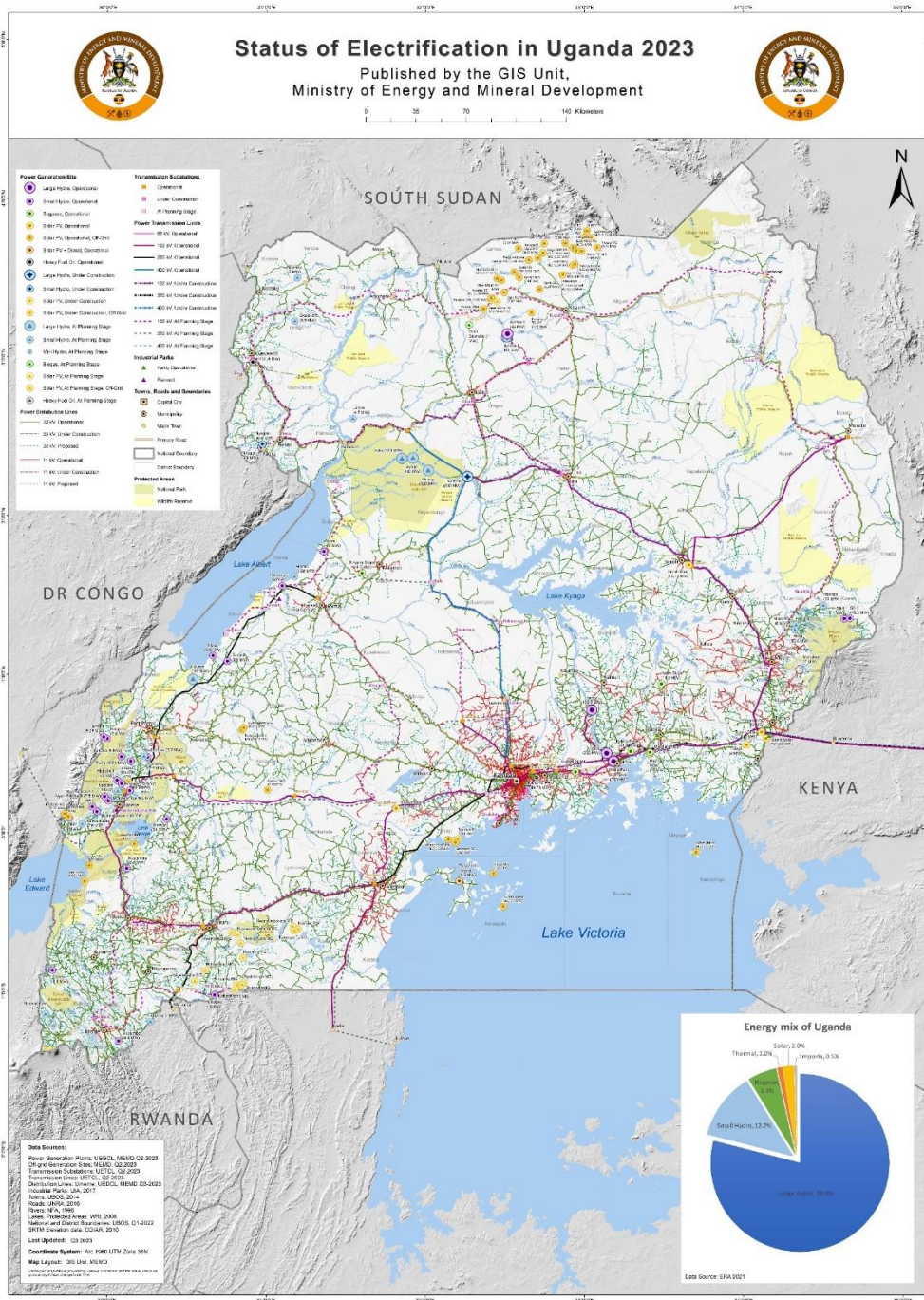




GIS UNIT

<https://memd.go.ug/gis-unit/>





The Ministry is the Secretariat of the Energy Sector GIS Working Group and this year's Chair

The unit supports the planning and monitoring activities of the ministry, as listed:

1. Harmonization and publication of country's electrification footprint

www.memd.go.ug/gis-unit

www.energy-gis.ug

2. Supporting the preparation and implementation of Ministry projects, like development of the Energy Transition Plan, TBEA, EASP, PDM

3. Site selection

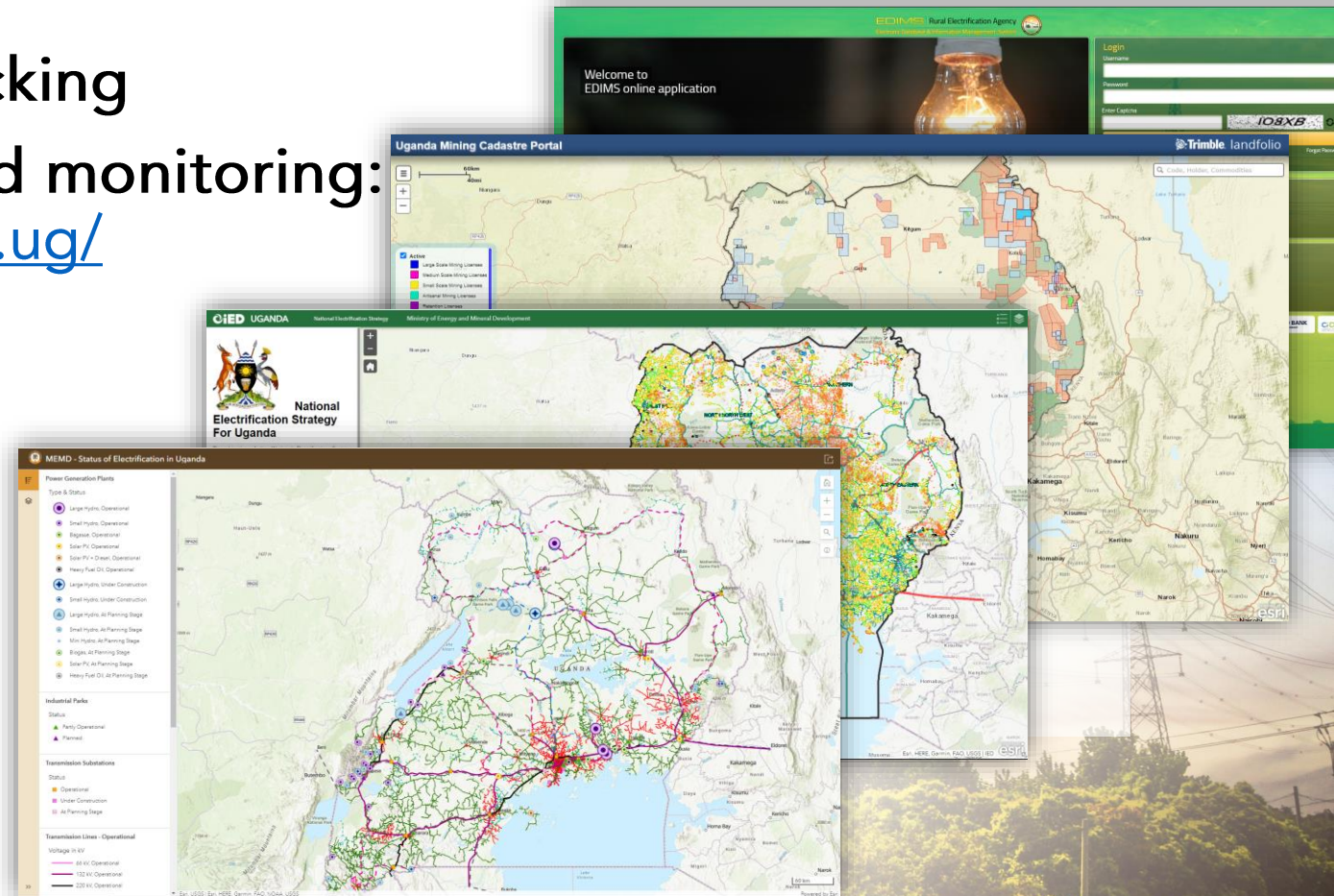
4. Powerline route design

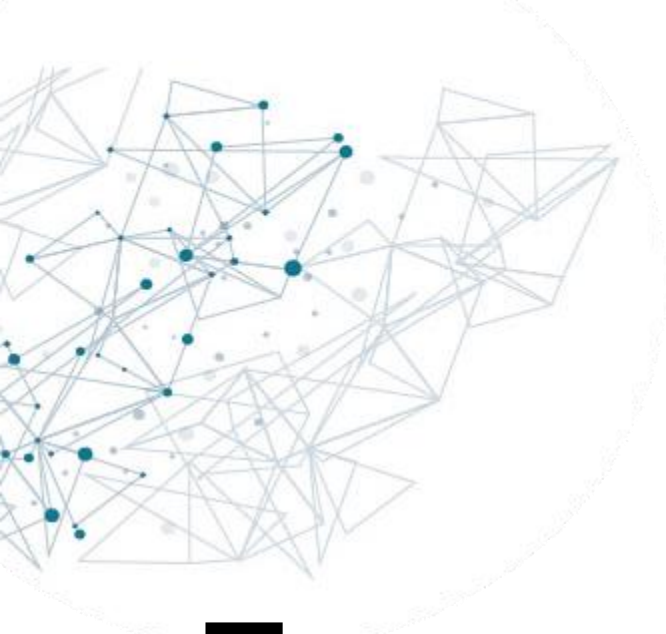
5. Electricity Network Asset Tracking

6. Mineral Resource Tracking and monitoring:
<https://dgsmportal.minerals.go.ug/>

7. Supporting carbon trade:
<http://edims.rea.or.ug/>

8. Cartography
<https://memd.go.ug/gis-unit/>





Energy Sector GIS Working Group

The New Look





For Sustainable Development





Energy Sector GIS Working Group





Give us your feedback!

www.energy-gis.ug/conference-feedback





**Energy
Sector GIS
Working Group**

Thanks for Coming!!

The 10TH

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