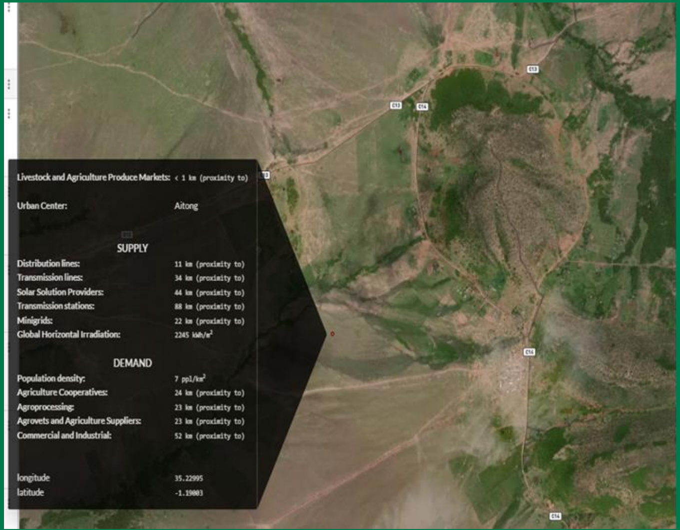
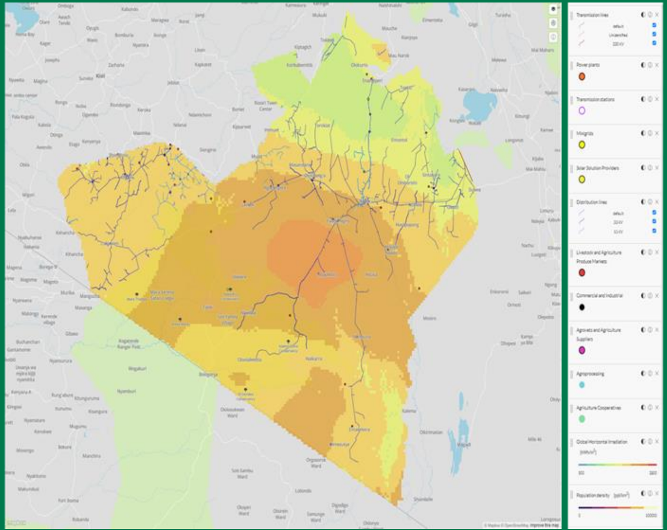
WORLD RESOURCES INSTITUTE

Energy Access Explorer
An Integrated, Data-driven Approach to Achieving Universal Access to Energy for Equitable Development





Dimitris Mentis, PhD
Lead, Energy Access Explorer

Capacity Building Training under the Framework of the AU-China Energy

ENERGY ACCESS AND SUSTAINABLE DEVELOPMENT OUTCOMES

Energy is interconnected with 125 (74%) out of 169 SDG targets*

Without access to electricity





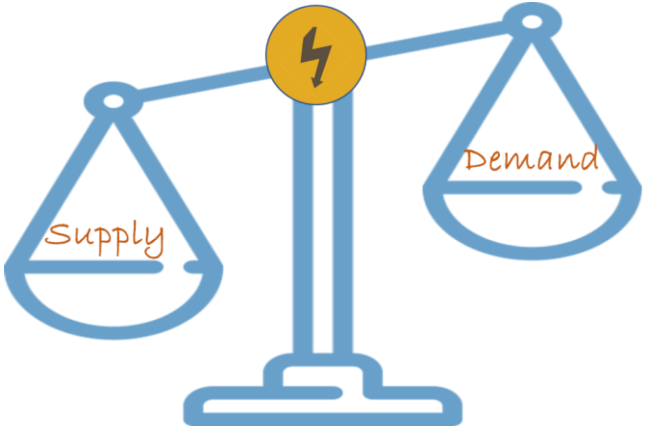

With access to electricity

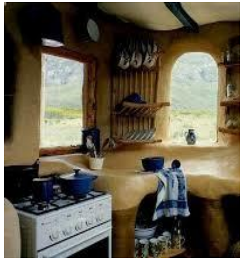





*Sustainable Development Goals, Status of Electricity Access Report, 2017

TREAT DEMAND AND SUPPLY AS EQUAL

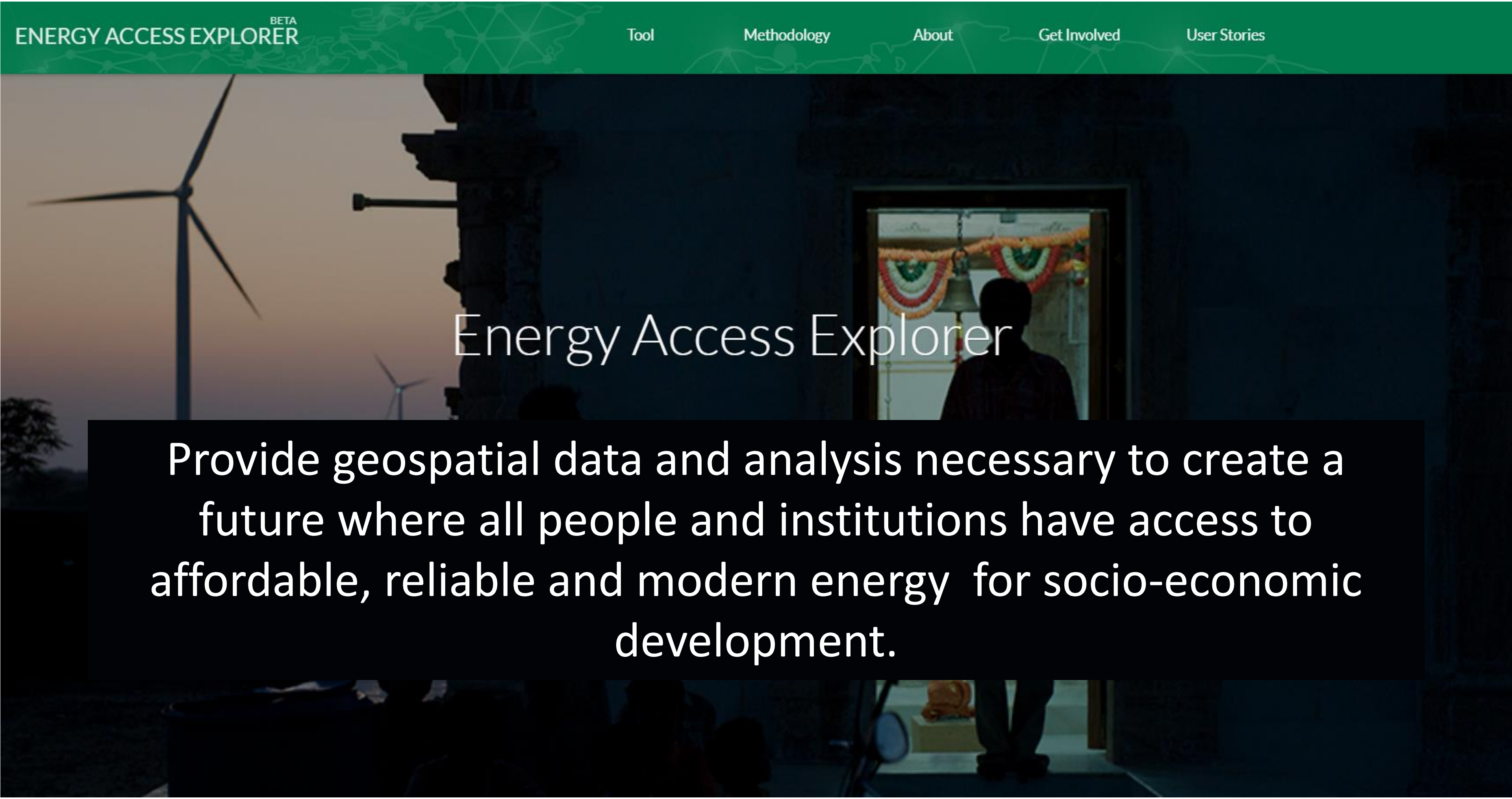




REDUCE RELIANCE ON GIS AND PROGRAMMING EXPERTISE FOR DATA USERS

DEPLOY AN OPEN-SOURCE DYNAMIC INFORMATION SYSTEM
FOR DATA PROVIDERS

open source initiative®



Provide geospatial data and analysis necessary to create a future where all people and institutions have access to affordable, reliable and modern energy for socio-economic development.

ENERGY ACCESS EXPLORER
OPEN ONLINE INTERACTIVE CUSTOMIZABLE

Spatial Data Infrastructure

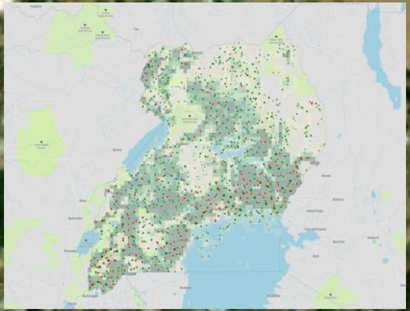
Data from different sources, in different scales and formats:

- ✓ Open Census
- ✓ Satellite
- ✓ Global
- ✓ National
- ✓ Sub-national

DEMAND

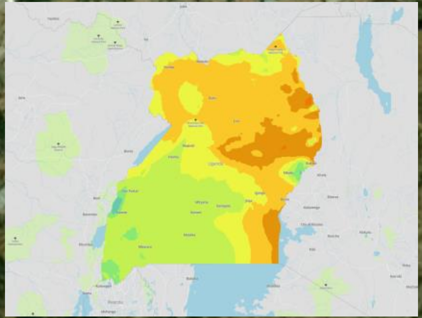
Demographics

Social & Productive Uses

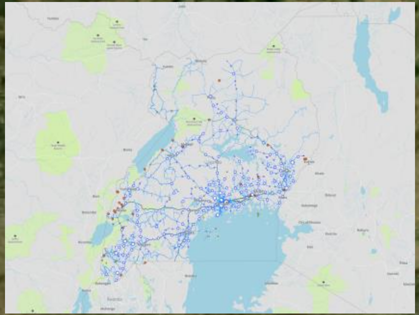


SUPPLY

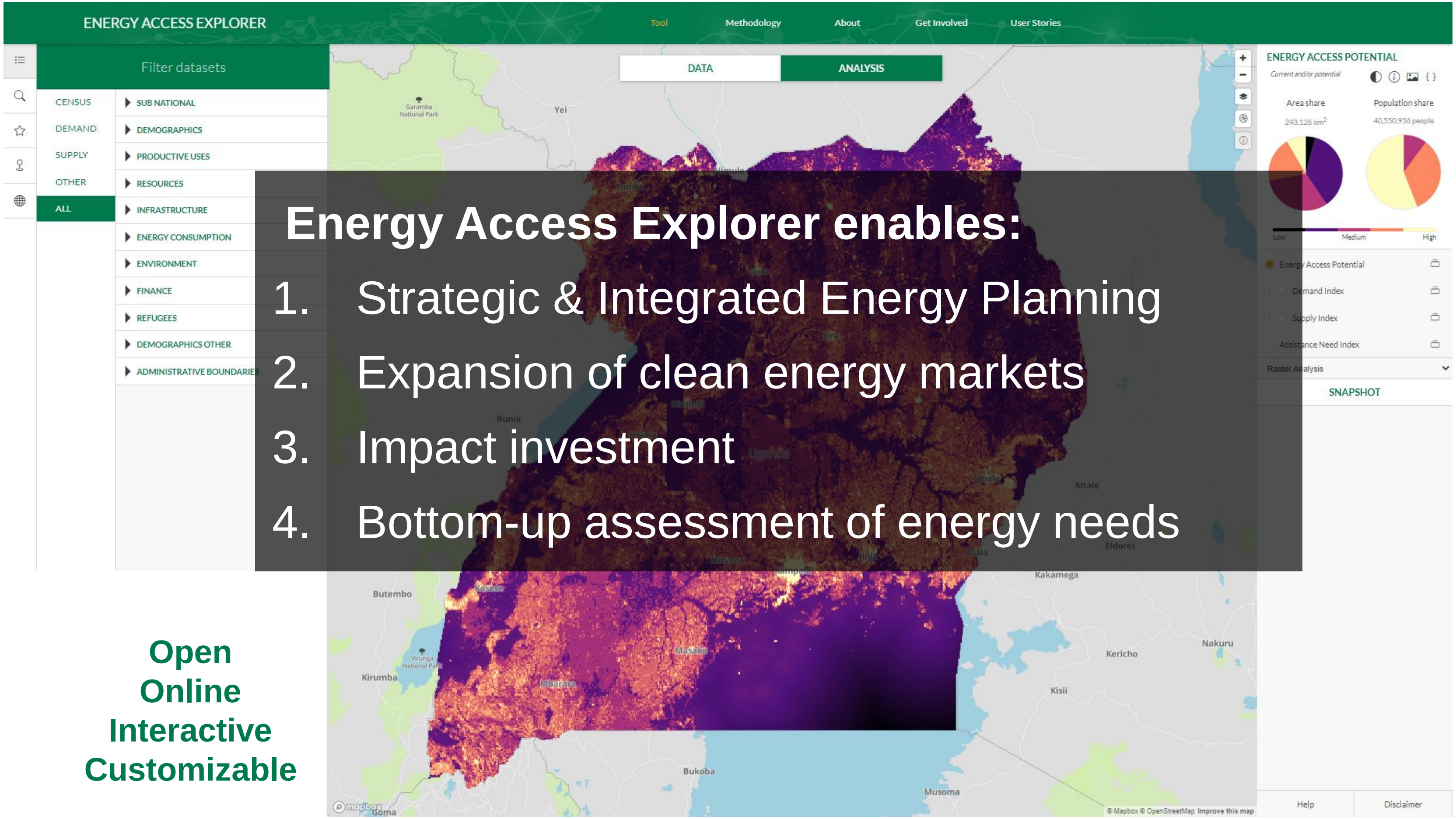
Energy Resources



Infrastructure



EAE USE CASES



Energy Access Explorer enables:

1. Strategic & Integrated Energy Planning
2. Expansion of clean energy markets
3. Impact investment
4. Bottom-up assessment of energy needs

Open
Online
Interactive
Customizable

KEY FUNCTIONALITIES OF THE FRONT END OF THE APPLICATION

- Select and visualize geospatial data
- Visualize temporal data to track progress
- Overlay data
- Apply Queries, Filters and Buffers
- Develop custom summary reports and dashboards
- Search for coordinates or Areas of Interest
- High resolution Multi-Criteria Analysis (1 km^2)
- List High-priority areas
- Save and download analysis
- View on mobile phone
- View in a Public version – Password protected version – Off-line version

Low hanging fruits

$$\textit{Energy Access Potential (EAP)}_j = \frac{w_d * NDI_j + w_s * NSI_j}{w_d + w_s}$$

Areas with potential demand

$$\textit{Demand Index (DI)}_j = \frac{\sum_{i=1}^{D} w_i * NDD_i}{\sum_{i=1}^{D} w_i}$$

Areas with potential supply

$$\textit{Supply Index (SI)}_j = \frac{\sum_{i=1}^{S} w_i * NSD_i}{\sum_{i=1}^{D} w_i}$$

Areas where financial assistance is needed

Assistance Need Index

Energy Access Explorer – Frontend
Open Online Interactive Customizable

Example of EAE Data – Uganda
In collaboration with Uganda’s Energy Sector GIS Working Group and Ministry of Health

Demographics
- Population density

Socio economic activities
- Education facilities
- Health care facilities
- Agricultural zones

Resource availability
- Global Horizontal Irradiation

Infrastructure
- Transmission, Distribution and Power Generation network

Environment
- Protected areas

Finance
- Finance service providers

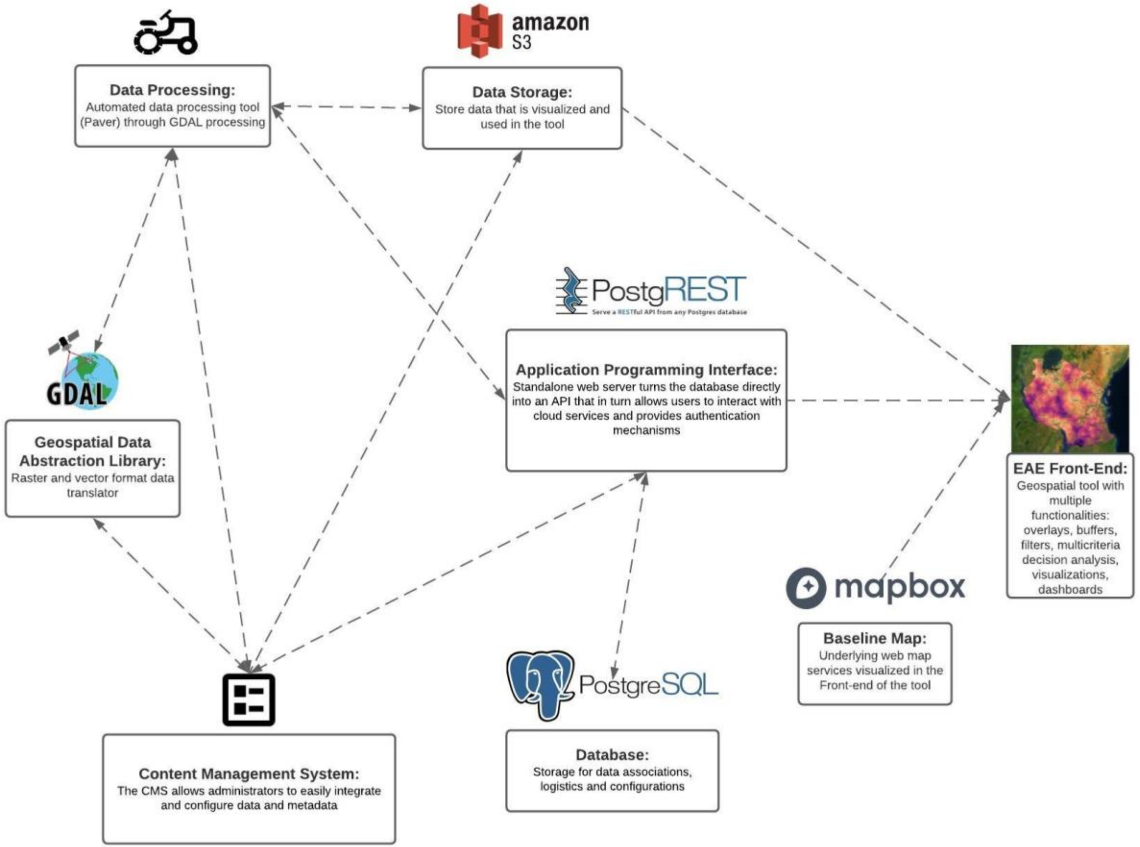
Multicriteria analysis
High priority areas close to health care facilities, far from distribution lines and with high solar irradiation

Plus high population density, and high agricultural productivity

ENERGY ACCESS EXPLORER – DYNAMIC GEOGRAPHIC INFORMATION SYSTEM
OPEN SOURCE -ADAPTABLE - WEB ARCHITECTURE

EAE's Backend provides:

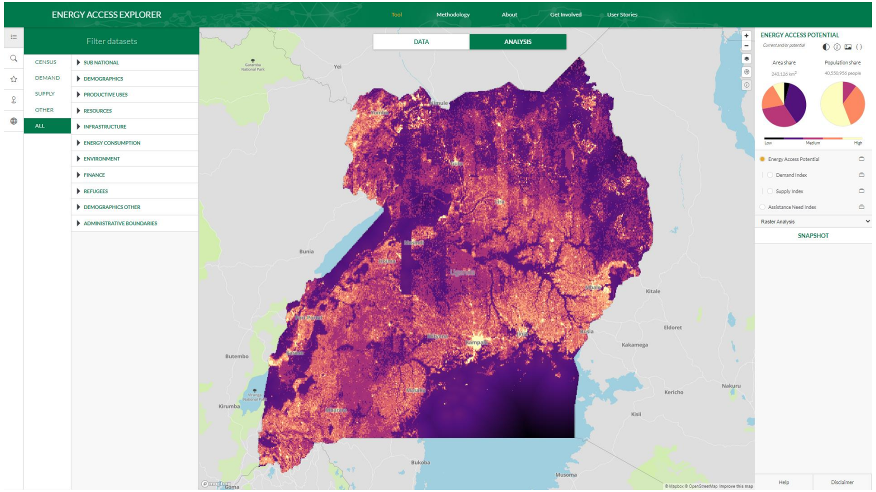
- Automated Data Processing
- Dynamic database
- Efficient data storage
- Customized Content Management System
- Variety of Baseline Maps
- A modular API



TECHNICAL EXPERTISE

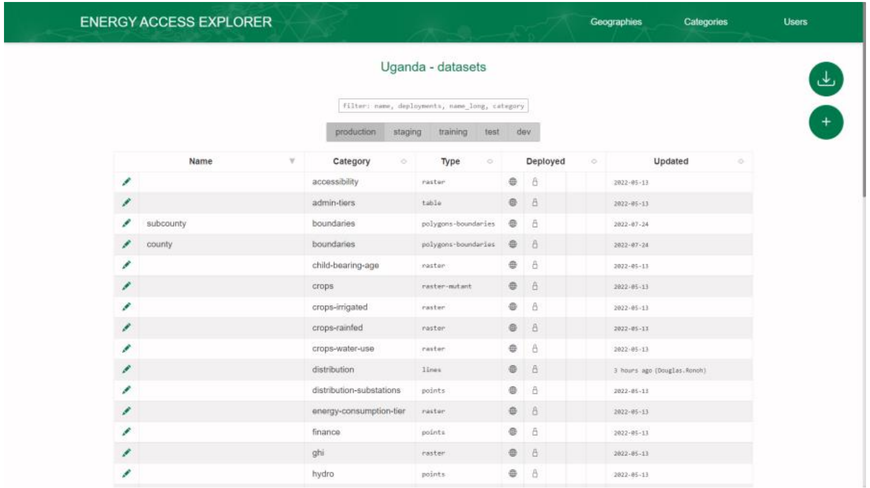
Frontend - Data & Analysis users

- No programming
- No GIS



Backend - Data administrators

- No programming
- Basic GIS



AN INTEGRATED, DATA-DRIVEN APPROACH TO ACHIEVING UNIVERSAL ACCESS TO ENERGY

- Covers countries with **32% of the total unserved population globally**
- **Originally prototyped for 3 countries** and is now being developed for **15 geographies**, at both **national and subnational levels**
- Close partnership with > **100 stakeholders and users**.
- > **9,000 users**
- > **7 MUSD** in kind contributions

PARTNERS

DATA

Strathmore University Energy Research Centre, eed Advisory, Duke Energy Access Project, e-GUIDE, unicef, Africa Clean Energy, CAFOD Just one world, JSAC, giz, iied, umeme, UEGCL

GOVERNMENT AGENCIES

The Republic of Uganda Ministry of Energy and Mineral Development, Ministry of Water and Energy, Narok County Government, REA, Republic of Tanzania Chamwino District Government, The Republic of Uganda Ministry of Health, TADP Transformation of Aspirational District Programme, NITI Aayog

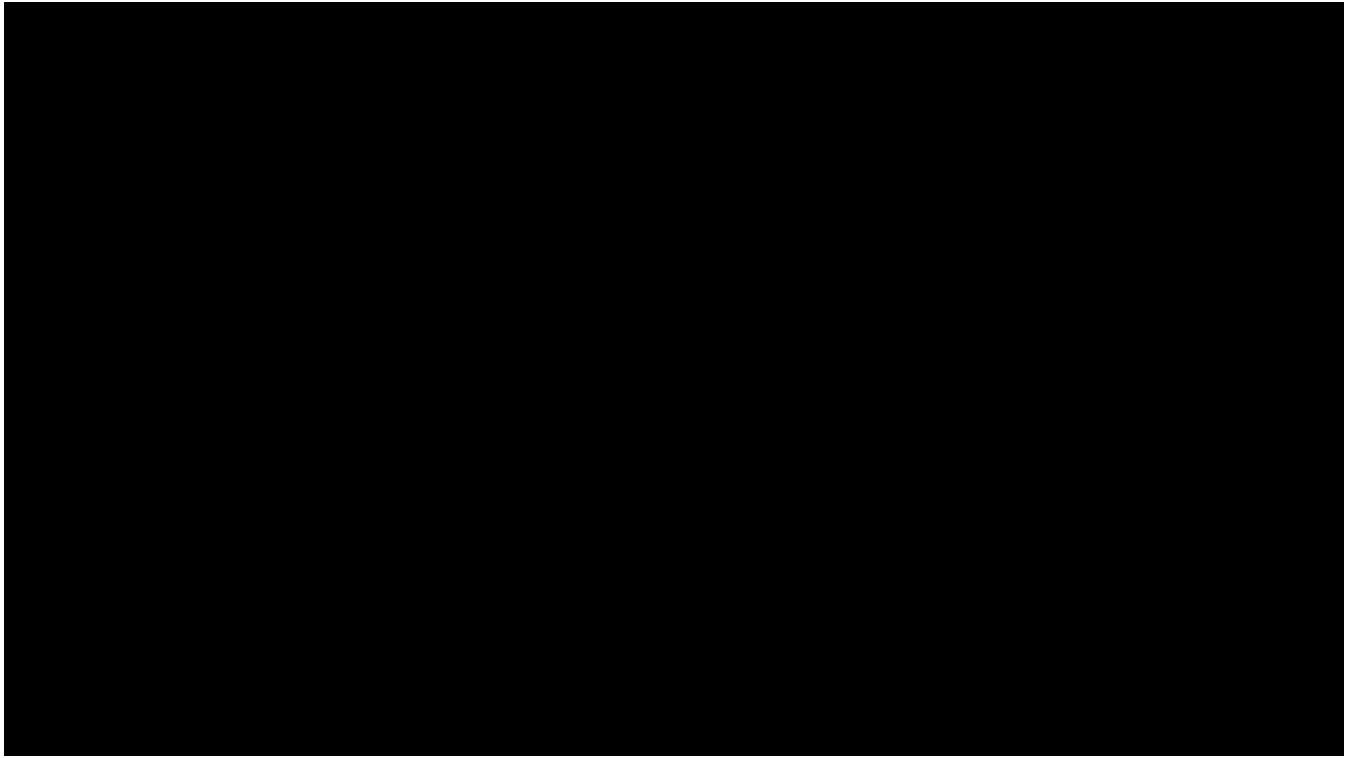
ADVISORY

KTH Vetenskap och Konst, Sustainable Energy for All, TaTEDO, UNDP, UNIDO, EACREEE, The World Bank, Power for All, Tata Trusts

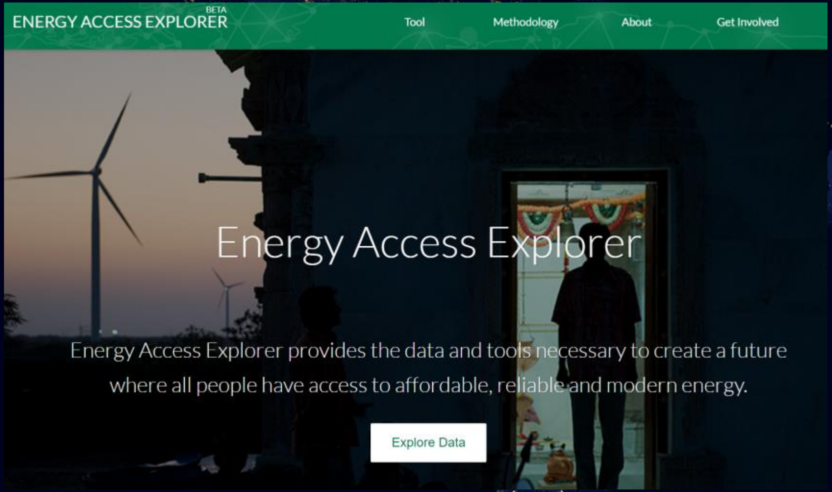
FUNDING

Tetra Tech International Development, UKaid, Charles Stewart Mott Foundation, IKEA Foundation, 3M, The Wallace Foundation, OAK Foundation, SNV, Stichting DOEN, Clean Cooking Alliance, World Health Organization, Good Energies

A MAPPING PLATFORM TO CONNECT SDG 7 AND SUSTAINABLE DEVELOPMENT OUTCOMES



https://www.energyaccessexplorer.org/user-stories/



Website: energyaccessexplorer.org
Code: GitHub.com/energyaccessexplorer

Interested in learning more or contributing to the development of EAE?

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Lead, Energy Access Explorer

- Source: NASA Earth Observatory