



CASE STUDY

HARNESSING MACHINE LEARNING TO IMPROVE ENERGY ACCESS PLANS

📅 2022 – ONGOING

A partnership between SEforAll and technology company IBM is establishing an open-source planning tool that provides better data to energy planners and decision-makers.

OUR PARTNERS



APRIL 2023





OBJECTIVE

Reliable data are essential to planning efforts to address energy access gaps in ‘Global South’ countries. National energy access plans, developed by governments and their advisors, are increasingly relying on a foundation of open-source, geospatial data related to human activity. Well-designed plans can help policymakers and the private sector quickly understand which communities can be best served by which energy technologies, based on parameters like distance from existing power grids, the ability of homeowners to pay for electricity services, and the local suitability for renewable power technologies like rooftop or community solar, small-scale hydro and biomass generation.

One key dataset required for effective energy planning relates to known building ‘footprints’ – the locations and sizes of residential and commercial buildings that in turn serve as proxies for tracking human activity. In many developing regions, this data is still challenging to source accurately, but recent advances in machine learning are opening up new opportunities.

Since October 2022, Sustainable Energy for All (SEforALL) has been working with the multinational technology company IBM to address this

data gap. Together we are developing a new planning tool that uses satellite imagery and machine-learning models to improve the quality of building footprint data for key countries still facing significant energy poverty challenges. The tool will be made publicly available through an open-source model that enables policymakers and their advisors to plan more effectively, and to reduce investment risk.

PARTNERS

The project is being developed in partnership with the IBM Sustainability Accelerator and the German Aerospace Center (DLR).

TECHNOLOGIES SUPPORTED

The model being developed is energy technology-agnostic. It focuses on generating foundational data that provides critical insights on the location and extent of human activities. These insights will help to estimate future energy demand, which is a vital component of energy planning.

OUR ROLE

SEforALL has been providing expertise on sustainable energy, helping connect the technical experts at IBM with the needs of potential users. We have also been collaborating with IBM to build the model, including the manual identification and tagging of existing building footprints that will serve as input data. In parallel, we developed a communication and stakeholder engagement plan, building on existing relationships with government agencies and raising awareness about the programme.

GOALS

This project is building a data generation model with the potential to drastically improve the quality of energy infrastructure plans. The output data will allow both public and private sector decision-makers to make more informed choices based on accurate data about existing building footprints. This will increase the efficiency of new interventions (for example, setting the precise location and scale of an access to energy project) eventually de-risking their investments and accelerating the impact.

Working toward this goal, the partners have identified existing challenges from both a

technical and a user perspective and are now developing a 'Minimum-Viable-Product' (MVP) to be deployed and tested in pilot geographies. Once the model is deployed and tested, the tool will be used in other regions facing inadequate energy planning data.



With the IBM Sustainability Accelerator, we are convening experts and using innovative technologies to help tackle the toughest environmental challenges our planet faces; and transitioning to clean energy is a critical step right now. Through our partnership with SEforALL, we are not only helping marginalized communities get just and equitable access to sustainable energy resources, in line with UN SDG7, but also supporting the larger global energy transition.



JUSTINA NIXON-SAINTEL

Vice President of Corporate Social Responsibility and ESG, IBM



NEXT STEPS

The IBM team and SEforALL are developing the intelligent model, which will serve as a testbed for the model with the intent to improve the accuracy of the data output. In addition, SEforALL and IBM will continue to engage with additional stakeholders to raise awareness about the model to expand its utilization.

FURTHER INFORMATION

- [IBM Press Release](#)
- Watch video to learn more about the IBM Impact Accelerator with SEforALL (and other cohort members): [Accelerating clean energy with the IBM Sustainability Accelerator](#)



SEforALL is committed to setting a new standard for energy planning data. Knowing the expected future energy demand for specific areas is vital information for energy planners, project developers and investors. With IBM and DLR we are using cutting-edge technology to measure and share this information with the sustainable energy sector.



JEM PORCARO

Head of Energy Access, SEforALL

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Examples of images used in the analysis.



ABOUT SEFORALL

Sustainable Energy for All (SEforALL) is an independent international organization that works in partnership with the United Nations and leaders in government, the private sector, financial institutions, civil society and philanthropies to drive faster action on Sustainable Development Goal 7 (SDG7) – access to affordable, reliable, sustainable and modern energy for all by 2030 – in line with the Paris Agreement on climate change.

SEforALL works to ensure a clean energy transition that leaves no one behind and brings new opportunities for everyone to fulfil their potential. Learn more about our work at www.SEforALL.org.

