

Johannesburg: Micro-Grid Installation Project in Alexandra

Mpho Tladi, Specialist: Research, Group Strategy, Policy Coordination and Relations

comanage



Co-funded by the
European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor CINEA can be held responsible for them.



Background and identified challenges

Main Challenges for Energy Supply:

- The Amarasta community in Alexandra faced load-shedding (energy-saving process) issues and inconsistent energy access, particularly impacting local businesses and daily living conditions.

Constraints for Sustainable Energy Transition:

- The susceptibility of solar panels to theft.
- High upfront costs of \$60 million (approx 1.032 billion South African Rands), although the project is expected to pay for itself within 18 months due to efficiency and savings.
- Potential displacement of vulnerable community members due to increased formalisation and associated costs, which could lead to the formation of new informal settlements.

Context of Energy Communities:

- The community consists of approximately 185 households (500 individuals) within an informal settlement transitioning through the introduction of sustainable energy solutions.
- The microgrid has a capacity of 2.65 MW with 1 MW of battery storage, facilitating about 3kWh of energy per day per household.

Challenges Encountered:

- Initial resistance due to potential displacement fears and the economic impact on the poorest residents.
- Theft and security concerns for solar infrastructure.
- The need for continuous engagement to maintain community buy-in and address emergent issues such as dust interference mitigated by road paving.



Implemented solutions- ongoing projects

Actions Taken to Support Energy Communities:

- The Amarasta-Alexandra project is a pioneering initiative that provided a structured electrification program for an informal settlement, indicating a significant policy and infrastructural commitment to improving access to electricity in such areas.

Implementation of Solutions:

- The project involved close collaboration with national and local authorities to align tariffs with the financial capabilities of the residents, bridging the gap between policy intentions and practical affordability.
- Ongoing adjustments to tariffs show a responsive governance approach, aiming to make energy costs manageable for lower-income households.

Other Considered Solutions:

- The discussion around providing solar solutions on a lease-to-own basis for low-income households illustrates an innovative approach to tackling energy poverty while potentially generating income for these households.

Alignment with Sustainable Development Goals (SDGs):

- This project supports multiple SDGs including Affordable and Clean Energy (SDG 7), Reduced Inequalities (SDG 10), and Sustainable Cities and Communities (SDG 11), by promoting equitable access to clean energy and fostering community resilience through infrastructural development.



comanage

Amarasta Solar PV micro-grid

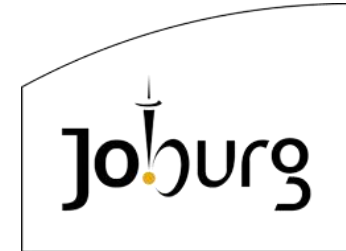
City Power Key Projects :

Non-affluent residential market

For the non-affluent residential market, we are focusing on microgrid projects. A key example is the Amarasta Microgrid, which provides localised and reliable power to underserved communities.

Microgrids:

Localised energy systems for remote or critical infrastructure.



a world class African city

Results and ongoing gaps in knowledge

1. What was the impact of your work to support energy communities? Did you meet your targets or expectations?

Our initiative substantially improved access to reliable and sustainable energy in the Amarasta community, primarily by installing a 2.65 MW solar PV micro-grid. This system ensures that each of the 185 households receives approximately 3kWh of energy per day. Early outcomes have shown reduced illegal electricity connections and increased community investments towards permanent housing, indicating significant strides towards our energy security and community stabilisation targets.

2. What lessons did you learn in the process of your project?

We learnt the importance of community engagement in achieving buy-in for sustainable projects. Effective communication and involving local leaders and residents from the outset can mitigate fears and resistance, such as those related to displacement or economic impact. Furthermore, addressing practical challenges like theft of solar panels through community patrols and security upgrades was critical.

3. What gaps remain in your administration's knowledge on this topic? What do you hope to learn from participating in the COMANAGE Board of Replicators?

While we have managed the technical and social aspects reasonably well, there remains a gap in comprehensive risk management strategies that can pre-emptively address potential socioeconomic impacts, such as displacement. Participation in the COMANAGE Board of Replicators could enhance our understanding of integrating flexible financial models and legal frameworks to support the scalability and replicability of such projects.

4. What information or methods would help you to implement more effective policies in support of energy communities?

Further insights into successful public-private partnership models and scalable financial strategies could be instrumental. Additionally, learning from other regions that have implemented similar projects could help refine our approaches, particularly in terms of legal structures and sustained community involvement.

5. Have you been aware of any other cities with successful policies in this area? Would these work in your city? What would need to change?

Nairobi (Kenya) has utilised microgrid technology to enhance electricity access in informal settlements, focusing on community engagement and sustainable energy solutions. Additionally, Bangalore (India) has integrated renewable energy sources with existing power grids to provide more stable and sustainable energy supplies in rapidly urbanising areas.

Adapting these models to Johannesburg would involve aligning the projects with local socio-economic conditions. This could include implementing subsidy programs tailored to the income levels of Johannesburg's communities and strengthening security measures to prevent theft and vandalism of the energy infrastructure.

Check which are the themes of interest based in the following topics developed in Comanage Governance Framework online toolkit?

1

2

3

4

5

LEGAL AND ADMINISTRATIVE

Information to establish legal entities, public-private partnerships, internal regulations, private rooftop leasing, and municipal tax incentives, supporting the necessary legal framework for successful and sustainable energy communities.

SOCIAL AND ORGANIZATIONAL

Focuses on long-term engagement strategies, including DIY rules, participation plans, and measures to address energy poverty, fostering inclusive dialogue and active community involvement to leave no one behind.

COMMUNICATION

Ready-to-use materials designed to raise awareness and inform the public and stakeholders about energy communities, encouraging participation and support.

FINANCIAL AND BUSINESS MODELS

Comprehensive guide for financial planning, including cash flow management, stakeholder identification, and risk analysis, ensuring the economic sustainability of energy communities.

TECHNICAL

step-by-step processes and templates for setting up and operating shared self-consumption systems, aiding community members in the technical implementation of their projects.