EBS EnergieBedrijven Suriname

Bridging Theory and Practice: Providing 24/7 Electricity Service to Remote Locations in Suriname

Shenzhen–Macao 2025 Symposium on Microgrids

uw betrouwbare ontwikkelingspartner

Richard Paal

November 2025

Background

EBS EnergieBedrijven Suriname

- 135 villages in rural areas in Suriname (South America) with no access to electricity
- 10 solar mini-grids in the Upper Suriname River, incl. distribution grid
- Project financed by: European Commission => EUR 5 MM (Grant)
- National Electricity Company (Energiebedrijven Suriname (EBS)) => 1 MM EUR (engineering and proj. management, network construction, community engagement)
- Inter American Development Bank (IDB)=> 3.2 MM USD => Loan
- Electric Utility (EnergieBedrijven Suriname (EBS)) => Project Executing Agency
- Inter-American Development Bank (IDB) => monitoring and supervision

POKIGRON SOLAR MINI-GRID

IDB financing

SU-L1009 Improve Sustainability of the Electricity Service

1st solar mini-grid installed in Suriname (2018)

Pokigron/Atjoni Solar Mini-grid

EBS ▲ EnergieBedrijven Suriname

- Paramaribo

- Pokigron in isolated area far from grid
- Distance Par'bo – Pokigron = 200 km
- Electrical grid ends at 100 km from Pokigron
- Pokigron can be reached over land

- Pokigron

Pokigron Hybrid Power plant - IDB Financing

EBS EnergieBedrijven Suriname

- 500 kWp solar plant Pokigron
- Village provided with 24 hrs service Feb 2018

- **Solar panels, batteries and diesel generators as back up**
- **1st solar mini-grid in Suriname**
- **Batteries are now (Nov 2025) being replaced => end of service life**

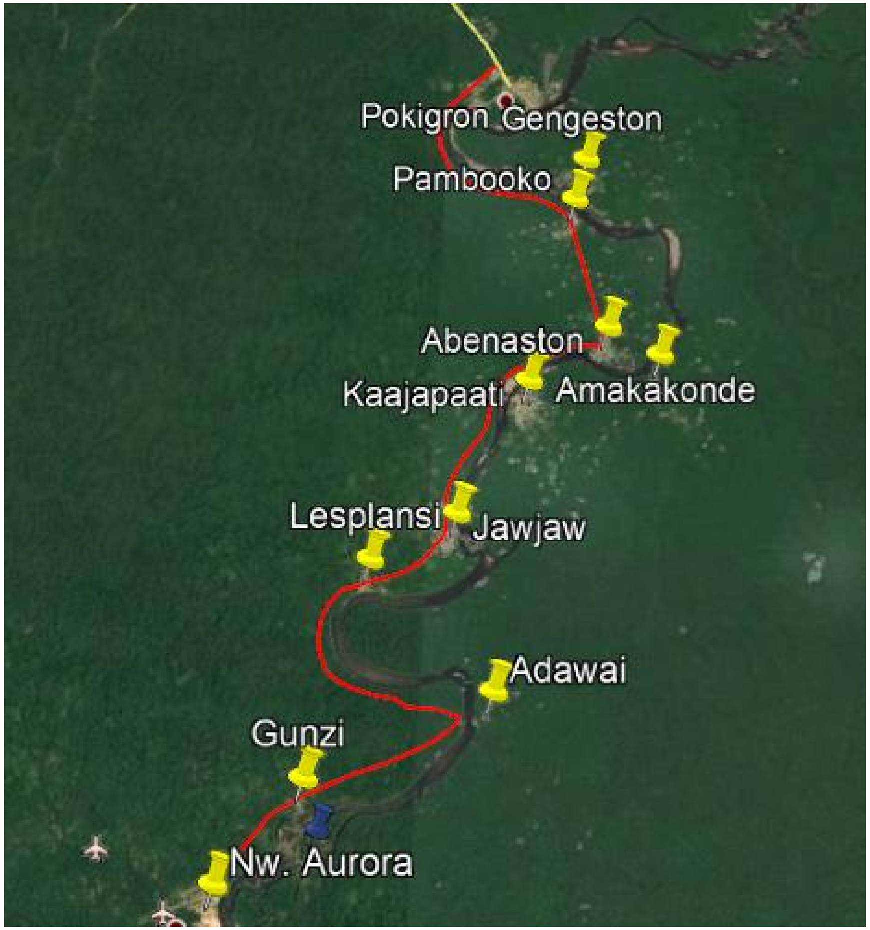
EBS ▲ EnergieBedrijven Suriname

Replicating the Pokigron/Atjoni project

Characteristics of the new project

EBS ▲ EnergieBedrijven Suriname

- Villages/communities along the Upper Suriname River (Rural area)
- Villages only be reached by small boats
- Gengeston – Nw Aurora (15 km)
- 10 locations with 2,568 Connections
- Total of 1,719 kWp Solar PV capacity and over 7 MWh of BESS for the 10 mini-grids
- Solar PV capacities from 25 - 554 kWp
- BESS capacities from 90 – 2,250 kWh
- Villages had 4 hrs electricity service per day



Project development

EBS ▲ EnergieBedrijven Suriname

- Preliminary assessment by consultant Trama Tecno Ambiental (TTA) in collaboration with EBS, financed by IDB (August 2018 - December 2018)

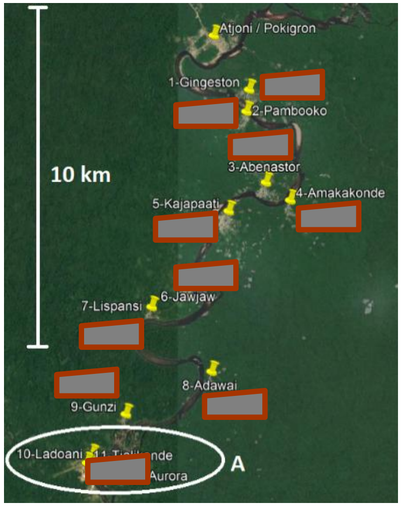
- Centralized solar mini-grids will be used (based on a multicriteria analysis of economic, environmental, social, and technical aspects)

- EBS also contracted TTA to provide technical support to EBS during project execution and supervision of works

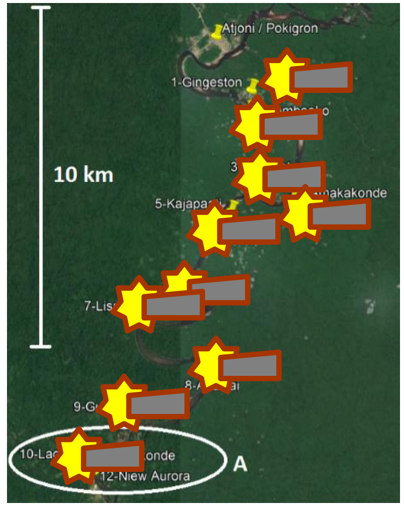
- Turnkey contractor Johs. Gram-Hanssen A/S constructed the solar systems

5 SCENARIOS

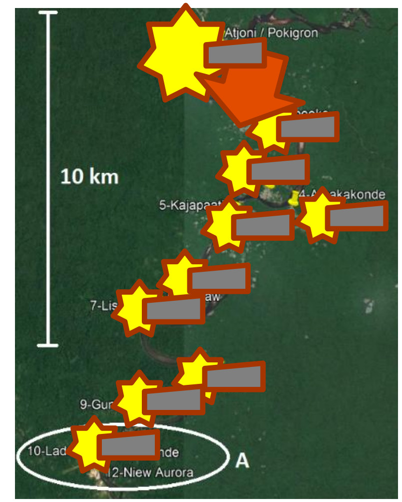
1: 100% Diesel



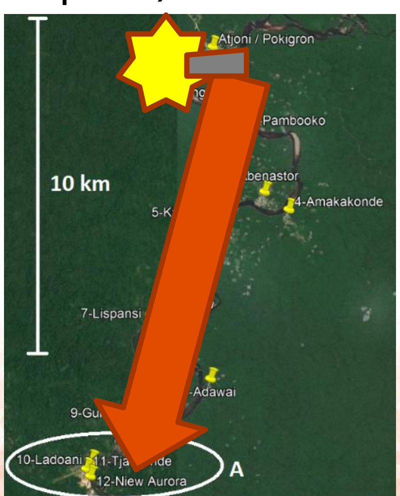
2: Centralized Mini-grids



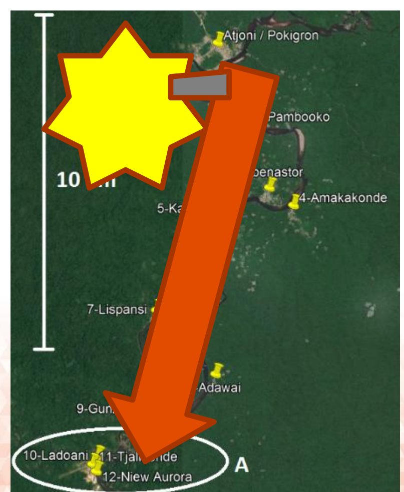
4: Atjoni/Pokigron Plant extension + Centralized Mini-grids



3 A: Atjoni/Pokigron Plant (+250 kWp PV) extension with diesel



3 B: Atjoni/Pokigron plant extension with additional PV



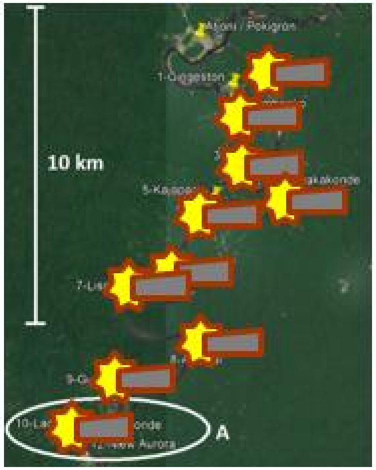
LEGEND

- Diesel Generation
- Hybrid PV-Diesel
- Grid Extension

Preferred solution

EBS EnergieBedrijven Suriname

2: Centralized Minigrids



LEGEND

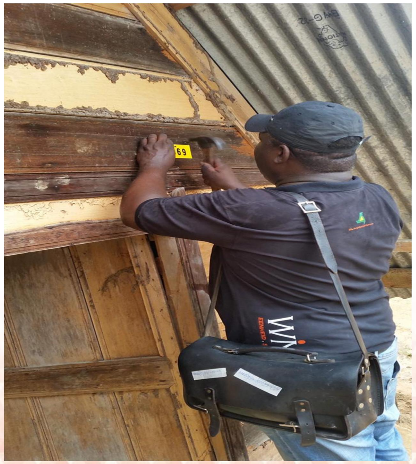
Diesel Generation

Hybrid PV-Diesel

Centralized solar mini-grids will be used (based on an analysis of economic, environmental, social, and technical criteria)

Main activities

- Project team => project manager, electrical engineer, socio environmental specialist, financial specialist, and a procurement specialist + consultant TTA
- Site visits from 2019 to 2025 => community engagement, data collection, explain project purpose, negotiate regarding land for solar panels, introduce consultants and contractors to communities
- Contract for solar plant delivery signed Oct 2022
- Agreement with villages regarding the land for the solar panels signed
- Procurement of network material and construction of network in March 2022
- Training for local villagers => EBS trained 18 villagers in the construction of electrical networks => together with EBS staff, villagers constructed the networks
- Smart meters will be installed => remote reading and operation



Participation and support from villagers

EBS EnergieBedrijven Suriname

- Procured 900 wooden poles for electrical network from the villagers
- Contracted villagers for solar site removal of vegetation (appr. 37,000 m2 in total)
- 18 villagers trained in construction of networks and constructed the networks
- Purchased services for transportation of materials, equipment and workers over the river from the local community
- Lodges from eco tourism resorts rented to accommodate workers during network construction

Project Milestones and Total Installed Cost

EBS EnergieBedrijven Suriname

- Electrical networks in the villages completed Q2 2023
- Contract for delivery of the 10 solar plants signed Oct 2022
- Construction of the solar mini-grids 100% complete in Nov 2025
- Project TIC = 10 MM USD

Lessons Learned

- Climate change => villages can only be reached over the river by small boats => Low river water levels because of dry season => Use rainy seasons/higher river water levels to transport heavy materials and equipment (generators and transformers)

- In 2021 and 2022 the network materials and shipping price increase for the distribution materials was 38%

- Design such that the old/existing generators can be put into operation while the new solar plant is being commissioned => back up for longer outages during commissioning

Lessons Learned

EBS ▲ EnergieBedrijven Suriname

- Contracting a consultant experienced in solar mini-grids engineering and execution to support the project worked very well
- Predevelopment phase => extensive solar site selection criteria (e.g. no flooding) => verified during actual flooding situation
- It was necessary to design the solar mini-grids with a diesel generator as back up
- Local content inclusion is a critical success factor (built ownership, capacity)

EBS EnergieBedrijven Suriname

Thank you
Questions / Remarks