20kW HOSORORO HYDROPOWER PROJECT
Outline

• Background
• History of Site
• Original Layout & Components
• Overview
• Objectives
• Off Taker

• Prior Consultations
• New Layout and Components – 2017
• Project Cost and Financing
• Proposed Schedule
• Job Opportunities
• Energy Sources Analyzed
Part of GEA’s mandate is:

• To advise and make recommendations to the Minister, regarding any measures necessary to secure the efficient management of energy and the source of energy in the public interest;

• To develop and encourage the development and utilisation of sources of energy other than sources presently in use;

• To carry out research into all sources of energy including those sources presently used in Guyana for the generation of energy, and securing more efficient utilization of energy and sources of energy.
Background

• In April 1976, Montreal Engineering Company Ltd. (Monenco) conducted a comprehensive study that identified 67 potential sites with over 7,000 MW of hydropower potential in the country. Guyana is focused on studying and analyzing the various options for hydropower with the ultimate objective to develop some of its resources.

• In this context, the Hosororo Micro Hydropower Site was identified as candidate to be implemented under direct support of the GEA as a pilot/demonstration and capacity building opportunity for the GEA engineers.
History of Site

• In 1985, a study done by Terrence Fletcher and Associates Limited studied the option to install a hydropower plant at the creek and supply electricity to an agricultural produce processing facility to be built nearby.

• In the late 1980’ies, a powerhouse with a turbine of reportedly 5 kW capacity was installed using the upper of two existing concrete weirs. The project was abandoned some years after its inauguration for reasons that are still unclear.
Original Layout and Components in - 1985
Overview

- 4.6 km bees flight to the south-west of Mabaruma.
- GIZ committed to assisting GEA in the Development of Guyana’s Hydropower Resources

Legend:
- Roads
- MPC – Mabaruma Power Company
- MBA – Main District Area
- SCH – School
- NARI – National Agricultural and Research institute
- HPI- Hydropower Intake
- HPS- Hydropower Station

Imagery Date: 12/31/1969
21 P 191457:23 in E 905493.88 m N
35 ft
eye alt 10562 ft
Overview

- Contracted a Hydropower Engineer to train GEA engineers
- Aim to study design and install a small hydropower Project

Cemetery
Access Road
NAREI Compound
Objectives

• To increase the energy mix of the Mabaruma electrical grid with a clean and renewable source of energy

• To gain experience in applying hydropower engineering and other multi-disciplinary concepts for sustainable rural electrification;

• To gain understanding of run-of-the-river hydro technology;

• Promote and increase the use of renewable energy in Guyana;
Off taker

Mabaruma Electrical Grid
Prior Consultations

July – August 2015:

Power Company, NAREI, GWI, RDC
Prior Consultations

November 2016:
RDC, GWI, NAREI, Town Clerk, Ministry of Health, MoIPA, Power Company
New Layout and Components - 2017
Project Cost & Financing

Financers | Amount
---|---
• GOG | USD 91,108
• GIZ/REETA | USD 74,067
**TOTAL** | **USD 165,175**

Preliminaries 9%
Intake Structure 12%
Penstock 28%
Power House 3%
Electro-Mechanical and Electrical equipment 17%
Electrical works 10%
Engineering and Supervision 8%
Electro-Mechanical and Electrical equipment 17%
13% Contingency
### Project Schedule

#### Proposed Project Schedule

**Activities and Duration (Weeks)**

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<tr>
<th>Activity</th>
<th>Plan Start</th>
<th>Plan Duration</th>
<th>Actual Start</th>
<th>Actual Duration</th>
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**Periods:**
- June: 1-8
- July: 9-16
- August: 17-24
- September: 25-32
- October: 33-40
- November: 41-48
- December: 49-56

**Notes:**
- Plan Duration
- Actual Start
- % Complete
- % Complete (beyond plan)
- Actual (beyond plan)

**2/6/2019**
Job Opportunities

• During Construction
  • Laborers
  • Electricians
  • Engineers
  • Masons
  • Carpenters
  • Surveyors
  • Security
  • Drivers
  • Cleaners
  • Caterers
  • Supervisors
  • Managers
  • H&S Officer
  • Logistics
  • Accountant

• After Construction
  • Maintenance Personnel
  • Operators
  • Engineer
  • Cleaners
  • Security
  • Electrician
Energy Sources Analyzed

- **LCOE = 0.31 USD/kWh**
  - (0.21 USD/kWh with grant financing)
  - Life span = 20ys
  - Discount Rate = 8%

- **LCOE = 0.36 USD/kWh**
  - Life span = 20ys
  - Discount Rate = 8%

- **LCOE = 0.50 USD/kWh**
  - Diesel
THANK YOU

QUESTIONS?
Project Facts

• Will the Plant provide everyone with electricity - No but will increase energy security.

• Construction Time – Estimated at 8 months

• Will locals be Employed – Yes, the contractor is required to employ locals once available

• Who are the Stakeholders utilizing the water source – GWI, MPLC, NAREI and Locals

• Owner of Land – NAREI (MOU with MPLC)
Project Facts

• Will the Hydro work the same as in the Wet and Dry – NO it will fluctuate throughout the year

• How much electricity will be generated in a year – estimated at 64 MWh (8% of the total energy demand)

• How much will customers Pay – Will be in Keeping with MPLC rates

• Will the rates for electricity go down- This is dependent on the cos of other energy sources.

• Will the Hydro work 24hrs – yes – 365 days in the year No
Project Facts

• Will there be environmental effects – yes but very minimal

Impacts During Construction
  • Loss of Vegetation
  • Modification of Flow
  • Increase in Water Turbidity
  • Destruction of Habitat
  • Erosion
  • Modification of Stream bed

Impacts During Operation
  • Reduce Pollutants in the atmosphere
  • Employment
Project Facts

- Will the Hydro work if the stream dries out – NO
- What is the Life Span of the Project – 20 years
- Who will be the Owner/Operator – HECI/MPLC
- Will the Hydro Contaminate the water – NO
- Will Riverine communities still have access to the water source – yes
- Will the Hydro Pose danger to locals – NO
- Will the Hydro withstand natural forces – yes was designed to do so
- What happens if the dam breaks - Water will flow in the stream without affecting anyone
Project Facts

• Will deforestation in the area affect the Hydro – Yes (will reduce rainfall)

• Will locals be able to continue swimming in the creek – yes

• What Happens if the Hydro Fails – failures are not anticipated but GEA remains committed to ensure continued operation

• Was the Area the best choice – yes based on the feasibility study, existing structure and minimal environmental impacts

• Will the facility have tourism value – yes

• Will the Hydro flood the area- Only a small area (<6 feet High and Area = 15’ X 15’)