



RIFT VALLEY ENERGY

SMALL HYDRO DEVELOPMENT IN TANZANIA

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Mike Gratwicke

Ndolela (micro) - 0.1 MW hydro (Tanzania)



- 0.1 MW micro hydro developed in on one of the RVC farms in the South/West of Tanzania in order to support the local agricultural business (over100 ha irrigated field crops) with the provision of clean sustainable energy
- Project fully financed by Mufindi Tea and Coffee Company Ltd. (MTC), a 100% subsidiary of RVC
- Status: Running

BTL 1 - 0.5 MW thermal power plant (Zimbabwe)



- BTL 1 is a steam engine driven, combined heat and power plant at Border Timbers Ltd (a RVC group company), producing 0,5 MW of electricity and 5 MW of process heat that is then used for timber drying.
- BTL 1 was completed in August 2009, within time & budget, and was partially financed by the 1st EU ACP Energy facility.
- A power purchase agreement (power banking model) with the local Grid Operator has been entered into, enabling greater generation levels to be reached, and the feeding of surplus electricity into the national grid.
- Status: operative
- BTL 2 (2.5 MW follow on project) Development Permits in place, but financing constraints present

Mwenga Hydro - 4 MW Hydro (Tanzania)



- Mwenga is a 4 MW hydro power plant in the Tanzanian Highlands, close to Mufindi Tea and Coffee (100% subsidiary of RVC)
- The produced electricity is provided to TANESCO (the national electricity supplier), the local tea industry and the rural community
- The project is the first greenfield project in Tanzania under the relatively recent SPPA scheme
- An extensive rural electrification program is part of the project, bringing green, sustainable electricity to 14 villages (which contain over 3,000 rural households - population approx 25,000) in the project region. This includes the construction of 120 km of power lines and the operation of an innovative cellular phone based, pre-paid electricity vending-system to actually sell electricity directly to our customers.
- The Project is registered with the UNFCCC as a CDM project.
- This project included elements of grant assistance from both the 1st EU ACP Energy Facility, and the TEDAP facility, and was completed within budget.
- Status: operative since September 2012

Mwenga Hydro - Associated Rural Distribution Network (Tanzania)



- Life line tariff employed for basic connections
- All schools, clinics and public institutions connected
- Individual customer consumption is rapidly growing as electricity much more affordable than alternative energy sources, but is still very small.
- Rapid growth especially seen in productive users of electricity
- Average tariff realized by rural sales is better than we had initially predicted, and is expected to continue to rise in line with productive use increases

Mwenga Hydro - Associated Rural Distribution Network (Tanzania)



- Red lines show existing network
- Orange lines show planned expansions currently seeking balance of funding
- Yellow lines show planned expansion into neighboring tea operations, as well as some internal planned expansion work

Typical Challenges Faced in Hydro Development



1. Obtaining Financial Close is difficult when key off taker is undergoing a financial crisis
2. Land and Permit processes are very time consuming (MHL required 27 Permits, Licenses, or Agreements, and many delays were encountered from being the first greenfield developer to go through this process)
3. Project execution in a very remote environment requires much more effort, time and cost than might initially be expected. A nearby operating base, and lots of experience in operating in such environments helps.
4. Absence of long term, site specific hydrological data - two feasibility studies both over estimated the flows available.
5. No data available on Lands Use trends within the Catchment, coupled with a lack of real control over such trends if and when they are noted.

And On a More Positive Note

1. Regulation of the tariffs for feeding into the grid has been, and remains transparent.
2. Rural Electrification gains wide support from all stakeholders, aligning directly and indirectly with many National Development initiatives across several sectors.
3. Significant support available from the Donor community towards Rural Electrification projects, which allows some adjustment of the financial risks involved, whilst also providing an additional source of stakeholder support

Will Improved Hydrological Mapping Help Small Hydro Developers?



- This gauging station has just been put in place on a river basin with over 1500 km² of catchment.
- There are no existing upstream or down stream stations that we can directly draw reliable data from.
- The flow variation reported cannot be reliably estimated from basic catchment area models, and we are not confident to use neighboring catchment data due to the variations observed.
- Investment considerations will need to wait at least two seasons to obtain a reasonable confidence level of the production capacity available from a wet season hydro at this location.