Bethlehem Hydro power project, South Africa

Information from Nu-Planet

Bethlehem Hydro will comprise the development, ownership and operation of a 7 MW hydro powered independent power plant (IPP) in South Africa.

The first greenfield IPP to reach construction in SA since the 1980s, Bethlehem hydro will generate income by selling electrical power and capacity under a long term power purchase agreement (PPA), and by selling its reduction in greenhouse gas emissions as Certified Emission Reductions (CERs). The lifespan of the business is in excess of 20 years. Annual base load power production is set at 38 GWh. The plant comprises two separate generation sites: the 4 MW run-of-river site located on the As river and the 3 MW site located at the wall of the Sol Plaatje dam.

Fig. 1: Merino intake works.

Fig. 2: Sol Plaatje dam.

Greenhouse gas emission reductions

As a renewable energy power producer Bethlehem Hydro will reduce the emission of some 33 000 tons of CO_2 per annum by displacing coal fired electricity. NuPlanet was contracted to manage the structuring and sale of its greenhouse gas emission reductions.

Sponsor

The project is developed by Bethlehem Hydro, a special purpose company registered in South Africa. Bethlehem Hydro has contracted NuPlanet to manage the development and implementation of the project on its behalf. NuPlanet through its principals has more than 20 years experience in the development and implementation of clean energy projects across the globe. NuPlanet as initiator and developer of the project will retain a significant equity stake in the final project. NuPlanet will also act as business manager for Bethlehem Hydro with technical operations contracted to a local firm.

Status

- Technical, environmental and legal feasibility assessments have been completed.
- All licences, permits and agreements secured, including the Environmental Impact Assessment (EIA), Power Purchase Agreement, Generation Licence, Land Lease agreements and water use licence.
- Financial closure in August 2005
- Construction started December 2006
- Commissioning is scheduled for July 2008

Financial

- Capital Cost: R 77-million
- Debt Equity ratio: 80/20
- Return on equity: 15 - 20%
- Annual power sales R8,5-million
- Annual Income from CO_2 emission reductions: R1,8-million
- Power purchase tariff (average) R0,22/kWh
- Operational costs: R 1,2-million/annum
- Needs CO_2 income to meet debt service cover ratio

Investment

Bethlehem Hydro has secured the full financing required for its development and construction. Term loan debt is provided by the Development Bank of Southern Africa (DBSA). The equity investors include NuPlanet, the Energy Development Corporation (formerly CEF) and HydroWSA, a broad based Black Economic Empowerment (BEE) consortium.

Fig. 3: Sol Plaatje Powerhouse construction.

Fig. 4: Merino Powerhouse.

Construction

Construction on the two sites commenced in December 2006 and will continue for 14 months. The construction team consists of:

- Project manager: NuPlanet (SA)
- Consulting engineers: Ninham Shand (SA)
- Civil engineers: Ninham Shand (SA)
- Mechanical engineers: BWG Hydro (SA)
- Electrical engineers: Merz & Mc Lellan (SA)
- Civil contractor: Eigenbau (SA)
- Mechanical & electrical supplier: Boving Fouress (India)

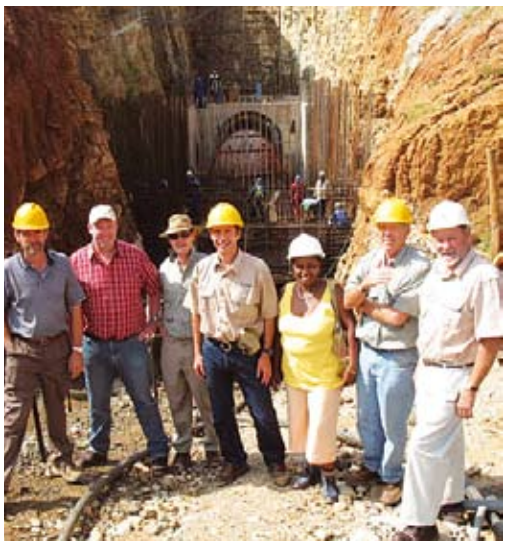

Fig. 5: Sol Plaatje project team.

Operations

Bethlehem Hydro will contract also a suitably company for technical management and will employ a general manager to manage the company's billing, business administration and accounting.

Lessons learned

- Regulatory compliance is the biggest barrier
- Final design (and budget) can differ vastly from feasibility design
- Put a good team together and work closely with your technical and financial partners
- Stick with it!

The market for IPPs in South Africa

Anton-Louis Olivier believes that the ESI is undergoing fundamental and rapid change in SA, in terms of electricity tariffs and the value of power. Eskom is emerging as a prime PPA counterpart and the "true" IPP market will be limited to small & renewable generators.

It is estimated there are many more sites where small scale hydro-power projects could be implemented, and this is a potentially untapped area for IPPs.

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