Beehive Solar Array

Chilomoni, Blantyre

Location
Beehive Main Campus, Chilomoni, Blantyre, Malawi

Type
Renewable Energy Resource

Year of Construction
2018

Design Engineers
Michael O'Sullivan and Jochen Ruehle

Project Engineers
Hendrix Mgawana and Michael O'Sullivan

Electrical Engineers
Rashid Mokini and Bob Kayange

Total Development Area (Approx. GEA)
606m²

Number of Storeys
1

Construction Cost
71million MWK for steel frame
€247,000 for solar panels
(£292,260 GBP TOTAL - rate correct as of 28th August 2020)

Cost per m²
N/A

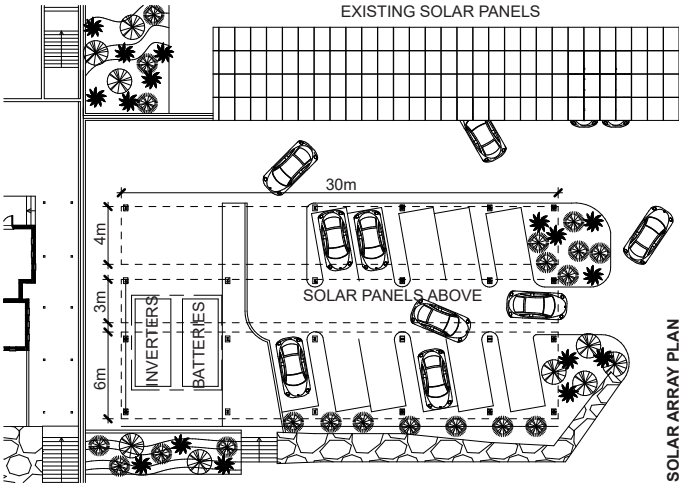
"Supporting us in meeting our daily targets, the only sustainable, cost efficient hope available to keep us working is Beehive's PV Solar System."

(Bob Kayange, Senior Electrician at Beehive)

"With a population of 17.6 million people, [Malawi] lags behind much of the world on energy access with just 11 percent of its population having access to grid electricity. And for those who are connected to grid power, supply remains largely unreliable. Accelerating energy access has clear benefits through direct impacts on poverty eradication, climate change, health, water and economic transformation."
(United Nations, 2019)

Beehive's Main campus in Chilomoni, Blantyre, was imagined as being a world-class hub for youth education and training, and a source of job creation in a community severely lacking employment opportunities. In order to achieve this goal, provision of a reliable electricity supply was vital, in order to create permanent access to computers and the internet, and sufficient lighting when required.

Opened in 2009, the Beehive Main Campus was originally powered by a diesel-run generator whenever the mains electricity supply became unavailable. Costly and contrary to the sustainable message promoted by Beehive, the generator was superseded by a solar array in 2018. The solar array system comprises 315 individual photo-voltaic solar panels, orientated at the optimum angle for their global location, to output a total of 93KW of energy at their peak, more than enough to power every computer and sewing machine on campus. When the sky is overcast, 24 lead-acid batteries are automatically engaged to provide a total of 48KW of power, enough to power the entire campus for approximately one working day. Two high-tech invertors are required to allow energy collected from the solar panels to take one of two different routes simultaneously; firstly directly to the buildings' electricity lines, and secondly to charge the batteries.



The solar panels are supported on a steel frame and raised approximately 3m above ground level - the space below the frame has been utilised as a shaded car park. The supporting columns have therefore been spaced to accommodate car and turning-circle dimensions. Integrated planted flower beds soften the arrangement, and provide suitable areas for rainwater egress.