PV Financing Best Practice: Hitachi Rail Industrial Park (UK)

A large rooftop installation on a new build train manufacturing plant with 100% self-consumption, funded through an innovative PPA agreement.

General project Description

The project is a large commercial rooftop installation, atop a newly built train manufacturing plant in Newton Aycliffe, County Durham, owned by Hitachi Rail Europe – their first manufacturing facility in Europe. The 1MW solar installation comprises of 3,800 Trina Solar high-efficiency 265MW mono-crystalline solar modules, together with 28 PowerOne Trio27 inverters.

The key driver for the project was for the building to have a smaller carbon footprint, as well as having the certainty of the solar electricity supplied over 20 years, at a guaranteed PPA price linked to the Retail Price Index (RPI).

Business case description / economic parameters

The entire plant, built in January 2015, was an investment of £82m, and is fully owned by Hitachi Rail Europe. The PV investment costs were around £900,000, which was financed by Macquarie Lending through a PPA structure. The roof space was leased from Hitachi Rail to

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Macquarie Lending, who own and run the installation for 20 years. This was the first project within Macquarie's £50m fund for commercial rooftop in the UK. Rates of return and other detailed financial/economic parameters were not provided as they are commercially sensitive.

Technical project parameters

The site, which covers 31.5 acres (127,500m2), contains both a 1.1km test track with a 25kVa power supply, and a 44,000m2 main manufacturing building. The solar installation of 3772 panels covers an area of 6,500m2. The system generates around 851MWh per year, all of which is used on-site. As the electricity generated is used on-site, there is no need for storage or other smart technologies in order to maximise self-consumption.

Stakeholders / companies / PPA

The system was financed through an innovative PPA structure under which Macquarie Lending leases the commercial roof space from the building owner and finances the capital cost of the solar PV installation. In return Macquarie Lending receives the Feed-in-Tariff and sells the electricity generated to the building owner. The PPA rate, at around 6p/kWh, allowed Hitachi Rail to save money on their energy bill immediately, without requiring investment upfront.

In terms of the project management structure, Hitachi Rail was the main client, with Shepherd Construction the delivery partner for the building construction. Photon Energy worked with Shepherd Construction to deliver the solar installation, and Photon Energy developed the PPA agreement and roof lease with Macquarie and Hitachi Rail. Operations and Maintenance is handled by a separate third party contractor.

Replicability / Outlook

The project was primarily enabled through the Feed in Tariff that pays the generator a rate per kWh of electricity that is generated by the installation. As rates and policies in different countries vary significantly, there is no guarantee that a project with exactly the same setup would be replicable in other regions.

That said, the general structure of the project is highly replicable, especially as the costs of solar continue to reduce. Companies always want to reduce their carbon footprint and save money on electricity costs: in particular site with very large energy consumption are keen to

reduce their exposure to energy price volatility. This means that signing an index-linked 20-year contract for a significant proportion of their energy bill is highly attractive.

The art in developing this as a viable business proposition in a low or no subsidy world will be to ensure that two conditions are met. Firstly, the savings that the client makes must make a strong business case; the PPA rate must be less than the electricity price the client (in this case Hitachi Rail) is paying, and the project must be big enough to deliver a significant differential benefit to the client through self-consumption. Secondly, the PPA rate must also allow the financier (in this case Macquarie) to deliver their target rate of return. In order to enable this, installation and equipment costs are required to reduce to a level at which the PPA rate sales are enough to finance the system and deliver the rate of return, without the additional Feed in Tariff income stream.

References and further reading

- Photon Energy Press Release:
  - http://photonenergy.co.uk/news/207-hitachi-rail-europe
- Hitachi Rail Europe Webpage:
  - http://www.hitachirail-eu.com/uk-manufacturing-facility_150.html
- Trina Solar press release:
  - http://www.trinasolar.com/uk/about-us/newinfo_856.html