The Herne Bay Pier Trust, formed in 2009, are very proud to be part of the management of one of the town's most important attractions. The original 1832 Victorian Pier structure which supported a small railway for passengers and their luggage to shore from the London paddle steamers, was originally a major part of what became the popular seaside resort of Herne Bay.

The short Pier seen today, is the remaining section of the third iron pier opened by Mr Prescott Westcar of Strode Park Herne in 1899, being the vessel landing stage at the head of the once second longest pier in England The isolated section of this Pier Head can be seen still standing out to sea after the Pier Neck final collapse in the sea storms in1978.

Along the walkway at the beginning of the suspended section, there is a canopy which provides a wind and rain shelter suitable for varying coastal weather conditions. The open structure, always known by locals as the Blue Canopy, has a raised roof section which had unfortunately deteriorated into a terrible state, leaking badly and was visually horrible.

The HBPT Board wanted to renovate the tired looking steel framed walkway canopy with seating areas underneath, that gives the public fantastic views along our coastline. However they also realised that apart from repainting the steel frame and wind shelter screens, the roof would need some serious consideration. Replacement of the leaking, and hazardous roof fabric might allow for some solar panels to transform part of a historic structure into a more sustainable and Greener Pier for the future.

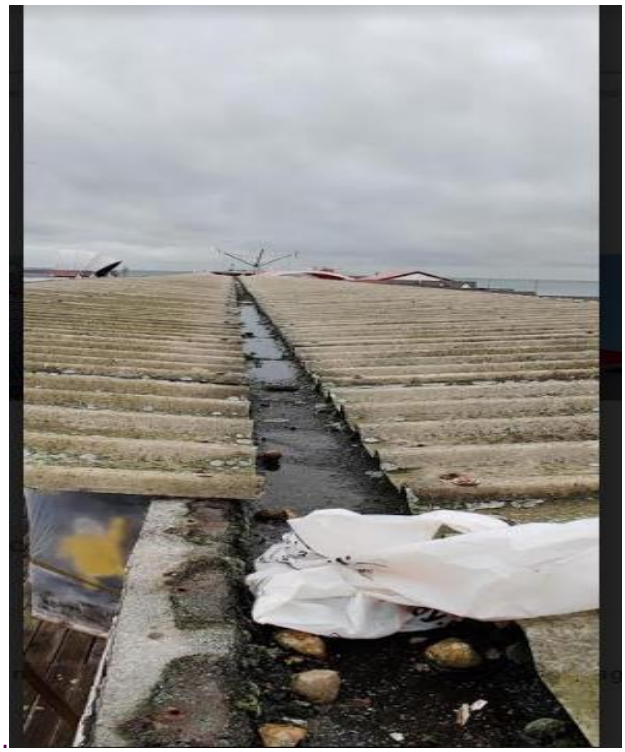
They enthusiastically explored how a nationally Listed Pier might be able to offer some unshaded open roof space to support some solar panels for some electricity for the small start-up businesses on the Pier. A small-scale renewable energy system could help out with any action plans being developed for the use of existing buildings, and any future policies for Climate Change for the area.

The Pier is a historic maritime structure which benefits from uninterrupted sunshine. This abundance of solar energy provides further opportunity to enhance the visitor experience and increase the Pier Trust's positive impact on the environment.exposure. As such, it can provide energy for its own consumption, LED lighting for displays and safety at open air events.

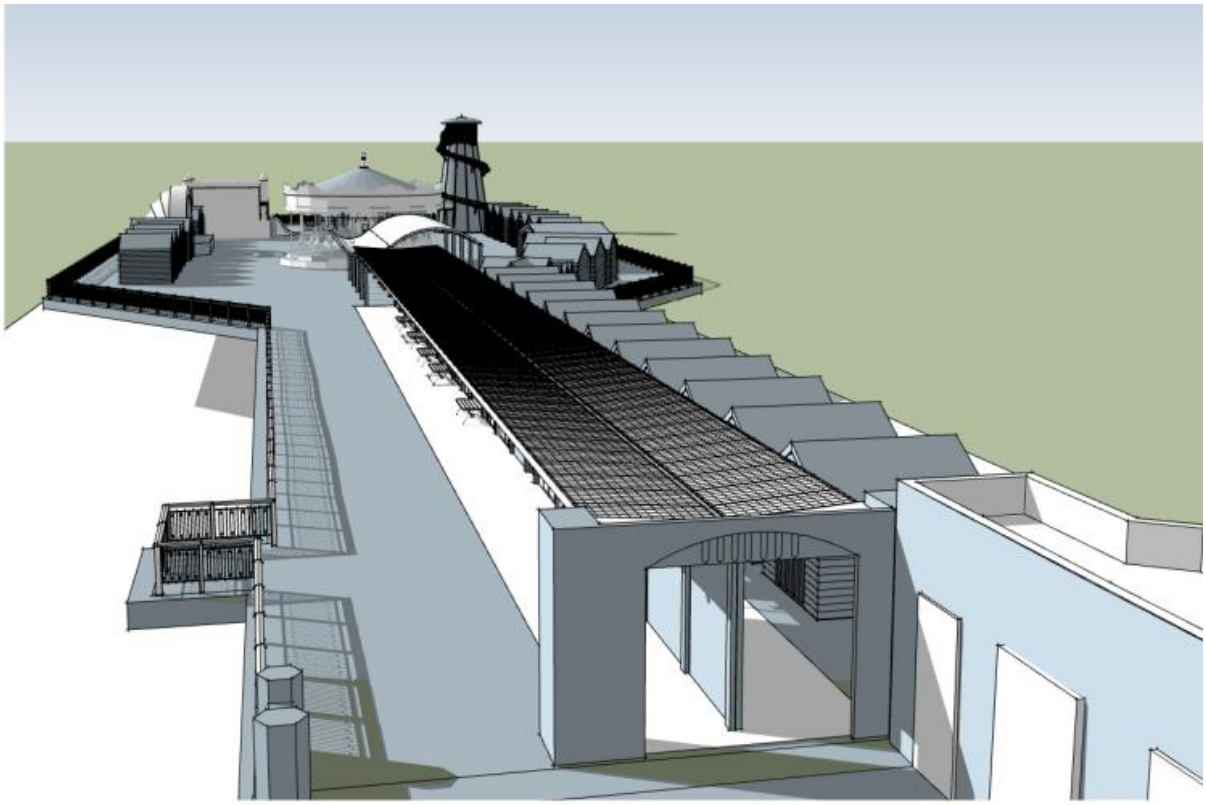
Any surplus energy generated through the solar array panels on the canopy roof could then be exported back to the national electricity grid. This would be beneficial from gaining a small income for further reinvestment in preservation of the pier facility for future generations to enjoy.

Alternatively. by integrating a lithium battery system, any solar energy not required to power the Pier, can also be stored if not exported back to the grid. This could provide power for EV chargers for electric bicycles, adding the Pier to the growing network of charging points established throughout Thanet, Whitstable and the inner City.

The replacement roof system needed to be designed to make the canopy roof watertight and this presented a challenge when using solar PV panels as a replacement roof covering. It required a panel which would effectively replace the old tatty, cracked and dirty glass fibre roof covering, whilst also delivering the most efficient solar solution to an open, but raised roof structure



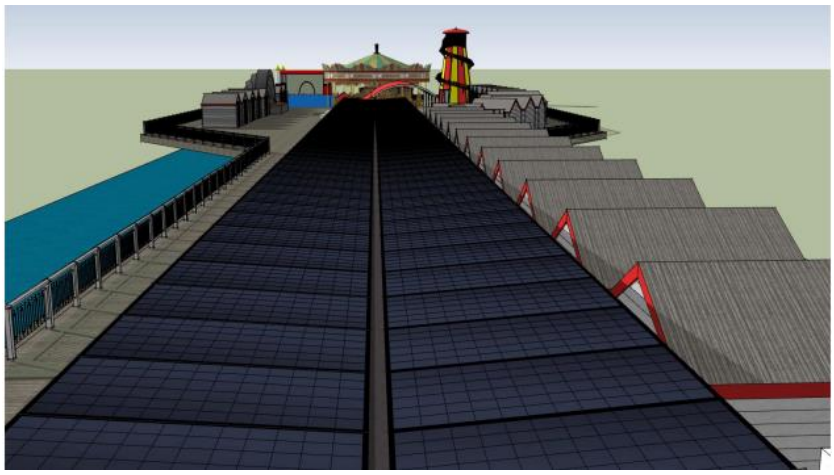
Convert Energy designed the system with a strong focus on the mounting system due to the unusual project requirements. They needed to take into account the harsh sea air, requirement of a waterproof finish, strong wind conditions and the need for safety due to the constant use of the walkway below. To do this the panels are fixed in multiple ways to ensure they will stay strong no matter what the weather throws at them. On top of the many marine grade fixings, the modules are also all connected to each other using glazing bars to stop drain off between them.



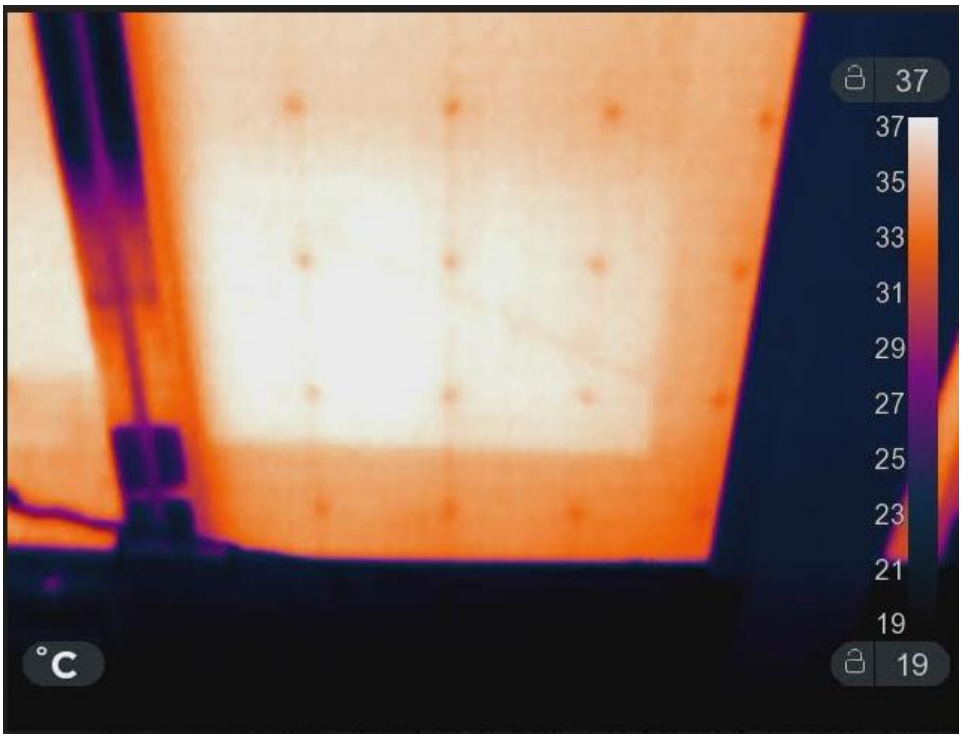
Cleverly incorporated roof drainage to maintain efficiency through self cleaning without public disruption.

The panels are fitted with solar edge power optimisers which allow the Pier Trust to log in and see the performance of each individual panel. These smart optimisers are also in place to reduce the power losses that could be caused by seagulls sitting on, and shading the solar panel arrays.

Carefully designed using the latest technology, the 370W Bifacial solar panel captures light on both top and bottom sides, maximising efficiency. The Bifacial solar panels are slightly angled east and west which means the East face generates more in the morning with the West generating more in the evening.



Following the sun's path through the sky, from East to the West, this means that the pier generates more power from early in the day into late in the afternoon. The bifacial solar panels are strengthened double glass modules that have solar cells on both sides. This means that light hitting the underside of the walkway cover will also be used to generate power giving a boost in annual energy production.



Temperature sensoring on the underside of panel showing extensive solar gain and minimal edge loss

Their impressive generation outputs rely on the open nature and sunlight exposure of the canopy, coupled with improved efficiency from the inverted roof pitch to a central guttering

system assisting in self cleansing, and then optimising the energy generation performance through each panel containing the highest performance passivated emitter solar cells. The peak DC installed capacity is 41.4kWp across the two aspects with Solar edge inverter installed offering a peak AC capacity of 27.6kW.

The HBPT Board managed to raise most of the funds equally from the Coastal Revival Fund and the Postcode Lottery. A Total of £40,000 pounds was grant aided with the shortfall Trust's own reserve funds of £16,000 required to complete the full project. This included removal and disposal of the old leaking roof, guttering, drainage relining, significant steel corrosion treatment and complete repainting of the canopy structure.

Cllr Andrew Cook worked very hard to deliver this special solar energy project and with close liaison with Canterbury City Council said

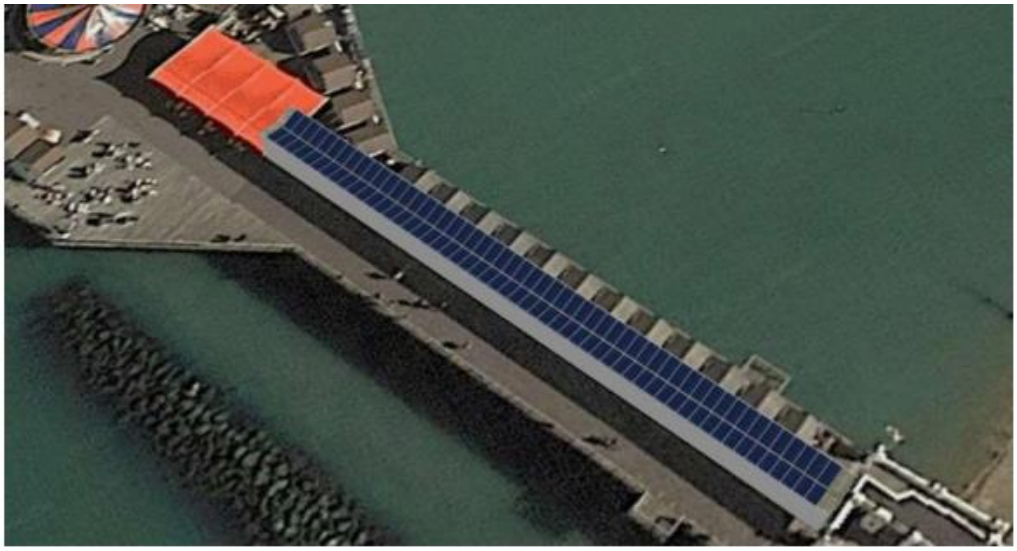
''With the renovation of the buildings at the front of the Pier, the renovated canopy colours being cream and red chosen by the HBPT Board, the new Solar roof's ability to pick up rays

of sunlight from both the top and underneath, then transform this to electric power is stunning, and what's more does not leak anymore !

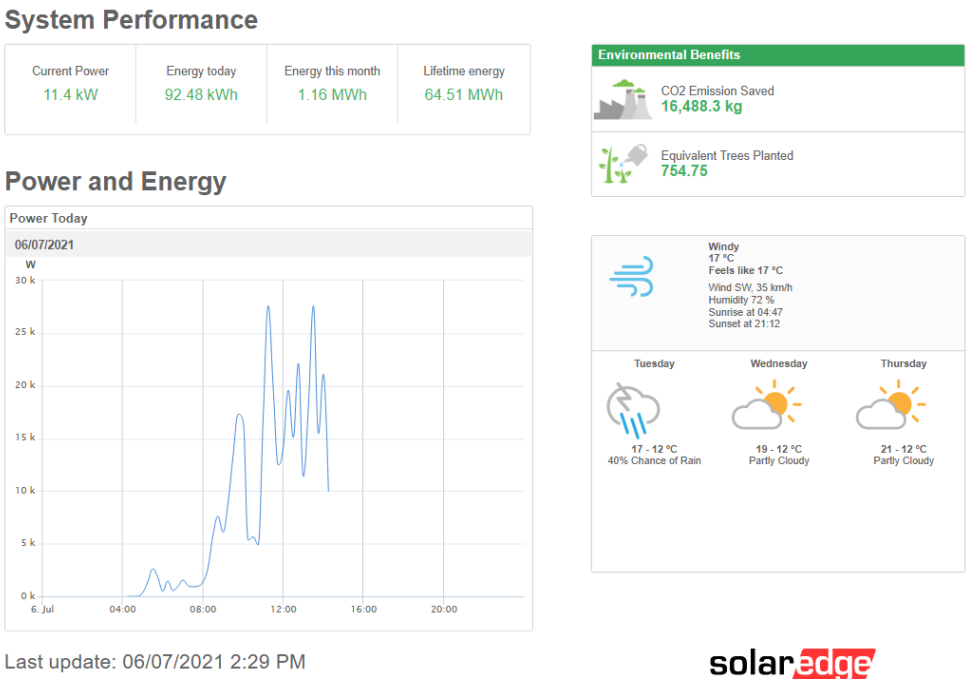
With a generation of around 40,000kWh, an energy saving cost of around £4000 per year, with a a dry seating area and walkway, this is a total win on both looks and cost savings for Herne Bay's Pier"

The installation has proved to be very successful over the 18 months since commissioning in the winter of 2019/2020. The timing of the installation was carefully thought through to minimise any inconvenience to the public and visitors with full closure of the Pier for the disruptive installation over quieter winter months.

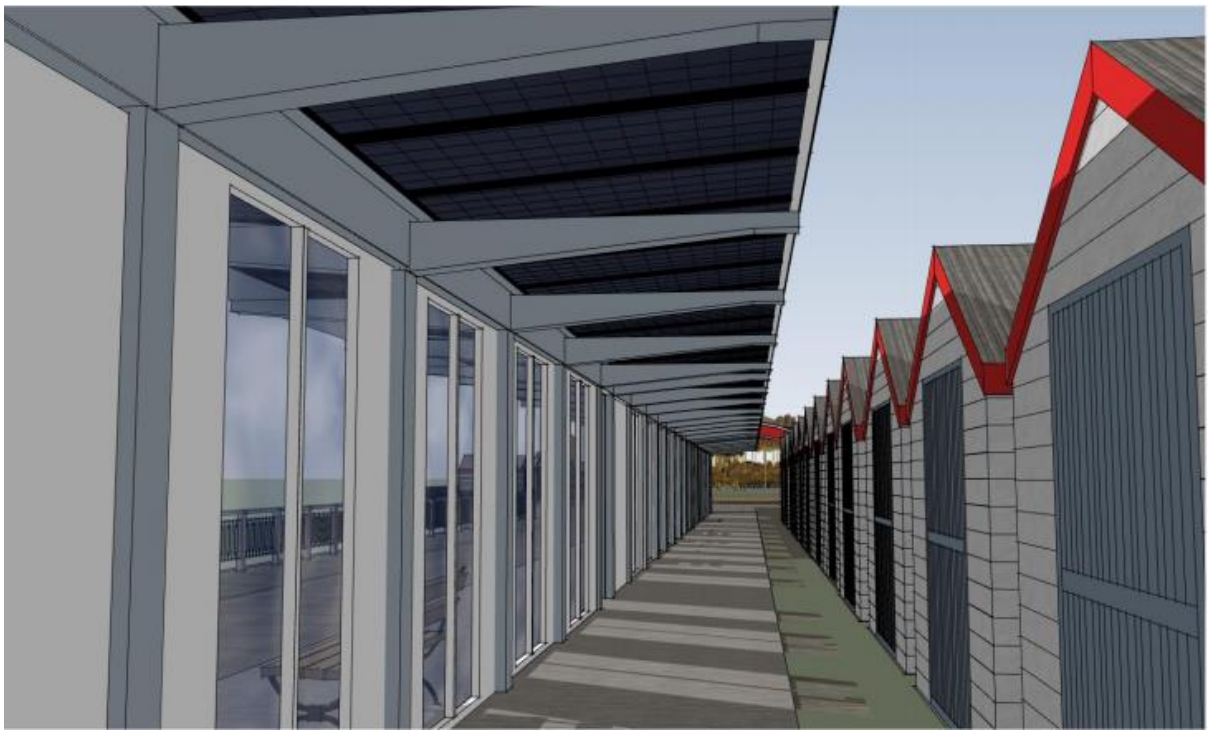
The HBPT Board are hopeful their hard work to deliver such an unusual concept on an historic structure, could be used as a pilot scheme for other coastal buildings in the area in the future. This system provides a carbon offset of 12,096kg per year, which is the equivalent of planting 254 trees. This with many other exciting and rapidly emerging green technologies could also be investigated further.



The energy generation from the Pier's solar array can be observed on a large weatherproof screen at the seaward end of the canopy demonstrating the environmental benefits of the solar panels. The HBPT will also encourage schools to visit the project and use the data monitoring to highlight Climate Change, and contribute to any Action Plans for reduced carbon emissions.



HBPT were extremely grateful for the technical assistance on design, modelling, energy prediction calculations followed with installation by Convert Energy Ltd, a Canterbury based, and locally established innovative company specialising in high quality renewable energy systems for new builds, retrofit and commercial buildings.



They commented

''This project was certainly unusual!
Whilst the walkway covering was clearly beyond repair, the structure underneath was the perfect shape for the integration of a solar array. The next challenge was to provide a watertight shelter that also provided shade but still allowed ambient light to fill the space.

This proved the perfect opportunity to utilise the semi-transparent qualities of bifacial solar technology. We designed a bespoke mounting system that allows the modules to be fixed individually, providing for expansion but also maintaining a continuous weathertight finish across the entire array. We are really pleased with the result and amazed at the power generation which has outperformed our simulations.

The success of this project is largely due to the Pier trusts' willingness to be flexible and open minded about how to turn an existing problem into a successful asset that not only enhances the appearance of the Pier, but provides clean energy, reduces carbon emissions and stops visitors getting wet!

This project was a true joy from start to finish.''

Cllr Andrew Cook said he was also grateful to have the technical support from the City Councils Engineering section through the expertise of John Davison, with his structural knowledge of the Pier.

HBPT will now also investigate the possibility of providing a display screen for all the local coastal monitoring including tidal, weather, wind and wave information from equipment located on the remaining isolated Pier section out at sea. Fortunately this is also powered by solar PV panels, with battery storage and located on the upper decks of the original, concrete mooring platforms.

John Davison
July 2021

Photos and Images courtesy of:

West Whelks, Whitstable Harbour
Convert Energy Ltd
Cllr Andrew Cook
Herne Bay Pier Trust