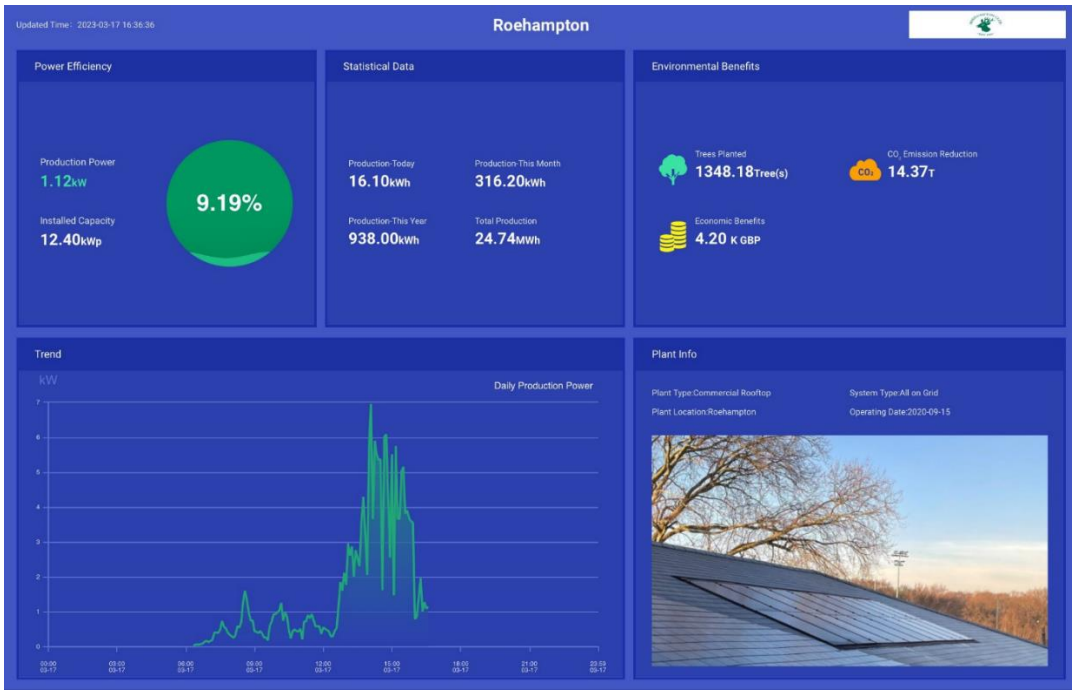
Solar Electricity Generation at Roehampton Club: Saving money and reducing our carbon footprint

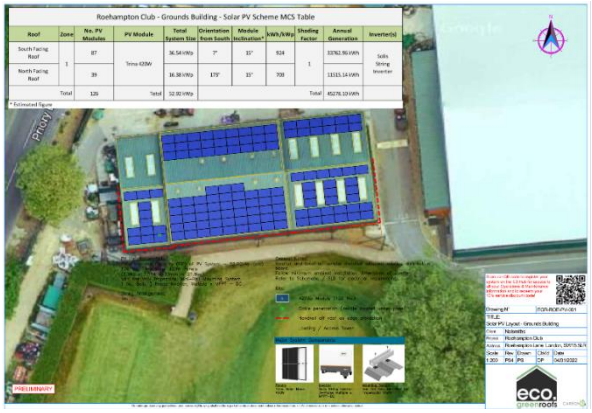
In September 2020 we had to replace the roof on the indoor swimming pool to cure some leaks and increase the insulation. The Environment Committee therefore requested that the Club consider installing solar panels on both the east and west-facing sides of the roof. Two arrays totalling 12.4kWp capacity were installed for an additional cost, over and above the original roofing cost, of only £4000. Our original estimate was that the scheme would pay back within 4 years leaving a system that should produce electricity for us for another 20-25 years with minimal additional maintenance costs. The panels generated more power than we estimated and the cost of grid electricity increased as well resulting in a much shorter payback time of only 2¼ years. At the end of last week, the data from the monitoring system showed that we had saved £4,200 and reduced our carbon footprint by nearly 14½ tonnes of CO2e over the period. This equates to the amount of carbon that would be sequestered by planting nearly 1350 trees.



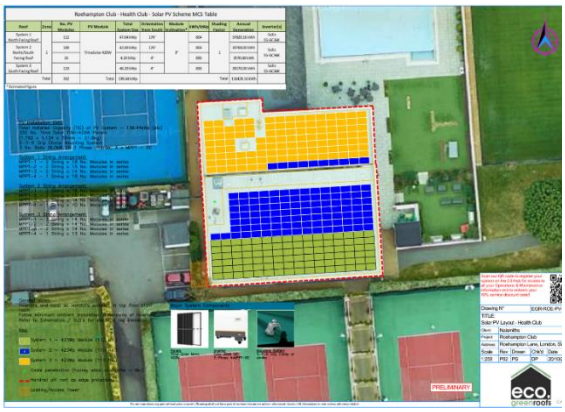
The success of this small project gave the Environment Committee the confidence to propose a much larger system for the Club. A more detailed specification was drawn up and sent to 4 potential suppliers for quotation. Responses were received, thoroughly inspected and assessed and a proposal was sent to the Board for consideration and approval. The proposal was approved and a contract let to install solar arrays on the appropriate roof areas on site.

These areas comprise:

The grounds building:

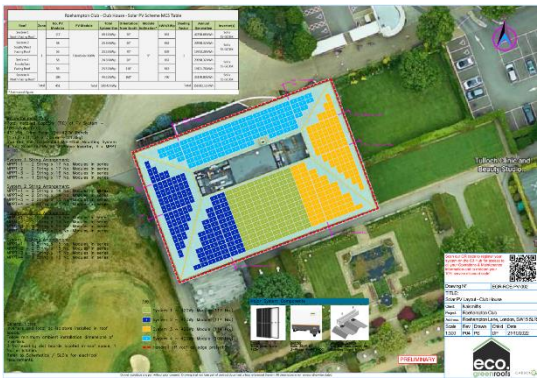


The Health Club:



The Tulloch Clinic, Squash Courts and Sports Hall

The Clubhouse



The colours aren't representative of the colour of the panels (they're dark grey) they merely show which panels are connected to which inverters – the electronic devices that take the DC electricity generated by the panels and convert it to 240V AC, just the same as the Grid supply. In fact the panels will be difficult to see in most cases since they are mounted on flat or very slightly sloping roofs. The cumulative potential peak power of all the arrays, if they were all generating at maximum capacity is 475kWp, enough to easily completely power the Club with some left over. We will never achieve that number because the sun will never be able to be directly overhead all of the panels at the same time because of the various different roof slopes and orientations but there will be times during the summer months when we will export power to the Grid for which they will pay us. In the winter the panels will make a much smaller contribution to satisfying our electricity demand and we will take the majority of power from the Grid. Over the year we predict that we will produce 395MWh of our own electricity – that's enough to keep 500 kettles boiling constantly throughout the whole of the year and has the carbon sequestration capacity of planting 20,000 trees!

Again, we have looked carefully at our costs and payback time. Our estimate is around 4 years to payback and having learned from our pessimistic calculations regarding the swimming pool array, we expect this to be accurate. It is somewhat ironic that the excellent negotiation conducted by our management team to fix our electricity supply price for 3 years from September 2021 has increased the payback time for the solar system by making our cost of electricity from the Grid significantly cheaper than it otherwise would have been. Despite this, we should expect to make a saving on our electricity bill in the remainder of this year in the order of £50,000 and at the same time save around 100T CO_2e from our Carbon Footprint.

Currently we are in a final commissioning and configuration stage. The Grounds building is connected and has been generating for the last three weeks and the Health Club came online and was connected 10 days ago. In the week commencing 20th March the other buildings will come online and the system will be handed over to us. This fits well with the 'solar generation season' since we expect to generate nearly 60% of the power available from the array in the 5 months between the beginning of April and the end of August.

The Environment Committee will be reporting on more of our initiatives in future Roehampton Club Recorder articles.

David Burditt
Chair, Environment Committee
Director, Environment and Sustainability