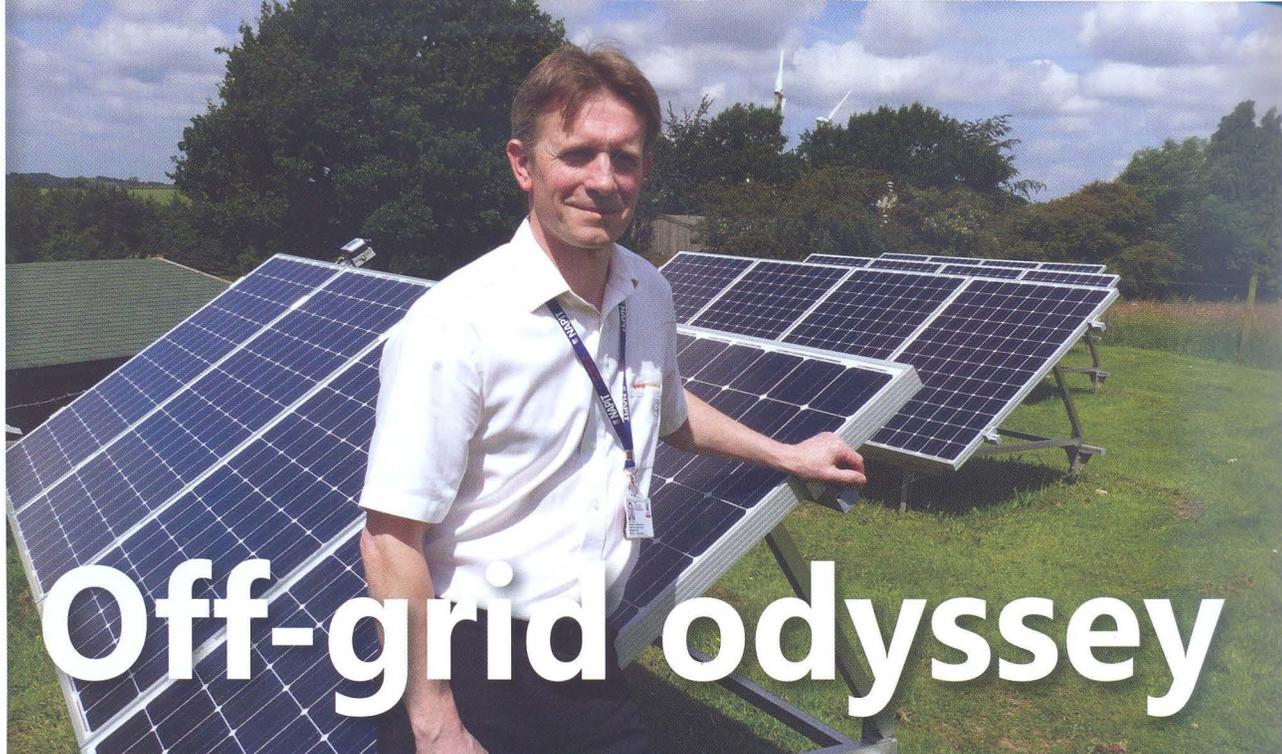




Roger Ryan meets a NAPIT member who is exploring the boundaries of MCS technology



Solar power plays a key role at West Beacon Farm

Nestling among the pretty hills of Leicestershire is a cutting-edge energy-saving project which could claim to be among the greenest in the country.

West Beacon Farm near Loughborough features most of the technologies you would associate with a first class microgeneration job but there is more to this venture than at first meets the eye.

This is no ordinary farm. There is a farmhouse, there are offices and a workshop but there is also a helicopter hangar.

A visitor would recognise familiar technologies on show like solar, wind and heat pump, all working to ensure that the farm and its outbuildings are powered off-grid.

But you would also find the unfamiliar. Energy produced by a turbine-based system from a man-made lake at the farm is used to heat and cool the buildings.

There's also a rainwater collection system which allows the farm to produce water for drinking, washing and cleaning.

Working relationship

In what could once have been a cowshed, a carbon capture unit has been built to produce aviation fuel from the air. In all seriousness, chemists at the farm are working to combine carbons with other chemicals to make fuel to run the helicopter housed some 200 yards away.

At the heart of the project is an energy-management system devised and built by NAPIT member Derek Beacroft of Energy Connect UK. His customer, helicopter enthusiast

Professor Tony Marmont who lives at the farm, has spent the past 30 years dedicating his life to finding technologies which can provide alternatives to burning oil and coal.

Client and contractor have a strong working relationship and this allows them to explore the boundaries of technology.

Professor Marmont told me: "Derek and his team are very dedicated and deliver a perfect job. Derek puts in the time to ensure the project fits with his desires as well as mine. The idea at West Beacon Farm is to be a self-sufficient entity independent of the National Grid.

"If we can do it here – and we have – it means that the rest of Leicestershire can do it, the rest of the country can do it and we won't be dependent on other sources of power. There has to be an alternative to how we generate power as a nation and this could be the way forward."

The German-manufactured SMA energy management system is supported by software designed by Derek, an IT consultant and Full Scope NAPIT member.

Grid integration

Derek explained: "We had many attempts with older technology to get the whole site off-grid. We'd get lights flickering, drop-outs and relay problems but only the electronic SMA system has been a success. The SMA back-up we have here is one of seven systems of its kind installed in the UK. We back-up all of the technologies through a G59 switch to ensure we have no problems with grid integration.



Professor Tony Marmont and Derek Beacroft: partners in off-grid generation

"From the start we involved our suppliers heavily and went to various meetings and training sessions to make sure we understood the technology before we implemented it. We also built a half system because it is so big – there's nearly £100,000 worth of equipment here.

"Stage one cost around about £40,000. We had to make sure the customer was happy with what was happening. We had to move distribution boards and relay large SWA cables around the place. With that complete we moved on to the full system and that's where everything got a lot bigger."

The present system works well and can be viewed onsite or remotely via computers or mobile phones. Daily generation figures are available at the touch of a button.

Derek said: "You can drill down into that data and see how each technology is working. Recently we had a solar panel stolen from the site. This was first detected by the energy management system when it was revealed that the power was down on the graphs."

Phase shifting

The wow-factor with the energy management system is the Frequency Shift Power Control on the electrics. "The way we stop the lights flickering when there is too much power is that the phase frequency is shifted by the system electronically," explained Derek. "This then allows the on-site system to slow down and stop producing power. So if we have full batteries and are not using any power pretty much all of the on-site sources switch off automatically."

A secondary generator powered from an on-site propane tank provides back-up for the new technologies and, if all else fails, West Beacon Farm is still connected to the National Grid.

"We have all the options necessary to export power into the grid or take power from the grid – or switch on the generator if we need it," explained Derek. On average the farm sells between 40 to 50kW of energy a day to the grid.

IT consultancy

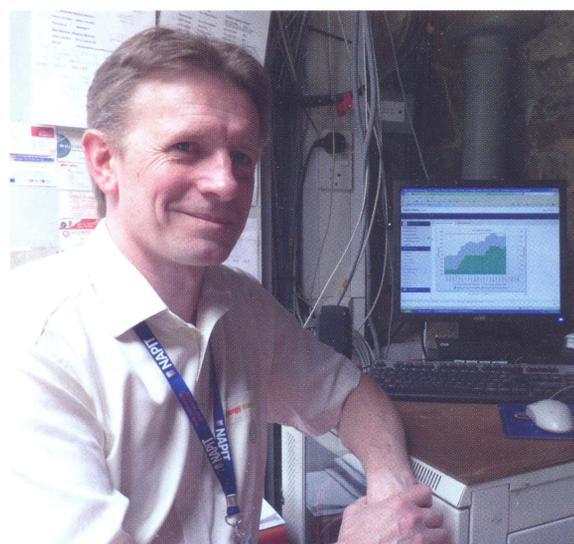
Derek (46), who has been a member of NAPIT for four years, was an IT consultant before moving into energy management and electrical contracting. He has known Tony Marmont for many years and with his encouragement has combined his IT and electrical skills to offer something different to the MCS industry. Derek runs IT firm Binary Star with its own workshop and servers back at the office in Leicester. "We are Microsoft Partners and have to maintain this status annually," he added, "I am currently also studying for an HND in electrical engineering."

Here lies the key to the success of the business. Derek said: "With the two skill sets we are able to produce software to provide the monitoring for the equipment. We have the expertise to do this and few businesses have. Most companies have to buy in the IT services."

Keep it simple

Work continues at West Beacon Farm and will do for some time.

"It is a challenging job and one where you must know your customer," concluded Derek. "I am contracted to spend one day a week here to oversee the site. The key point is to make the customer's life as simple as possible and as long as the system remains efficient and reliable, I will be happy."



Derek monitors the energy management system