

BELOW The aerial view illustrates the space available at Silverstone. Why not cover the facility's empty areas with photovoltaics?

RACING TOWARDS CARBON-NEUTRALITY

Dominic Harlow reflects on the de-carbonisation of motorsport

DAVID COULTHARD, it was recently announced, has been elected as the new President of the British Racing Drivers' Club (BRDC). He will therefore take over the responsibility for the running of Silverstone, the axis of Britain's Motorsport Valley, home of the British Grand Prix and one of the most prestigious sporting venues in the world.

DC is known as an approachable, open and intelligent racer, with a good head for business. So it can't have escaped his attention that the issue of climate change and the need to de-carbonise, even more rapidly than is currently underway, are major challenges that must be faced by any enterprise in order to thrive in the future.

We are all aware that motorsport could easily become a high-profile target for the negative publicity and invective surrounding the climate debate, a snowball that is very difficult to stop once it has taken root in the global 'conversation'. Unfortunately, the

fact that even a very broad-based qualitative assessment would place it toward the trivial end of carbon intensive or carbon generative activities, motorsport can always be seen as non-essential and profligate as well as an activity reserved just for the elites of the leading economies. At the same time, people can't be taken as fools and any hint of greenwash is to be avoided. This in itself is nothing particularly new, it's just another one of many tightropes – financial, legal and moral – that are walked as a part of life.

What is different now though, is the rapidly falling cost of so-called renewable energy. The largest three corporate buyers of renewable energy in the world last year were none other than Google, Amazon and Facebook. The financial resources they have deployed amidst aggressive targets to reach carbon-neutral status in a short timeframe has resulted, amongst other things, in an 80% drop in the cost of solar energy. Sure, it's not all down to

renewables but according to the National Grid, Friday 21 April 2017 was the first working day in the UK without coal power since the Industrial Revolution.

I have been fortunate to have quite a few hours of experience flying, sometimes at relatively low altitude, in the skies above Silverstone and the surrounding countryside. Two things have stood out which, I have come to believe, may offer an interesting opportunity for DC and the Silverstone team to take a step forward in de-carbonizing. Firstly, there are a lot of disused or re-purposed former WWII airfields in this part of the UK, (a statement of the obvious maybe, since Silverstone itself is one); secondly, many of them have been covered in solar panels.

SOLAR PARK

In fact, Silverstone's closest neighbour and former satellite airfield, Turweston, as well as nearby Westcott, another wartime home to Wellington bombers, both now house solar parks. The logic is obvious: these sites have space (Silverstone included), a lot of which is not intensively used; they are usually higher than the surrounding land; they are relatively flat and with an open aspect to the south-west (the preferred landing direction in the UK since it aligns with the predominant wind). So why not cover Silverstone's empty areas with photovoltaics? Use the car parks, the infields, the remaining runways, the roof of the grandstands and so on. Could the power generated then be used to offset the fossil fuels being used on track and allow the venue to claim a level of carbon-neutrality?

Turning to the excellent reference, *Sustainable Energy without the hot air*, by David JC Mackay, it's possible to examine the prospect in more detail using some data.

The power of the sun, per m² of land area in Britain, correcting for the angle of the sun, seasonality, effect of cloud cover and averaging over the hours of daylight, is around 100W. The most efficient PV panels are reaching 25% efficiency, and probably won't get above 30% in such an application. Now on track, during the British Grand Prix, 20 cars burn fossil fuel for 90 minutes and release CO₂ in a similar way to an oil or gas-fired power station, albeit slightly more efficiently. So, if we wanted to channel our solar-generated electricity back into the grid (or maybe

directly to the Silverstone Technology Park to power those businesses), what area of panels would be required?

Obviously, this depends how quickly we want to offset the Grand Prix. If we want to do it 'instantaneously', then it will be necessary to match the 110 kg (at 100 kg/hr maximum) of fuel powering the cars for the hour and a half, with a calorific value of 46 MJ/kg. That equates to 18.75 MW – incidentally, Turweston solar park has a quoted power of 16.7 MW and cost around £15m, including land, around five years ago – and we're going to need 625,000m² or 154 acres.

Silverstone's total site area is 850 acres, so whilst it might not be practical to achieve that kind of coverage, given the track is not used anywhere near 100% of the time or by 20 F1 cars, the numbers appear to add up. It is also worth just dispelling one 'mythconception' that PV panels require more power to manufacture than they harvest in their lifetime: in fact, they can have a yield of five times that energy over their lifetime.

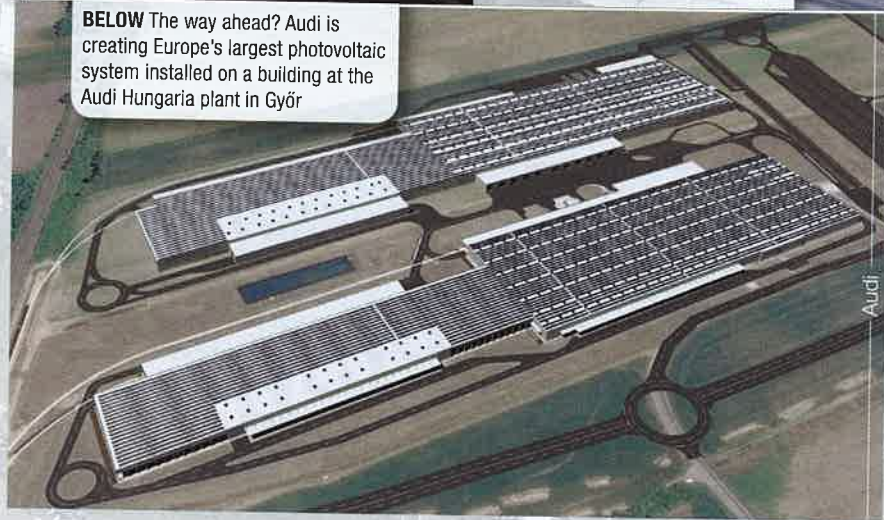
If this is indeed the case, then why

not roll this model out to more circuits? Motorsport Vision owns almost all the remaining large UK venues with paddock, offices, garages and so on, and so perhaps the entire site energy consumptions could be offset this way? Perhaps F1 should require new circuit developments to include this kind of element, particularly given the often sunnier regions in which they are built. Some progress seems really possible. Okay, perhaps not Monaco...

It seems surprising that this entire topic has not been more widely considered. I mean, anyone who has ever been knows Silverstone is also quite windy – those airfields again. In one possible glimpse of the future, I have recently noticed that I parked under a large solar array in the visitors and staff car-park of one Alfa Romeo Sauber F1 team. Switzerland, like Germany, is fairly advanced in the adoption of renewables, and clearly there are a few electrons trickling back into the grid to offset the wind tunnel and CFD clusters chugging away next door. It's not as fashionable to say it, but the difference is likely to be in many quiet, incremental changes like this. **ET**



ABOVE F1's newly-launched sustainability initiative is indicative of increasing momentum in this area



BELOW The way ahead? Audi is creating Europe's largest photovoltaic system installed on a building at the Audi Hungaria plant in Győr