

# UNLOCKING A MORE SUSTAINABLE FUTURE WITH AI



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**It's no secret that the health of our planet is declining. Deforestation, melting sea ice, rapidly disappearing species and more have weakened Earth's ecosystems, and climate change is arguably the most pressing issue of our time. We need to think outside of the box – and move swiftly – to recover a sustainable future.**

The solution isn't going to come from the small percentage of the world who are willing to overhaul their lifestyle by not travelling by aeroplane, for example. It's going to come from as many people as possible taking their own steps towards a cleaner, greener energy system. And when we add up all of those little steps, that will be the difference between winning and losing the fight against climate change.

So how do we get everyone in the country, or on the planet to do their bit? Let's look at something like the plastic bag tax. Charging 10p for plastic bags has resulted in their use plummeting by 85% compared to the year before it was introduced.

I believe this has become even more sticky due to the strong 10p bags, or cloth bags, which you bring from home, serving the consumer's purpose better than any of the free cheap plastic bags we used before. They are stronger and don't hurt your hand so much. You can get more into them, and sling them over your shoulder which makes them less cumbersome to carry. After the initial transition period, the consumer shopping experience is now better. Ultimately, to make big changes like this, we have to create

experiences that make consumers want to change because it adds value to their lives in some way.

And the same goes for businesses. There is a misconception that sustainability must increase business costs when in fact the two can go hand in hand. AI company DeepMind, for example, have harnessed their machine learning capabilities to reduce the amount of energy needed to cool Google's data centers by 40%.

I believe that AI will be a key technology in helping to tackle climate change in innovative ways. At Verv, we use high speed data monitoring techniques and AI to unlock untapped energy data within the home in a bid to make households smarter and more efficient.

One of Verv's most notable projects involved teaming

blockchain with AI to create a peer-to-peer renewable energy trading platform that adds a new dimension to smart energy. Within the platform, our high speed data monitoring and AI technology is used to gain a detailed, real-time view of energy production (if there is a renewable energy source) and consumption within a household. In turn, forecasts based on supply and demand can be used to enable trading at the best times on blockchain technology.

In practice this means that the platform enables households with solar panels to sell the excess energy that they generate directly to their neighbours. Communities can benefit from cheaper energy whilst those with solar panels can receive an ROI by selling to their neighbours. Given it is not currently legal for consumers to sell energy directly to one another, we were



The Hackney social housing estate where our peer-to-peer energy trading pilot took place

extremely lucky to receive funding from BEIS to develop this project.

In 2018, with further funding provided by Innovate UK, we took our platform to the next level at a social housing estate in Hackney. At this specific location there are solar panels on the 14 blocks of flats, but residents can't currently benefit from the green energy due to the constraints of the UK electricity market. We were given regulatory flexibility by Ofgem through a sandbox programme in order to bring our platform to life, and in April 18 we conducted the UK's first peer-to-peer trade of energy on the blockchain. The impact of our work has been more than we could've imagined with case studies of our work in reports and articles worldwide. In 2019 we supported New Anglia energy in raising a modification to UK law (p379) which takes a massive step towards making peer-to-peer renewable energy trading possible.

Despite that, we are still waiting. And as innovation continues to outpace relegation, we are running out of time. More needs to be done at government level to ensure that technologies that can have a real impact can be commercialised quickly.

So whilst we're waiting for legislation, how can we continue to harness Verv's technology to combat climate change?

A recent study estimates that because of the CO<sub>2</sub> emitted in the manufacturing process, a long-lasting washing machine will generate 1.1 tonnes less CO<sub>2</sub> than a short-lived model over two decades. In addition, an estimated 1 million electrical items are being sent to landfill each week, with e-waste becoming the fastest growing waste stream in the world.

We are tackling this using the same high speed data acquisition techniques and AI used in our previous projects, but this time to monitor the health of white goods in real-time. Our high definition predictive maintenance technology detects anomalies in how white goods are performing by analysing their electrical load signatures or digital footprints. We can identify signs of component fatigue and locate faults that are occurring or are about to occur, in the utmost detail, alerting manufacturers and in turn end-users to recommended action. Through real-time performance monitoring, earlier fault diagnostics and a more streamlined maintenance process, there is significantly more opportunity to repair vs replace white goods and in turn extend their life cycles for a reduced impact on the planet. Not to mention the improved customer experience and reduced business costs in warranty for manufacturers who

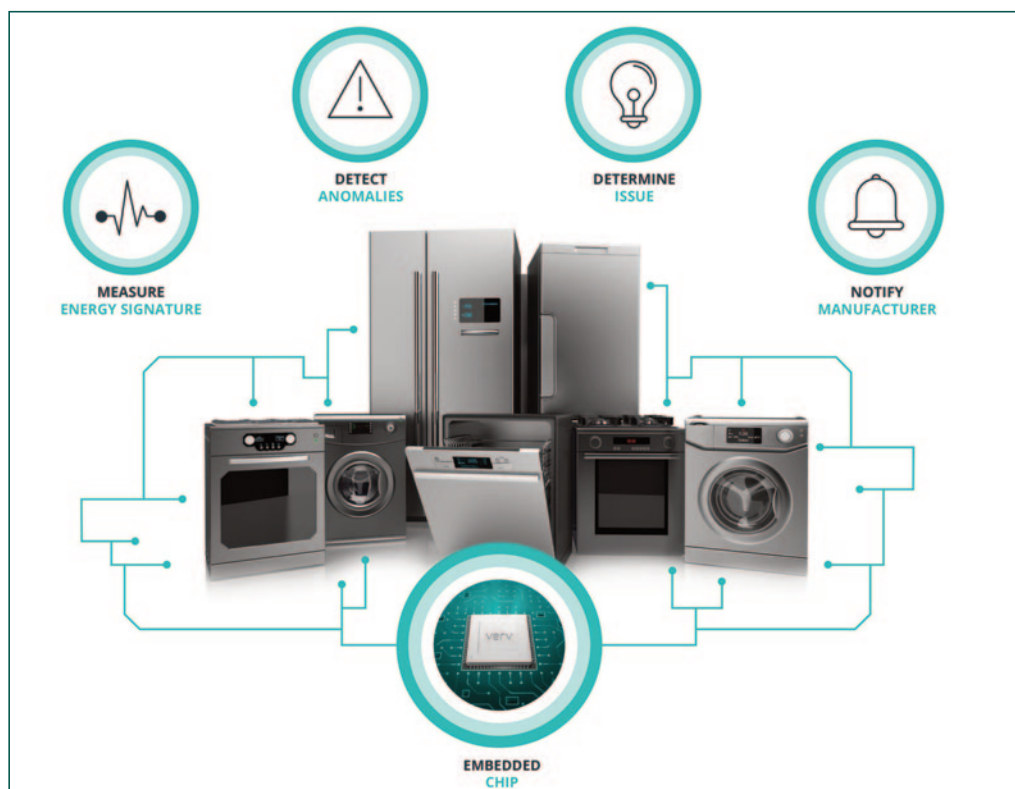


The Verv team at the Hackney estate where our peer-to-peer energy trading pilot took place

will be able to avoid engineer call-outs where unnecessary (e.g an issue easily resolved by a consumer) and improve first time fix rates thanks to detailed diagnostics. Due to the embedded nature of the technology (within the appliance), manufacturers and consumers will also be able to contribute to demand side response once the domestic play is ready. As mentioned earlier, sustainability does not have to equal increased costs.

These are all of the benefits appliance manufacturers could receive using smart energy AI (including significantly reduced costs in call-outs!), and consumers who will have less downtime of their appliances.

I am extremely excited to be working in the field of energy technology and look forward to the further progress we will make as an industry to bring the climate crisis under control and meet that all important target of reaching net zero by 2050.



Our predictive maintenance technology