



## Innovative Solutions for Net Zero Targets: Harnessing the Power of Machine Learning and IoT

### BACKGROUND

With the rise of electric and hybrid cars, the reduction of fossil fuel usage and an increase in renewable energy from conscious buyers, the UK's energy consumption is slowly decreasing compared to previous years. However, with the pressure on businesses to become more energy efficient against the cost-of-living crisis and rising bills, businesses are ever more concerned with how they can lower their consumption, and costs.

AllGreen Energy works with homeowners and businesses to reduce energy costs with green energy solutions. Harnessing a wide range of technologies from renewable energy, battery storage, power electronics, IoT, big data, machine learning and cloud computing, the company aims to make green energy affordable for all.

The end goal for AllGreen Energy is to support SMEs and businesses in reducing their energy costs and to lower their impact on the environment, paving the way to Net Zero.

### CHALLENGE

AllGreen Energy was interested in collaborating with the VEC through the LCR4.0 Holistic project (European Regional Development Funded initiative), to explore how additional Industry 4.0 technologies could further improve the service they offer to their clients and in turn, reach a greener and more sustainable way of working.

The company was particularly interested in enhancing solar panel services, including how we can collate efficient data sets from remote and hard to reach devices. The data set types AllGreen Energy were interested in included variables such as the weather and electrical usage.

### SOLUTION

The VECs digital experts explored the opportunities that Machine Learning techniques could provide, evaluating historical and ongoing data to support the prediction of future energy consumption and cost, based on trends and patterns.

The VEC also suggested training an AI model on these various data sources. The model would support the solar panel battery management system to make decisions accurately and autonomously regarding the management of its electrical charge, reducing waste and optimising energy use where possible.

The testing has theoretically highlighted the ways of working, which can lead to increased efficiencies as testing the proof of concept will explore how the AI model performs in the real world.

## BENEFITS

In today's fast-paced world, informed decision-making is more important than ever. With a more holistic view of energy consumption trends and patterns, it becomes much easier to identify trends quickly.

This kind of information can support in reducing the need for human interference in energy consumption management, whilst leading to long-term cost savings and lower energy usage.

Additionally, this approach can uncover opportunities for energy-saving in areas that may not have been initially considered. By leveraging this information, organisations can make decisions that are not only good for their bottom line, but for the environment as well.

*"Working with companies like AllGreen Energy who are contributing to a better world for us all is incredibly rewarding. It was a privilege to get to work with such committed people, and the strong results of the project will hopefully play a small part in a longer battle against rising energy costs and climate change."*

- Shaun Johnson, Data Scientist, VEC

*"The VEC's study demonstrated the potential of AI for enhancing energy efficiency, reducing carbon emissions and lowering energy costs. This boosts our confidence in developing AI-based energy management systems."*

*"We highly appreciate the VEC's excellent support."*

- George Huang, Managing Director, AllGreen Energy

