



ULTIMATE CELL TRUCK ENGINE V3.0

CASE STUDY

LLYNCH

MICK GEORGE 

 **ULTIMATE CELL**
by ULTIMATE POWER



BACKGROUND

Lynch is committed to helping our customers reduce carbon emissions and meet their sustainability goals. By embracing cutting-edge technologies and leading innovative initiatives, we support our customers on their journey toward a greener future, all while working towards our goal of achieving **Net Zero Carbon**.

GOALS & OBJECTIVES

As a commitment to their drive to achieve **Net Zero**, Mick George approached Lynch to understand the available technology to reduce carbon emissions on heavy plant.

Our **40-tonne 360 excavator** is at the forefront of this effort, ensuring both productivity and sustainability on this much-needed bypass.

Mick George selected their project at Long Stratton, providing Earthworks for the much needed **New A140 Long Stratton Bypass**.

RESEARCH & DEVELOPMENT

Following on from initial Ultimate Cell pilot trials which showed a **significant reduction in carbon**, Lynch and Mick George identified the **Ultimate Cell Truck Engine V3.0** as an innovative technology suitable for application on the Long Stratton Bypass.

We aimed to retrofit this to a **heavy excavator**, running it alongside a standard Tier V diesel engine, gather data, and demonstrate significant benefits. We identified a suitable test machine and worked with Caterpillar, the Original Equipment Manufacturer, to ensure the installation would not void any machinery warranties.

THE TECHNOLOGY

This smart retrofit fuel cell technology optimises combustion engines by producing hydrogen on demand and introducing small quantities of hydrogen into the engine air intake via electrolysis, in response to driver throttle commands.

It is a simple technology that does not require hydrogen storage tanks on the vehicles or on-site. The unit is as small as a can of beans and can be scaled up to **3 or 6 cells**, depending on the equipment needed.

This patented device is designed to work with all fuels, including diesel, petrol, LPG, and ethanol engines meeting US and European Standards.

THE TRIAL

Between **August and December 2024**, we assessed the impact of Ultimate Cell on fuel consumption and emissions. We equipped one machine with a Triple cell Unit, which was subsequently scaled up to a Six Cell Unit, and a similar machine had standard OEM specifications, serving as a control machine. Both machines had the same workload to compare savings accurately.

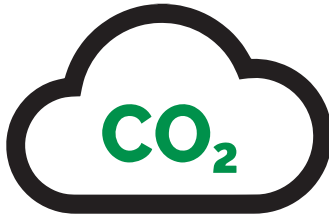
We collected data over the four months and utilised statistical methods to compare performance metrics. This innovative approach has resulted in significant cost savings, detailed below.

KEY RESULTS



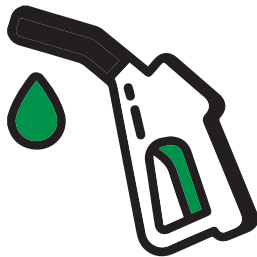
COST SAVINGS OF:

£18K



CO² SAVED:

12,000KG



FUEL SAVED:

14,950L



**FUEL BURN SAVING
PER HOUR:**

25.00%

*This is based on a price of £1.20 per litre of diesel and a 10 hour working day for 260 days year.

**This is an average monthly saving and is based on average usage as measured in the trial.

KEY FINDINGS

Hydrogen-on-demand technology enhances the fuel efficiency of our excavators, delivering a **25%** reduction in fuel consumption per hour.

This innovation reduces operational costs and minimises environmental impact, aligning with Mick George's sustainability goals. It exemplifies a proactive approach to adopting solutions that deliver tangible benefits.

Ultimate Cell technology has proven to be a cost-effective choice, offering a swift payback period of just five months.

During the six-month trial, the excavator equipped with Ultimate Cell technology demonstrated a substantial reduction in fuel consumption, saving nearly **six litres per hour**. This innovation allowed the machine to operate more efficiently, performing the same tasks with less fuel, resulting in both cost savings and reduced emissions.

The trial also showed a significant reduction in CO2 emissions, saving **11,700kg** per year. Projected annual fuel savings for a single machine amount to **14,950L**, a cost saving of **£17,940**, further highlighting the substantial cost benefits.

Additional indirect savings can be achieved through lower maintenance costs for DPF filters and EGR valves. While not directly measured, reduced servicing requirements lead to less downtime and fewer refuelling stops, saving both time and resources.

OUR PILLARS

Our strategic pillars govern everything we do,
Helping Our Customers Build Britain's Infrastructure.

This project aligns to:



**NET ZERO
CARBON**

Delivering **5-star
customer service**
that exceeds
expectations.

To learn how Lynch can support your carbon reduction and
cost-saving goals, contact us today!

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CUSTOMERS BUILD
BRITAIN'S INFRASTRUCTURE.**