TOYOTA
MANUFACTURING UK

Case study

Pressac help major car manufacturer achieve significant energy savings

Installing Pressac sensors and pulse counters on equipment, Toyota has so far seen total energy cost savings more than double.

Background

ESCO (Energy reduction Support & Collaboration) is the energy-supporting function of Toyota Motor Manufacturing UK, based in Burnaston, Derbyshire with a remit to manage utilities and consumption, which is done in two ways. The first is using Kaizen, a Continuous Improvement concept and foundation of lean manufacturing. The second is via abnormality management.

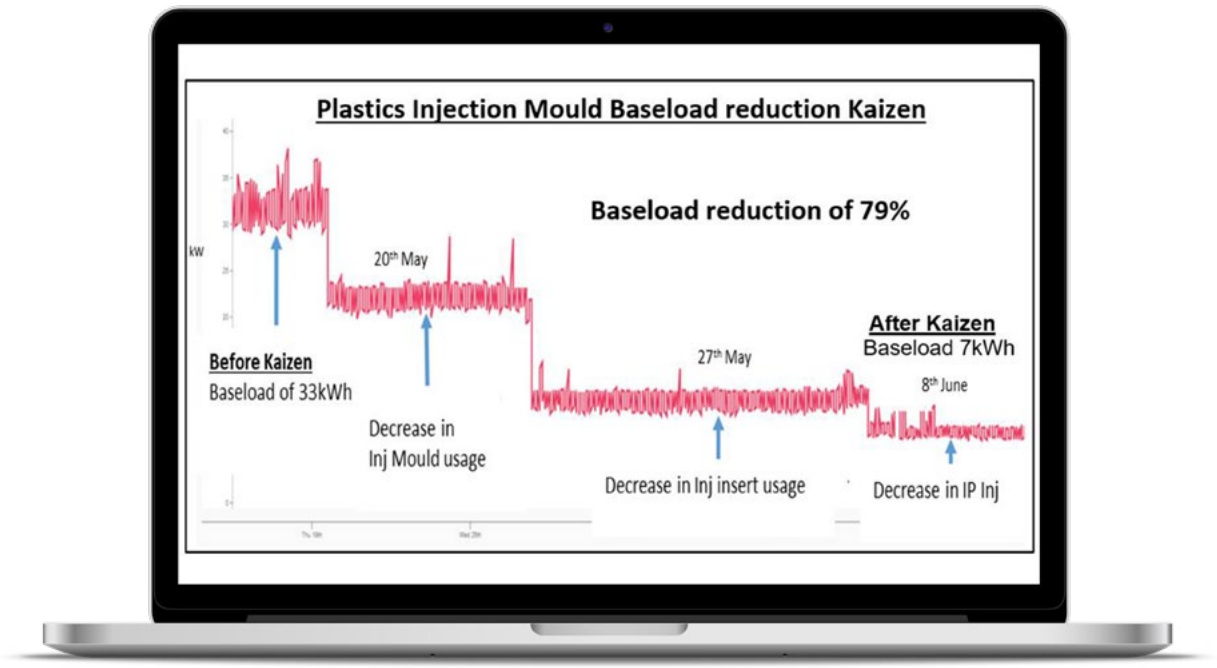
One of their tasks is to find out when too much energy is being consumed, either through abnormality or through equipment not being turned off.

The challenge

The company is focusing on meeting their 2030 milestone target, part of Toyota Environmental Challenge 2050, to become a net-zero business. Monitoring (and critically, managing) energy consumption is a big part of this agenda. Cost savings are also a key aspect, given the rapidly increasing rise in energy prices.

ESCO have a challenge to reduce the utilities cost required to produce a vehicle by 2% year on year, which through volume increase changed to 7.5%. Back in 2020, the group had already identified which equipment consumes most energy at transformer level. What they couldn't see was granular detail, whether each piece of equipment was operating at its optimum and expected level. With multiple production zones at the site, monitors had to cover thousands of square metres with many obstacles to their signal. Finally, the monitoring solution over such a vast area had to be cost-effective (product and installation time and cost).

In an ideal world, they want to be able to view every piece of equipment's energy consumption and condition in real-time.



"The big advantage of using the Pressac CTs is the simplicity and increased safety of non-intrusive installation"

Graham Lane, ESCO Group Leader
at Toyota Motor Manufacturing UK

The Solution

Toyota trialled Pressac's wireless CT clamps to monitor energy consumption and machine condition. They were impressed by the lack of intervention and maintenance needed for the equipment (wireless, self-powered CT sensors simply clamp around power cable).

The installation of sensors was smooth, without any production downtime. Pressac also advised how to set up initial visualisation of data.

ESCO use a modular system called Ignition, which includes built-in MQTT (a standard messaging protocol for the Internet of Things). They established that Pressac's sensors would integrate well with this system. The ease of use, cost viability and quick installation ticked all the boxes they were looking for in a sensor manufacturer and supplier.

Toyota currently have fitted around 300 wireless current sensors to energy-intensive key significant equipment, such as painting ovens. They have also installed them on lower-level kit, which were more unknown entities in terms of energy consumption. From here, they have created an energy map of different aspects of their production process.

Additionally, they installed some pulse counters to understand gas consumption, as well as CO2, temperature and humidity sensors to monitor status on the shop floor and keep optimal indoor air quality conditions for team members through HVAC systems.

The results

The team have been able to create a highly detailed view of not just each type of equipment fitted with sensors, but each individual control panel. For example, one injector moulder purely used for service parts was identified as ticking over at a high-power level. This has now been modified, still ticking over to keep it fully functional but no longer consuming energy when not needed. Savings on this piece of kit alone has seen energy consumption in non-production periods reduced by **82%**.

This type of energy monitoring can now be done for all pieces of equipment with the CT sensors, with the team able to break down into patterns, e.g. if one shift is turning off equipment and another isn't.

Although the initial aim was for energy consumption, the team soon realised that the granular monitoring would help with their tandem aim of spotting abnormalities. In fact, the first area to benefit from monitoring was the water farm in 2020. The sensors highlighted a failing inverter — an abnormality — which meant the team could perform an early intervention to replace the part, preventing a shutdown and huge production impact.

The ESCO team have noticed their Energy Reduction Kaizen has increased by **100%** since using Pressac due to the ability to identify opportunities through real-time visualisation. They have overachieved their targets for savings-per-vehicle, with significant further potential savings ahead. The investment in Pressac technology and Ignite platform has yielded a return of **1900%** so far. Impressive stuff.

> “If we look back five years, small improvements may not have been as impactful as they are today. All energy consumption savings are taking us a step further towards our carbon-neutral ambition. Skyrocketing energy costs also means that little interventions can have hugely beneficial results. Going forward we'd like to have every single piece of kit covered, to give us a complete model of the whole production process and identify where we can make even more energy savings”
>
> Graham Lane, ESCO Group Leader at Toyota Motor Manufacturing UK

Pressac

If you're looking for a partner who offers quality solutions in high volumes – get in touch

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