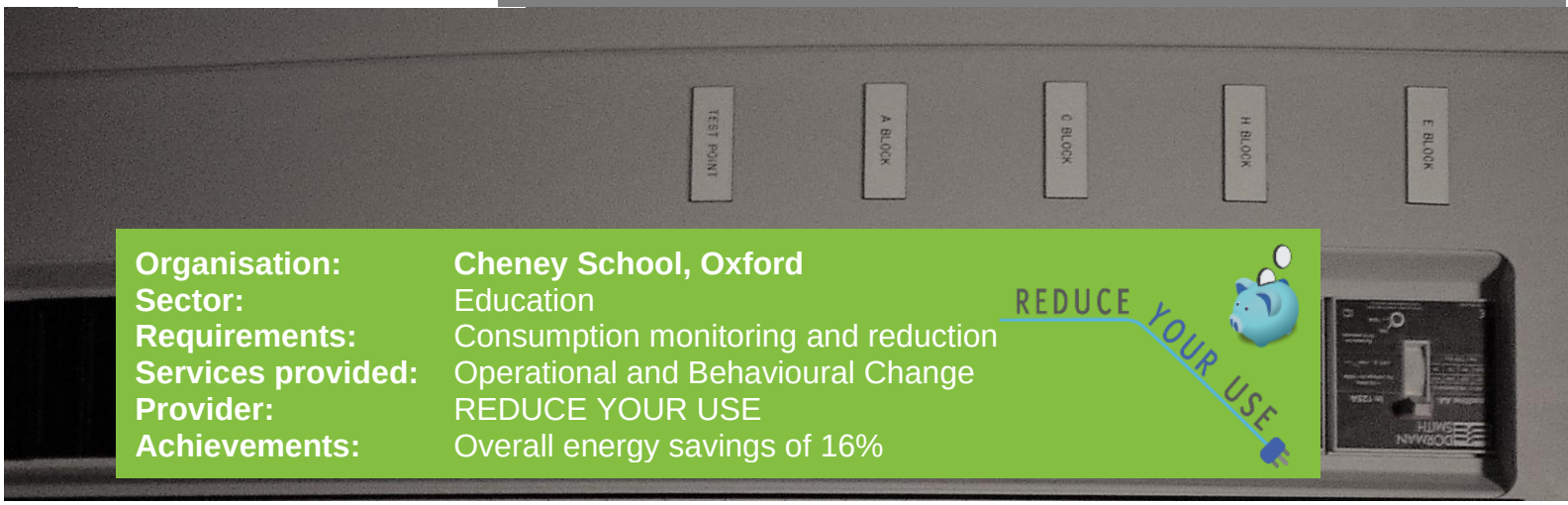
Case Study



Organisation:	**Cheney School, Oxford**
Sector:	Education
Requirements:	Consumption monitoring and reduction
Services provided:	Operational and Behavioural Change
Provider:	REDUCE YOUR USE
Achievements:	Overall energy savings of 16%

The Customer

Cheney School is a secondary school and sixth form with academy status, located in Oxford, England. The school, established in 1797, moved to its current site in 1954. Buildings range in age from 1954 to the new Science block in 2016.

The school has c.1,500 pupils on the roll each year and 210 members of staff.

The school was a founding member of the Community Schools Alliance Trust which includes two of its feeder Primary Schools.

Energy Management is reported widely across the Leadership Team, Governors and Trust Level.

In 2014 three solar PV arrays totally 90kWp were added to the roof by a local non-for-profit organisation. The electricity generated is sold to the school at a discount and sums raised fund energy efficiency and fuel poverty reduction projects locally.

Objectives

Once the school converted to Academy Status the procurement and management of energy fell to the Finance Director. Following a presentation to the school using interval data from the one electricity and two gas supplies the following was identified.

- 25% of the gas consumption occurred out-of-hours including taking into account preheat timings.
- 37% of electricity consumption out-of-hours (10pm-6am) was over the baseload and therefore ‘unexpected’.

The objective of the Finance and Operations Directors was to reduce needless consumption in the first instance and cut costs.

Services provided

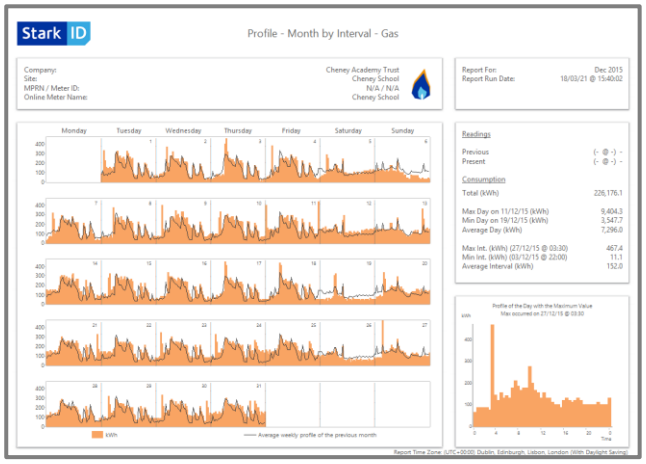
The school used a Data Collector (Stark) to record gas in 30-minute intervals as well as on the Half-Hourly electricity supply. There was a wealth of historical data.

Patterns of consumption were analysed from which:

1. Gas consumption was compared to operational hours and external temperatures.
2. A baseline was set.
3. An overnight and out-of-hours (OOH) baseload was established.

GAS

Graph 1. The gas consumption over Christmas did not reflect the unoccupied status of the school.



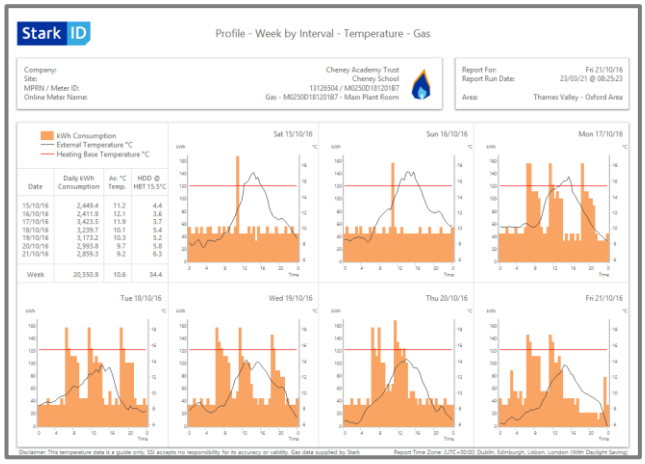
There are two gas supplies to the school supplying numerous plant rooms and the kitchen.

It was calculated that the ideal heating timings were - on at 05:00am and off at 20:30 – the school being occupied 6am-10pm.

It was found school gas consumption overnight from 20:30-05:00 was 25% of the school gas bill and if Bank Holiday daytime use and Christmas was included, it rose to (32%)

The BMS was not controlling the boilers properly, additionally one boiler never seemed to go off.

Graph 2. Constant Gas consumption from one of the plant rooms



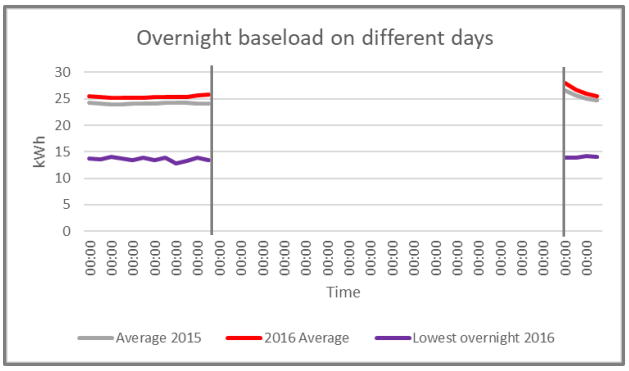
Picture 1. The sports hall boiler plant had never been connected to BMS outstation.

Electricity

Due to the PV array etc. only the overnight baseload between 10pm and 6am was analysed.

The annual baseload was creeping up. The 2016 average was twice that of the lowest 2016 night. What was turned off that evening that could not been turned off every night?

Graph 3. Electrical baseloads



Using the data, overnight consumption was analysed and assessed against reduction actvitiy, such as asking cleaning staff to fully shut down buildings and record issues. Walk arounds at the end of term ensured thorough shut down.

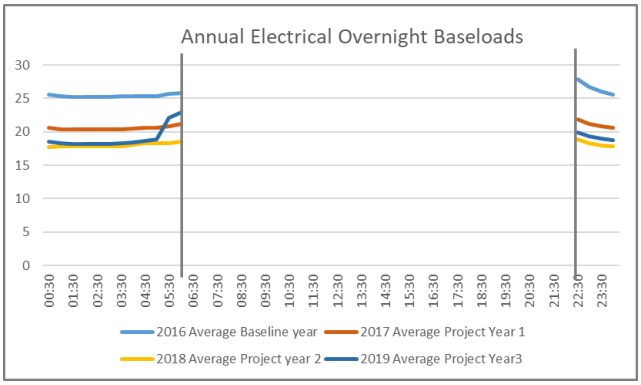
Results

For gas, the consumption is now aligned to the operation of the school. Alerts are set on the data portal for OOH consumption and investigated.

The average annual electrical overnight baseload reduced by 19.5%. The money saved was used to fund sub metering across the eight buildings.

This resulted in a further savings against the baseline year of 29.7% on OOH consumption. By year 3 lettings occurred until midnight at the weekend which slightly reduced savings but are an important income stream.

Graph 4 Electrical Baseloads



Summary

By tackling OOH consumption overall electricity at the school reduced by 11% in year 1 rising to 16% thereafter. This is all attributed to using data to spot problems, investigate and allocating the responsibility of shutting down to the correct staff.