

Local Government Civic Office

Autonomous HVAC optimisation case study

£37.5k	138 MWh	8,500 m ²
Calculated first-year net saving	First-year energy reduction against expected profile	Civic office existing BMS retained

Measured against the expected post-decarbonisation energy profile | Wider low-carbon measures already underway | Existing controls retained

17.9%	8.0%
Electricity below expected consumption 222,278 kWh lower than the expected first-year profile	Total energy below expected consumption 137,701 kWh net reduction across electricity and gas

Executive summary

A UK local authority was implementing a wider building decarbonisation programme across its estate, including heat pumps, solar generation, battery storage and Building Management System improvements. At an 8,500 m² civic office, EcoAI's optimisation technology was integrated with the existing BMS to improve HVAC operation while retaining the building's installed controls infrastructure.

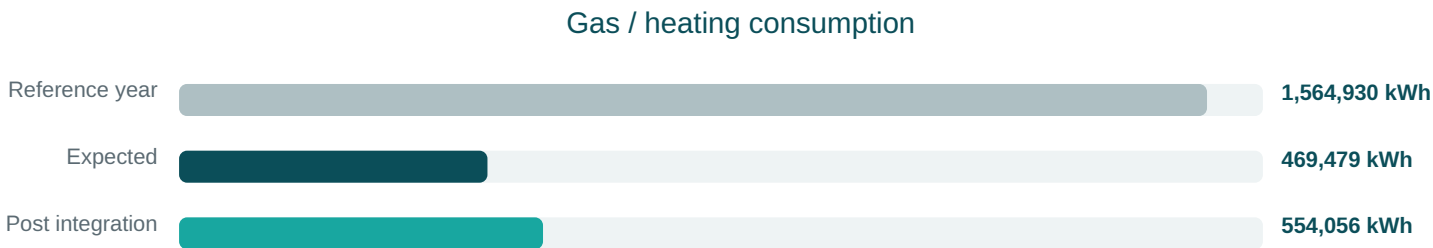
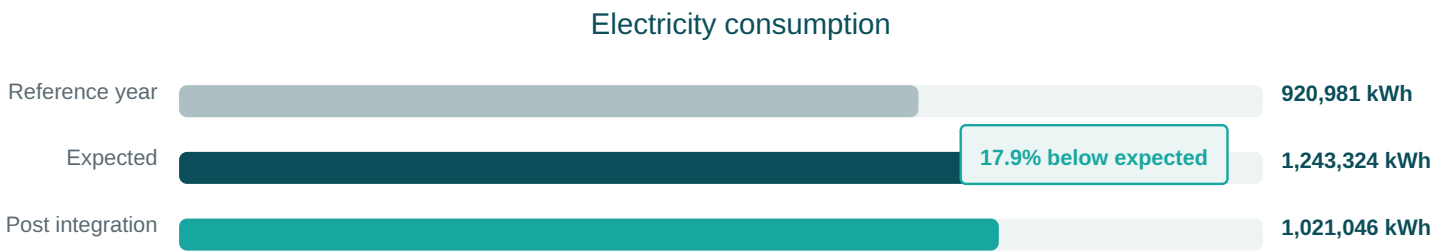
The challenge was not simply to compare one year with another. The wider carbon-reduction measures were expected to materially change the building's energy profile, with electricity consumption forecast to increase by 35% and gas consumption forecast to reduce by 70%. Performance was therefore assessed against the expected post-project profile.

Across the first 12 months, electricity consumption was 222,278 kWh below expected. Gas consumption was 84,577 kWh above the expected level, giving a net energy reduction of 137,701 kWh. At the rates used in the verification, this equated to a calculated net saving of £37,474.87.

The project shows how active BMS optimisation can work alongside wider decarbonisation investment, helping improve operational performance without requiring the existing controls platform to be replaced.

Measured performance vs expected profile

The first-year verification compared actual post-integration performance with the energy profile expected after the site's wider decarbonisation measures. This is important because the building was undergoing a major shift from gas towards electricity, making a simple historic year-on-year comparison potentially misleading.



Expected profile: the wider project anticipated a 35% increase in electricity use and a 70% reduction in gas use as other carbon-reduction measures were implemented.

Result	First-year position
Electricity	Expected: 1,243,324 kWh Actual: 1,021,046 kWh Saving: 222,278 kWh
Gas / heating	Expected: 469,479 kWh Actual: 554,056 kWh Variance: +84,577 kWh
Net energy position	137,701 kWh reduction against expected consumption
Electricity cost	Expected: £246,802.80 Actual: £202,680.07 Saving: £44,122.73
Gas / heating cost	Expected: £36,901.65 Actual: £43,549.51 Variance: +£6,647.86
Calculated net saving	£37,474.87

Background and deployment

The local authority had invested significantly in energy-efficiency and carbon-reduction measures across a portfolio of public buildings. The civic office combined an existing BMS with a range of mechanical systems and was selected as a practical location to improve operational performance alongside the wider programme.

EcoAI's optimisation technology was integrated with the existing Building Management System. It coordinated heating, ventilation and cooling operation using building conditions together with local weather and forecast information, while making greater use of the building's thermal behaviour.

The existing BMS and plant remained in place. During operation, the project also helped identify systems requiring attention, providing additional operational insight alongside the energy optimisation.

Working alongside decarbonisation

This project is particularly relevant to local government because the building's energy profile was changing as other measures were introduced. Heat electrification and other carbon-reduction projects can shift demand between fuels, which means optimisation performance should be assessed against the expected future operating profile, not just a historic baseline.

In this case, the expected first-year position allowed for substantially lower gas use but materially higher electricity demand. EcoAI's contribution was then evaluated against that adjusted profile, separating the optimisation effect from the wider programme as far as the available data allowed.

Verification approach

The facilities energy team reviewed historical consumption, the expected consumption after the wider efficiency measures, and the first 12 months following integration. Changes in unit rates and the expected shift in fuel use were incorporated so the reported financial and energy position reflected the optimisation project rather than simply comparing raw annual totals.

Verification note. The figures in this case study reproduce the first-year project analysis. The calculated £37.5k saving is the difference between the expected and actual energy costs used in that analysis.

What the project demonstrates

EXISTING BMS	WIDER PROGRAMME	MEASURED VALUE
Optimisation can be introduced through existing controls infrastructure rather than requiring a wholesale replacement project.	Operational optimisation can complement heat pumps, on-site generation, storage and other decarbonisation measures.	The business case can be evaluated against an adjusted expected profile when other projects are changing the building's energy mix.

A practical local-government reference for optimising existing buildings as estates decarbonise.