

The background of the entire page is a photograph of a mountain range. The mountains are layered, creating a sense of depth, and are shrouded in a light blue mist or fog. The color palette is monochromatic, consisting of various shades of blue and white. The sky is a pale, clear blue, blending into the mist.

powerdown220

Coolnomix Trial Report

Moto, Pease Pottage

reducing carbon emissions locally and globally



About

MOTO is the UK's leader in motorway service areas with 45 locations and employing 5,000 staff.

Coolnomix Model

2 x AG-01 for air-conditioning and
1 x AR-01 for refrigeration
+
3 x MID smart meters with GPS
capability for remote monitoring

Direct Annual Savings



2,810.5kWh



702.63kg CO2



Saving of £393.47
49% energy saving
32-month ROI

Coolnomix®

Reduce the energy consumption of your air-conditioning and refrigeration without affecting the output you need. Our technology is maintenance free and can be easily installed by our qualified engineers with no disruption to your operation. You can expect up to 40% energy saving on your air-conditioning and up to 30% on your refrigeration.

We keep your people, equipment and produce cool, and your energy budget from overheating

Client

The Pease Pottage service station is largest services between London and Brighton on the M23. The trial was undertaken at the Greggs and Burger King stores.

Overview

The purpose of the trial was 'proof of concept' and to identify the potential for reducing both carbon emissions and direct energy consumption with the installation of COOLNOMIX - our unique patented intelligent thermostat, with a view to supplying and installing COOLNOMIX across the entire portfolio of motorway service stations.

Trial

On the 25/11/2020 three COOLNOMIX devices were installed and connected. One to a refrigeration unit at Greggs and a second to the Greggs' air-conditioning unit, then the third device was connected to the Burger King air-conditioning unit.

To measure the energy consumed by the refrigerator and two air-conditioning units, three MID smart meters, with remote connectivity, were connected to each of the three external condensers.

The COOLNOMIX devices were switched either on/off at varying times during the trial and the metered half-hourly and 4-hourly data was collected and analysed. All the information is available on the Emissis cloud platform as well as the two appendices as supporting evidence.

Greggs' AC: Data recording commenced on the 25/11/2020. COOLNOMIX (ON) was operational for 972 hours (40.5 days). COOLNOMIX (OFF) was bypassed and the refrigeration operated as 'normal' for 840 hours (35 days).

Greggs' refrigerator: Data recording commenced on the 25/11/2020. COOLNOMIX (ON) was operational for 652 hours (27.2 days). COOLNOMIX (OFF) was bypassed and the refrigeration operated as 'normal' for 500 hours (20.8 days).

Burger King: The trial could not be accurately run, see notes below.

Results

Daily

Across the Greggs' air-conditioning unit and refrigerator, COOLNOMIX (ON) reduced daily energy consumption by a combined 49% (see Figure 1), providing a reduction of 7.7kWh per day.

Greggs' air-conditioning

Energy usage COOLNOMIX (ON) was 4.5kWh and with COOLNOMIX (OFF) 10.9kWh showing a saving of 6.4kWh or 59% reduction.

This saving is based on using 121.8kWh over 652 hours with COOLNOMIX (ON) and with COOLNOMIX (OFF) energy consumption was 226.4kWh over 500 hours.

Greggs' refrigerator

Energy usage COOLNOMIX (ON) was 3.5kWh and with COOLNOMIX (OFF) 4.8kWh showing a saving 1.3kWh or 26% reduction.

This saving is based on using 141.6kWh over 972 hours with COOLNOMIX (ON) and with COOLNOMIX (OFF) energy consumption was 165.5kWh over 840 hours.

Burger King

The Burger King air-conditioning unit is very erratic and shows a negative saving. When analysed, the air-conditioning unit is operating in heating mode for around 4 hours every night using a significant amount of electricity and effecting the trial results.

The air-conditioning unit is set to 'auto', to circumvent this issue we would need to set the thermostat to cool or wait until March or April when the ambient temperature improves, to gain more accurate results.

Daily energy consumption (kWh) and saving with COOLNOMIX

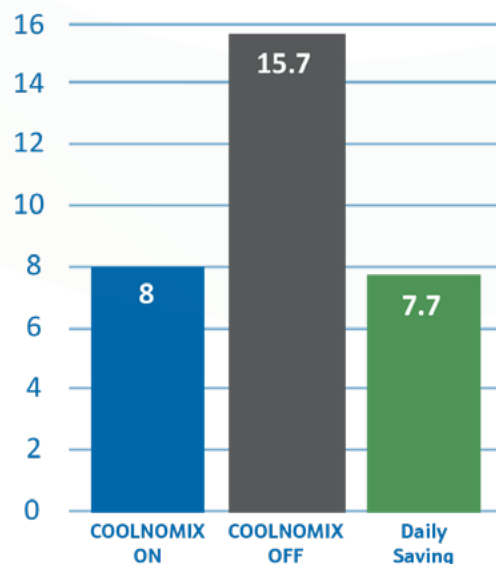


Figure 1: Daily energy consumption and saving

Annual energy consumption (kWh) and annual saving with COOLNOMIX

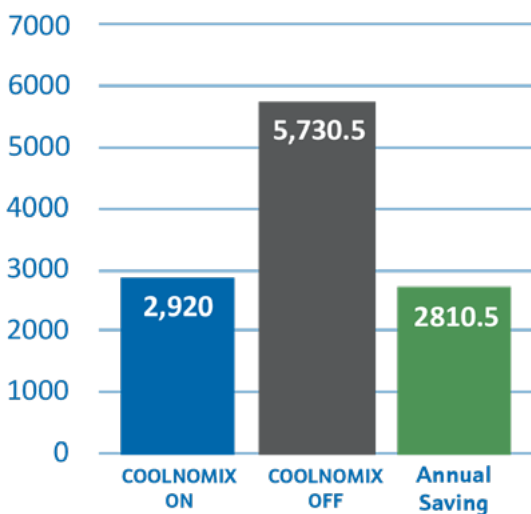


Figure 2: Annual energy consumption and savings

Annual

The calculated combined saving of 7.7kWh gives a total annual saving of 2,810.5kWh and 702.63kg CO₂.

The annual savings were calculated on average daily consumption showing:

COOLNOMIX (ON) daily consumption averages 8kWh
COOLNOMIX (OFF) daily consumption averages 15.7kWh

COOLNOMIX will reduce your carbon emissions by 702.63kg of CO₂ per annum

Conclusions

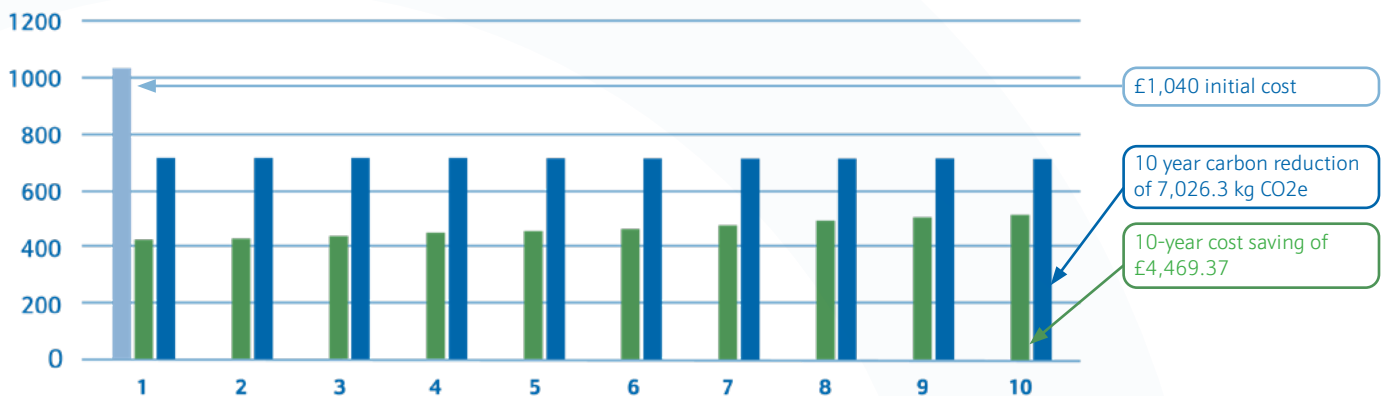
The trial test accurately proves the daily energy savings with COOLNOMIX, allowing us to predict the annual carbon emissions reduction and the energy savings plus the financial benefit. We have based cost savings on the trial site's electricity supply cost of £0.14 per kWh including any CCL.

The COOLNOMIX trial delivered a 49% energy reduction in electricity consumption; annualised this equates to a combined reduction as follows:

- 2,810.50kWh
- 702.63kg of CO2
- Cost savings of £393.47

Return on investment is under 32 months with a 49% energy and carbon savings across the two COOLNOMIX units.

10-year benefit: CO2 and financial



COOLNOMIX

Emissis | Exclusive European Distributor

Recommendations

The savings achieved on these relatively small air-conditioning and refrigeration units are significant, both in terms of energy and emissions savings in addition to the fact that the test has been conducted during a particularly cold winter. We would highly recommend a rollout on similar air-conditioning units and refrigerators across the Moto estate, and with respect to Burger King we suggest altering the setting on the air-conditioning unit from Auto to Cool to stop the heating overnight, leaving the installed COOLNOMIX device to further understand the benefits.

The net effect of this on these results will reduce the percentage saving but increase the daily kWh energy consumption saving and further improve the return on investment.

Appendix

All half hourly data and its summary '4-hourly readings' is attached.

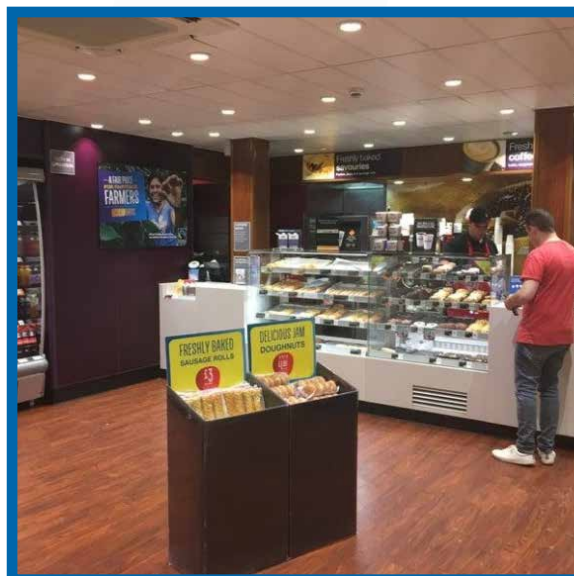
GREEN indicates COOLNOMIX active (ON) and the AC/refrigeration operating with COOLNOMIX 'optimisation'

RED Indicates COOLNOMIX inactive (OFF) and the AC/refrigeration operating as 'normal'

Notes

1. The COOLNOMIX device's ROI is dependent on the following criteria:

- kW rating of the refrigeration or cooling system
- Operational run hours
- Electricity cost per kWh + CCL
- Electricity cost increase at 2.8% per annum excluding CCL



We're ahead of the game

We deliver a powerful suite of solutions that reduce your carbon emissions, save you money with lower energy bills and generate revenue from being a more flexible energy user with the help of today's leading technology.

See our COOLNOMIX brochure and videos

See our other solutions

COOLNOMIX

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