The Department of Climate Change, Energy, the Environment and Water

Measurement and verification demonstration project

Supermarket: Appendix D

Measurement and verification (M&V) report

August 2024

NSW GOVERNMENT

Acknowledgment of Country The Department of Climate Change, Energy, the Environment and Water acknowledges that it stands on Aboriginal land. We acknowledge the Traditional Custodians of the land and we show our respect for Elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically.

Published by NSW Department of Climate Change, Energy, the Environment and Water

dcceew.nsw.gov.au

Title Measurement and verification demonstration project

Sub-title Supermarket - Appendix D Measurement and verification report

First published August 2024

ISBN 978-1-923076-44-0

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Appendix D - M&V report

This measurement and verification (M&V) report was prepared by the M&V practitioner after the Implementation of the energy efficiency measures (EEMs) to detail and communicate the findings of the M&V process using the procedure outlined in the M&V plan.

This document was prepared in a way that is in adherence with the reporting requirements described in chapter 13 of EVO 10000 – 1:2022, IPMVP Core Concepts 2022.

1. Overview of the M&V report

1.1. M&V report authorisation

Site name	Alex Supermarket
Date of this M&V report	21 July 2020
Period covered by this report	1 July 2019 to 30 June 2020
Name and date of authorised M&V plan	M&V Plan – Supermarket refrigeration, 15 June 2019
International Performance Measurement and Verification Protocol (IPMVP®) version being followed	IPMVP Core Concepts 2022[1]

The signatures below indicate acceptance and adoption of this report.

Organisation that prepared the report

Person responsible	Able Smith
Title	M&V Officer
Organisation	Acme Energy Savings Verification Pty Ltd
Signature of approval and acceptance	Able Smith
Date	21 July 2020

Third party quality assurance

Person responsible	Not undertaken
Title	
Organisation	
Signature of approval and acceptance	
Date	

Energy user

Person responsible	Tesfaye Gebra Mariam

[1] INTERNATIONAL PERFORMANCE MEASUREMENT AND VERIFICATION PROTOCOL (IPMVP®), *CORE CONCEPTS*, MARCH 2022, EVO 10000 – 1:2022

Title	Manager
Organisation	Alex Supermarket
Signature of approval and acceptance	Tesfaye Gebra Mariam
Date	27 July 2020

1.2. M&V report distribution

Alex Supermarket

Earnest ESCO

Quality Assessor

2. Project background

Parameter	Details
IPMVP Option	IPMVP Option C, whole of site
Energy efficiency measure (EEM) description	1. A voltage optimisation (VO) unit installed on the power supply to the entire site. 2. Variable speed drives (VSDs) fitted to the lead compressors of the refrigeration units.
Reporting period start date	1 July 2019
Reporting period end date	30 June 2020
Frequency of M&V reports	Annual

3. M&V data collection during current reporting period

Parameter	Details
Reporting period start time	00:00 on 1 July 2019
Reporting period end time	24:00 on 30 June 2020
Energy and key parameter data	Baseline data was collected from the site electricity interval data supplied by the electricity retailer. Refer to Appendix 1.

Parameter	Details
Independent variable data	The same set of independent variables as used in the baseline have been used. Refer to Appendix 1.
Static factor data	Static factors are shown in the M&V plan. There are no changes in static factors.

Description of inspection and/or operational verification activities conducted and findings	The EEMs were installed and commissioned over the period 16 June 2019 to 27 June 2019. On 29 June 2019, the M&V practitioner Able Smith visited the site to inspect the installation and verify that the EEMs were performing as designed. Able Smith identified the following: - The voltage supplied by the VO unit was shown to be 230V. Using a multi-meter, the voltage reading at a wall socket power outlet near the main supply board was 229.8V. It was consistent with the reading on the VO equipment. The VO unit showed an input voltage of 245V at the time. - Building management system (BMS) data showed that in the preceding 24 hours, the VSDs fitted to the refrigeration compressors delivered electricity to the compressors whose frequency varied between 35 and 46 Hz, corresponding to 70% and 92% of full speed. Without the VSDs, the compressors would have operated at 50Hz (full speed). - After the VSDs installation, BMS trend logs showed that the pressure difference (Delta P) between the compressor and the evaporator, averaged at 1,700 kPa over 24 hours. BMS logs from a month before the installation of VSDs, for the same day of the week and with similar temperatures, showed an average (Delta P) of 1,900 kPa. The refrigerant used is R404A. - When a refrigeration expert reviewed this data, she was able to confirm that the decrease in Delta P confirms that the efficiency of the refrigeration cycle has indeed improved due to the installation of the VSDs. The above observations revealed that the EEMs were indeed operating as expected. One month after the EEMs installation and commissioning, the site interval data was analysed to determine if the savings were in line with the expected savings that the energy service provider had estimated (14%). The avoided energy use over the first month was just under 10%.

Parameter	Details
	This was lower than expected. Since the EEMs were verified to be performing as intended a possible reason for the lower percentage of savings could be that the savings from the VO unit had been overestimated by the energy service provider. The VO unit saves energy mostly on inductive loads which are connected directly to the electricity supply. The installation of VSDs on motors (such as compressor motors) reduces the savings that could be achieved by the VO unit. This was not taken into account in the energy service provider's energy savings estimates. The M&V practitioner conveyed to the energy user that the savings were lower than expected but cautioned that one month's worth of data was not sufficient to estimate the annual savings. Every three months after the EEMs installation and commissioning, Able Smith did the following: • reviewed the data and determined the avoided energy use to see if there were unexpected changes. The pattern observed in the first month continued – with savings continuing to be less than 10%. • called the store manager to double-check that there had been no site changes that might cause energy usage to change. No changes were reported.

4. Savings calculation and methodology

4.1 Method overview

Data collection:

The following data was collected for the reporting period:

- energy consumption data (electricity, kWh)
- independent variable data
- data on changes to static factors

The same independent variables (IVs) are used as in the baseline period.

Data modelling:

The data collected was used through 'LINEST' function in Microsoft Excel to build a regression model that determines the mathematical relationship between energy consumption and the IVs in the reporting period.

The model was tested to determine its statistical validity. It satisfied the tests.

Normalised savings calculations:

As stipulated in the M&V plan, the basis for savings was identified as being "normalised savings". Values of the independent variables for the normal year were collected.

Using the values of the independent variables in the normal year, the baseline and reporting period regression models were respectively applied to this data to determine the adjusted baseline energy and adjusted reporting period energy. It took into account the range of the regression models in respect to the range of the IVs in the normal year.

The annual savings is the total adjusted baseline energy minus the adjusted reporting period energy, adjusted to the conditions of the normal year.

Non-routine adjustments:

As there were no changes in static factors, there was no need to undertake any non-routine baseline adjustments.

4.2 Method detail

The reporting period model was established via regression analysis using the LINEST function in Microsoft Excel to be:

> Reporting period daily electricity consumption (kWh) = 1560.6 + 38.4 x {average temperature} – 71.5 x {if a Sunday} – 365.91 x {if the site is closed}.

Equation 1 Reporting period regression model

The model statistics, including the range of the independent variables, t-statistics, CV_{RMSE}, and R^2 are shown in Table 1 and Table 2. The model is acceptable and passes the tests.

Table 1 Reporting period model statistical test results.

Statistical test	Value	IPMVP Recommendation	Acceptable?
Expected Values error	0.000%	< 0.005%	Yes
Adjusted R^2	0.79	> 0.75	Yes
CV_{RMSE}	0.038	< 0.2	Yes

Table 2 Reporting period model coefficients, t-statistics, and range of independent variables.

Parameter	Intercept	Average Temperature	Sunday	Site closed
Coefficient	1560.6	38.4	-71.5	-365.91
t-statistic	74	36	-5.6	-7.3
t-statistic acceptable? (> |2|)	N/A	Yes	Yes	Yes
Minimum value		11.55	0	0
Maximum value		32.2	1	1

The baseline regression model and reporting period regression models were then used to determine the adjusted baseline and adjusted reporting period energy for each day of the normal year.

As developed in the M&V plan, the baseline model is:

> Baseline daily electricity consumption (kWh) = 1919.8 + 31.2 x {average temperature} – 86.6 x {if a Sunday} – 744.53 x {if the site is closed}.
>
> Equation 2 Baseline regression model

The ranges of independent variables in the baseline, reporting, and normal year are shown in Table 3 below:

Table 3 Ranges of the IVs in the baseline period, reporting period and the normal year.

Independent variable	Baseline period year		Reporting period year		Normal year	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
Average temperature (°C)	10.85	31.2	11.55	32.2	10.8	31.2
Is Sunday (binary variable)	0	1	0	1	0	1
Is closed (binary variable)	0	1	0	1	0	1

For the minimum average temperature, the normal year has one or more observations where the temperature is below the minimum temperature of the reporting period year.

IPMVP has no specific guidance around the extent to which a regression model is valid outside the range of its independent variables. The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Guideline 14-2014 Measurement of Energy, Demand and Water Savings (ASHRAE Guideline 14)[2] allows for a regression to be used with a range extension of up to 10%.

In this case, the minimum value of 10.8 in the normal year is 3.6% outside the range of the reporting year regression model. Going with ASHRAE Guideline 14, this is acceptable.

On this basis, no observations are excluded from the overall determination of savings due to an observation in a normal year being excessively outside the range of either the baseline or reporting period regression models.

The range of the models are also acceptable under the NSW Energy Savings Scheme (ESS) and Victorian Energy Upgrade (VEU) program requirements. These are shown in the Table 4, along with the IPMVP and ASHRAE recommendations. Only the average temperature is considered in this table, as the binary variables are clearly acceptable.

[2] ASHRAE Guideline 14-2014 Measurement of Energy, Demand and Water Savings. Approved by ASHRAE on December 18, 2014. © 2014 ASHRAE ISSN 1049-894X

Table 4 Acceptable range for average temperature under IPMVP, ASHRAE, ESS, and VEU

Range	Average temperature (°C)		Acceptable IPMVP range	Acceptable ASHRAE range
Baseline period year	Min	10.85		9.77
	Max	31.2		34.32
Reporting period year	Min	11.55		10.4
	Max	32.2		35.42
Acceptable range for savings calculation	Min		No specific guidance	10.4
	Max		No specific guidance	34.32
Is the normal year within acceptable range	Min	10.8		Yes
	Max	31.2		Yes

Range	Average temperature (°C)		Acceptable ESS range[3]	Acceptable VEU range
Baseline period year	Min	10.85	9.83	
	Max	31.2	32.22	
Reporting period year	Min	11.55	10.52	
	Max	32.2	33.23	
Acceptable range for savings calculation	Min		10.52	10.57
	Max		32.22	32.18
Is the normal year within acceptable range	Min	10.8	Yes	Yes
	Max	31.2		

4.3 Assumptions used in the savings calculations

It was assumed that there were no changes to those static factors which were not recorded (such as heating, ventilation and air conditioning (HVAC) operating times). Able Smith verified

[3] The ESS applies an Effective Range Adjustment Factor on observations outside a model's effective range.

every three months by phone call with the store manager that there were no changes to the site that might cause energy usage to change.

As outlined above, it is similarly assumed that the baseline and reporting models are effective over the full range of independent variables in the normal year.

4.4 Non-routine adjustments

There have been no changes to static factors. No non-routine adjustments were made.

5. Verified savings

5.1. Verified savings calculations

Savings were calculated on the basis of normalised savings and are presented in Table 5 below. It shows savings in energy, cost and greenhouse gas for the reporting period that spanned from 1 July 2019 to 30 June 2020 using the normal year from 1 January 2019 to 31 December 2019.

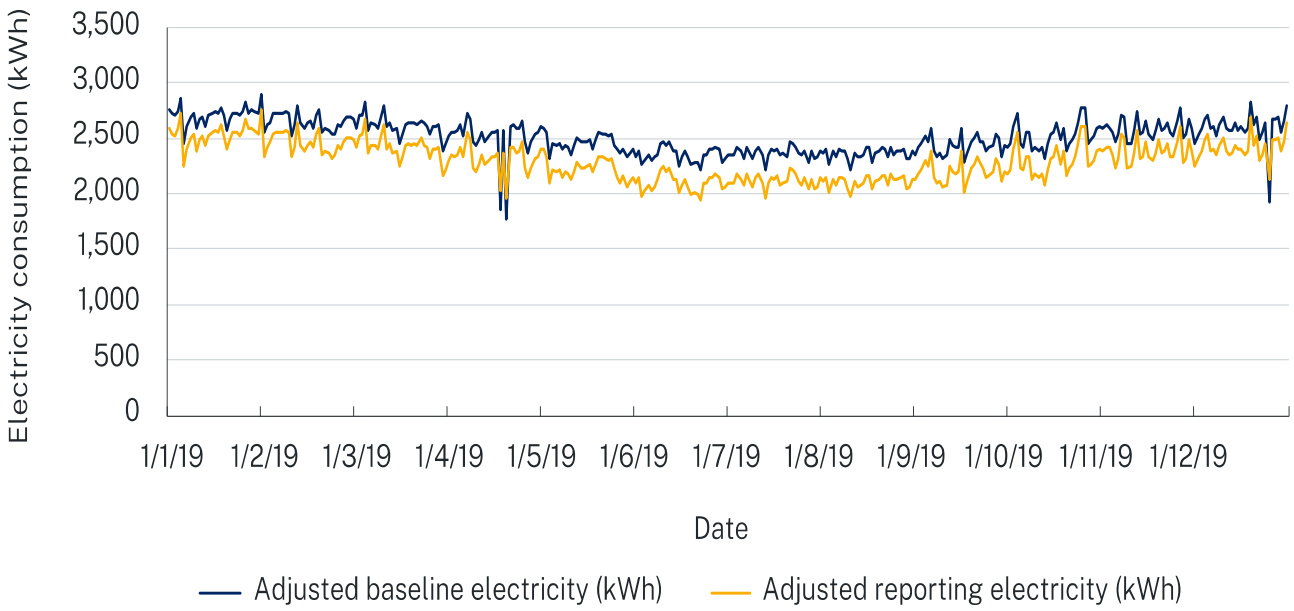
Table 5 Summary of savings.

Savings	Amount
Normalised energy savings (kWh)	77,782
Cost savings ($)	15,556
GHG savings (t CO_2-e)	66

Appendix D2 shows, for each day of the normal year (calendar year 2019), the values of the independent variables, the adjusted baseline, adjusted reporting energy and savings.

This is as graphed below:

Figure 1 Adjusted baseline and adjusted reporting period energy (adjusted to the conditions of the normal year)



The average daily load profiles, shown in the graph below, also visually illustrate how loads in the reporting period, are, on average, slightly lower than in the baseline.

Figure 2 Hourly electricity consumption in kWh during weekdays, Saturday, and Sunday in the baseline period (1/6/2018 - 7/6/2018)

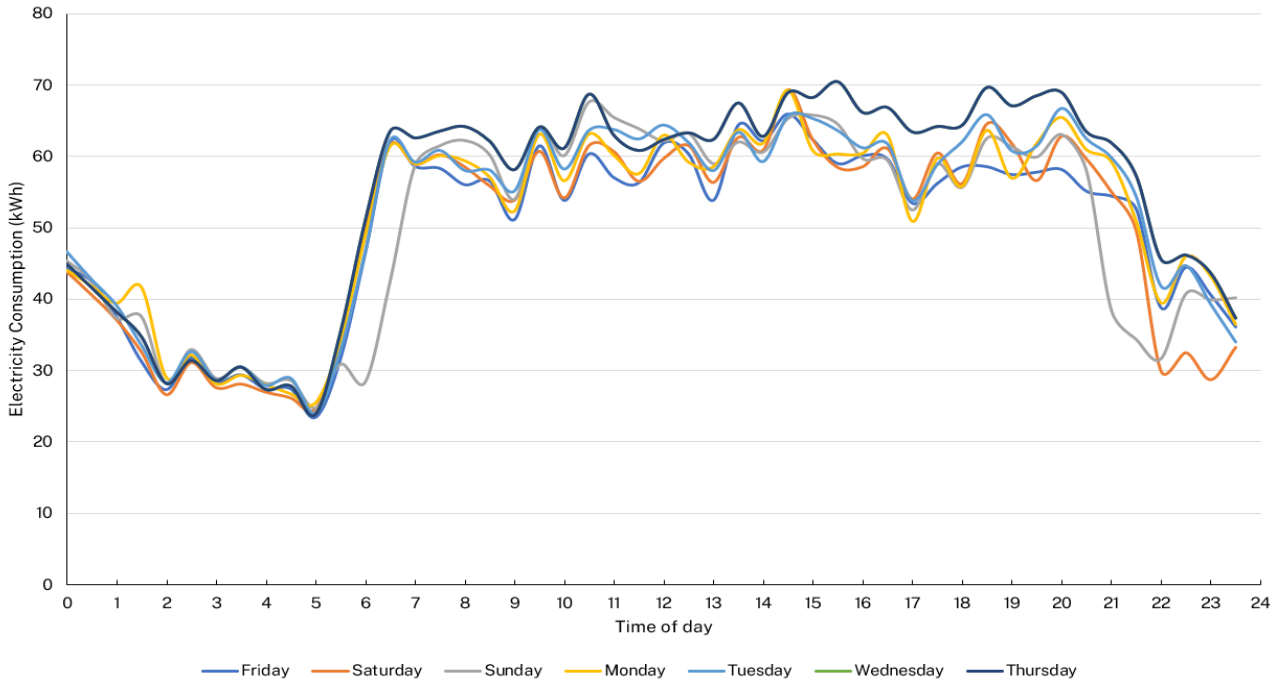
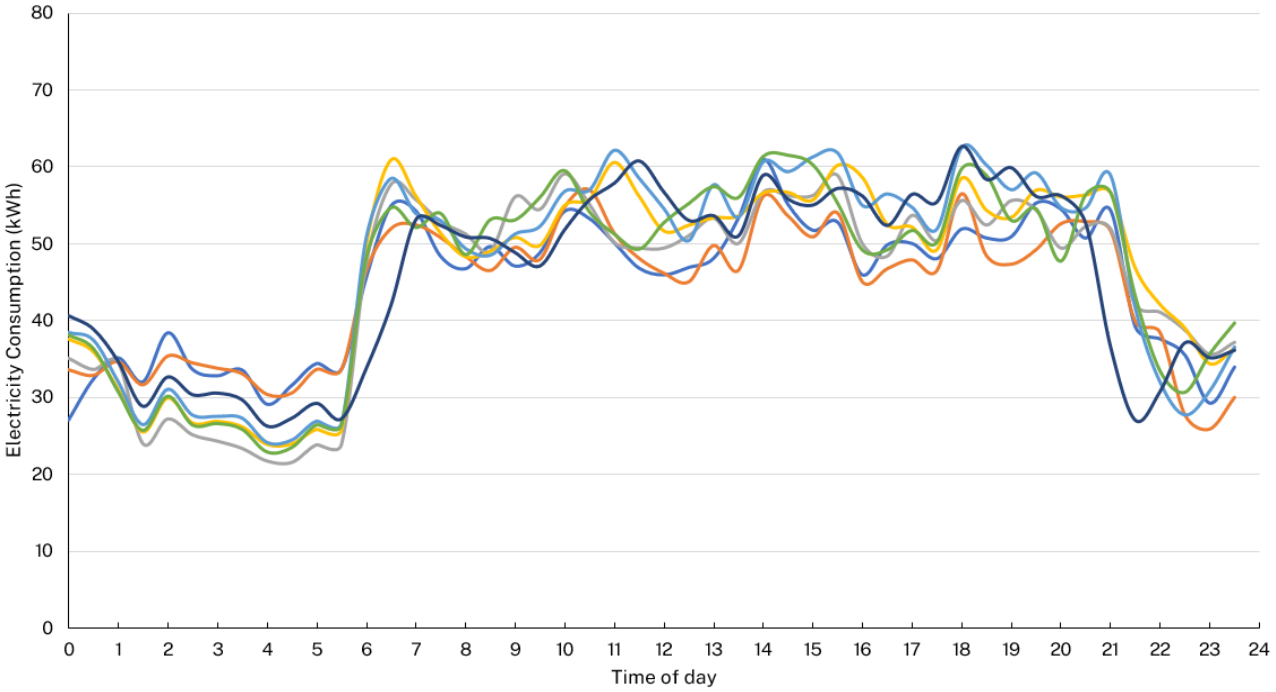


Figure 3 Hourly electricity consumption in kWh during weekdays, Saturday, and Sunday in the reporting period (1/7/2019 - 7/7/2019)



5.2. Uncertainty

The only sources of uncertainty are, as described in the M&V plan, the uncertainty in the baseline and reporting period energy models.

The uncertainty parameters in the reporting period energy model (including auto-correlation) are calculated in Table 6 below.

Table 6 Reporting period energy model uncertainty.

Uncertainty calculation parameter	Value
SEy, Regression model standard error (kWh)	146.10
N, Number of observations in the normal year	365
SE_{allobs}, Standard error over all observations = SEy * sqrt(N) (kWh)	3,395

Combining the baseline and reporting period uncertainties, the overall uncertainty is determined as follows:

$$Savings\ standard\ uncertainty = \sqrt{\mathbf{SE(Baseline)^2 + SE(Reporting)^2}}$$

Equation 3 Formula for calculating savings standard uncertainty

This is shown in Table 7 below, taking into account autocorrelation (which provides a more accurate estimate of the uncertainty).

Table 7 Reporting period energy model uncertainty.

Uncertainty parameter	Baseline period	Reporting period	Overall error
Standard error of savings (kWh)	3,395	2,791	4,395
Uncertainty at the 90% confidence level (kWh)	5,599	4,603	7,248
		Savings (kWh)	77,782
		Uncertainty as a per cent of savings @ the 90% confidence level	9.3%

The IPMVP requirement that savings be at least twice the standard error is achieved.

Based on the above analysis, savings are 78,000 kWh ± 7,200 kWh at the 90% confidence level.

5.3. Utility costs used to calculate the reported savings

Savings have been valued at a tariff of $0.20/kWh.

5.4. Greenhouse gas emissions factors used to report savings

The emissions factor of the reporting period year has been used to determine savings.

The reporting year greenhouse gas (GHG) emissions factor is based on the 2019/2020 financial year emissions factors estimates published in the National Greenhouse Accounts Factors, August 2021.

It includes scope 2 emissions and scope 3 emissions (covering transmission and distribution losses), with an overall full fuel cycle emissions factor of 0.85 kg CO_2-e/kWh.

5.5. Verified energy and cost savings compared with the estimations expected in the M&V plan

The expected and actual savings are shown in Table 8 below.

Table 8 Expected and actual savings.

Savings	Expected	Actual
Savings (kWh)	133,000	78,000
Savings (%)	14%	8%
Cost savings ($)	26,600	15,600
GHG savings (t CO_2-e)	116	66

Savings are significantly less than estimated by the energy service provider delivering the project. It was difficult to identify the reasons for this. It's important to keep in mind that the problem was not that the savings were not properly measured or that the upgrades were not performing as intended. The issue was that the savings were overestimated by the energy service provider.

One reason, as stated earlier, could be that the savings from the VO unit were overestimated due to an oversight of the impact of VSDs on the VO unit savings.

Nonetheless, the project has still delivered useful cost and greenhouse gas savings. Using a discount factor of 8%, the net present value (NPV)[4] of the project over eight years is $44,000 (ignoring the value of any certificates in this calculation, which would increase the NPV), assuming that the EEMs continue to perform effectively.

Additionally, when examining the GHG savings, the emissions factor in the reporting year, at 0.85 kg CO_2-e/kWh, was lower than the emissions factor (0.87) used in the M&V plan to estimate the expected saving. This has resulted in GHG savings being lower than they would have been had the emissions factor remained constant.

6. List of appendices

Appendix D1 Reporting period energy and independent variables
Appendix D2 Determination of normalised savings for each observation

[4] Calculated based on the EEMs costing $26,500 to install, the M&V plan costing $3,000, M&V reporting and verification costing $3,000 in the first year and $2,000 thereafter, and savings of $15,600 a year.

Appendix D1 - Reporting period energy and independent variables

Table 9 Baseline energy and independent variable data

Date	Electricity consumption (kWh)	Average temperature (°C)	Is the day a Sunday?	Is the site closed?
1/07/2019	2,145.18	12.85	0	0
2/07/2019	2,111.36	13.8	0	0
3/07/2019	2,155.44	13.7	0	0
4/07/2019	2,228.43	13.75	0	0
5/07/2019	2,256.82	16.1	0	0
6/07/2019	2,200.13	14.8	0	0
7/07/2019	2,190.23	15.4	1	0
8/07/2019	2,265.81	16.2	0	0
9/07/2019	2,065.34	14.15	0	0
10/07/2019	2,132.51	12.85	0	0
11/07/2019	2,091.52	15.1	0	0
12/07/2019	2,117.17	15.95	0	0
13/07/2019	2,084.85	13.8	0	0
14/07/2019	1,985.23	12.3	1	0
15/07/2019	2,130.70	14	0	0
16/07/2019	2,058.31	15.25	0	0
17/07/2019	2,081.00	14.7	0	0
18/07/2019	2,094.99	15.5	0	0
19/07/2019	2,092.60	13.65	0	0
20/07/2019	2,080.18	14.05	0	0
21/07/2019	2,077.71	16.15	1	0
22/07/2019	2,164.16	17.55	0	0

Date	Electricity consumption (kWh)	Average temperature (°C)	Is the day a Sunday?	Is the site closed?
23/07/2019	2,112.43	16.85	0	0
24/07/2019	2,085.02	16	0	0
25/07/2019	2,078.11	14.15	0	0
26/07/2019	2,198.61	13.5	0	0
27/07/2019	2,170.14	15.05	0	0
28/07/2019	2,062.03	14.55	1	0
29/07/2019	2,125.29	14.6	0	0
30/07/2019	2,256.49	12.6	0	0
31/07/2019	2,182.09	13.2	0	0
1/08/2019	2,157.02	15.1	0	0
2/08/2019	2,200.40	14.3	0	0
3/08/2019	2,169.42	15.3	0	0
4/08/2019	2,080.67	13.6	1	0
5/08/2019	2,209.56	14.6	0	0
6/08/2019	2,135.84	13.35	0	0
7/08/2019	2,121.52	15.25	0	0
8/08/2019	2,146.45	15.05	0	0
9/08/2019	2,121.72	14.85	0	0
10/08/2019	2,084.50	12.5	0	0
11/08/2019	2,045.99	12.45	1	0
12/08/2019	2,172.18	14.15	0	0
13/08/2019	2,092.08	13.05	0	0
14/08/2019	2,129.82	13.45	0	0
15/08/2019	2,147.22	13.75	0	0
16/08/2019	2,176.23	15.8	0	0

Date	Electricity consumption (kWh)	Average temperature (°C)	Is the day a Sunday?	Is the site closed?
17/08/2019	2,136.22	15.8	0	0
18/08/2019	2,110.68	14.6	1	0
19/08/2019	2,089.67	14.15	0	0
20/08/2019	2,096.34	14.8	0	0
21/08/2019	2,159.83	15.7	0	0
22/08/2019	2,140.93	15.45	0	0
23/08/2019	2,192.11	13.3	0	0
24/08/2019	2,184.89	16.05	0	0
25/08/2019	2,117.28	16.5	1	0
26/08/2019	2,257.33	14.6	0	0
27/08/2019	2,201.42	15	0	0
28/08/2019	2,102.87	15.45	0	0
29/08/2019	2,135.53	12.6	0	0
30/08/2019	2,191.71	12.95	0	0
31/08/2019	2,184.53	14.6	0	0
1/09/2019	2,044.03	16.65	1	0
2/09/2019	2,143.10	16.2	0	0
3/09/2019	2,113.71	16.9	0	0
4/09/2019	2,190.65	19.05	0	0
5/09/2019	2,360.52	17.85	0	0
6/09/2019	2,397.42	21.6	0	0
7/09/2019	2,135.52	15.1	0	0
8/09/2019	2,060.20	15.8	1	0
9/09/2019	2,096.52	14.2	0	0
10/09/2019	2,109.60	12.85	0	0

Date	Electricity consumption (kWh)	Average temperature (°C)	Is the day a Sunday?	Is the site closed?
11/09/2019	2,106.99	13.65	0	0
12/09/2019	2,169.79	17.95	0	0
13/09/2019	2,283.33	16.65	0	0
14/09/2019	2,271.88	16.1	0	0
15/09/2019	2,300.00	18.6	1	0
16/09/2019	2,322.17	21.35	0	0
17/09/2019	2,118.71	11.7	0	0
18/09/2019	2,256.69	14.25	0	0
19/09/2019	2,463.57	17.55	0	0
20/09/2019	2,370.76	18.45	0	0
21/09/2019	2,397.27	20.25	0	0
22/09/2019	2,287.02	20.45	1	0
23/09/2019	2,260.67	17.4	0	0
24/09/2019	2,116.31	15.1	0	0
25/09/2019	2,156.74	15.8	0	0
26/09/2019	2,336.23	16.7	0	0
27/09/2019	2,427.16	19.6	0	0
28/09/2019	2,266.84	18.5	0	0
29/09/2019	2,169.56	16.2	1	0
30/09/2019	2,275.78	16.55	0	0
1/10/2019	2,291.10	16.05	0	0
2/10/2019	2,370.37	16.95	0	0
3/10/2019	2,434.36	21.75	0	0
4/10/2019	2,470.06	25.7	0	0
5/10/2019	2,393.19	17.25	0	0

Date	Electricity consumption (kWh)	Average temperature (°C)	Is the day a Sunday?	Is the site closed?
6/10/2019	2,237.28	18.7	1	0
7/10/2019	2,405.38	20.3	0	0
8/10/2019	2,388.86	20.3	0	0
9/10/2019	2,128.45	14.95	0	0
10/10/2019	2,170.85	16.15	0	0
11/10/2019	2,279.13	15.05	0	0
12/10/2019	2,236.83	16.2	0	0
13/10/2019	2,133.73	15.2	1	0
14/10/2019	2,362.27	16.95	0	0
15/10/2019	2,436.67	19.7	0	0
16/10/2019	2,491.69	20.25	0	0
17/10/2019	2,503.62	22.85	0	0
18/10/2019	2,389.10	18.25	0	0
19/10/2019	2,364.75	21.6	0	0
20/10/2019	2,273.68	17.45	1	0
21/10/2019	2,360.83	17.25	0	0
22/10/2019	2,382.97	18.35	0	0
23/10/2019	2,497.76	19.95	0	0
24/10/2019	2,495.87	23	0	0
25/10/2019	2,601.06	27.3	0	0
26/10/2019	2,496.58	27.2	0	0
27/10/2019	2,266.67	19.65	1	0
28/10/2019	2,392.14	18.2	0	0
29/10/2019	2,450.20	19.2	0	0
30/10/2019	2,437.15	21.5	0	0

Date	Electricity consumption (kWh)	Average temperature (°C)	Is the day a Sunday?	Is the site closed?
31/10/2019	2,457.57	22	0	0
1/11/2019	2,421.60	21.6	0	0
2/11/2019	2,374.20	22.35	0	0
3/11/2019	2,408.09	24.2	1	0
4/11/2019	2,426.09	20.45	0	0
5/11/2019	2,335.90	17.55	0	0
6/11/2019	2,308.03	19.85	0	0
7/11/2019	2,355.27	25.2	0	0
8/11/2019	2,393.23	24.6	0	0
9/11/2019	2,220.14	17.25	0	0
10/11/2019	2,201.27	19.85	1	0
11/11/2019	2,420.67	20.8	0	0
12/11/2019	2,440.62	26.45	0	0
13/11/2019	2,264.29	19.5	0	0
14/11/2019	2,246.67	20.3	0	0
15/11/2019	2,311.30	23.55	0	0
16/11/2019	2,318.64	19.95	0	0
17/11/2019	2,278.37	20.85	1	0
18/11/2019	2,395.96	21.1	0	0
19/11/2019	2,423.20	24.25	0	0
20/11/2019	2,418.65	20.95	0	0
21/11/2019	2,465.01	21.55	0	0
22/11/2019	2,446.06	23.05	0	0
23/11/2019	2,389.14	20.3	0	0
24/11/2019	2,314.11	22	1	0

Date	Electricity consumption (kWh)	Average temperature (°C)	Is the day a Sunday?	Is the site closed?
25/11/2019	2,500.78	23.55	0	0
26/11/2019	2,483.82	27.3	0	0
27/11/2019	2,255.79	18.65	0	0
28/11/2019	2,376.45	19.8	0	0
29/11/2019	2,442.13	24.1	0	0
30/11/2019	2,397.93	21.6	0	0
1/12/2019	2,274.16	19.7	1	0
2/12/2019	2,213.60	19.9	0	0
3/12/2019	2,301.28	21.25	0	0
4/12/2019	2,389.80	24.2	0	0
5/12/2019	2,474.87	25.25	0	0
6/12/2019	2,506.52	21.5	0	0
7/12/2019	2,482.50	21.85	0	0
8/12/2019	2,301.39	22.2	1	0
9/12/2019	2,467.53	22.6	0	0
10/12/2019	2,497.67	24.5	0	0
11/12/2019	2,331.53	21.55	0	0
12/12/2019	2,328.91	20.7	0	0
13/12/2019	2,325.10	20.9	0	0
14/12/2019	2,401.54	22.8	0	0
15/12/2019	2,372.76	23.55	1	0
16/12/2019	2,412.62	21.8	0	0
17/12/2019	2,386.59	20.45	0	0
18/12/2019	2,426.72	21.6	0	0
19/12/2019	2,644.96	29.2	0	0

Date	Electricity consumption (kWh)	Average temperature (°C)	Is the day a Sunday?	Is the site closed?
20/12/2019	2,505.72	22.55	0	0
21/12/2019	2,622.89	24.9	0	0
22/12/2019	2,344.44	21.05	1	0
23/12/2019	2,410.41	20.5	0	0
24/12/2019	2,605.26	23.05	0	0
25/12/2019	1,745.72	24.15	0	1
26/12/2019	2,381.18	24.1	0	0
27/12/2019	2,406.09	24	0	0
28/12/2019	2,457.25	24.4	0	0
29/12/2019	2,406.06	23.2	1	0
30/12/2019	2,521.53	23.7	0	0
31/12/2019	2,587.31	28	0	0
1/01/2020	2,260.74	22.7	0	0
2/01/2020	2,405.93	22.65	0	0
3/01/2020	2,554.14	25.35	0	0
4/01/2020	2,773.70	28.6	0	0
5/01/2020	2,383.26	24.5	1	0
6/01/2020	2,404.51	22.45	0	0
7/01/2020	2,549.73	23.75	0	0
8/01/2020	2,523.18	24.65	0	0
9/01/2020	2,507.01	24.05	0	0
10/01/2020	2,644.54	25.2	0	0
11/01/2020	2,383.94	21.3	0	0
12/01/2020	2,300.01	20.7	1	0
13/01/2020	2,410.06	21.65	0	0

Date	Electricity consumption (kWh)	Average temperature (°C)	Is the day a Sunday?	Is the site closed?
14/01/2020	2,365.06	22.75	0	0
15/01/2020	2,433.43	22.65	0	0
16/01/2020	2,485.14	24	0	0
17/01/2020	2,413.44	20.45	0	0
18/01/2020	2,374.23	20.8	0	0
19/01/2020	2,310.88	22.75	1	0
20/01/2020	2,438.36	24.05	0	0
21/01/2020	2,443.76	25.9	0	0
22/01/2020	2,584.72	26.1	0	0
23/01/2020	2,820.31	32.2	0	0
24/01/2020	2,669.60	24.85	0	0
25/01/2020	2,651.11	25.55	0	0
26/01/2020	2,678.04	28.25	1	0
27/01/2020	2,652.87	26.05	0	0
28/01/2020	2,707.91	26.75	0	0
29/01/2020	2,675.27	26.25	0	0
30/01/2020	2,628.05	24.45	0	0
31/01/2020	2,764.87	27.15	0	0
1/02/2020	2,831.27	29.45	0	0
2/02/2020	2,625.85	27.75	1	0
3/02/2020	2,692.59	26.85	0	0
4/02/2020	2,323.85	21.2	0	0
5/02/2020	2,456.57	21.9	0	0
6/02/2020	2,485.64	22.45	0	0
7/02/2020	2,453.72	20.8	0	0

Date	Electricity consumption (kWh)	Average temperature (°C)	Is the day a Sunday?	Is the site closed?
8/02/2020	2,459.74	21.5	0	0
9/02/2020	2,328.06	20.85	1	0
10/02/2020	2,476.11	23.1	0	0
11/02/2020	2,541.33	25.85	0	0
12/02/2020	2,605.49	24.1	0	0
13/02/2020	2,589.89	24.05	0	0
14/02/2020	2,549.87	24.15	0	0
15/02/2020	2,488.67	23.5	0	0
16/02/2020	2,441.11	24.05	1	0
17/02/2020	2,450.04	23.05	0	0
18/02/2020	2,615.53	24.95	0	0
19/02/2020	2,513.71	24.85	0	0
20/02/2020	2,390.36	21.9	0	0
21/02/2020	2,449.28	22.7	0	0
22/02/2020	2,430.12	21.15	0	0
23/02/2020	2,361.67	22.45	1	0
24/02/2020	2,440.71	23.7	0	0
25/02/2020	2,516.67	24.4	0	0
26/02/2020	2,645.88	27.5	0	0
27/02/2020	2,440.75	23	0	0
28/02/2020	2,441.57	22.35	0	0
29/02/2020	2,440.74	22.75	0	0
1/03/2020	2,509.83	23.5	1	0
2/03/2020	2,616.21	29.1	0	0
3/03/2020	2,438.60	21.4	0	0

Date	Electricity consumption (kWh)	Average temperature (°C)	Is the day a Sunday?	Is the site closed?
4/03/2020	2,466.91	21.75	0	0
5/03/2020	2,495.41	21.45	0	0
6/03/2020	2,478.30	24.4	0	0
7/03/2020	2,445.46	22.35	0	0
8/03/2020	2,319.94	20.05	1	0
9/03/2020	2,324.07	19.65	0	0
10/03/2020	2,334.27	20.2	0	0
11/03/2020	2,367.68	20.4	0	0
12/03/2020	2,355.72	21.3	0	0
13/03/2020	2,347.19	20.25	0	0
14/03/2020	2,284.89	17.7	0	0
15/03/2020	2,169.78	17	1	0
16/03/2020	2,227.32	19.1	0	0
17/03/2020	2,357.80	19.4	0	0
18/03/2020	2,407.09	20.2	0	0
19/03/2020	2,530.34	24.45	0	0
20/03/2020	2,667.09	27.35	0	0
21/03/2020	2,471.08	22.3	0	0
22/03/2020	2,395.01	23.85	1	0
23/03/2020	2,306.88	20.95	0	0
24/03/2020	2,313.75	19.15	0	0
25/03/2020	2,346.63	21.75	0	0
26/03/2020	2,295.41	19.65	0	0
27/03/2020	2,372.79	20.8	0	0
28/03/2020	2,315.58	19.75	0	0

Date	Electricity consumption (kWh)	Average temperature (°C)	Is the day a Sunday?	Is the site closed?
29/03/2020	2,294.42	21.2	1	0
30/03/2020	2,306.06	22.15	0	0
31/03/2020	2,340.84	22.75	0	0
1/04/2020	2,385.70	22.2	0	0
2/04/2020	2,411.43	22.1	0	0
3/04/2020	2,394.10	21.8	0	0
4/04/2020	2,299.01	22.9	0	0
5/04/2020	2,140.51	19.55	1	0
6/04/2020	2,245.16	19.9	0	0
7/04/2020	2,194.95	18.65	0	0
8/04/2020	2,218.75	18.05	0	0
9/04/2020	2,323.56	19.35	0	0
10/04/2020	2,162.41	20.8	0	1
11/04/2020	2,137.04	20.25	0	0
12/04/2020	2,001.43	17.4	1	1
13/04/2020	2,155.31	16.4	0	0
14/04/2020	2,277.10	18.65	0	0
15/04/2020	2,294.28	20.2	0	0
16/04/2020	2,390.51	21.85	0	0
17/04/2020	2,335.71	22.95	0	0
18/04/2020	2,166.28	19.25	0	0
19/04/2020	2,153.05	17.6	1	0
20/04/2020	2,218.09	16.75	0	0
21/04/2020	2,228.30	19.8	0	0
22/04/2020	2,284.37	20.65	0	0

Date	Electricity consumption (kWh)	Average temperature (°C)	Is the day a Sunday?	Is the site closed?
23/04/2020	2,172.31	19.9	0	0
24/04/2020	2,278.57	22.55	0	0
25/04/2020	2,204.84	19.7	0	0
26/04/2020	2,170.89	22.35	1	0
27/04/2020	2,144.14	19	0	0
28/04/2020	2,271.30	20.1	0	0
29/04/2020	2,306.37	20.85	0	0
30/04/2020	2,126.28	20.55	0	0
1/05/2020	1,988.56	13.65	0	0
2/05/2020	1,957.43	15.65	0	0
3/05/2020	1,970.67	15.8	1	0
4/05/2020	2,031.21	14.7	0	0
5/05/2020	2,056.39	16.55	0	0
6/05/2020	2,078.50	17.8	0	0
7/05/2020	2,090.65	18.35	0	0
8/05/2020	2,188.42	21.3	0	0
9/05/2020	2,214.25	22.1	0	0
10/05/2020	1,935.91	15.75	1	0
11/05/2020	1,997.62	13.85	0	0
12/05/2020	2,102.99	14.95	0	0
13/05/2020	2,170.96	14.85	0	0
14/05/2020	2,120.03	14.3	0	0
15/05/2020	2,103.99	12.8	0	0
16/05/2020	2,116.33	14.8	0	0
17/05/2020	2,083.59	15.55	1	0

Date	Electricity consumption (kWh)	Average temperature (°C)	Is the day a Sunday?	Is the site closed?
18/05/2020	2,167.21	15.55	0	0
19/05/2020	2,174.78	17.25	0	0
20/05/2020	2,234.00	18.9	0	0
21/05/2020	2,194.29	16.5	0	0
22/05/2020	2,045.34	12.55	0	0
23/05/2020	2,024.20	14.35	0	0
24/05/2020	2,007.40	15.65	1	0
25/05/2020	2,071.20	14.55	0	0
26/05/2020	2,034.93	16.8	0	0
27/05/2020	2,141.55	16.1	0	0
28/05/2020	2,102.05	17.05	0	0
29/05/2020	2,064.26	13.85	0	0
30/05/2020	2,122.63	15.3	0	0
31/05/2020	2,051.45	17.55	1	0
1/06/2020	2,110.00	18.55	0	0
2/06/2020	1,957.08	11.55	0	0
3/06/2020	2,041.83	13.9	0	0
4/06/2020	1,988.94	13.95	0	0
5/06/2020	2,016.06	13.2	0	0
6/06/2020	2,009.31	13.2	0	0
7/06/2020	1,829.77	12.4	1	0
8/06/2020	1,998.53	13.5	0	0
9/06/2020	2,030.92	15.3	0	0
10/06/2020	2,015.23	14.15	0	0
11/06/2020	2,129.79	17.5	0	0

Date	Electricity consumption (kWh)	Average temperature (°C)	Is the day a Sunday?	Is the site closed?
12/06/2020	1,975.97	14.25	0	0
13/06/2020	2,145.15	15	0	0
14/06/2020	2,025.63	17.25	1	0
15/06/2020	2,032.19	14.65	0	0
16/06/2020	2,064.98	16.1	0	0
17/06/2020	2,066.05	14.35	0	0
18/06/2020	2,087.40	15.25	0	0
19/06/2020	2,074.65	14.25	0	0
20/06/2020	2,063.17	15.3	0	0
21/06/2020	1,994.82	14.4	1	0
22/06/2020	1,943.60	13.15	0	0
23/06/2020	2,009.55	12.3	0	0
24/06/2020	2,024.96	13.3	0	0
25/06/2020	2,002.14	14.6	0	0
26/06/2020	1,994.84	14.4	0	0
27/06/2020	2,021.58	13.1	0	0
28/06/2020	1,979.45	12.6	1	0
29/06/2020	2,086.93	12.95	0	0
30/06/2020	2,079.72	13.1	0	0

Appendix D2 - Determination of normalised savings for each observation

Table 10 Normalised electricity savings each day of the normal year

Date	Average temperature (°C)	Is the day Sunday?	Is the site closed?	Adjusted baseline (kWh)	Adjusted reporting (kWh)	Normalised savings (kWh)
1/01/2019	26.65	0	0	2,752	2,585	167
2/01/2019	25.6	0	0	2,719	2,545	175
3/01/2019	25.1	0	0	2,704	2,526	178
4/01/2019	26.55	0	0	2,749	2,581	168
5/01/2019	30.2	0	0	2,863	2,722	141
6/01/2019	19.95	1	0	2,456	2,256	200
7/01/2019	21.95	0	0	2,605	2,404	201
8/01/2019	24.55	0	0	2,687	2,504	182
9/01/2019	25.6	0	0	2,719	2,545	175
10/01/2019	21.6	0	0	2,594	2,391	203
11/01/2019	24.1	0	0	2,673	2,487	185
12/01/2019	24.75	0	0	2,693	2,512	181
13/01/2019	24.8	1	0	2,608	2,443	165
14/01/2019	25	0	0	2,701	2,522	179
15/01/2019	25.75	0	0	2,724	2,551	174
16/01/2019	26.25	0	0	2,740	2,570	170
17/01/2019	25.9	0	0	2,729	2,556	172
18/01/2019	27.6	0	0	2,782	2,622	160
19/01/2019	24.95	0	0	2,699	2,520	179
20/01/2019	23.7	1	0	2,574	2,400	173
21/01/2019	24.25	0	0	2,677	2,493	184
22/01/2019	25.7	0	0	2,723	2,549	174
23/01/2019	26	0	0	2,732	2,560	172
24/01/2019	24.95	0	0	2,699	2,520	179

Date	Average temperature (°C)	Is the day Sunday?	Is the site closed?	Adjusted baseline (kWh)	Adjusted reporting (kWh)	Normalised savings (kWh)
25/01/2019	26.15	0	0	2,737	2,566	171
26/01/2019	29.15	0	0	2,830	2,681	149
27/01/2019	28.8	1	0	2,733	2,596	137
28/01/2019	26.65	0	0	2,752	2,585	167
29/01/2019	26.25	0	0	2,740	2,570	170
30/01/2019	25.55	0	0	2,718	2,543	175
31/01/2019	31.2	0	0	2,894	2,760	134
1/02/2019	20.3	0	0	2,554	2,341	213
2/02/2019	22.5	0	0	2,623	2,426	197
3/02/2019	25.7	1	0	2,636	2,477	159
4/02/2019	25.55	0	0	2,718	2,543	175
5/02/2019	25.85	0	0	2,727	2,554	173
6/02/2019	25.7	0	0	2,723	2,549	174
7/02/2019	25.9	0	0	2,729	2,556	172
8/02/2019	26.45	0	0	2,746	2,577	169
9/02/2019	25.9	0	0	2,729	2,556	172
10/02/2019	21.95	1	0	2,519	2,333	186
11/02/2019	22.25	0	0	2,615	2,416	199
12/02/2019	27.85	0	0	2,790	2,631	158
13/02/2019	22.9	0	0	2,635	2,441	194
14/02/2019	21.6	0	0	2,594	2,391	203
15/02/2019	22.8	0	0	2,632	2,437	195
16/02/2019	23.45	0	0	2,652	2,462	190
17/02/2019	24.35	1	0	2,594	2,425	169
18/02/2019	25.3	0	0	2,710	2,533	177
19/02/2019	26.75	0	0	2,755	2,589	166
20/02/2019	20.55	0	0	2,562	2,351	211
21/02/2019	21.2	0	0	2,582	2,376	206

Date	Average temperature (°C)	Is the day Sunday?	Is the site closed?	Adjusted baseline (kWh)	Adjusted reporting (kWh)	Normalised savings (kWh)
22/02/2019	20.9	0	0	2,573	2,364	209
23/02/2019	19.7	0	0	2,535	2,318	217
24/02/2019	22.55	1	0	2,538	2,356	182
25/02/2019	22.55	0	0	2,624	2,428	197
26/02/2019	21.95	0	0	2,605	2,404	201
27/02/2019	23.55	0	0	2,655	2,466	189
28/02/2019	24.45	0	0	2,683	2,501	183
1/03/2019	24.55	0	0	2,687	2,504	182
2/03/2019	24.05	0	0	2,671	2,485	186
3/03/2019	24.1	1	0	2,586	2,416	170
4/03/2019	25	0	0	2,701	2,522	179
5/03/2019	25.25	0	0	2,708	2,531	177
6/03/2019	28.9	0	0	2,822	2,672	151
7/03/2019	20.95	0	0	2,574	2,366	208
8/03/2019	22.8	0	0	2,632	2,437	195
9/03/2019	22.75	0	0	2,630	2,435	195
10/03/2019	23.9	1	0	2,580	2,408	172
11/03/2019	24.85	0	0	2,696	2,516	180
12/03/2019	27.8	0	0	2,788	2,629	159
13/03/2019	21.7	0	0	2,598	2,395	203
14/03/2019	23.2	0	0	2,644	2,452	192
15/03/2019	20.95	0	0	2,574	2,366	208
16/03/2019	21.2	0	0	2,582	2,376	206
17/03/2019	19.9	1	0	2,455	2,254	201
18/03/2019	19.9	0	0	2,541	2,326	216
19/03/2019	22.7	0	0	2,629	2,433	196
20/03/2019	23.3	0	0	2,648	2,456	191
21/03/2019	22.95	0	0	2,637	2,443	194

Date	Average temperature (°C)	Is the day Sunday?	Is the site closed?	Adjusted baseline (kWh)	Adjusted reporting (kWh)	Normalised savings (kWh)
22/03/2019	23.15	0	0	2,643	2,451	192
23/03/2019	22.7	0	0	2,629	2,433	196
24/03/2019	26.4	1	0	2,658	2,504	154
25/03/2019	22.9	0	0	2,635	2,441	194
26/03/2019	22.2	0	0	2,613	2,414	199
27/03/2019	19.6	0	0	2,532	2,314	218
28/03/2019	21.95	0	0	2,605	2,404	201
29/03/2019	21.95	0	0	2,605	2,404	201
30/03/2019	22.3	0	0	2,616	2,418	198
31/03/2019	17.5	1	0	2,380	2,162	218
1/04/2019	16.95	0	0	2,449	2,212	237
2/04/2019	19.3	0	0	2,523	2,303	220
3/04/2019	20.45	0	0	2,559	2,347	212
4/04/2019	20.1	0	0	2,548	2,333	214
5/04/2019	20.75	0	0	2,568	2,358	210
6/04/2019	22.3	0	0	2,616	2,418	198
7/04/2019	22.1	1	0	2,524	2,339	185
8/04/2019	25.65	0	0	2,721	2,547	174
9/04/2019	23.9	0	0	2,666	2,479	187
10/04/2019	17.45	0	0	2,465	2,231	233
11/04/2019	16.4	0	0	2,432	2,191	241
12/04/2019	18.15	0	0	2,487	2,258	228
13/04/2019	20.5	0	0	2,560	2,349	211
14/04/2019	20.25	1	0	2,466	2,268	198
15/04/2019	19.1	0	0	2,516	2,295	221
16/04/2019	20.2	0	0	2,551	2,337	214
17/04/2019	20.15	0	0	2,549	2,335	214
18/04/2019	20.85	0	0	2,571	2,362	209

Date	Average temperature (°C)	Is the day Sunday?	Is the site closed?	Adjusted baseline (kWh)	Adjusted reporting (kWh)	Normalised savings (kWh)
19/04/2019	21.75	0	1	1,855	2,031	- 176
20/04/2019	20.8	0	0	2,569	2,360	209
21/04/2019	21.65	1	1	1,765	1,956	- 191
22/04/2019	22.1	0	0	2,610	2,410	200
23/04/2019	22.3	0	0	2,616	2,418	198
24/04/2019	21.15	0	0	2,580	2,374	207
25/04/2019	21.5	0	0	2,591	2,387	204
26/04/2019	23.6	0	0	2,657	2,468	189
27/04/2019	17.5	0	0	2,466	2,233	233
28/04/2019	17.25	1	0	2,372	2,152	220
29/04/2019	17.6	0	0	2,470	2,237	232
30/04/2019	19.6	0	0	2,532	2,314	218
1/05/2019	20.2	0	0	2,551	2,337	214
2/05/2019	21.8	0	0	2,601	2,399	202
3/05/2019	21.65	0	0	2,596	2,393	203
4/05/2019	20.2	0	0	2,551	2,337	214
5/05/2019	15.55	1	0	2,319	2,087	232
6/05/2019	16.95	0	0	2,449	2,212	237
7/05/2019	16.6	0	0	2,438	2,199	240
8/05/2019	17.15	0	0	2,455	2,220	236
9/05/2019	15.2	0	0	2,395	2,145	250
10/05/2019	16.75	0	0	2,443	2,205	238
11/05/2019	16.05	0	0	2,421	2,178	243
12/05/2019	16.7	1	0	2,355	2,131	224
13/05/2019	16.7	0	0	2,441	2,203	239
14/05/2019	18.6	0	0	2,501	2,276	225
15/05/2019	17.35	0	0	2,462	2,228	234
16/05/2019	17.5	0	0	2,466	2,233	233

Date	Average temperature (°C)	Is the day Sunday?	Is the site closed?	Adjusted baseline (kWh)	Adjusted reporting (kWh)	Normalised savings (kWh)
17/05/2019	17.8	0	0	2,476	2,245	231
18/05/2019	18.4	0	0	2,495	2,268	227
19/05/2019	18.35	1	0	2,406	2,195	212
20/05/2019	18.2	0	0	2,488	2,260	228
21/05/2019	20.1	0	0	2,548	2,333	214
22/05/2019	19.95	0	0	2,543	2,328	215
23/05/2019	19.65	0	0	2,534	2,316	218
24/05/2019	19.35	0	0	2,524	2,304	220
25/05/2019	19.8	0	0	2,538	2,322	216
26/05/2019	19.35	1	0	2,438	2,233	205
27/05/2019	15.3	0	0	2,398	2,149	249
28/05/2019	14.05	0	0	2,359	2,101	258
29/05/2019	15.55	0	0	2,405	2,158	247
30/05/2019	13.05	0	0	2,327	2,062	265
31/05/2019	14.4	0	0	2,370	2,114	255
1/06/2019	15.2	0	0	2,395	2,145	250
2/06/2019	15.75	1	0	2,325	2,095	231
3/06/2019	15.05	0	0	2,390	2,139	251
4/06/2019	10.8	0	0	2,257	1,976	281
5/06/2019	12.25	0	0	2,302	2,032	271
6/06/2019	13.55	0	0	2,343	2,082	261
7/06/2019	12.2	0	0	2,301	2,030	271
8/06/2019	13	0	0	2,326	2,060	265
9/06/2019	16.65	1	0	2,353	2,129	224
10/06/2019	16.95	0	0	2,449	2,212	237
11/06/2019	17.7	0	0	2,473	2,241	232
12/06/2019	16.55	0	0	2,437	2,197	240
13/06/2019	17.65	0	0	2,471	2,239	232

Date	Average temperature (°C)	Is the day Sunday?	Is the site closed?	Adjusted baseline (kWh)	Adjusted reporting (kWh)	Normalised savings (kWh)
14/06/2019	14.65	0	0	2,377	2,124	254
15/06/2019	14.7	0	0	2,379	2,126	253
16/06/2019	13.45	1	0	2,253	2,006	247
17/06/2019	13.4	0	0	2,338	2,076	263
18/06/2019	14.9	0	0	2,385	2,133	252
19/06/2019	13.2	0	0	2,332	2,068	264
20/06/2019	11.3	0	0	2,273	1,995	278
21/06/2019	11.7	0	0	2,285	2,010	275
22/06/2019	11.35	0	0	2,274	1,997	277
23/06/2019	11.95	1	0	2,206	1,949	258
24/06/2019	13.7	0	0	2,348	2,087	260
25/06/2019	14	0	0	2,357	2,099	258
26/06/2019	15.3	0	0	2,398	2,149	249
27/06/2019	15.35	0	0	2,399	2,151	249
28/06/2019	16.05	0	0	2,421	2,178	243
29/06/2019	15.2	0	0	2,395	2,145	250
30/06/2019	14.2	1	0	2,277	2,035	242
1/07/2019	12.85	0	0	2,321	2,055	267
2/07/2019	13.8	0	0	2,351	2,091	260
3/07/2019	13.7	0	0	2,348	2,087	260
4/07/2019	13.75	0	0	2,349	2,089	260
5/07/2019	16.1	0	0	2,423	2,180	243
6/07/2019	14.8	0	0	2,382	2,130	252
7/07/2019	15.4	1	0	2,314	2,081	233
8/07/2019	16.2	0	0	2,426	2,183	242
9/07/2019	14.15	0	0	2,362	2,105	257
10/07/2019	12.85	0	0	2,321	2,055	267
11/07/2019	15.1	0	0	2,391	2,141	250

Date	Average temperature (°C)	Is the day Sunday?	Is the site closed?	Adjusted baseline (kWh)	Adjusted reporting (kWh)	Normalised savings (kWh)
12/07/2019	15.95	0	0	2,418	2,174	244
13/07/2019	13.8	0	0	2,351	2,091	260
14/07/2019	12.3	1	0	2,217	1,962	255
15/07/2019	14	0	0	2,357	2,099	258
16/07/2019	15.25	0	0	2,396	2,147	249
17/07/2019	14.7	0	0	2,379	2,126	253
18/07/2019	15.5	0	0	2,404	2,156	247
19/07/2019	13.65	0	0	2,346	2,085	261
20/07/2019	14.05	0	0	2,359	2,101	258
21/07/2019	16.15	1	0	2,338	2,110	228
22/07/2019	17.55	0	0	2,468	2,235	233
23/07/2019	16.85	0	0	2,446	2,208	238
24/07/2019	16	0	0	2,420	2,176	244
25/07/2019	14.15	0	0	2,362	2,105	257
26/07/2019	13.5	0	0	2,341	2,080	262
27/07/2019	15.05	0	0	2,390	2,139	251
28/07/2019	14.55	1	0	2,288	2,048	239
29/07/2019	14.6	0	0	2,376	2,122	254
30/07/2019	12.6	0	0	2,313	2,045	268
31/07/2019	13.2	0	0	2,332	2,068	264
1/08/2019	15.1	0	0	2,391	2,141	250
2/08/2019	14.3	0	0	2,366	2,110	256
3/08/2019	15.3	0	0	2,398	2,149	249
4/08/2019	13.6	1	0	2,258	2,012	246
5/08/2019	14.6	0	0	2,376	2,122	254
6/08/2019	13.35	0	0	2,337	2,074	263
7/08/2019	15.25	0	0	2,396	2,147	249
8/08/2019	15.05	0	0	2,390	2,139	251

Date	Average temperature (°C)	Is the day Sunday?	Is the site closed?	Adjusted baseline (kWh)	Adjusted reporting (kWh)	Normalised savings (kWh)
9/08/2019	14.85	0	0	2,384	2,131	252
10/08/2019	12.5	0	0	2,310	2,041	269
11/08/2019	12.45	1	0	2,222	1,968	254
12/08/2019	14.15	0	0	2,362	2,105	257
13/08/2019	13.05	0	0	2,327	2,062	265
14/08/2019	13.45	0	0	2,340	2,078	262
15/08/2019	13.75	0	0	2,349	2,089	260
16/08/2019	15.8	0	0	2,413	2,168	245
17/08/2019	15.8	0	0	2,413	2,168	245
18/08/2019	14.6	1	0	2,289	2,050	239
19/08/2019	14.15	0	0	2,362	2,105	257
20/08/2019	14.8	0	0	2,382	2,130	252
21/08/2019	15.7	0	0	2,410	2,164	246
22/08/2019	15.45	0	0	2,402	2,155	248
23/08/2019	13.3	0	0	2,335	2,072	263
24/08/2019	16.05	0	0	2,421	2,178	243
25/08/2019	16.5	1	0	2,349	2,123	225
26/08/2019	14.6	0	0	2,376	2,122	254
27/08/2019	15	0	0	2,388	2,137	251
28/08/2019	15.45	0	0	2,402	2,155	248
29/08/2019	12.6	0	0	2,313	2,045	268
30/08/2019	12.95	0	0	2,324	2,058	266
31/08/2019	14.6	0	0	2,376	2,122	254
1/09/2019	16.65	1	0	2,353	2,129	224
2/09/2019	16.2	0	0	2,426	2,183	242
3/09/2019	16.9	0	0	2,448	2,210	237
4/09/2019	19.05	0	0	2,515	2,293	222
5/09/2019	17.85	0	0	2,477	2,247	231

Date	Average temperature (°C)	Is the day Sunday?	Is the site closed?	Adjusted baseline (kWh)	Adjusted reporting (kWh)	Normalised savings (kWh)
6/09/2019	21.6	0	0	2,594	2,391	203
7/09/2019	15.1	0	0	2,391	2,141	250
8/09/2019	15.8	1	0	2,327	2,097	230
9/09/2019	14.2	0	0	2,363	2,107	257
10/09/2019	12.85	0	0	2,321	2,055	267
11/09/2019	13.65	0	0	2,346	2,085	261
12/09/2019	17.95	0	0	2,480	2,251	230
13/09/2019	16.65	0	0	2,440	2,201	239
14/09/2019	16.1	0	0	2,423	2,180	243
15/09/2019	18.6	1	0	2,414	2,204	210
16/09/2019	21.35	0	0	2,587	2,381	205
17/09/2019	11.7	0	0	2,285	2,010	275
18/09/2019	14.25	0	0	2,365	2,108	256
19/09/2019	17.55	0	0	2,468	2,235	233
20/09/2019	18.45	0	0	2,496	2,270	226
21/09/2019	20.25	0	0	2,552	2,339	213
22/09/2019	20.45	1	0	2,472	2,275	197
23/09/2019	17.4	0	0	2,463	2,230	234
24/09/2019	15.1	0	0	2,391	2,141	250
25/09/2019	15.8	0	0	2,413	2,168	245
26/09/2019	16.7	0	0	2,441	2,203	239
27/09/2019	19.6	0	0	2,532	2,314	218
28/09/2019	18.5	0	0	2,498	2,272	226
29/09/2019	16.2	1	0	2,339	2,112	227
30/09/2019	16.55	0	0	2,437	2,197	240
1/10/2019	16.05	0	0	2,421	2,178	243
2/10/2019	16.95	0	0	2,449	2,212	237
3/10/2019	21.75	0	0	2,599	2,397	202

Date	Average temperature (°C)	Is the day Sunday?	Is the site closed?	Adjusted baseline (kWh)	Adjusted reporting (kWh)	Normalised savings (kWh)
4/10/2019	25.7	0	0	2,723	2,549	174
5/10/2019	17.25	0	0	2,459	2,224	235
6/10/2019	18.7	1	0	2,417	2,208	209
7/10/2019	20.3	0	0	2,554	2,341	213
8/10/2019	20.3	0	0	2,554	2,341	213
9/10/2019	14.95	0	0	2,387	2,135	251
10/10/2019	16.15	0	0	2,424	2,181	243
11/10/2019	15.05	0	0	2,390	2,139	251
12/10/2019	16.2	0	0	2,426	2,183	242
13/10/2019	15.2	1	0	2,308	2,073	235
14/10/2019	16.95	0	0	2,449	2,212	237
15/10/2019	19.7	0	0	2,535	2,318	217
16/10/2019	20.25	0	0	2,552	2,339	213
17/10/2019	22.85	0	0	2,634	2,439	194
18/10/2019	18.25	0	0	2,490	2,262	228
19/10/2019	21.6	0	0	2,594	2,391	203
20/10/2019	17.45	1	0	2,378	2,160	218
21/10/2019	17.25	0	0	2,459	2,224	235
22/10/2019	18.35	0	0	2,493	2,266	227
23/10/2019	19.95	0	0	2,543	2,328	215
24/10/2019	23	0	0	2,638	2,445	193
25/10/2019	27.3	0	0	2,773	2,610	162
26/10/2019	27.2	0	0	2,769	2,606	163
27/10/2019	19.65	1	0	2,447	2,245	202
28/10/2019	18.2	0	0	2,488	2,260	228
29/10/2019	19.2	0	0	2,519	2,299	221
30/10/2019	21.5	0	0	2,591	2,387	204
31/10/2019	22	0	0	2,607	2,406	201

Date	Average temperature (°C)	Is the day Sunday?	Is the site closed?	Adjusted baseline (kWh)	Adjusted reporting (kWh)	Normalised savings (kWh)
1/11/2019	21.6	0	0	2,594	2,391	203
2/11/2019	22.35	0	0	2,618	2,420	198
3/11/2019	24.2	1	0	2,589	2,419	170
4/11/2019	20.45	0	0	2,559	2,347	212
5/11/2019	17.55	0	0	2,468	2,235	233
6/11/2019	19.85	0	0	2,540	2,324	216
7/11/2019	25.2	0	0	2,707	2,529	178
8/11/2019	24.6	0	0	2,688	2,506	182
9/11/2019	17.25	0	0	2,459	2,224	235
10/11/2019	19.85	1	0	2,453	2,252	201
11/11/2019	20.8	0	0	2,569	2,360	209
12/11/2019	26.45	0	0	2,746	2,577	169
13/11/2019	19.5	0	0	2,529	2,310	219
14/11/2019	20.3	0	0	2,554	2,341	213
15/11/2019	23.55	0	0	2,655	2,466	189
16/11/2019	19.95	0	0	2,543	2,328	215
17/11/2019	20.85	1	0	2,484	2,291	194
18/11/2019	21.1	0	0	2,579	2,372	207
19/11/2019	24.25	0	0	2,677	2,493	184
20/11/2019	20.95	0	0	2,574	2,366	208
21/11/2019	21.55	0	0	2,593	2,389	204
22/11/2019	23.05	0	0	2,640	2,447	193
23/11/2019	20.3	0	0	2,554	2,341	213
24/11/2019	22	1	0	2,520	2,335	186
25/11/2019	23.55	0	0	2,655	2,466	189
26/11/2019	27.3	0	0	2,773	2,610	162
27/11/2019	18.65	0	0	2,502	2,278	225
28/11/2019	19.8	0	0	2,538	2,322	216

Date	Average temperature (°C)	Is the day Sunday?	Is the site closed?	Adjusted baseline (kWh)	Adjusted reporting (kWh)	Normalised savings (kWh)
29/11/2019	24.1	0	0	2,673	2,487	185
30/11/2019	21.6	0	0	2,594	2,391	203
1/12/2019	19.7	1	0	2,449	2,246	202
2/12/2019	19.9	0	0	2,541	2,326	216
3/12/2019	21.25	0	0	2,584	2,378	206
4/12/2019	24.2	0	0	2,676	2,491	185
5/12/2019	25.25	0	0	2,708	2,531	177
6/12/2019	21.5	0	0	2,591	2,387	204
7/12/2019	21.85	0	0	2,602	2,401	202
8/12/2019	22.2	1	0	2,527	2,343	184
9/12/2019	22.6	0	0	2,626	2,429	196
10/12/2019	24.5	0	0	2,685	2,502	183
11/12/2019	21.55	0	0	2,593	2,389	204
12/12/2019	20.7	0	0	2,566	2,356	210
13/12/2019	20.9	0	0	2,573	2,364	209
14/12/2019	22.8	0	0	2,632	2,437	195
15/12/2019	23.55	1	0	2,569	2,394	174
16/12/2019	21.8	0	0	2,601	2,399	202
17/12/2019	20.45	0	0	2,559	2,347	212
18/12/2019	21.6	0	0	2,594	2,391	203
19/12/2019	29.2	0	0	2,832	2,683	149
20/12/2019	22.55	0	0	2,624	2,428	197
21/12/2019	24.9	0	0	2,698	2,518	180
22/12/2019	21.05	1	0	2,491	2,298	192
23/12/2019	20.5	0	0	2,560	2,349	211
24/12/2019	23.05	0	0	2,640	2,447	193
25/12/2019	24.15	0	1	1,930	2,123	- 194
26/12/2019	24.1	0	0	2,673	2,487	185

Date	Average temperature (°C)	Is the day Sunday?	Is the site closed?	Adjusted baseline (kWh)	Adjusted reporting (kWh)	Normalised savings (kWh)
27/12/2019	24	0	0	2,669	2,483	186
28/12/2019	24.4	0	0	2,682	2,499	183
29/12/2019	23.2	1	0	2,558	2,381	177
30/12/2019	23.7	0	0	2,660	2,472	188
31/12/2019	28	0	0	2,794	2,637	157

Total annual adjusted baseline consumption (kWh)	Total annual adjusted reporting consumption (kWh)	Total annual normalised savings (kWh)
916,702	838,921	77,782

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