The Data Revolution

Will Jenkins & Joe Pigott

Carbon Credentials

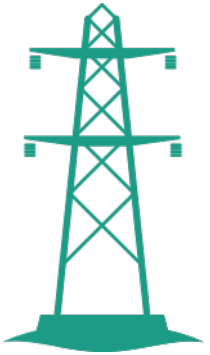
One Version of the Truth

Our Experience

ADAPt
Assured Data Analytics Platform

Over
59,000
meters

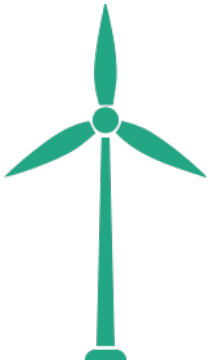
7.3 billion
kWh
In the last
12 months



Over
34,000
buildings

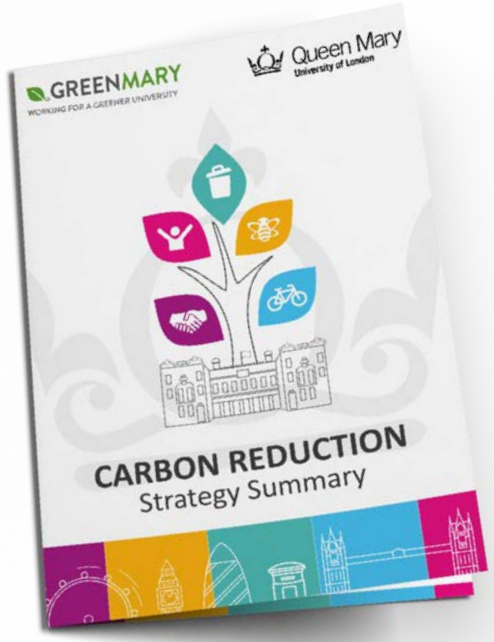
£550 million
Energy spend in
Last 12 months

2.5 Million
tCO2e
In last 12 months

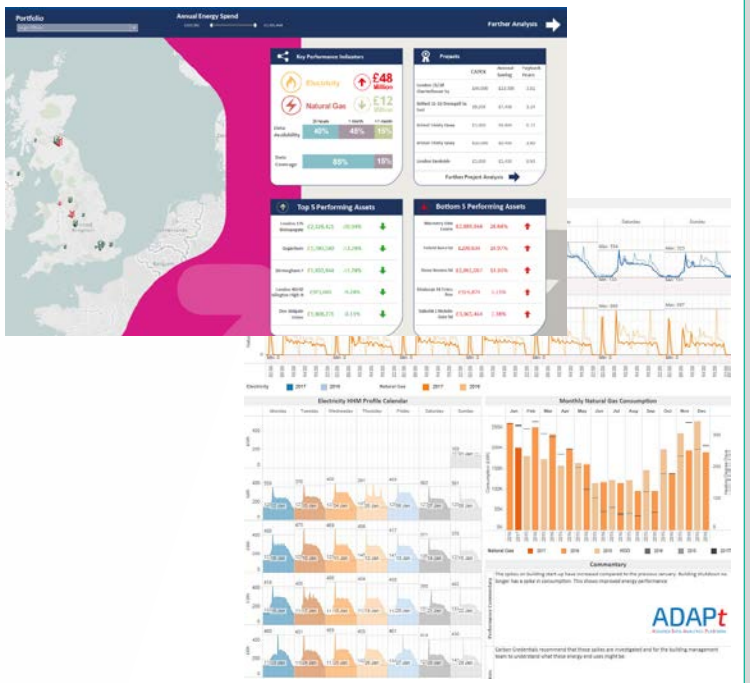


Our Experience

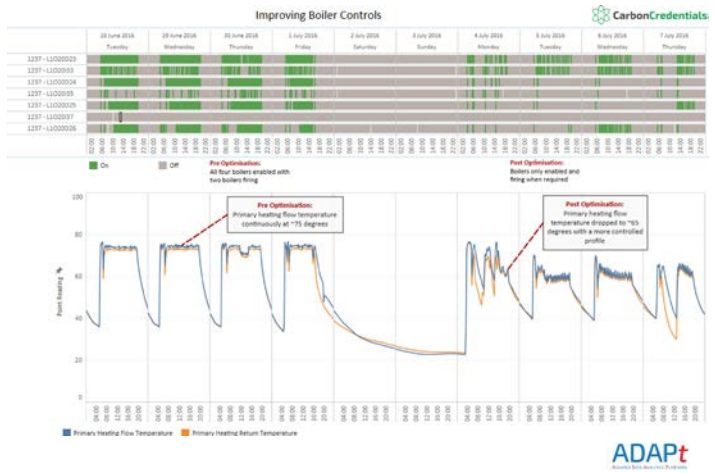
Carbon Management Planning



Data Management



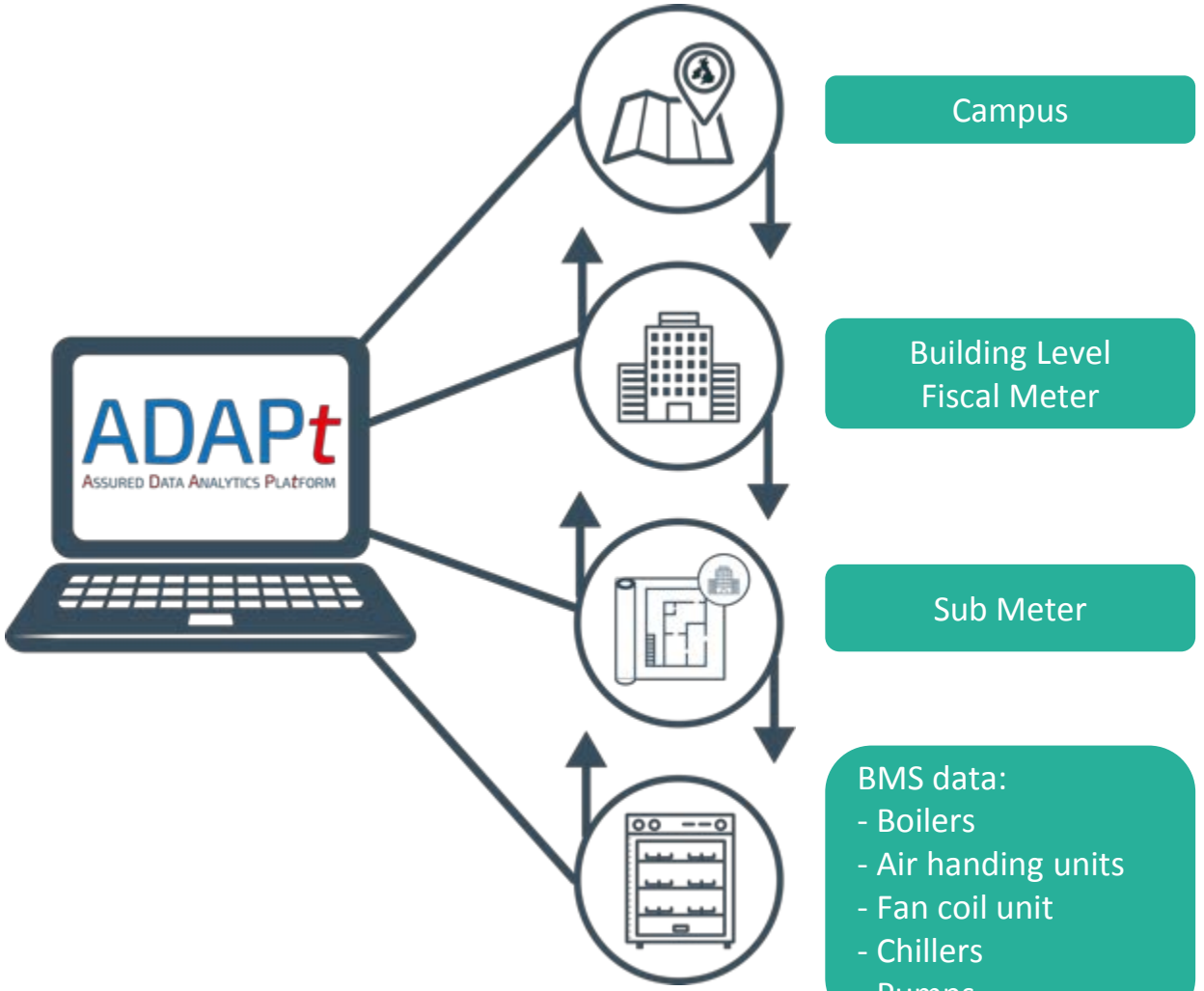
Asset and Operational Performance Improvement




Data Revolution

The Data Revolution

One version of the truth at all levels of building energy data



Starting the Journey in Higher Education

Carbon Credentials

www.carboncredentials.com

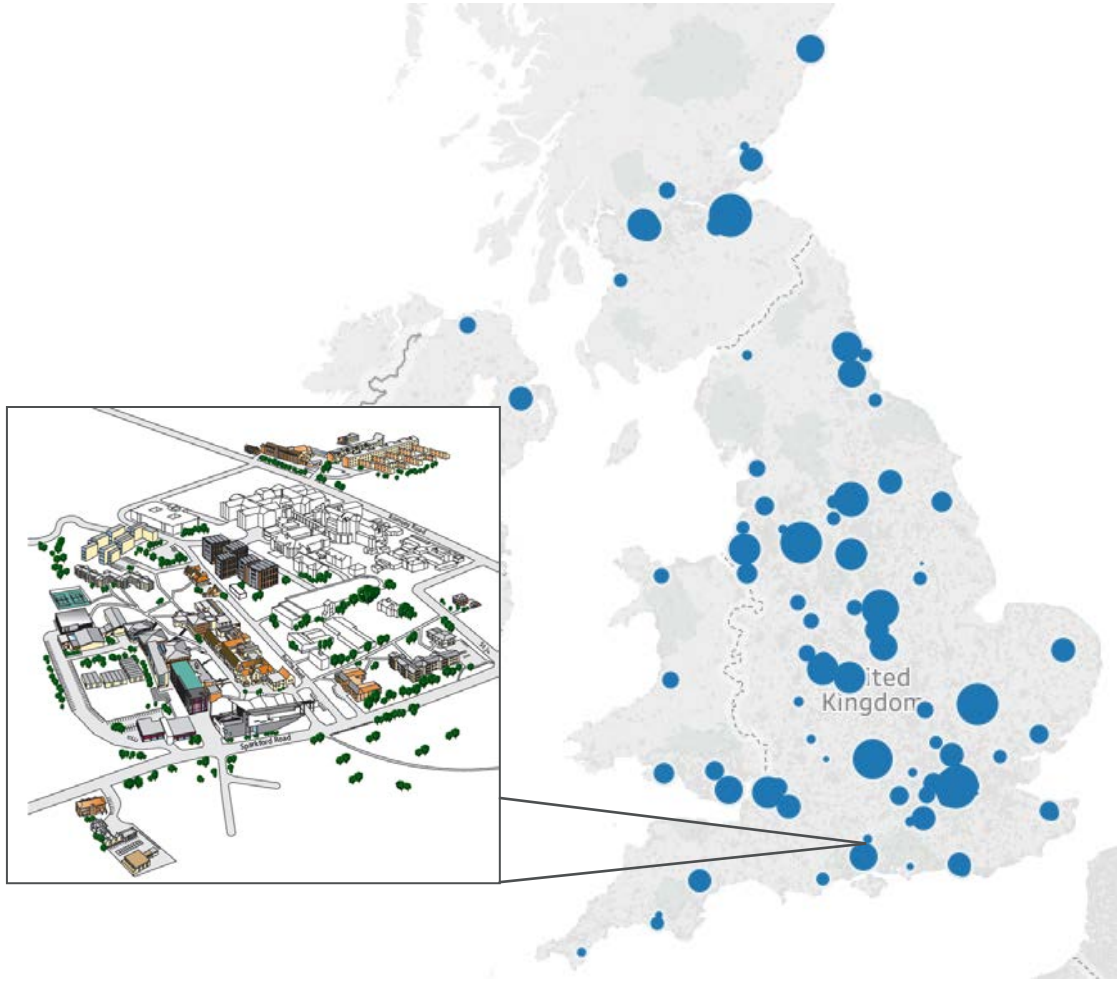
Innovative Approach to Data Management

Data Flows → Data Integrity → Data Warehouse → Reporting → Success

THE UNIVERSITY OF WINCHESTER

*"Carbon Credentials' innovation and expertise will enable us to **get more value out of our data** and achieve our carbon management goals."*

Mat Jane, Head of Energy & Environment



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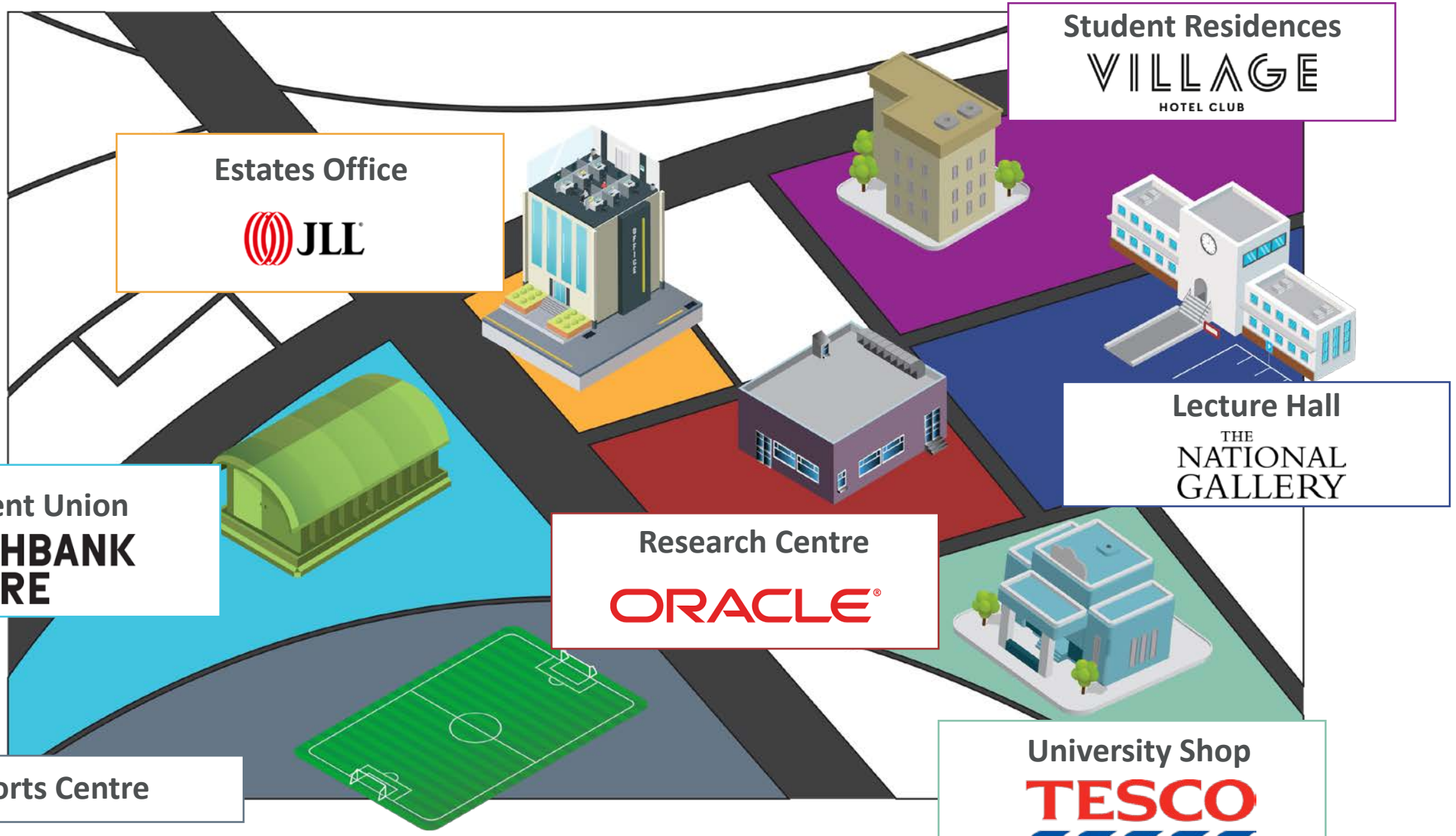
Case Studies

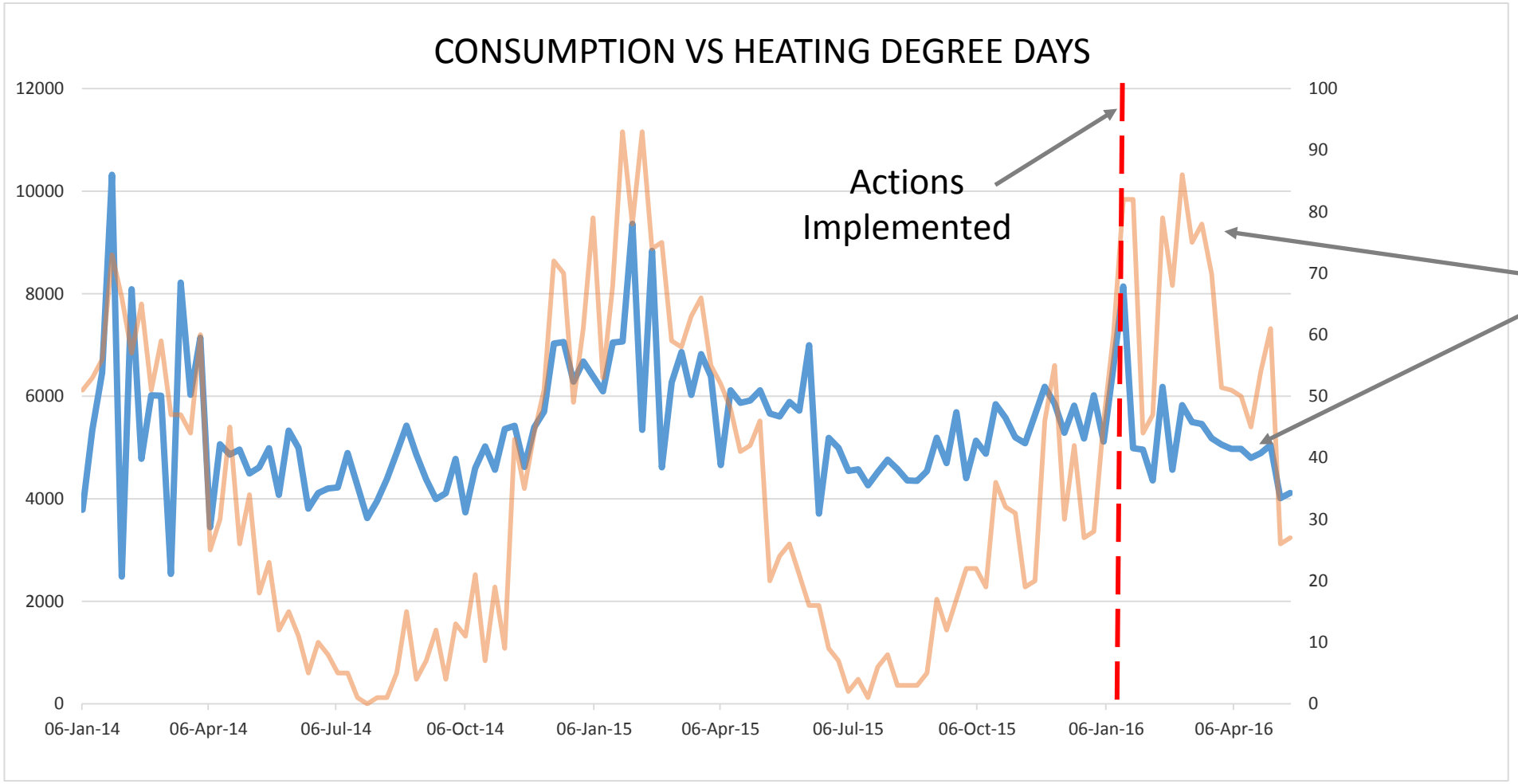

Student Residences
VILLAGE
HOTEL CLUB
Estates Office
JLL
Lecture Hall
THE NATIONAL GALLERY
Student Union
SOUTHBANK CENTRE
Research Centre
ORACLE
University Shop
TESCO
Sports Centre
THE CHAMPIONSHIPS WIMBLEDON

Delivering Savings and Identifying Maintenance Issues

Carbon Credentials

VILLAGE
THE HOTEL CLUB

SIGNIFICANT REDUCTION IN GAS CONSUMPTION



Low gas consumption despite cooler conditions

22 % REDUCTION

Gas Consumption

Degree Days

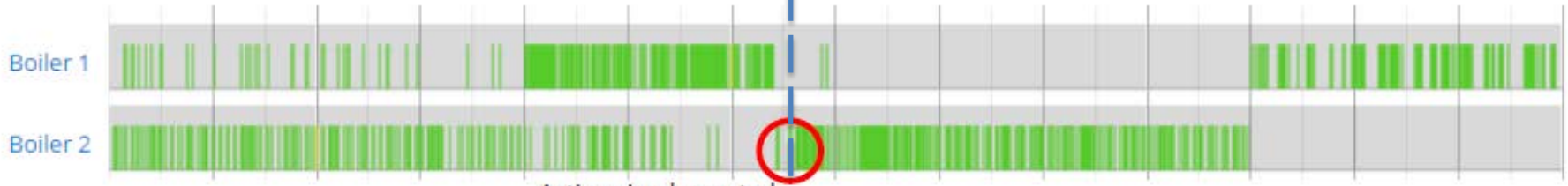
VILLAGE
THE HOTEL CLUB

The following visuals show savings that have been achieved at asset level. The opportunity is highlighted at diagnostic stage and savings are seen after implementation.

DIAGNOSTIC

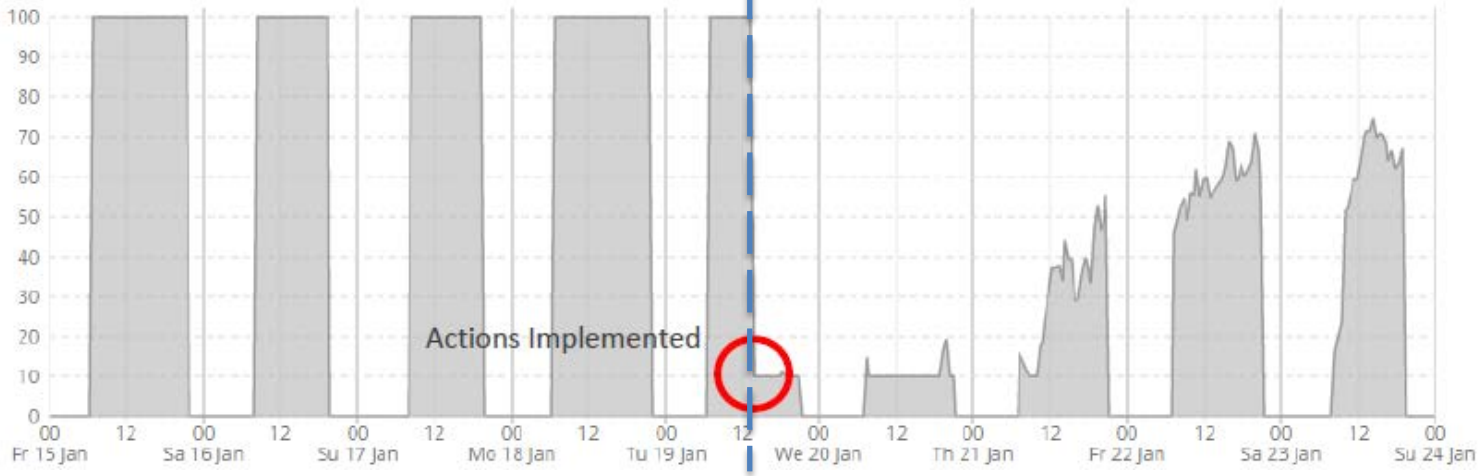
IMPLEMENTATION

BOILER OPERATION VISUALISATION



GAS SAVINGS

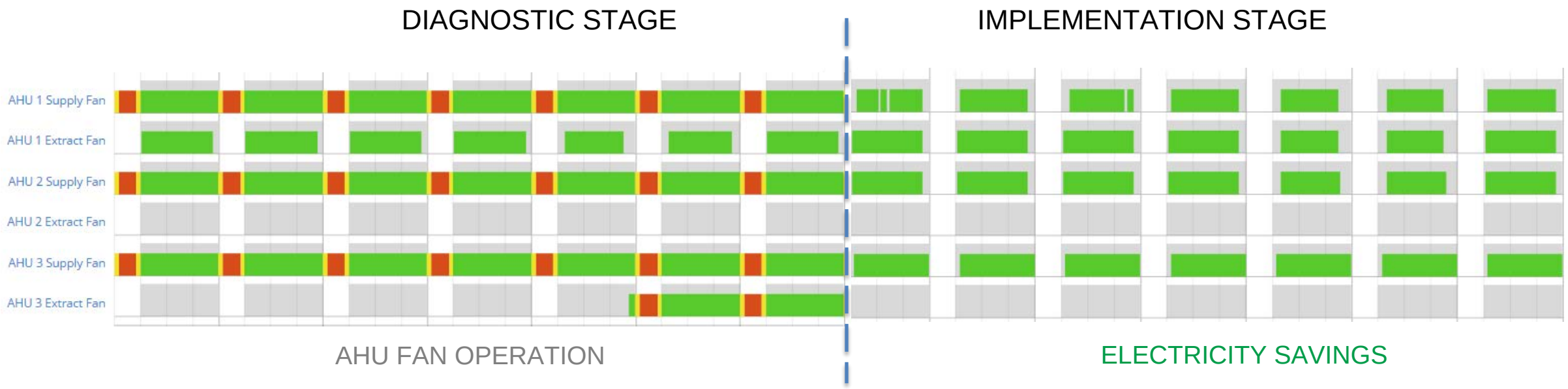
AHU DAMPER OPERATION



GAS & ELECTRICITY SAVINGS

VILLAGE
THE HOTEL CLUB

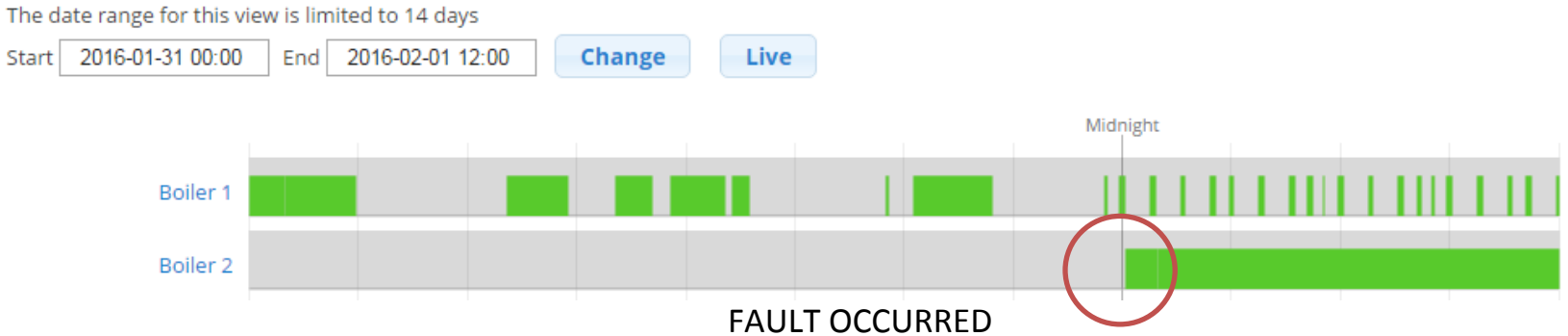
LARGE AIR FANS RUNNING 24/7 UNNECESSARILY



"I did not realise so much energy intensive plant was running for extensive periods of time" Maintenance Manager

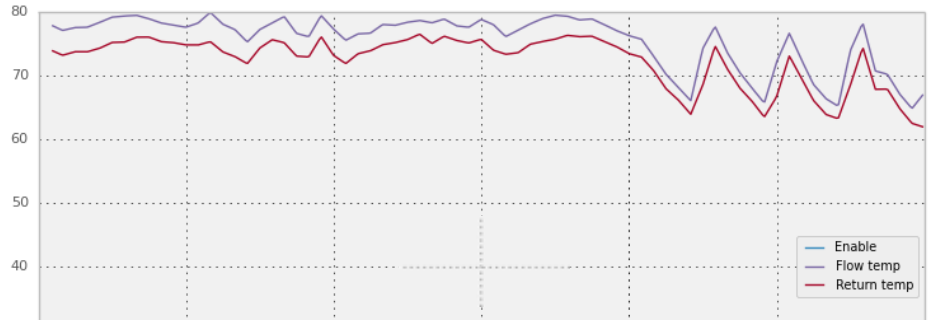
VILLAGE
THE HOTEL CLUB

ADDITIONAL BENEFITS

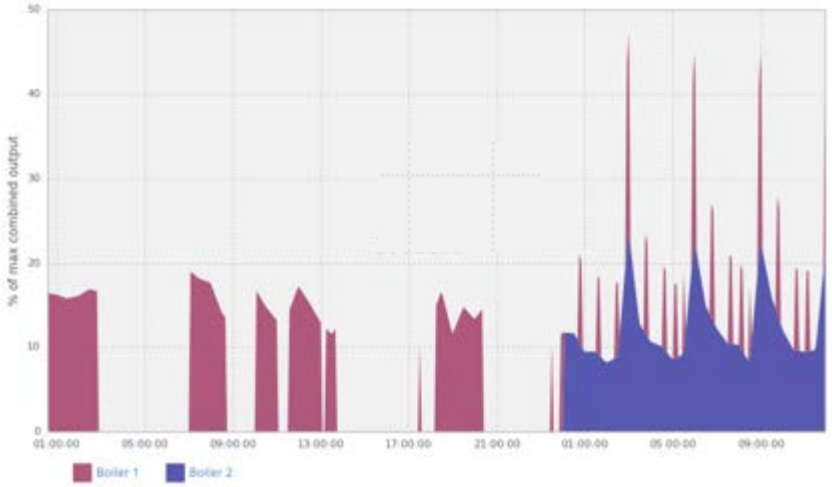


FAULT OCCURRED

On a Monday morning Carbon Credentials identified a fault through the platform



BOILER FLOW & RETURN TEMPERATURE

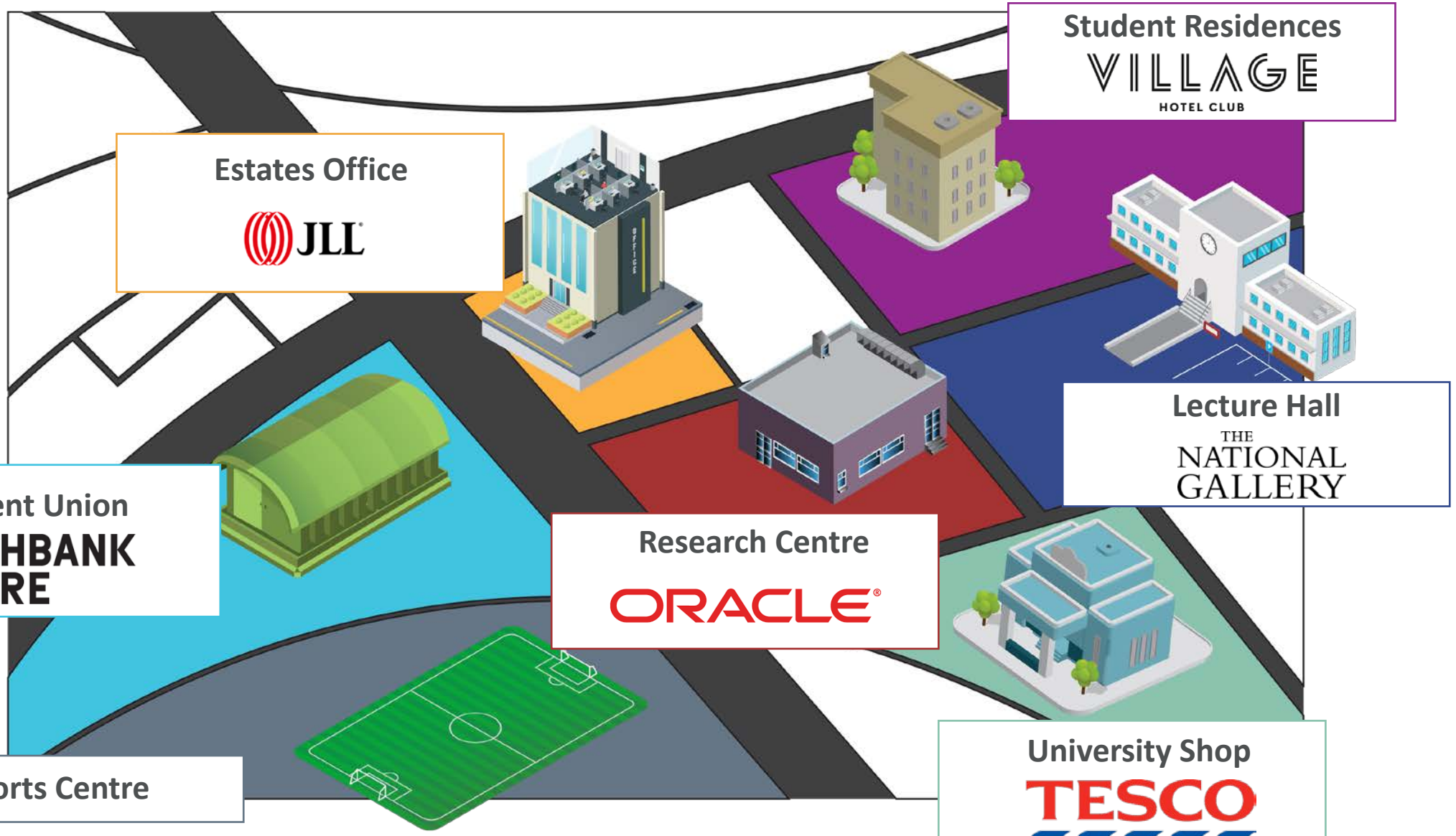


BOILER VIRTUAL ENERGY METER

Boiler 2 has been permanently enabled and the fault was causing significant temperature & consumption fluctuations

Delivering savings and improving comfort levels

Carbon Credentials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THE CHAMPIONSHIPS WIMBLEDON

Space Temperatures – 12pm to 7pm

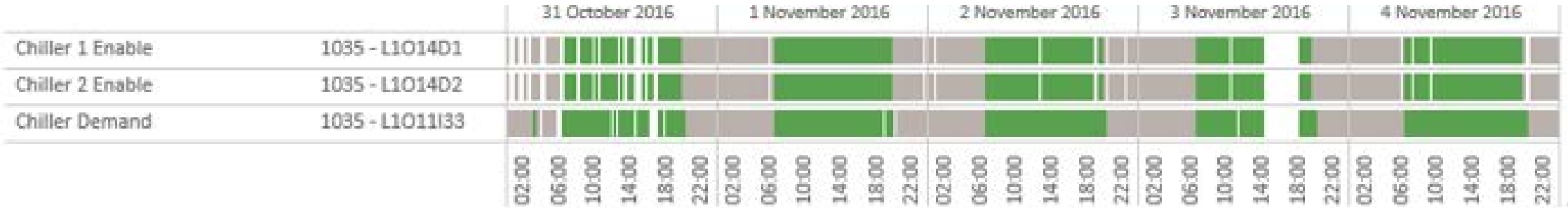
21 November 2016

Reporting Name	Min..	Max ..	12 PM				1 PM				2 PM				4 PM				5 PM				6 PM				7 PM			
Average Room Temp From Osn12	20	23	.41	21.46	21.51	21.51	21.54	21.63	21.65	21.69	21.76	21.85	21.87	22.00	22.00	21.95	21.93	21.93	21.93	21.78	21.65	21.51	21.39	21.27	21.18	21.09	21.00	20.88	20.82	20.72
Average Building Temperature	20	23	.04	21.07	21.12	21.15	21.18	21.22	21.28	21.31	21.34	21.46	21.50	21.53	21.55	21.57	21.52	21.52	21.56	21.46	21.36	21.22	21.10	21.00	20.90	20.85	20.77	20.68	20.55	20.47
B Block 1st Floor Temperature	20	23	.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62
B Block 3rd Floor Temperature	20	23	.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62	41.62
B Block 5th Floor Temperature	20	23	.32	20.32	20.41	20.46	20.50	20.50	20.58	20.59	20.59	20.74	20.77	20.68	20.68	20.74	20.68	20.68	20.77	20.74	20.68	20.59	20.50	20.45	20.32	20.32	20.24	20.14	20.02	19.88
Block B & C Average Temperature Av..	20	23	.40	21.43	21.47	21.50	21.53	21.58	21.62	21.67	21.72	21.82	21.87	21.96	21.98	21.98	21.94	21.94	21.96	21.84	21.69	21.53	21.40	21.28	21.19	21.11	21.04	20.94	20.83	20.76
Block B & C Minimum Temperature ..	20	23	.02	20.11	20.19	20.29	20.33	20.38	20.47	20.55	20.55	20.73	20.77	20.68	20.68	20.76	20.68	20.68	20.77	20.72	20.64	20.47	20.29	20.11	19.96	19.84	19.76	19.62	19.49	19.40
C Block 2nd Floor Temperature	20	23	.53	22.53	22.53	22.53	22.53	22.61	22.61	22.70	22.79	22.89	22.97	23.06	23.06	23.10	23.15	23.24	23.24	23.06	22.89	22.70	22.53	22.35	22.26	22.17	22.08	21.99	21.91	21.91
C Block 4th Floor Temperature	20	23	.74	22.79	22.74	22.74	22.74	22.83	22.91	22.84	22.95	23.00	22.91	23.10	23.19	23.10	23.00	22.91	22.91	22.74	22.56	22.38	22.28	22.25	22.21	22.12	22.10	22.02	21.93	21.86
C Block Ground Floor Temperature	20	23	.02	20.11	20.19	20.29	20.32	20.38	20.47	20.55	20.55	20.64	20.82	21.00	21.07	20.91	20.91	20.91	20.91	20.82	20.64	20.47	20.29	20.11	19.99	19.84	19.76	19.65	19.49	19.40

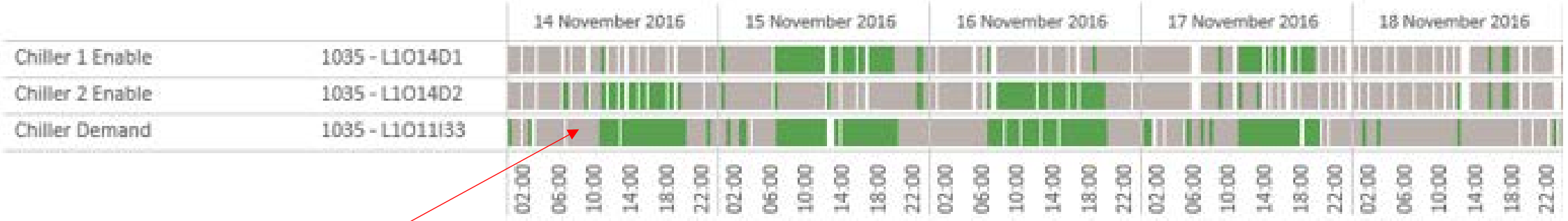
B Block 1st and 3rd floor temperature sensors thought they were above 40°C

Issue 1: Chillers creating unnecessary cooling

Before

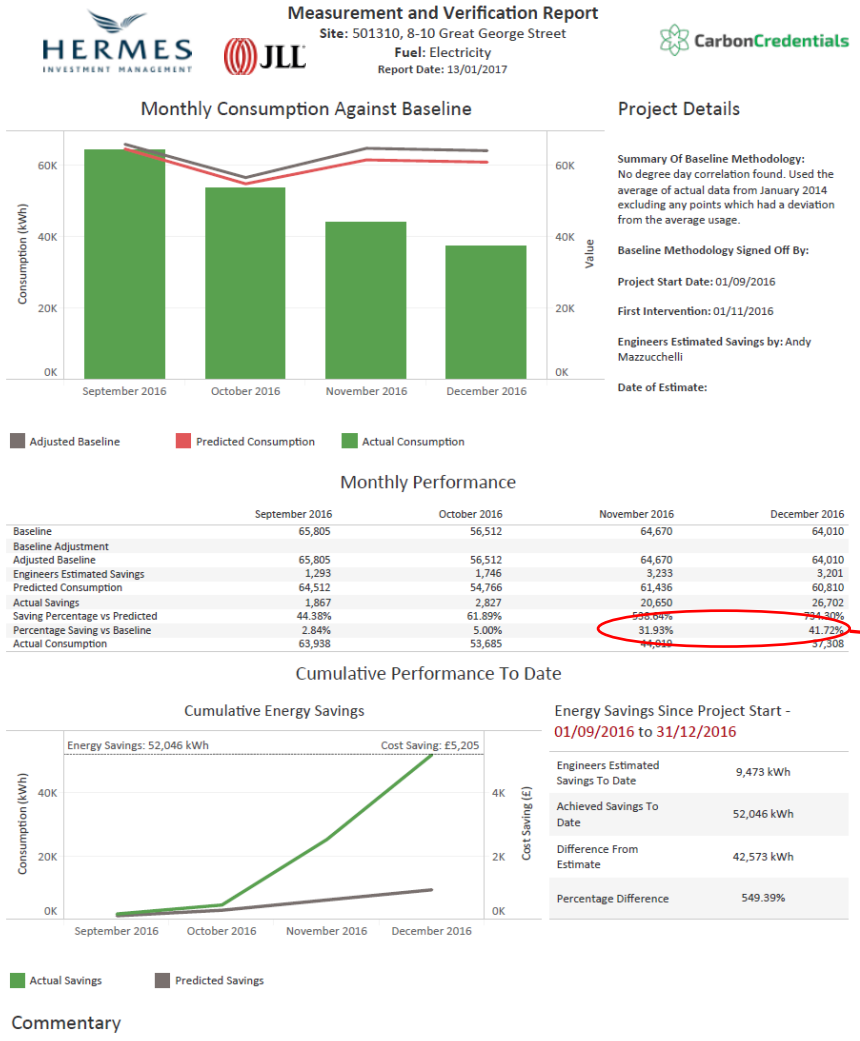


After



Chillers now operate based on demand

Results: 32% and 42% savings in months 1 and 2 post implementation



HERMES INVESTMENT MANAGEMENT

JLL

Measurement and Verification Report
Site: 501310, 8-10 Great George Street
Fuel: Electricity
Report Date: 13/01/2017

CarbonCredentials

Monthly Consumption Against Baseline

Project Details

Summary Of Baseline Methodology: No degree day correlation found. Used the average of actual data from January 2014 excluding any points which had a deviation from the average usage.

Baseline Methodology Signed Off By:

Project Start Date: 01/09/2016

First Intervention: 01/11/2016

Engineers Estimated Savings by: Andy Mazzucchelli

Date of Estimate:

Adjusted Baseline Predicted Consumption Actual Consumption

Monthly Performance

	September 2016	October 2016	November 2016	December 2016
Baseline	65,805	56,512	64,670	64,010
Baseline Adjustment				
Adjusted Baseline	65,805	56,512	64,670	64,010
Engineers Estimated Savings	1,293	1,746	3,233	3,201
Predicted Consumption	64,512	54,766	61,436	60,810
Actual Savings	1,867	2,827	20,650	26,702
Saving Percentage vs Predicted	44.38%	61.89%	~~938.64%~~	~~734.30%~~
Percentage Saving vs Baseline	2.84%	5.00%	31.93%	41.72%
Actual Consumption	63,938	53,685	~~44,810~~	~~37,308~~

Cumulative Performance To Date

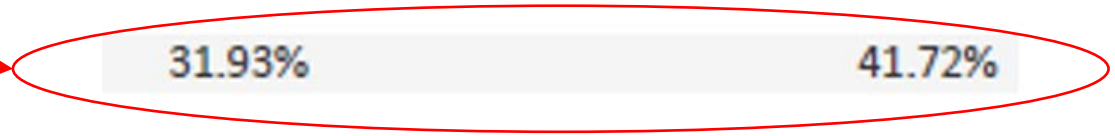
Cumulative Energy Savings

Energy Savings Since Project Start - 01/09/2016 to 31/12/2016

Engineers Estimated Savings To Date	9,473 kWh
Achieved Savings To Date	52,046 kWh
Difference From Estimate	42,573 kWh
Percentage Difference	549.39%

Actual Savings Predicted Savings

Commentary



Automated monthly Measurement and Verification reports augment standard site level consumption reports

These become a key driver for additional or different action


Why Now?

Why Now?

Now is the right time to focus on the **quick-win** and **low-cost optimisation projects**

Figure 5: UK population by single year of age

2014

Your Opportunity: 226,000 tonnes of carbon saved

People
Process
Technology

10%
SAVING

Partner to Enable

Data from HESA: 156 institutions


Q&A