demand logic

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Smaller building analytics

Demand Logic has previously made a name for itself in monitoring and analysing large buildings containing complex mechanical assets. At Grosvenor Estate, where Demand Logic have been monitoring five such buildings for over 18 months, there was a shared desire to increase the scope to cover smaller buildings.

Seven properties with minimal to no existing data networks to utilise were identified as a testbed. There was a requirement to monitor Heating Ventilation and Air Conditioning (HVAC), utility meters, lifts and Indoor Air Quality (IAQ). Therefore, a combination of hardware including Demand Logic's Data Acquisition Device (DAD) and other Internet of Things (IoT) sensors would have to be utilised. The key client objectives were, data quality, value for money and speed of deployment.

9,646 data points established within **3 days**

21 Building Performance Actions initially identified

Headline assets being monitored:

- Central Plant
- LTHW, HWS, CWS
- Terminal Units
- Lifts
- Meters
- Indoor IAQ

Within three days the equipment was deployed at the selected properties and a week later all properties were visible on the Demand Logic platform.

The project was a success and demonstrates that smart technology can also help existing stock buildings, not just the widely reported 'trophy' assets.

The challenge with smaller buildings

Management teams face significant challenges in benchmarking small buildings and maintaining them when spread across an estate. These are challenges which need to be overcome during the road to net zero;

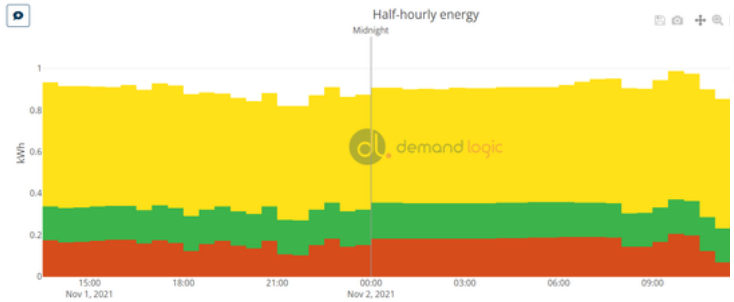
- Range of building types and uses
- Varying specifications/ ages of plant/ technology
- Lack of visibility
- Access to technical areas or tenant demises
- Economics of FM and technical solutions

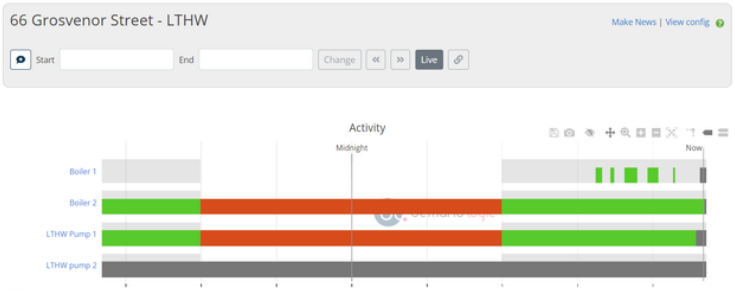
Demand Logic assists by giving maintenance teams the visibility they are looking for, meaning the key metrics of a building's operational performance are monitored remotely, whether it's a modern multi-let office or Georgian FRI with legacy systems.

Level of insight achieved

MAJOR PLANT MONITORING

Both CT and temperature sensors on central plant are used. This allows for the measurement of individual asset consumption and means that these assets can be configured to show on DL's Major Plant Watchdog (MPW).





This MPW then automatically included the energy score for 66 Grosvenor Street allowing it to be benchmarked on same basis as buildings with BMS. (Score calculated on partial month data only, hence the low figure).

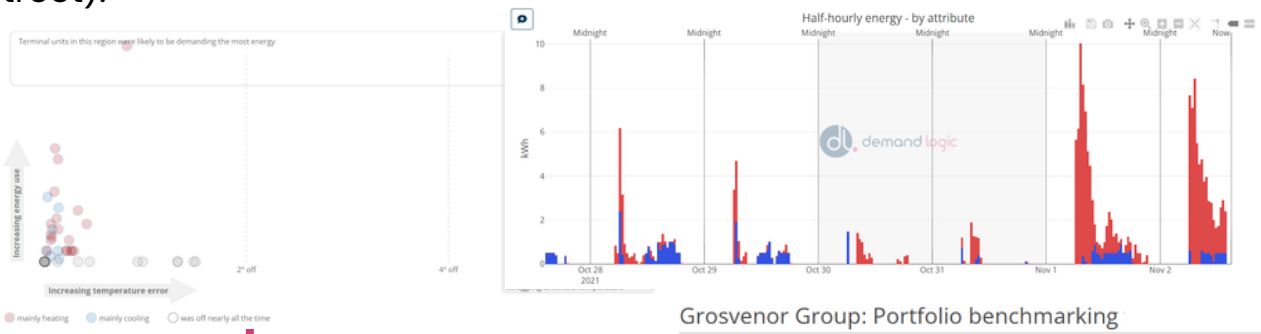
Grosvenor Group: Portfolio benchmarking

October November December January February March April May June July August September **October**

		Area	Activity	Actions				DL Score	Quartile	+/-
1	33 Davies St	5,278	21	10	99.2	95.4	94.3	**96.3**	2nd	→
2	70 Grosvenor St	5,669	0	9	99.3	99.6	85.8	**94.9**	3rd	↓0.2
3	50 Grosvenor Hill	2,323	0	6	99.4	97.9	82.0	**93.1**	3rd	↑2.5
4	42-44 Grosvenor Gardens	1,839	0	1	99.2	97.6	81.3	**92.7**	3rd	↓0.2
5	6 Grosvenor St	3,345	0	37	99.5	96.6	77.2	**91.1**	4th	↑1.1
6	110 Buckingham Palace Road	1,858	0	33	99.6	95.2	68.6	**87.8**	4th	↓2.8
7	46-48 Grosvenor Gardens	2,230	0	0	99.3	92.6	60.2	**84.0**	4th	↓6.9
8	66 Grosvenor Street	859	5	0	98.0		38.4	**77.6**	4th	→
9	Grosvenor Hill Court	2,000	0	0						→
	Average	2,822	2.9	10.7	99.2	96.4	73.5	89.7		-0.7

TERMINAL UNITS

There are a number of methods by which DL can acquire data from VRF/VRV systems that do not sit on a "BMS". Two such as examples are DBACs devices (42-44 & 46-48 Grosvenor gardens) and Daikin open protocol licence (24/25 Grosvenor Street).



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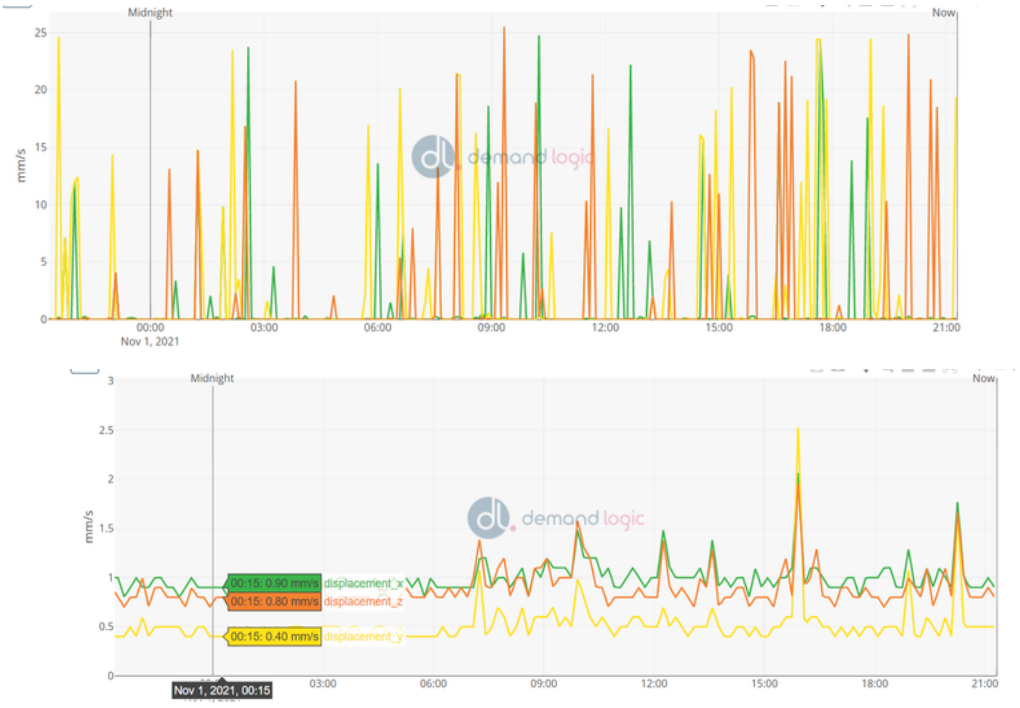
	Average	2,822	2.9	10.7	99.2	96.4	73.5	89.7		-0.7

Each method allows the same level of analysis as other BMS connected terminal units, as well as enabling DL benchmarking on the scorecard.

LIFTS

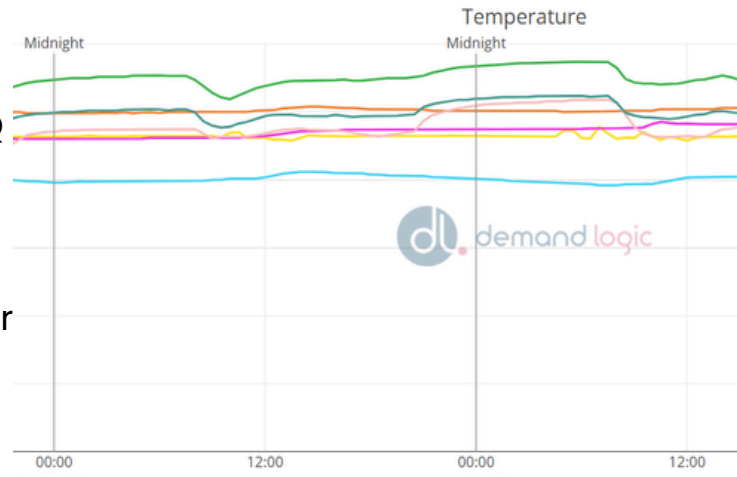
A combination of vibration and electric current monitoring can highlight typical lift component faults.

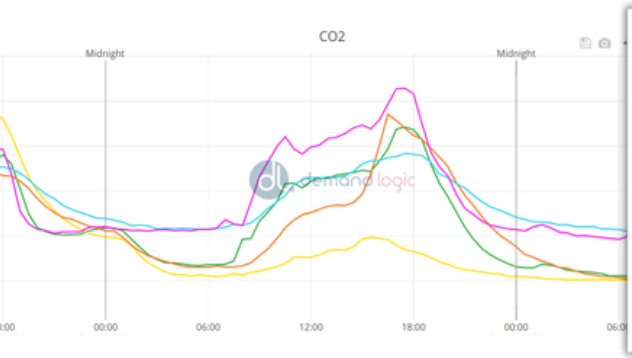
- Rotor misalignment
- Bearing faults
- Groove wearing
- Loose tensioners
- Guide wear

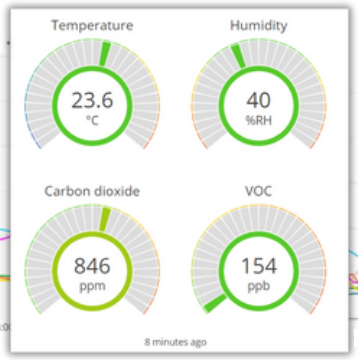


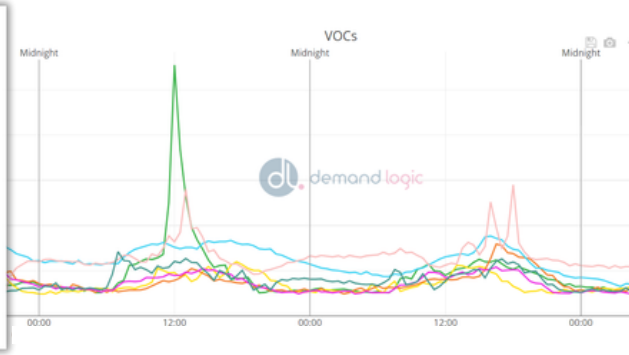
INDOOR AIR QUALITY (IAQ)

We are currently monitoring a range of IAQ metrics across 66 Grosvenor Street. As with other sites where Demand Logic are using IAQ sensors, associating the air quality of a particular space with the HVAC equipment serving provides the ability to proactively manage IAQ. The difference with 66 Grosvenor Street is that the HVAC data is accessed via other IoT devices due to no existing data networks existing.



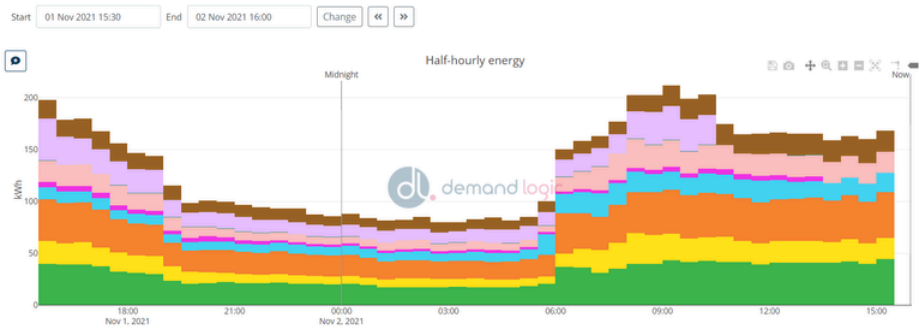






METERING AND ELECTRICAL MONITORING - MAIN INCOMERS

With the aggregation of both BMS connected meters, in the larger sites, and Panoramic Power, in the smaller sites we were able to start aggregating energy consumption on main incomers across the estate.



This is useful top level insight for peer comparison and trend identification. The true value is from the granularity of insight that now sits below - lower level metering and monitoring of individual asset operation.

Assessing this data alongside more granular consumption data from sub-meters or Demand Logic's Virtual Meters, enables an interrogation of the equipment responsible for the greatest energy demand. In this example, mechanical services is seen as the largest consumer of energy, of which AC on a 3rd floor can be identified as the highest consumer as it had been operating 24/7.