CIBSE EPG: Tenant metering – TfL Reality Check
Reality check 1: aM&T software and how it can help

36 Sites with 2,429 Datasets
- Waste data, 289
- Virtual datasets, 773
- Landlord Supply meters, 23
- Incoming utility meters, 298
- Sub-meters, 1046

36 Sites with 2,429 Datasets
- Water, 209
- Coolth, 12
- Heat, 34
- Gas, 171
- Electricity, 1709

Windsor House
- Total DEC CO2 tonnes
- DEC Score

Carbon Emissions (tonnes)

% of Benchmark non-AAC building

0 50 100 150 200 250 300 350
Reality check 2: aM&T utilities target setting & reporting

Key TfL Head Offices total energy and energy efficiency vs industry benchmarks

- Last 13 Periods Building Gas, kWh/e
- Last 13 Periods Building Electricity, kWh/e
- Proposed Building Energy efficiency, kWh/m²
- REEB Typical Practice, kWh/m²
- REEB Good Practice, kWh/m²
- Proposed Whole Portfolio KPI: 209.5 kWh/m²

Whole Portfolio Performance - YTD vs Target

Utilities Cost £ | Energy kWh/m² | Water m³/person | Recycling % recycled
--- | --- | --- | ---
£398,388 | 17.8 | 0.38 | 96%

% better than target (+X% = good, -Y% = bad)

- Utilities: +3%
- Energy: -4%
- Water: +12%
- Recycling: +5%

YTD RAG Status by Building Group

- Baker St Group
- Broadway Group
- BPR Group
- Greenwich Group
- Palestra Group
- Ops Group
- Stratford Group
- Windsor Group

Whole Portfolio

> 5% over target  ◦ < 5% over target ◦ under target
Reality check 3: The “out of hours” problem

Average Weekly total cost
Average Weekly "Out of hours" cost
Whole portfolio weekly "Out of hours" cost = £38,122

"In hours" are 0700-1800 M-F, "Out of hours" are 1800-0700 M-F and all Weekend

Potential out of hours savings
Reality check 4: Energy Leagues – how low can you go?

Energy league “Latest whole week” Out of hours report
Description: Palestra - Floor tenant lighting and power - F07-N (v) Floor (Zone Description): 07-N (Y&R)
Ref: 10213-ELE-V-101-F07-N

Last Week

Out of hours %
5-week average: 49%
Last week: 47%
5-week trend:

Total consumption

Around 56% of your colleagues on this floor are turning off their PC when they leave.
Log off and shutdown when you leave the office and your team might win the league!
Please report all building faults to Auto 1622 or facilities.helpdesk@tfl.gov.uk
Reality check 5: 5ES. Landlord billing system

TIQ S6

Proposed Billing Strategy Rev 1

Electrical Consumption

All these N and S circuit reference numbers are wrong compared to the physical switch gear on site. As built schematics need snagging by Lendlease and resolving, and then this document & associated marked up schematics needs updating to reflect actual references on site.

The Retail Tenant in Retail Unit 1 (3 Endeavour Square) will be charged based on the consumption of energy measured in kWh by electricity meter on circuit S12 on the South LV Switchboard.

The Retail Tenant in Retail Unit 2 (4 Endeavour Square) will be charged based on the consumption of energy measured in kWh by electricity meter on circuit S13 on the South LV Switchboard.

The Retail Tenant in Retail Unit 3 (6&7 Endeavour Square) will be charged based on the consumption of energy measured in kWh by electricity meter on circuit S14 on the South LV Switchboard.

The Retail Tenant in Retail Unit 4 (1&2 Endeavour Square) will be charged based on the consumption of energy measured in kWh by electricity meter on circuit S15 on the South LV Switchboard.

The Retail Tenant in the Creche (8 Endeavour Square) will be charged based on the consumption of energy measured in kWh by electricity meter on circuit S11 on the South LV Switchboard.

TfL will be charged based on the consumption of electrical energy measured in kWh calculated from the following meters.

- Electricity meter on the main incomer to the North LV switch panel
- Electricity meter on the main incomer to the South LV switch panel
- Electricity meter on circuit S11 on the South LV Switchboard (Creche)
- Electricity meter on circuit S12 on the South LV Switchboard (Retail Unit 1)
- Electricity meter on circuit S13 on the South LV Switchboard (Retail Unit 2)
- Electricity meter on circuit S14 on the South LV Switchboard (Retail Unit 3)
- Electricity meter on circuit S15 on the South LV Switchboard (Retail Unit 4)
- Electricity meter on circuit S19 on the North LV Switchboard (ENGIE Room)
Reality check 6: 5ES. Meter choice & commissioning
Reality check 7: 5ES. Is the BMS meter data trustworthy?
Reality check 8: 5ES. What about incoming heat/coolth?
Reality check 9: 5ES. Actual performance: Whole building

### Energy Consumption for Whole Building Loads

**Weekday**
- Total Energy Consumption: **26,900 kWh**
- "Offcharged" non-TFL head office usage: **2 kWh**
  - Cost: **£157,253**
  - Percentage: 51%
- All Central Plant & Miscellaneous Loads: **14,734 kWh**
  - Cost: **£78,911**
  - Percentage: 48%
- Control, Server & Comms Rooms Total Loads: **1,153 kWh**
  - Cost: **£13,537**
  - Percentage: 67%
- Standard Floors' Lighting and Small Power Loads: **10,974 kWh**
  - Cost: **£64,930**
  - Percentage: 51%

**Weekend**
- Total Energy Consumption: **27,492 kWh**
- "Offcharged" non-TFL head office usage: **6 kWh**
  - Cost: **£32**
  - Percentage: 70%
- All Central Plant & Miscellaneous Loads: **13,796 kWh**
  - Cost: **£78,911**
  - Percentage: 48%
- Control, Server & Comms Rooms Total Loads: **2,367 kWh**
  - Cost: **£13,537**
  - Percentage: 67%
- Standard Floors' Lighting and Small Power Loads: **11,351 kWh**
  - Cost: **£64,930**
  - Percentage: 51%
Reality check 9: 5ES. Actual performance: Tenant floors

Endeavour Square, 5 Weekday average Electricity Consumption for Standard Floors' Lighting and Small Power Loads. From 01/10/2017 to 28/02/2018

Endeavour Square, 5 Weekend average Electricity Consumption for Standard Floors' Lighting and Small Power Loads. From 01/10/2017 to 28/02/2018

<table>
<thead>
<tr>
<th></th>
<th>In hours weekly total (0700-1800 M-F)</th>
<th>Out of hours total M-Su</th>
<th>Annual estimate of Out of hours cost M-Su, £</th>
<th>Out of hours M-Su, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Floors' Lighting and Small Power Loads</td>
<td>10,974 kWh</td>
<td>11,351 kWh</td>
<td>£64,930</td>
<td>51%</td>
</tr>
<tr>
<td>Standard Floors' Lighting Loads</td>
<td>6,885 kWh</td>
<td>6,784 kWh</td>
<td>£38,805</td>
<td>50%</td>
</tr>
<tr>
<td>Standard Floors' Small Power Loads</td>
<td>4,119 kWh</td>
<td>4,587 kWh</td>
<td>£26,125</td>
<td>53%</td>
</tr>
</tbody>
</table>

Well controlled, normally occupied floors should have an out of hours % closer to 15%
Reality check 9: 5ES. Actual performance: Central plant

Endeavour Square, 5 Weekday average Electricity Consumption for All Central Plant & Miscellaneous Loads.
From 01/10/2017 to 28/02/2018

<table>
<thead>
<tr>
<th>Load Type</th>
<th>In hours weekly total (0700-1800 M-F)</th>
<th>Out of hours total M-Su</th>
<th>Annual estimate of Out of hours cost M-Su, £</th>
<th>Out of hours M-Su,%</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Central Plant &amp; Miscellaneous Loads</td>
<td>14,734 kWh</td>
<td>13,796 kWh</td>
<td>£78,911</td>
<td>48%</td>
</tr>
<tr>
<td>Other Roof fed Building Services Plant Loads</td>
<td>8 kWh</td>
<td>0 kWh</td>
<td>£0</td>
<td>0%</td>
</tr>
<tr>
<td>Other Basement fed Building Services Plant Loads</td>
<td>918 kWh</td>
<td>1,740 kWh</td>
<td>£9,952</td>
<td>65%</td>
</tr>
<tr>
<td>Metered Catering Loads</td>
<td>0 kWh</td>
<td>0 kWh</td>
<td>£0</td>
<td>0%</td>
</tr>
<tr>
<td>Metered Lifts Loads</td>
<td>918 kWh</td>
<td>530 kWh</td>
<td>£3,031</td>
<td>37%</td>
</tr>
<tr>
<td>Metered Refrigeration Plant (Chillers) Loads</td>
<td>0 kWh</td>
<td>0 kWh</td>
<td>£0</td>
<td>0%</td>
</tr>
<tr>
<td>Metered Ventilation Plant Loads</td>
<td>8,426 kWh</td>
<td>6,129 kWh</td>
<td>£35,059</td>
<td>42%</td>
</tr>
<tr>
<td>Metered Pumps &amp; Controls Loads</td>
<td>1,889 kWh</td>
<td>3,905 kWh</td>
<td>£22,339</td>
<td>67%</td>
</tr>
<tr>
<td>Standard Floors' HVAC Loads</td>
<td>0 kWh</td>
<td>0 kWh</td>
<td>£0</td>
<td>0%</td>
</tr>
</tbody>
</table>

(Currently not sub-metered)
(Car Park, Security and Reception)
(Currently not sub-metered)
(Currently not sub-metered)
(Included in floor lighting and power)
Quinten Babcock
Environmental Manager
TfL | Facilities Operations
Quinten.Babcock@tube.tfl.gov.uk