An Owner Operator’s Perspective

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Check Metering

• Why do we have it
• What we have
• What it helps us to see
• Common Issues
• Nirvana (what we’d like)
The University’s metering

Purpose

- Billing by retailer
- Cost recovery from internal commercial tenants
- Determining cost & consumption of a building
- Providing feedback to building occupants
- Detecting a fault/leak (TOU)
- Measuring after-hours usage (TOU)
- Auditing – building performance
- Analysing system performance – heating/lighting/plant
- Benchmarking (consum/m2/yr or EFTS/m2/yr)
- Long term trend analysis
1519 Meters!

- **Electricity**
  - 88 Billing meters + 9 lease opex
  - 714 check meters
- **Gas**
  - 21 Billing meters + 1 lease opex
  - 144 check meters
- **Water**
  - 64 billing meters + 8 lease opex
  - 386 check meters
- **Steam**
  - 1 billing meter + reference check meter
- **Heat**
  - 82 check meters (ChW & HHW)

660,000m² – 1 meter / 434 m²
Water ring main
Gas ring main
Electricity – Smart & Manual
Water – Lows & Highs
Gas
## Existing meter information systems

<table>
<thead>
<tr>
<th>System</th>
<th>Utility</th>
<th>Revenue or Check</th>
<th>Load increments</th>
<th>Download frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stream</td>
<td>Electricity</td>
<td>Both</td>
<td>30 min</td>
<td>Daily</td>
</tr>
<tr>
<td>BMS</td>
<td>Elec, Gas, Water</td>
<td>Both</td>
<td>1 min</td>
<td>Real-time</td>
</tr>
<tr>
<td>EnergyPro</td>
<td>Elec, Gas, Water, Heat</td>
<td>Revenue</td>
<td>Month</td>
<td>Month</td>
</tr>
<tr>
<td>CheckMeter (M.S. Access)</td>
<td>Elec, Gas, Water, Heat</td>
<td>Check</td>
<td>Month</td>
<td>Month</td>
</tr>
<tr>
<td>Excel</td>
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</tbody>
</table>
Gas – Billing Vs Check Meters

sum of UoA check meters
Billing meter - UoA check meters: kWh variance
Stream – time interval

[Graph showing electrical consumption and power factor over time, with dates from 14 to 20 March 2017]
Stream - maximum demand
EnergyPro
Revenue meter is read at midnight. Check meter is read on nearest business day. Pulse counters?

Virtual = Revenue minus Check

Bldg 1 generates chilled water and exports to neighbouring Bldgs 2 & 3

What is electrical component in chilled water?
Future Focus

• Storage of data
• What data to use
• Combining different data streams
• Reconciling consumption & costs by building
• Configuration & presentation of calculations
• Automatic alerts to consumption changes
• Common report presentation & format
• Rapid processing – minimal human intervention
So... what do Owner’s really want?

- To lock in absolute building performance
- Through an energy management ecosystem
  - Of capable people that are enabled by
  - Accurate and timely information
Ideally (with the right budget)

• Meters are assigned ‘parents’ & ‘children’
• Automatic graphical presentation of meter structure for all utility networks
• Automatic calculation of Virtual meters
• Allows multiple inputs to a network
• Facility for exporting and importing utilities & ‘transformed’ energy across buildings
• Automatic calculation of network losses/variations
• Monthly cost/consumption reports for each building & commercial tenants
and remember,

A poorly designed but well operated building is often more energy efficient than

a well designed but poorly operated building