

Jisc Industrial Internet of Things (IIoT) & Building Management Services (BMS) Proof of Concept (PoC) with Honeywell Forge

Healthier buildings and smarter campuses

September 2022

Who are Jisc?

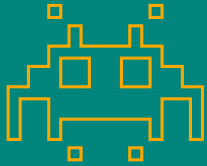
We serve the whole UK:

- All traditional universities and some independent providers
- FE colleges
- All research institutes
- Schools
- Key sector agencies and national institutions such as AdvanceHE, UCAS and NCSC (National Cyber Security Centre)
- Local authorities and adjacent sectors, and global customers



We provide the Janet Network - the UK's National research and education network (NREN)

It is used by **18 million** people



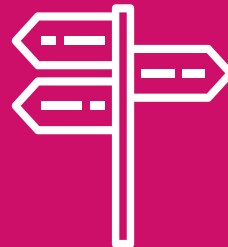
It has built in, world class cyber security protection, utilising sector specific intelligence

Help the sector save time and money

Through our sector wide deals and shared services alone we save the sector around:

£192m (2020-2021)

We provide trusted expert advice and practical assistance



- Providing insight, guidance and thought leadership
- Delivering training and events
- Building communities

Jisc's BMS / IIoT PoC with Forge

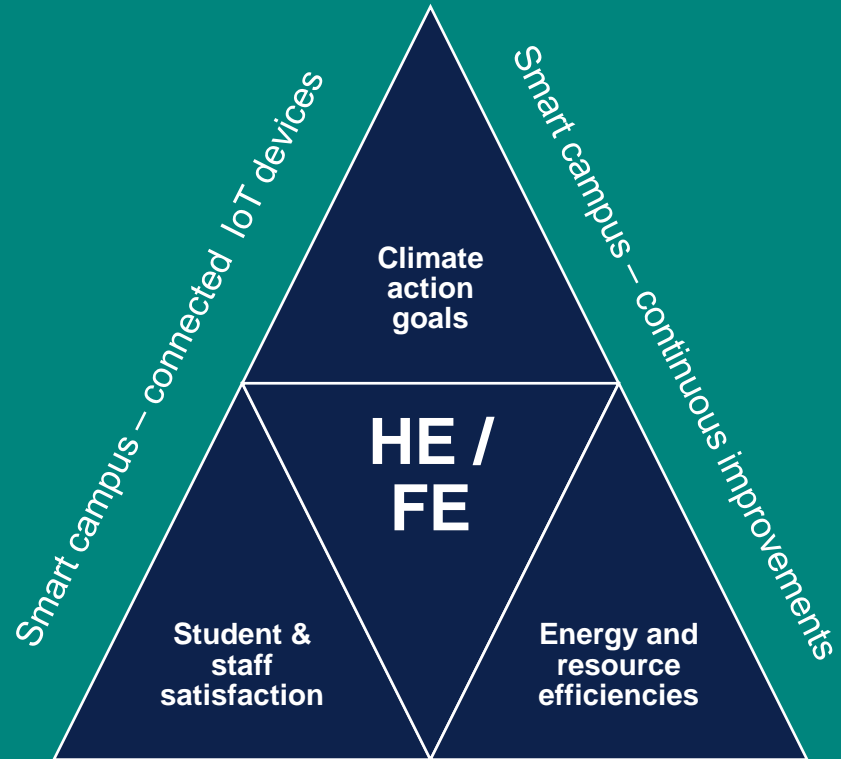
We're working with Jisc members on this exciting BMS / IIoT PoC journey with Honeywell Forge that could form part of smart campus strategies.



Smart building management with Forge analytics

Supporting key member challenges:

- Reduce carbon footprint and achieve carbon neutral goals
- Improve building comfort and safety for student and staff increasing satisfaction levels
- Optimise building health and deliver energy and resource efficiencies across the estate
- Action real-time maintenance alerts



Smart campus – real-time data insights



HONEYWELL FORGE

FOR EDUCATION



HONEYWELL PRESENCE **GLOBAL**



100,000+
EMPLOYEES



SALES
\$32.6B IN 2020



FORTUNE
100

PORTFOLIO



Aerospace



Performance Materials & Technologies



Building Technologies



Safety & Productivity Solutions



Connected Enterprise (Honeywell Forge)



GLOBAL INSTALLED BASE



On virtually every **Commercial, Defense and Space Aircraft**



10,000+ Plants



Specialty **Chemicals** and **Packaging**



10M+ Buildings



10,000+ Warehouses



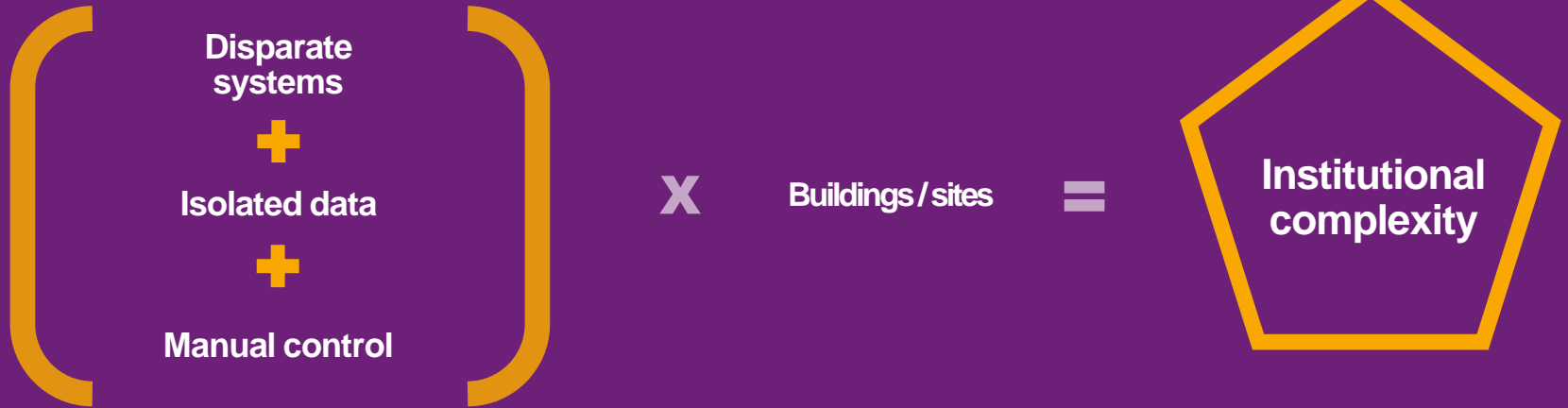
550M+ users of PPE

About Honeywell Forge

Honeywell is an American multinational conglomerate primarily operating in four business areas: building technologies, aerospace, performance materials and technologies, and safety and productivity solutions.

Honeywell Forge is an Enterprise Performance Management Service-as-a-software (SaaS) and analytics solution for building management systems (BMS).

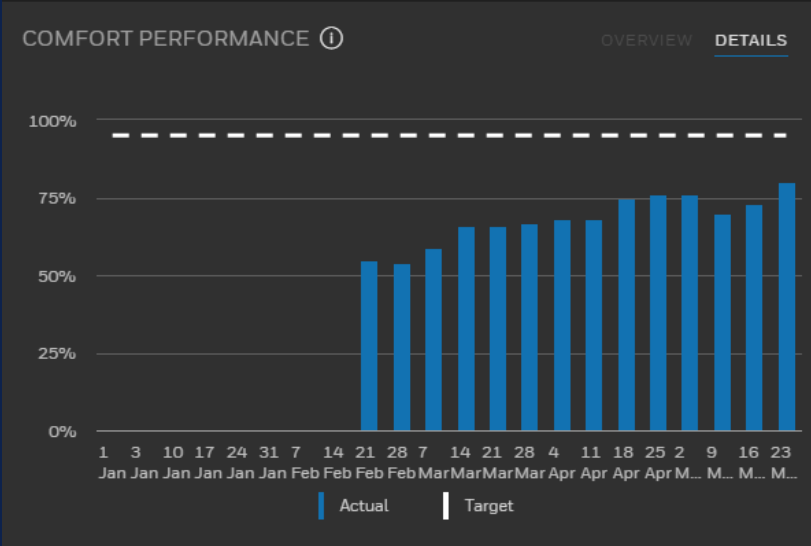
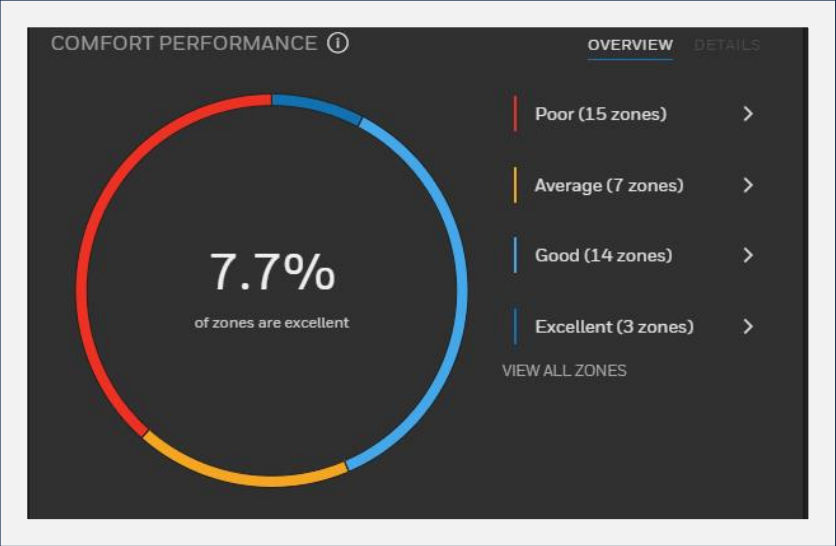
Institutional complexity



How can Forge help?

- **Delivering sustainability and carbon neutral goals**
- **Optimising buildings for a healthier estate**

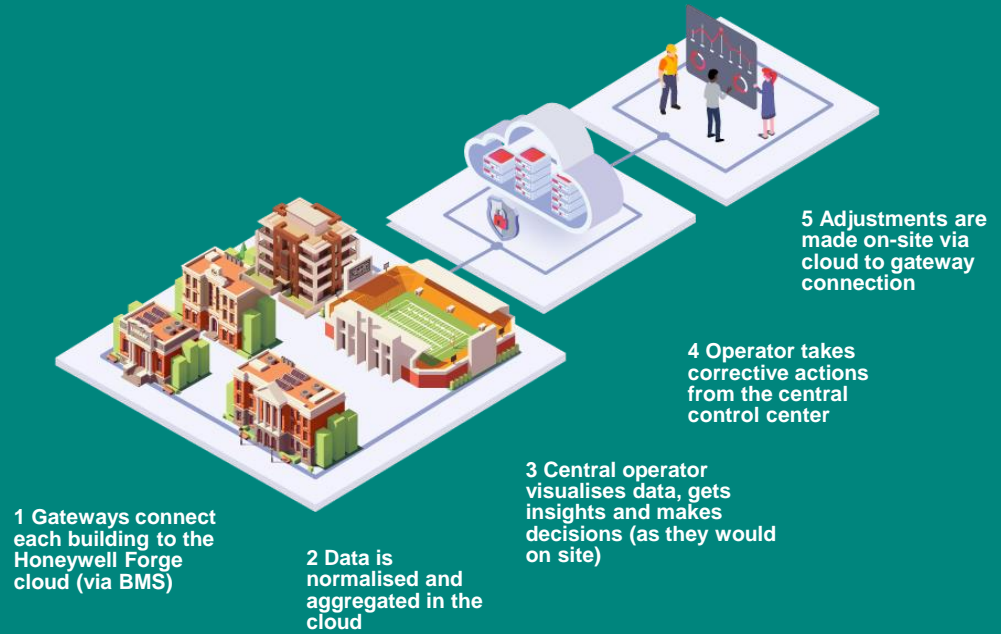
Transparent buildings make productive learning environments



Centralised facility operations interface

Investigate and resolve – remotely

Troubleshoot, mitigate and resolve - across every building



Real-time analytical insights

Dashboards and actionable insights:

- Healthy buildings
 - Comfort levels
 - Energy performance
 - Asset availability
 - Fault summary and maintenance effort
-
- ```
graph LR; A[Healthy buildings] --> B[Temperature]; C[Comfort levels] --> D[Humidity]; E[Energy performance] --> F[Pollutants]; G[Asset availability] --> H[Indoor climate]; I[Fault summary and maintenance effort] --> J[Safe space utilisation];
```

Temperature

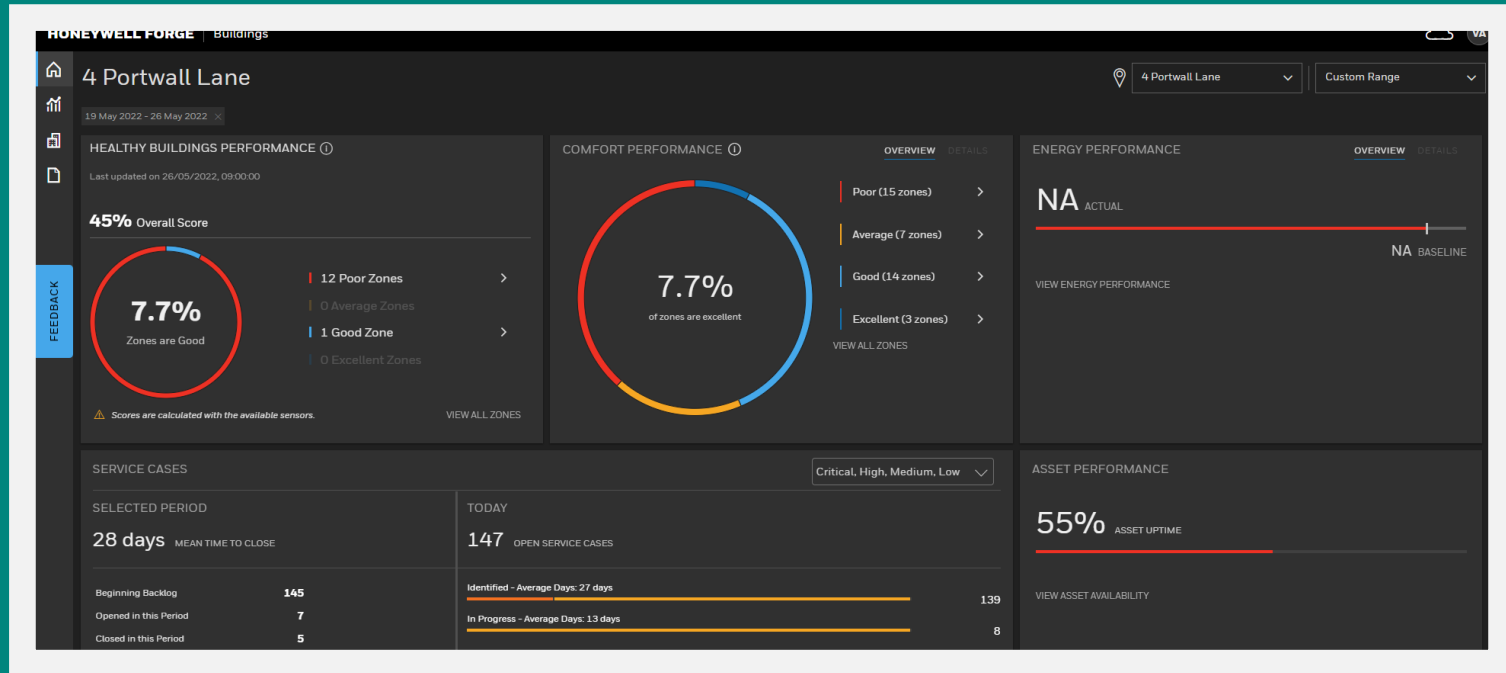
Humidity

Pollutants

Indoor climate

Safe space utilisation

# Forge analytics dashboards



# A shifting operating context necessitates digitisation - everywhere



Campus  
operations  
management

Health &  
safety for  
students and  
staff

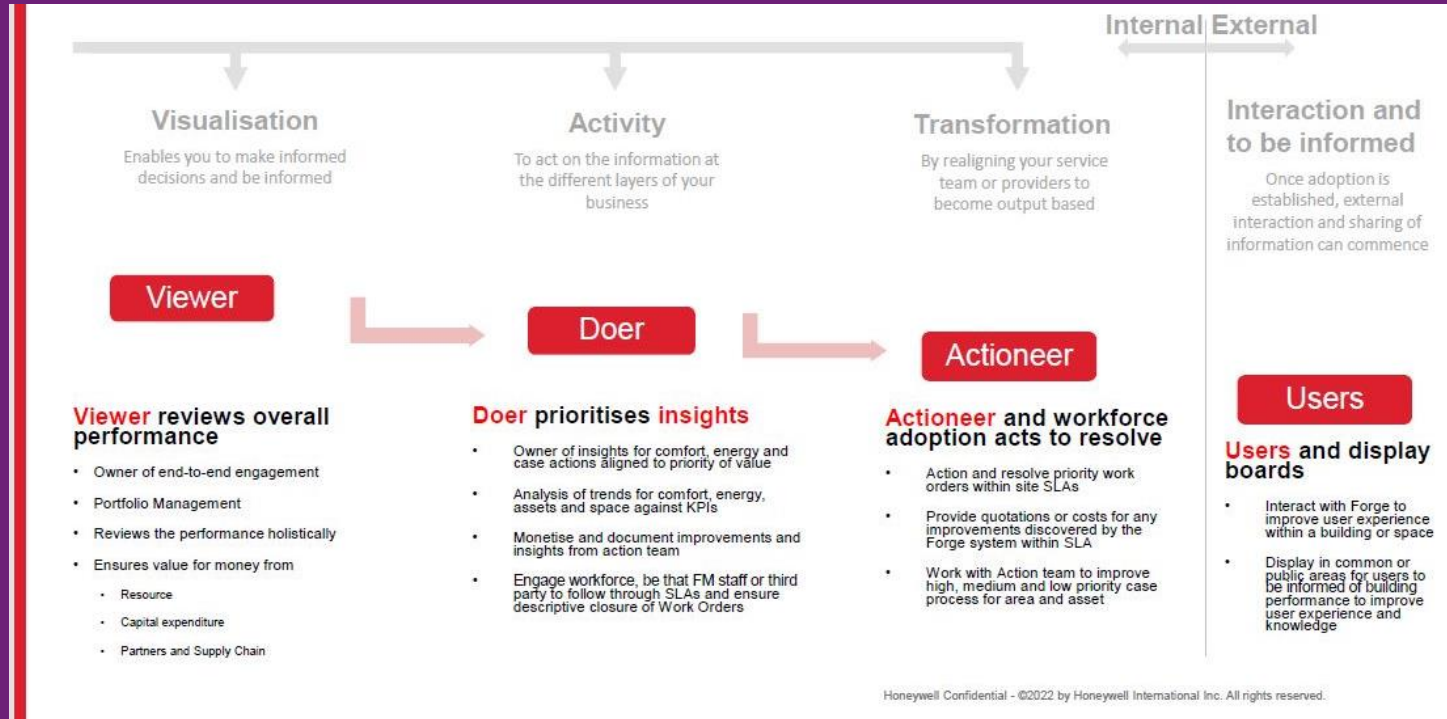
Learner  
experience  
and  
productivity

Campus  
sustainability  
goals

Asset  
performance  
and longevity

# Getting started on your PoC journey

## ➤ Identify building and proposed actors





# After identifying the starting point...

- Complete BMS points questionnaire
- Create optimal building management rules
  - Environment
  - Monitor
- Define target KPIs
  - Health
  - Climate
  - Comfort
  - Efficiencies

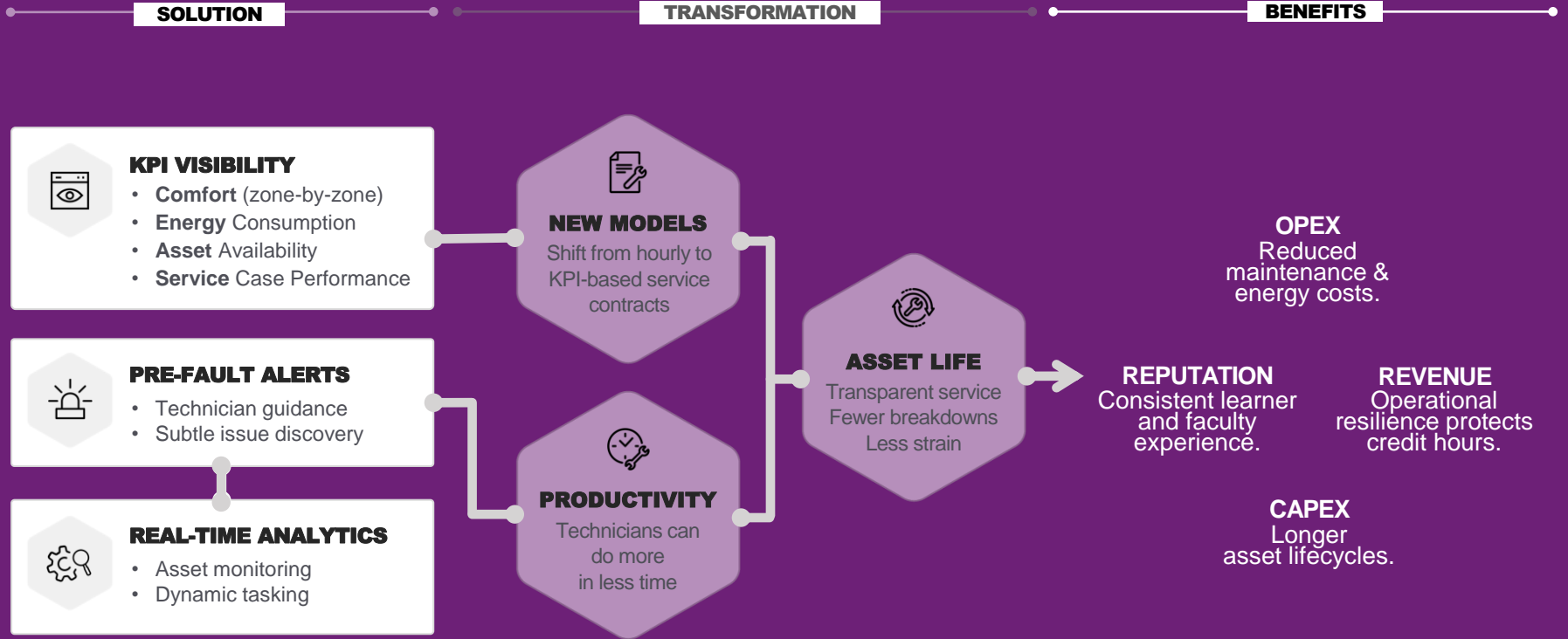
# Example target KPI's

| Task       | Type 1                                  | Type 2                   | Role                    | Impacts                                                             | KPI                                                                                                                                                                                                                  | Description                                                                | Success Factor                                                                                                               | Value                                                                                                                                                                                               |
|------------|-----------------------------------------|--------------------------|-------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Visibility | Climate                                 | Financial                | Estates/<br>Engineering | Finance / Sustainability / Student Services Engineering and Estates | Comfort target defined. Financial target defined and Energy Budget defined. KPI widgets are aligned to customer defined priorities. Any specific plant or area to be highlighted for critical/high case notification | Demonstrate area or plant priorities are aligned with customer expectation | Does or doesn't replicate agreed requirements                                                                                | Customer will also see their budget or target data as well as any critical assets/areas are always a priority                                                                                       |
| Activity   | Estates /<br>Maintenance                | Financial                | Energy<br>Manager       | Facilities Engineering                                              | Ensure accuracy of energy monitoring                                                                                                                                                                                 | Maintain/Improve Energy Performance                                        | Accuracy confirmed monthly. Percentage of inaccuracy                                                                         | Accuracy of data and reduced resource                                                                                                                                                               |
| Visibility | Student/staff<br>Satisfaction /<br>User | Estates /<br>Maintenance | FM Manager              | Facilities Engineering                                              | User able to see comfort performance over set periods - actual against target. Drill down to building, temp, CO <sup>2</sup> and Humidity (as available)                                                             | See Comfort Performance across building/site over period of time           | Demonstrate visually No. of buildings/zones available to view per performance (Poor to Excellent)                            | Ensure comfort is a priority for those that maintain the building for the occupants. Remove the noise to perform activities on assets that are working and therefore concentrate efforts on issues. |
| Transform  | Student/staff<br>Satisfaction /<br>User | Estates /<br>Maintenance | FM Manager              | Facilities and HR<br>Student Services,<br>Users                     | Improve Comfort across building by X% against baseline across building                                                                                                                                               | Improvement in Comfort Performance                                         | Demonstrate improvement of comfort across building/site on a monthly base with Comfort improvement % increase from baseline. | Building is meeting the building strategy for comfort based on functional specification of building and plant, note setpoints in areas to mitigate related plant issues or incorrect setpoints      |

- Receive real-time alerts and action maintenance service cases
  - Intuitive notifications and alerts when an operational, mechanical or connectivity issue needs attention or if there's a problem brewing
  - Automate incident response standards
  - Manage and respond to proactive service requests anytime, anywhere

| IDENTIFIED                                                                                                                                                                                                                                                                                                                                                                        | IN PROGRESS                                                                                                                                                                                                                                                                                                                                                                         | DONE                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>VRF Zone Temp Setpoint out of Range</b><br/>Forge: E003218</p> <p>Zone temp setpoint is higher than 28°C (adj) or lower than 18°C (adj). The above conditions to remain true for &gt;30mins (adj) 2 (adj) times or more in a day or &gt;60mins (adj) once in a day to trigger the fault. Recommendations: 1...</p> <p>Audio_Record</p> <p>25/05/2022, 15:58:21</p>          | <p><b>Zone Temp Sensor for Wellness Out Of Limit</b><br/>Forge: E003142</p> <p>Zone temperature sensor is higher than 25DegC (adj) or lower than 20DegC (adj). The above conditions to remain true for &gt;30mins (adj) 2 (adj) times or more in a day or &gt;60mins (adj) once in a day to trigger the fault...</p> <p>Mechanical<br/>Brunel_L-IoT</p> <p>22/05/2022, 18:57:01</p> | <p><b>VRF Air Temperature Check</b><br/>Forge: E001180</p> <p>Difference between vrf sensor and IoT sensor data is more than 5°C (adj). The above conditions to remain true for &gt;30mins (adj) 2 (adj) times or more in a day or &gt;60mins (adj) once in a day to trigger the fault. Recommendations: 1...</p> <p>Wendolene-IoT</p> <p>11/05/2022, 13:33:12</p>          |
| <p><b>VRF Zone Temp Setpoint out of Range</b><br/>Forge: E003210</p> <p>Zone temp setpoint is higher than 28°C (adj) or lower than 18°C (adj). The above conditions to remain true for &gt;30mins (adj) 2 (adj) times or more in a day or &gt;60mins (adj) once in a day to trigger the fault. Recommendations: 1...</p> <p>The_Downs</p> <p>25/05/2022, 10:58:01</p>             | <p><b>VRF Zone Temp Setpoint out of Range</b><br/>Forge: E002125</p> <p>Zone temp setpoint is higher than 28°C (adj) or lower than 18°C (adj). The above conditions to remain true for &gt;30mins (adj) 2 (adj) times or more in a day or &gt;60mins (adj) once in a day to trigger the fault. Recommendations: 1...</p> <p>Mechanical<br/>Lab 1</p> <p>20/05/2022, 17:55:54</p>    | <p><b>Sensor reading Constant value</b><br/>Forge: E000986</p> <p>Sensor reading has not changed by 0.1 (adj) value for more than 24 hours. Recommendations: 1. Check sensor for any faults/damage. 2. Check sensor to controller cables/wires faults, loose connections. 3. Verify voltage/current signal...</p> <p>Wallace-AC</p> <p>03/05/2022, 23:48:32</p>             |
| <p><b>Low Common Hot Water Supply Temperature</b><br/>Forge: E003166</p> <p>Hot Water Supply temperature is less than SP (or Default SP of 71 degC) by 2 degC (adj) when any Boiler is On. The above conditions were true for &gt;30mins (adj) 2 (adj) times or more in a day or &gt;60mins (adj) once in a day to trigger L...</p> <p>VT_Heating</p> <p>24/05/2022, 08:57:23</p> | <p><b>VRF Fan Failed to Start</b><br/>Forge: E001872</p> <p>Fan status is Off when command is On in occupied mode. The above conditions were true for &gt;30mins (2 times or more in a day) OR &gt;60mins once in a day to trigger the fault. Recommendations: 1. Check for manual overrides at Fa...</p> <p>Mechanical<br/>Cumberland_Basin</p>                                    | <p><b>Outside Air Temperature Check</b><br/>Forge: E000892</p> <p>Difference between outside air temperature sensor and weather station sensor data is more than 5°C (adj). The above conditions to remain true for &gt;30mins (adj) 2 (adj) times or more in a day or &gt;60mins (adj) once in a day to trigger the...</p> <p>Brunel_L-IoT</p> <p>03/05/2022, 11:49:11</p> |

- Drive forward institutional experience and capitalise on savings



# Overarching and ongoing goals

- Improve building efficiencies
  - Assets
  - Energy
  - Climate
  - Pollutants
  - Occupant and space safety
- Review and optimise building performance over time to achieve KPIs and goals

# Progress to date - 1

*“It’s a marathon, not a sprint...”*

- Partners recruited
  - (There are no spaces left on the PoC, but there is a waiting list)
- Jisc Bristol PoC doing well
  - Showing results / improvements have been made
- Early days – Partners starting to make progress

# Progress to date - 2

## Jisc Bristol Office

- Bristol office enhancements
- Consumption stats and reporting
- Scheduled power control
- Socket level metering

# Synergy with EGI-ACE

*“Every little helps...”*

- Holistic approach to carbon control
  - Carbon impact is more than just the embedded carbon and cost of compute/storage
- Measurements drive control mechanisms
- Knowledge, good practice and shared experiences



# Thank you!

For more information contact

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