HEATWEB
INTEGRATED THERMAL TECHNOLOGY

Optimisation of City Heat Networks

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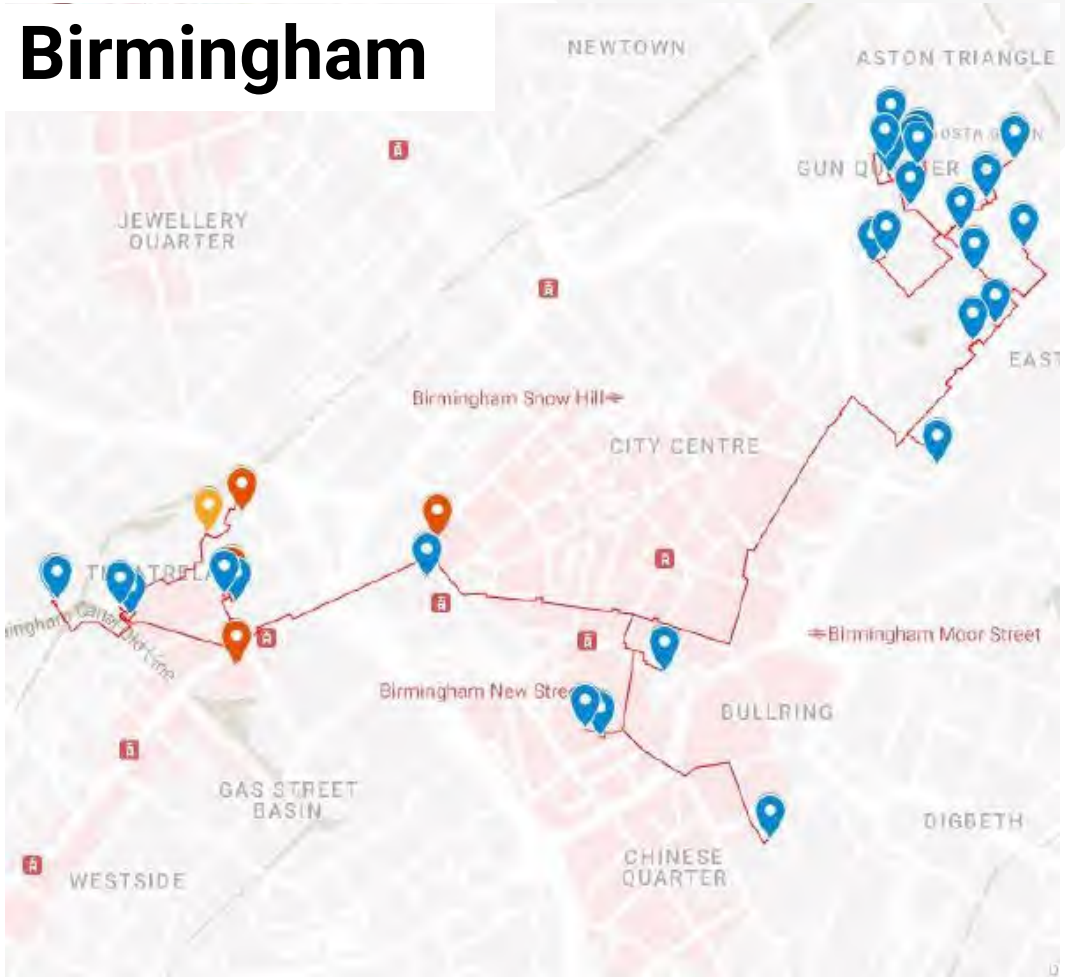
HNES: Optimising Cities

Bring Energy

Southampton

Birmingham

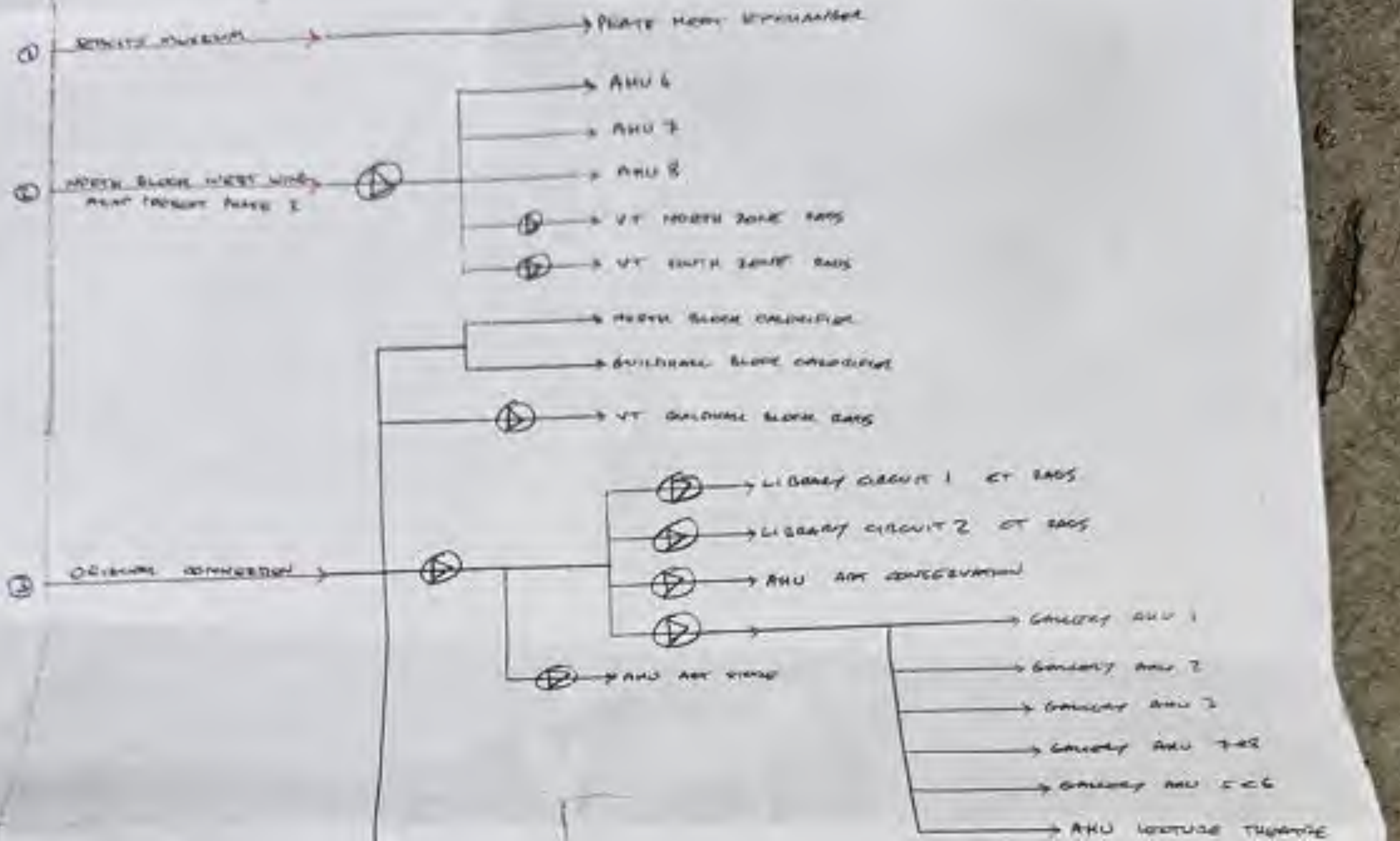


Types of Heat Network

- Residential networks [with HIUs]
- Commercial & retail buildings
- Council buildings & civic centres
- Hospital, libraries and schools

Areas of Investigation

- Fault detection and reporting
- Secondary system KPIs
- Substation operation and KPIs
- Return temperatures & bypass flow
- Water quality
- Direct & indirect connections
- Heating & cooling overlap
- DHW generation & storage
- BMS Quality


AHU 6
AHU 7
AHU 8
VT NORTH ZONE RAYS
VT SOUTH ZONE RAYS
NORTH BLOCK CHILLER
BUILDING BLOCK CHILLER
VT CHILLER BLOCK RAYS
LIBRARY CIRCUIT 1 CT RAYS
LIBRARY CIRCUIT 2 CT RAYS
AHU ART CONSERVATION
AHU ART STORE
AHU LECTURE THEATRE

DHWS

File Mode View User Graphs SMS Database Tools Edit Data recording Zoom Navigation Help

Navigator

DHWS

Outside Air Temp
12.3 DegC

Com Flow Temp
65.2 DegC

Navigation

Overview
Main Menu
VT Menu

Com Return Temp
61.9 DegC

Adjustments
DHWS Temp SP. 60.0 DegC

Calorifier 1

71.3 DegC

60.4 DegC

Calorifier 2

FLOW

HWSXPump 1

FLOW

HWSXPump 2

Overrides
HWS Valve Override !Manual!
Override Position 100.0 %

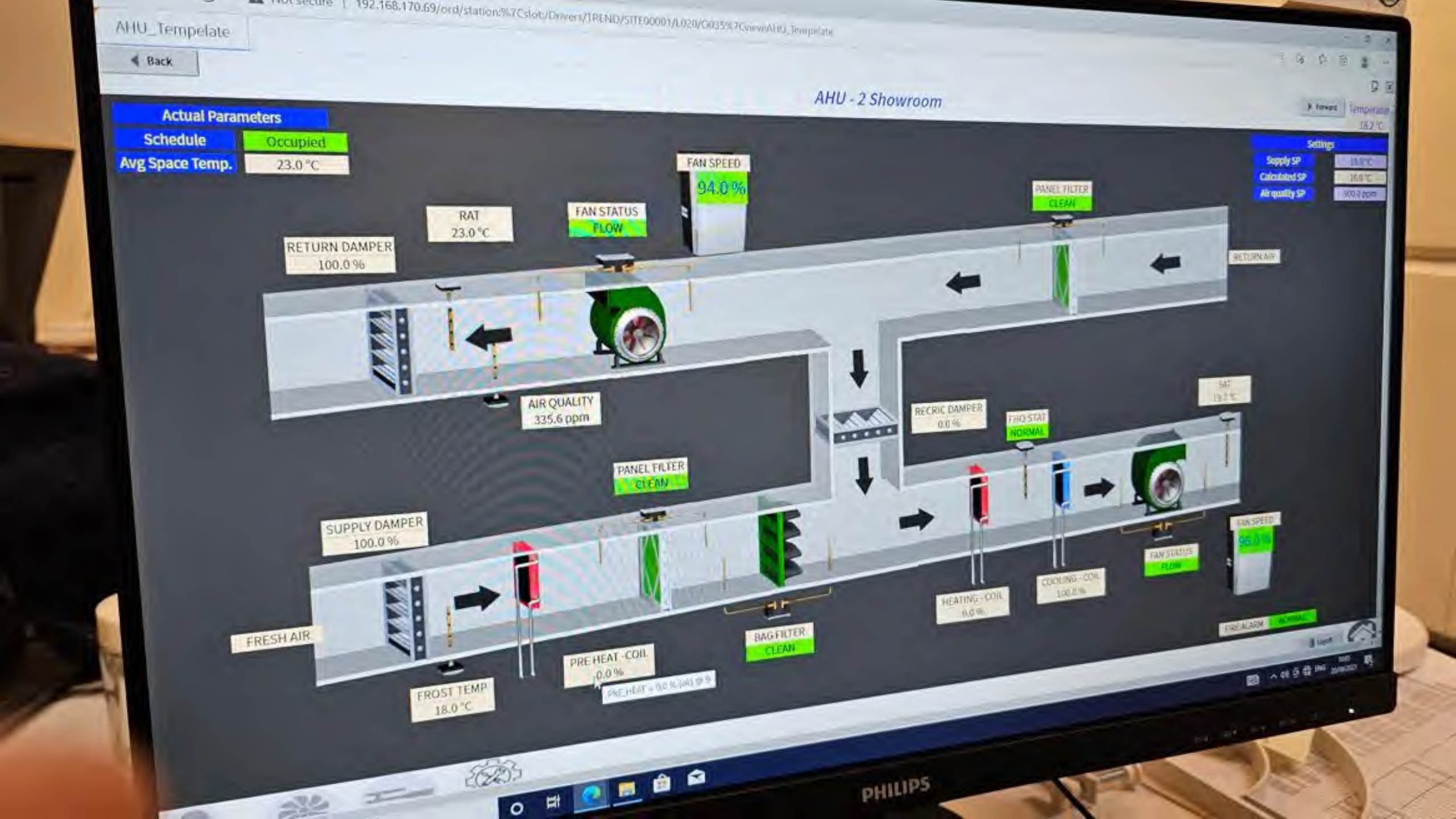
Automatic Position 100 %

3 % Automatic Position

Overrides
HWS Valve Override Normal
Override Position 0.0 %

Geothermal Flow Temp

Geothermal Return Temp 21.6 DegC


AHU_Tempelate
Back
AHU - 2 Showroom
Actual Parameters
Schedule
Occupied
Avg Space Temp.
23.0 °C
FAN SPEED
94.0 %
RAT
23.0 °C
FAN STATUS
FLOW
RETURN DAMPER
100.0 %
PANEL FILTER
CLEAN
RETURN AIR
AIR QUALITY
335.6 ppm
RECRIC DAMPER
0.0 %
FIRE STAT
NORMAL
PANEL FILTER
CLEAN
SUPPLY DAMPER
100.0 %
FRESH AIR
FROST TEMP
18.0 °C
PRE HEAT -COIL
0.0 %
BAG FILTER
CLEAN
HEATING - COIL
0.0 %
COOLING - COIL
100.0 %
FAN STATUS
FLOW
FAN SPEED
95.0 %
Settings
Supply SP
Calculated SP
Air quality SP
PHILIPS


FRESH AIR
20A
CHILLED WATER
R
CHILLED WATER
F
415 V
ISOLATE UNIT BEFORE
AHU 18A
EXTRACT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Data Analysis

- Meter data (requires sanitation)
- Sensor data
- Exported BMS data
- Degree Day weather data
- Photographs and site records
- Contracts
- Operational requirements (e.g. Geothermal)

1. ***Import data into PostgreSQL database***
2. ***Analyse data in Grafana***

Reporting

- 120+ page report (for each city)
- Detailed reporting of all problems found
- Specification for client – operator BMS connectivity (QA+Loads)
- Specifications for substation upgrades
- Specifications for DHW system replacements
- Operational KPIs for both clients and operator
- Procedural documentation strategy
- Training strategy

Key Learnings

- Rather than efficiently controlling systems and reporting problems, BMS systems, in general, hide inefficiencies or are untrustworthy. Some have no BMS head end.

- Many commercial buildings lack any technical knowledge on-site regarding efficient operation. Problems are often managed entirely by external contractors.

- Poor knowledge often leads to the replacement of old systems with a like-for-like approach, missing key opportunities to comply with modern best practices.

- While a few commercial clients are exemplary, most will require a stick rather than a carrot to achieve efficient operation. All will accept free consultancy, but few will willingly invest additional effort or spending [*follow head office strategy*].

- Some people don't want any help because it means admitting they have been doing it wrong when they should turn it into a positive and use monitoring to show how savings can be achieved.