Utilisation of Digital Twin Technology to Enhance Building Performance

Hydronic System Digital Twins

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CIBSE

Young Energy Performance Group

hysopt

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Our Customers

Universities - UK

UCL
University of York
The University of Edinburgh
University of Exeter
University of Reading
University of Greenwich
University of Strathclyde Glasgow

NHS - UK

NHS Hull and East Yorkshire Hospitals NHS Trust
NHS Southend University Hospital NHS Foundation Trust
NHS Ayrshire & Arran
NTW Solutions
NHS The Christie NHS Foundation Trust
NHS North Bristol NHS Trust

Local Authorities - UK

Newcastle City Council
Durham County Council
Belfast City Council
Surrey County Council
Leeds City Council
Perth & Kinross Council
Greater Manchester Combined Authority GMCA

Commercial Sector - UK

CBRE
Aviva
sodexo
gsk
Westfield
Standard Chartered
mitie

Hysopt

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1. **Technology provider**

*Specialist **digital twin** software for **design, simulation and optimisation** of heating and cooling*

2. **Engineering and professional support services**

3. **Training**

University of Antwerp spin-off

University of Antwerp

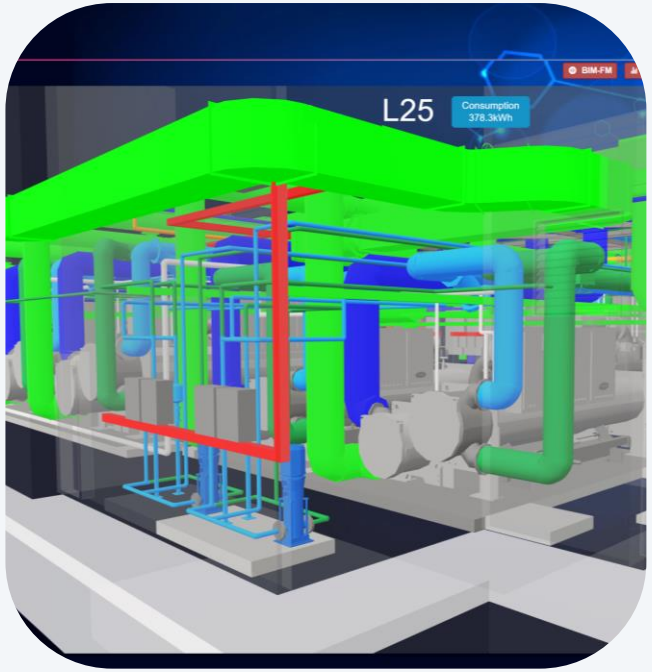
CIBSE Building Performance Award Winners, 2020

CIBSE Building Performance Awards 2020 WINNER

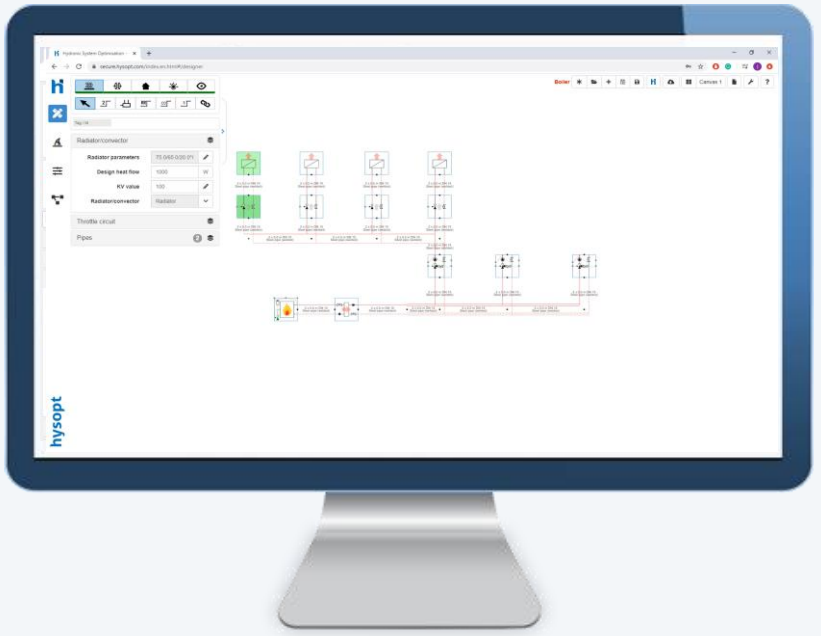
Building vs Hydronic Digital Twins

Whole Building Digital Twin

BIM Model



Hydronic System Digital Twin



Calculate performance
Optimise design
Eliminate performance gaps

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Simulation & Comparison Tool

Measure Performance
at the design stage

Improve M&E Consultant Design

2 Concept Design

3 Developed Design

- Simulate and compare different system alternatives
- Eliminate hydronic and control errors
- Optimise temperature regimes, plant sizing, etc
- Optimise energy consumption, operational cost, carbon savings and investment costs

Value
Full transparency of performance at the design stage vs client KPI's

Higher system efficiencies

Lower opex / CO_2

Lower capex

Improved comfort

Whole System Calculation

Protect Design Integrity
at the installation stage

Improve Quality of the Installation

4 Technical Design

5 Construction

- Detail the preferred design concept
- Full system component selection and optimisation
- Tender specifications
- Calculate the performance impact of Value Engineering requests
- Ensure the optimised design concept is not compromised

Value
Less design time

Lower compliance risk

Fewer design errors

Eliminate unnecessary oversizing of plant (capex)

Measurable performance impact (component/plant alternatives)

6 Handover and Close Out

- Calculate all component commissioning pre-sets for the entire system
- Soft landings benchmark
- Defects resolution

Value
Faster, more accurate commissioning

First time right hand over

Less cost resolving defects

As Built Digital Twin

Asset Lifecycle Management

7 In Use

- Digital asset of the final, optimised as-built hydraulic installation
- What is in it **and** How it should perform
- Operational vs Theoretical performance
- Plan future upgrades/improvements

Value
Energy/ CO_2 savings are delivered in real life

Lower maintenance

Longer life expectancy

Renovation projects

Hospital Belgium
- 225ton CO2/yr
- 89k €/yr

Living & Care campus
- 35% savings CO2/yr
- 58% savings €/yr

- Univ. Hospital Antwerp
- 27% savings CO2/yr
- 5% savings €/yr

Revalidation hospital
- 26% savings CO2/yr
- 17% savings €/yr

Innovation Centre – Netherlands
- CO2 savings = 103 ton = 37%
- Energy cost savings = € 29k → 36%

600 Student homes
- CO2 savings = 95,5 ton = 22%
- Energy cost savings = € 84k → 51%

Commercial Shop. Centre London
- CO2 savings = 88 ton = 34%
- Energy cost savings = € 46k → 43%

Univ. College London – Heat network (34 buildings)
- CO2 savings = 404 ton = 7%
- Energy cost savings = € 974k → 70%

Hospital – Netherlands
- CO2 savings = 437,2 ton = 98%
- Energy cost savings = €32k → 45%

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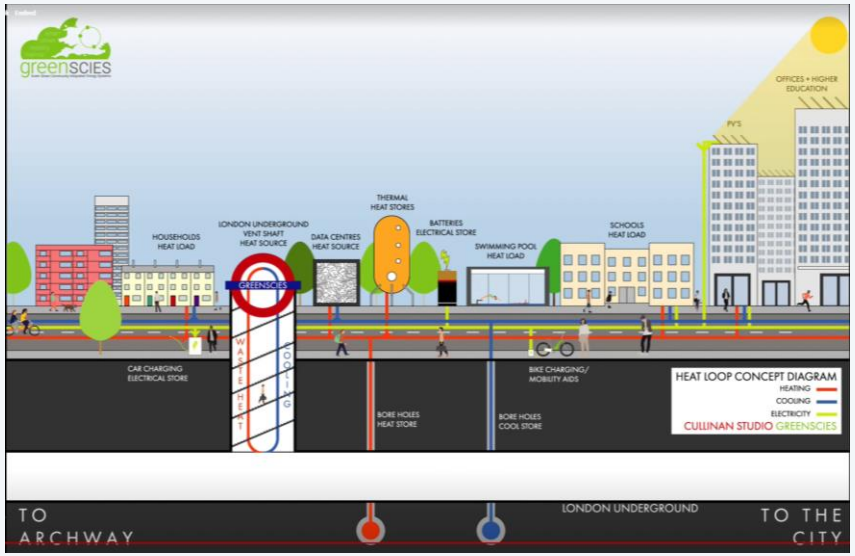
New build projects

GreenScies II – Ambient Loop Heat Network in London



ZNA – Cadix (Hospital)

AZ Sint-Maarten – (Hospital)

Hof Ter Schelde - (Carehome)

600 Student Homes

Project scope:

- Digital Twin of existing heating system
- Hydraulic optimisation
- Analysis on temperature regimes
- Introduction low carbon technology
- Net zero option

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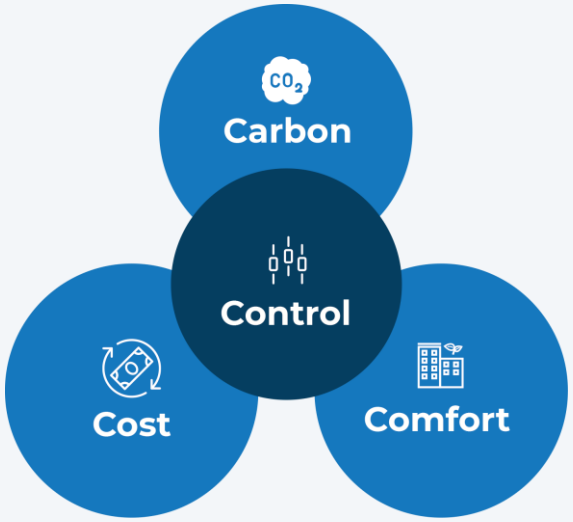
600 Student Homes

Achieved results

- Digital Twin for the life cycle management of system
- Decarbonisation strategy
- 19% annual energy cost saving
- 65% annual CO_2 reduction



Training – Hysopt eAcademy

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KMO-PORTEFEUILLE
ERKEND DIENSTVERLENER

CPD CIBSE APPROVED UNTIL 2023

E-ACADEMY | 5 SESSIONS | STARTING SEPTEMBER 2021

Hysopt e-Academy:
Mastering Heating and Cooling Hydraulics

Are you ready to make your buildings future-proof? Do you want to save costs, lower carbon emissions and optimise the comfort of your buildings? **Register for our September e-Academy about heating and cooling hydraulics, and benefit from our early bird price!**

What is this e-Academy about?

01 **Session 1** | 04 - 05 | 14:00-16:00 CEST

Optimising heat distribution by correct use of distribution circuits and hydraulic balancing

OPTIONAL: Exercise session

02 **Session 2** | 11 - 05 | 14:00-16:00 CEST

Optimising existing heating installations

OPTIONAL: Exercise session

03 **Session 3** | 25 - 05| 14:00-16:00 CEST

Designing hybrid plantrooms with CHP and boiler: unlocking the full potential of a CHP for your heating installation

OPTIONAL: Exercise session

04 **Session 4** | 01 - 06 | 14:00-16:00 CEST

Designing hybrid plantrooms with heat pumps and boilers, optimising low-grade and high-grade heat

OPTIONAL: Exercise session

05 **Session 5** | 08 - 06 | 14:00-16:00 CEST

Making the right choices when designing heat networks and communal heating systems with HIU's

5 Live Virtual Sessions

Application of Hydronics

Live Support

https://hysopt.com/resource-center/academy

Special Discount Code:

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