

March 2024

Imjin Barracks Single Living Accommodation: The role of SMART Technology in decarbonizing our buildings

Modular Matters 2024

Reds10: Recently built volumetric school buildings



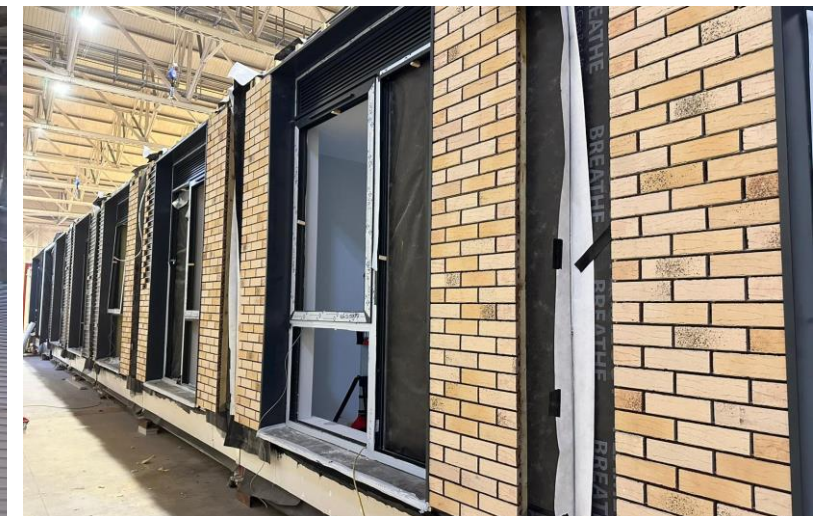
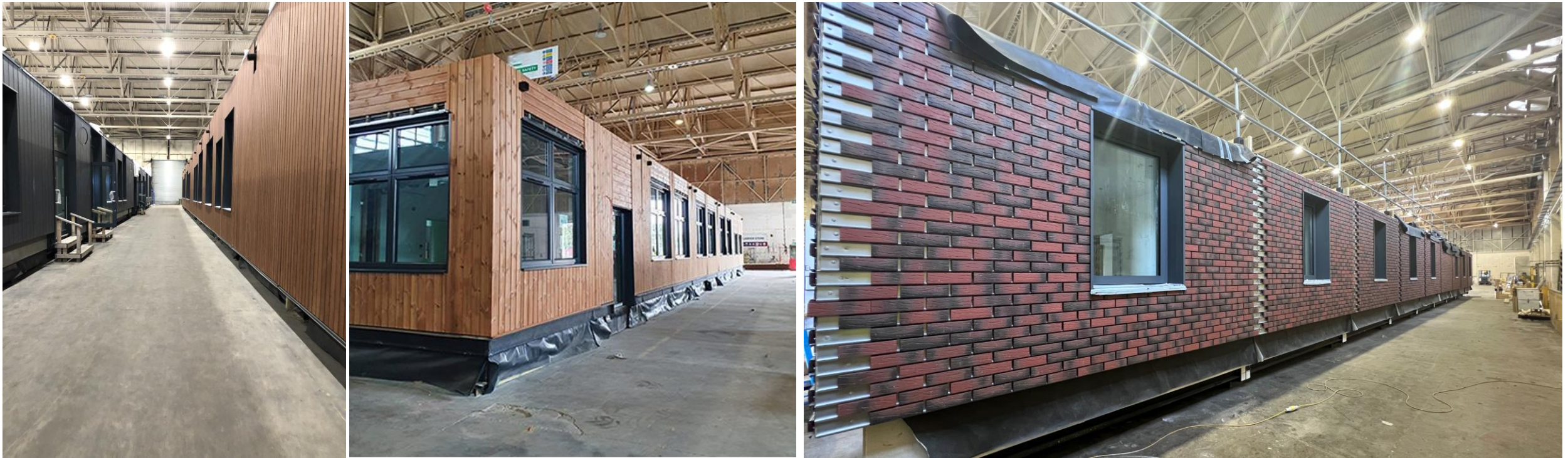
Reds10: Recently built volumetric school buildings



Reds10 Factory



High level of completion in factory

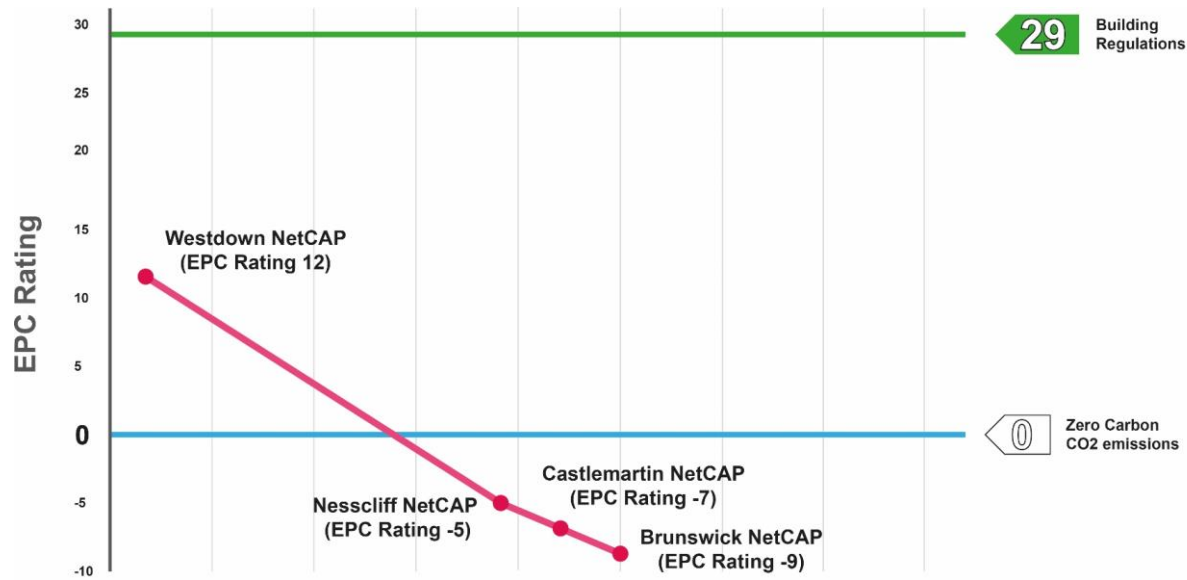


Modular buildings installed in one day

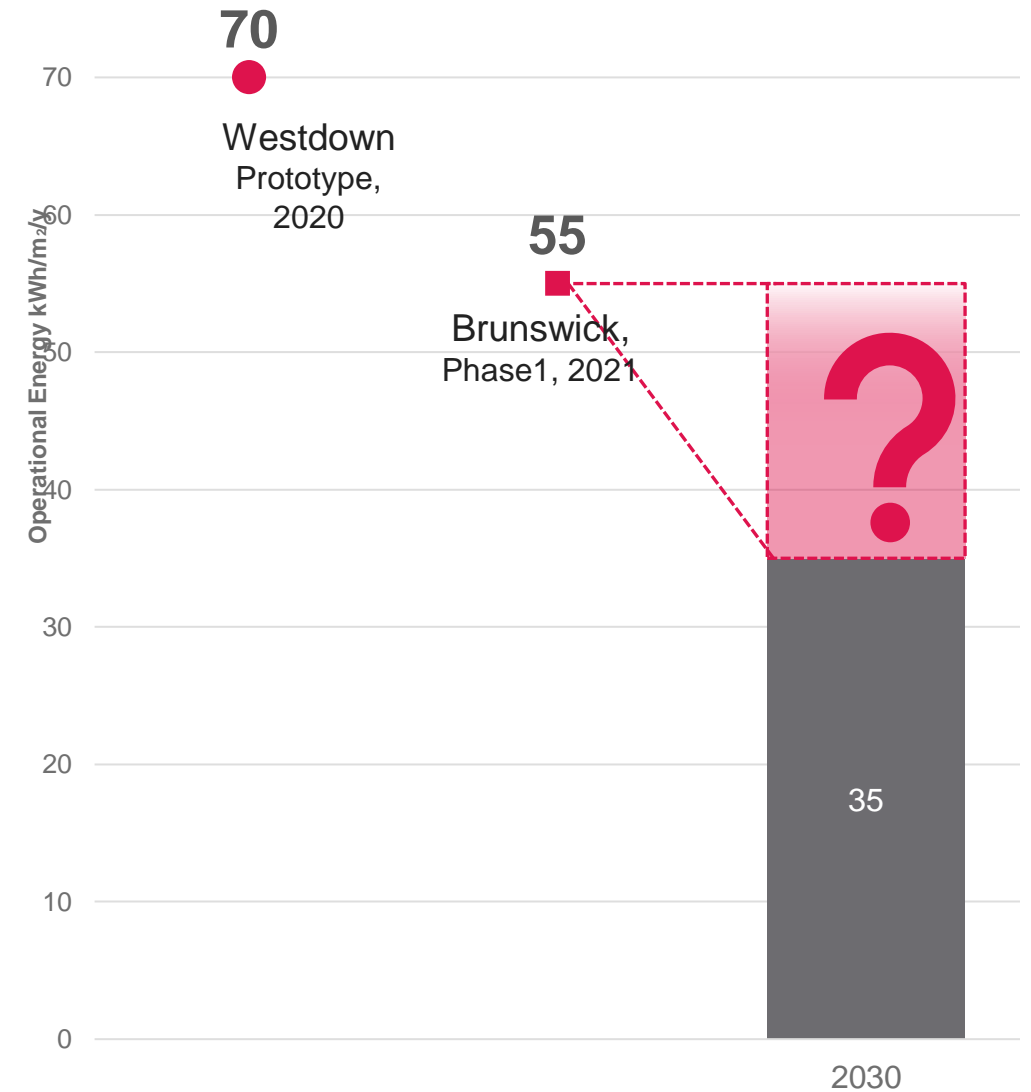


NetCAP - Carbon Continued Improvement

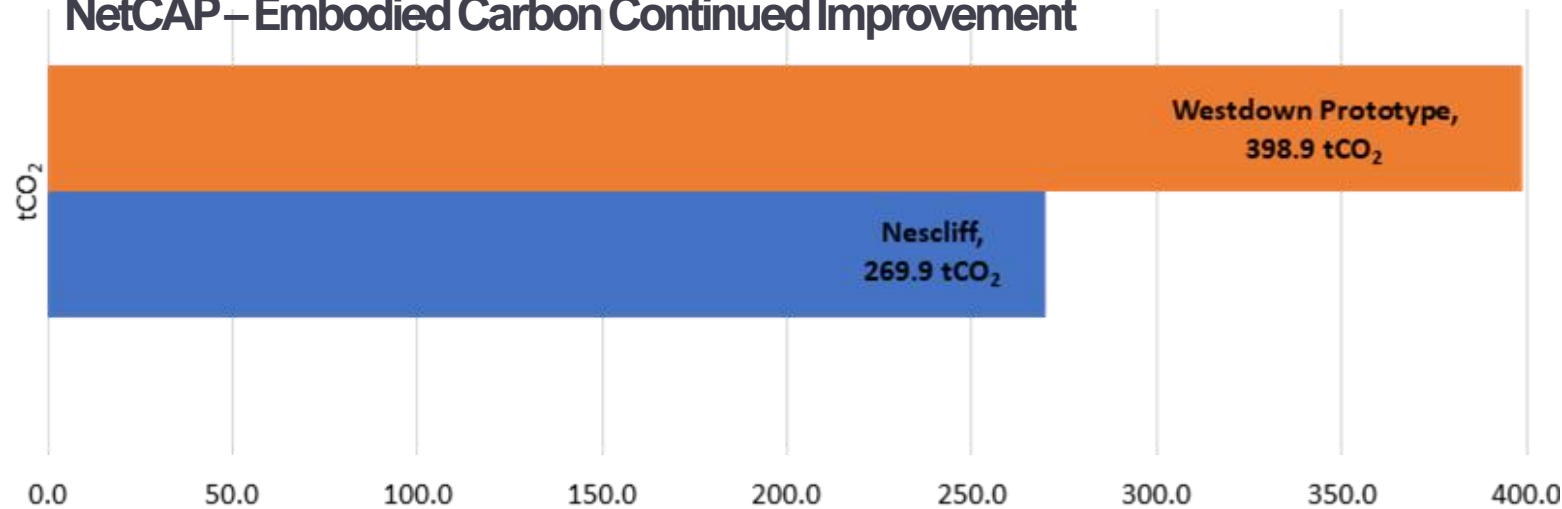
EPC Rating Continued Improvement



Energy Usage Intensity (EUI) - NetCAP



NetCAP - Embodied Carbon Continued Improvement



Imjin Barracks - SLA



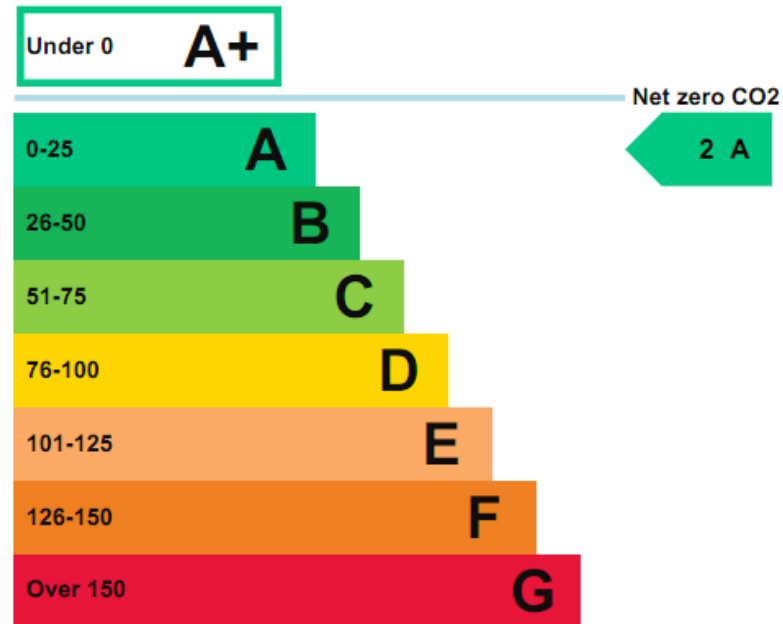
Imjin Barracks - SLA



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Energy rating and score

This property's current energy rating is A.

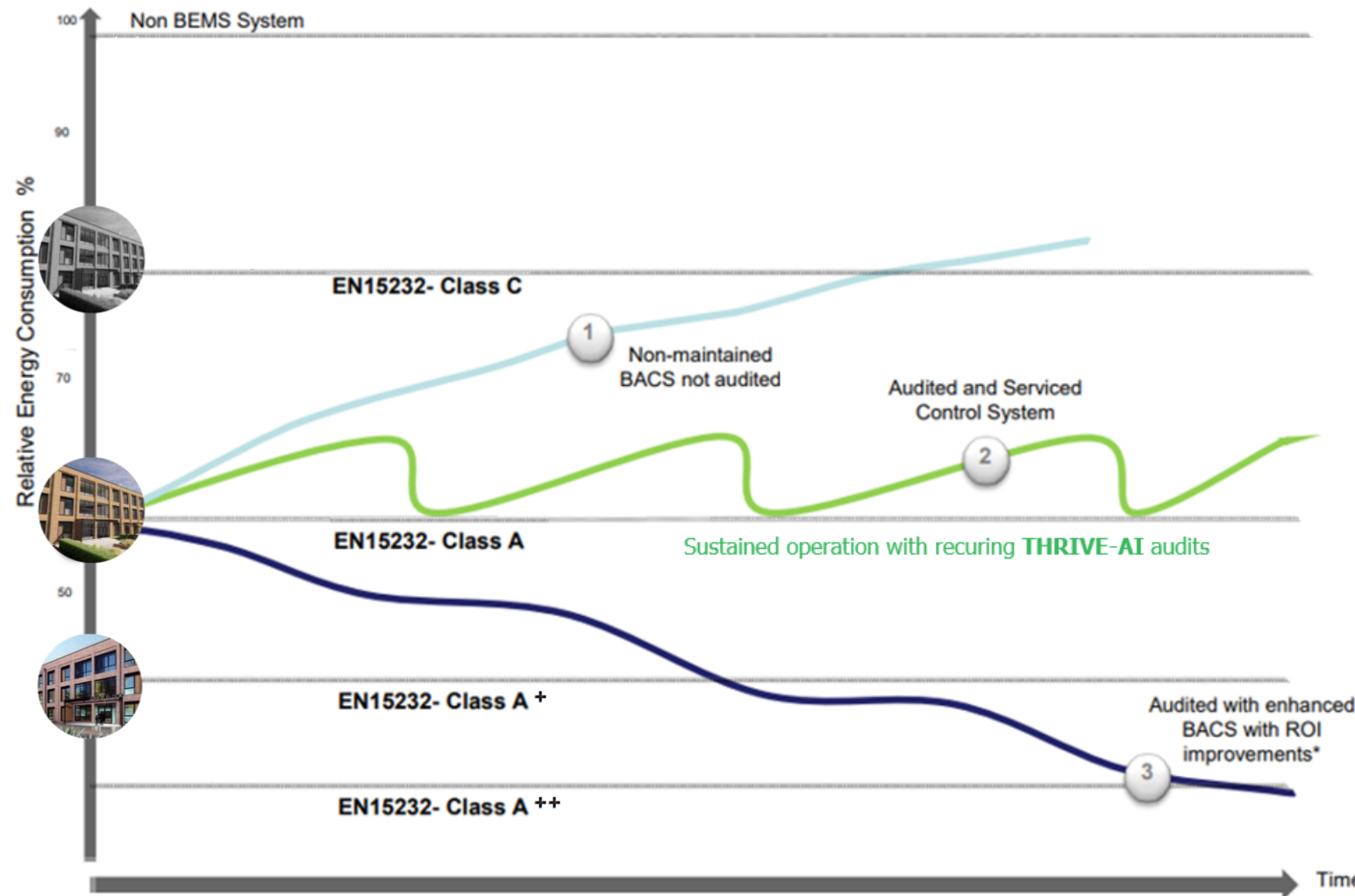


EUI – 42 (DIO Imjin Target 55)



Embodied Carbon - 480 kgCO2e/m2 for stages A1 – A5 (DIO Imjin Target 500 kgCO2e/m2)

Why SMART Buildings



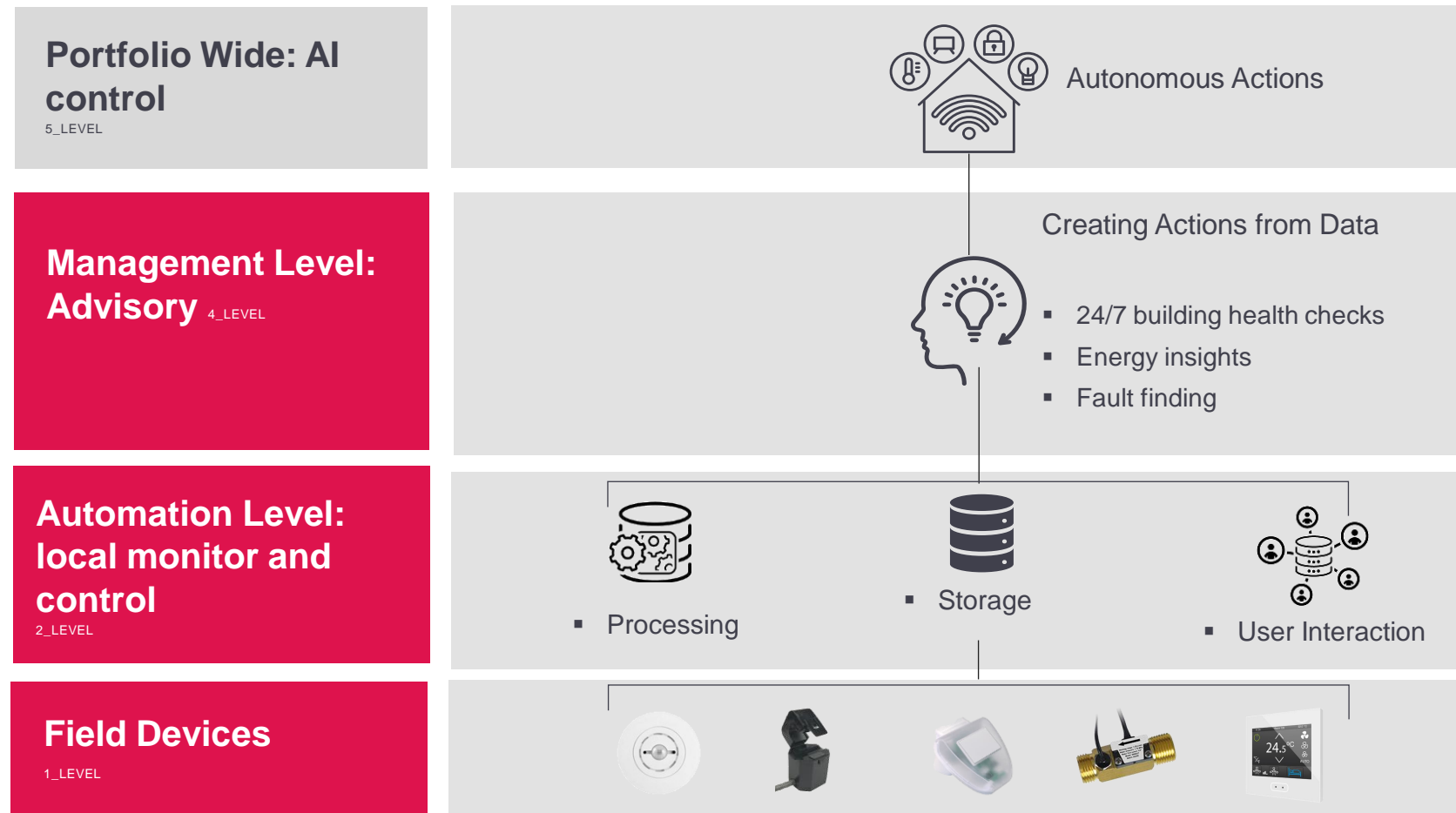
*For illustration purposes only, energy savings will vary from site to site

Class C BACS (with enhancements)

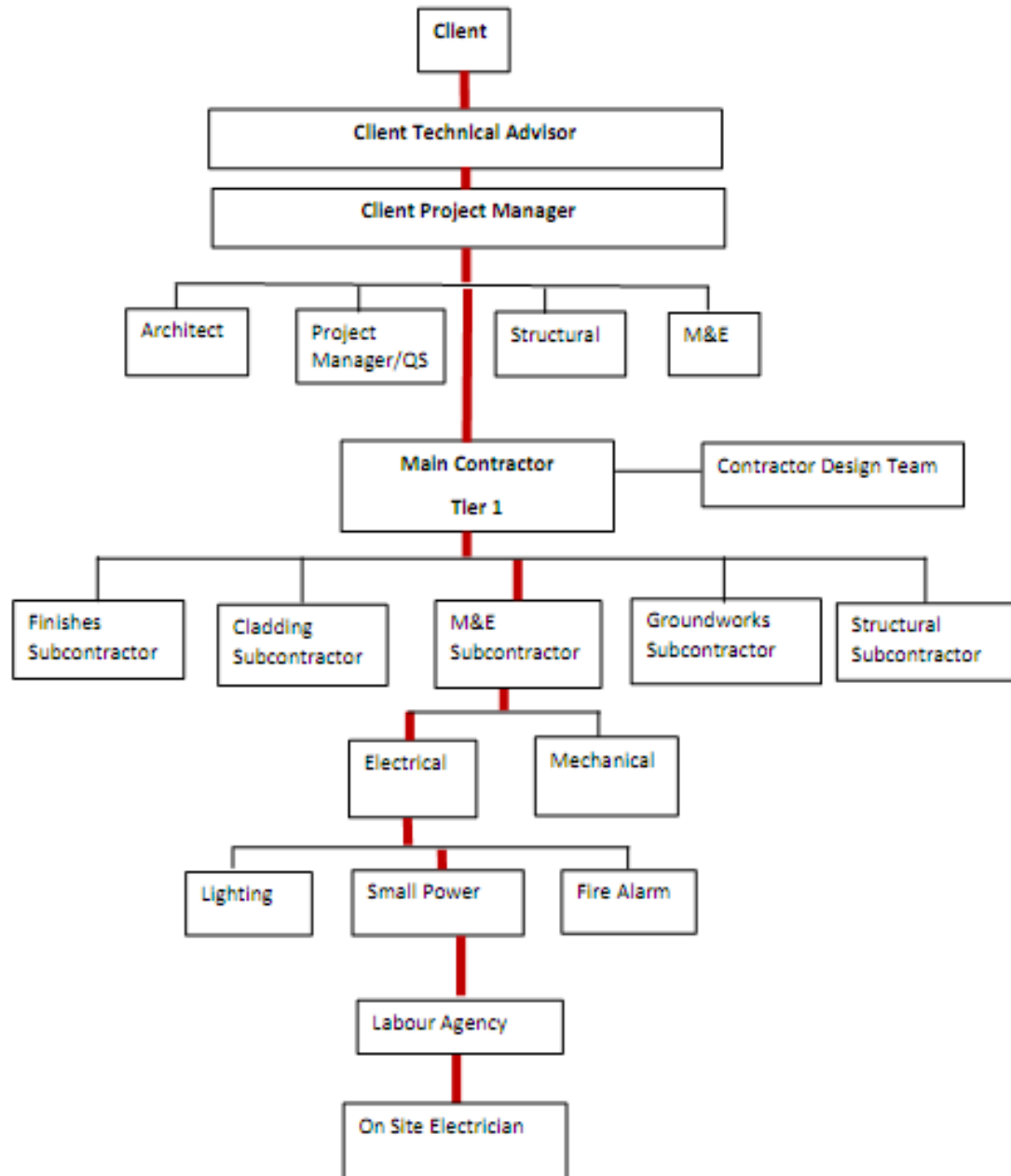
For temporary accommodations **BACS class A vs class C** has an improved building performance by:

- 24% Electricity-Lighting
- 22% Electricity-Auxiliary energy
- 39% Heating
- 20% Domestic Hot Water

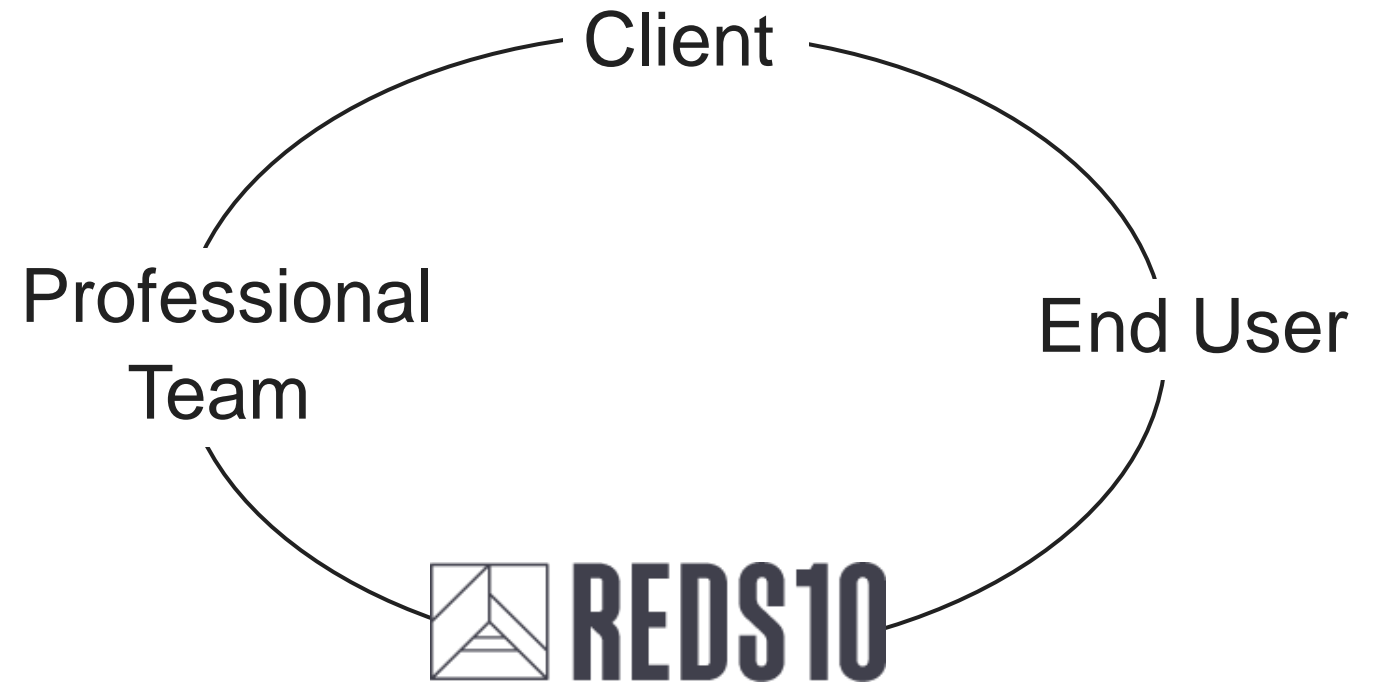
How does it work?



Traditional Construction Model



Vertical Integrated Construction Model



- Own Factory where buildings are 85%
- Inhouse Technical Design / M&E
- Directly employed Trades
- Direct links with material Suppliers
- Alliance agreements with key manufacturers and sub-contractors

Field devices

Enhanced sensing



Elements

- Humidity
- Door & window contacts
- Temperature in bathroom
- Sound
- Daylight linking and lighting reporting
- Hot water flow and temperature
- Water leak detection
- Bedroom power metering (per lighting and small power circuit)
- Sun Intensity (Global irradiance)
- VOC/eCO₂

Advanced sensing to drive **Analytics**, **User Experience** and **User Behaviour** based on open protocols via customisable and upgradable User Interface.

Management Level - User behaviors and feedback

Increasing user engagement with competition...



How?

Advanced monitoring via metering every room's:

- Final small power & lighting circuit
- Ventilation operation
- Hot water consumption

Bespoke interface:

- User Interface via programmable touch screens (local)
- Live Alarm, Metering and Plantroom monitoring Interface (local/remote)
- User Interface App (SaaS) (local/remote)
- Reporting and Insights (SaaS)

Management Level - Actionable Insight

Clear, relevant and tailored analysis from a single source of data

Owner

- Benchmarking
- Portfolio capital cost allocation
- Carbon emissions
- Sustainability
- Whole life cost analysis and ROI

Manufacturer

- Air and water quality
- Water egress
- Predictive maintenance
- System setting optimization
- Efficient fault handling
- Physical inspection reduction
- Contract management



User

- Empower and educate
- Optimise the lived experience
 - Democratise control

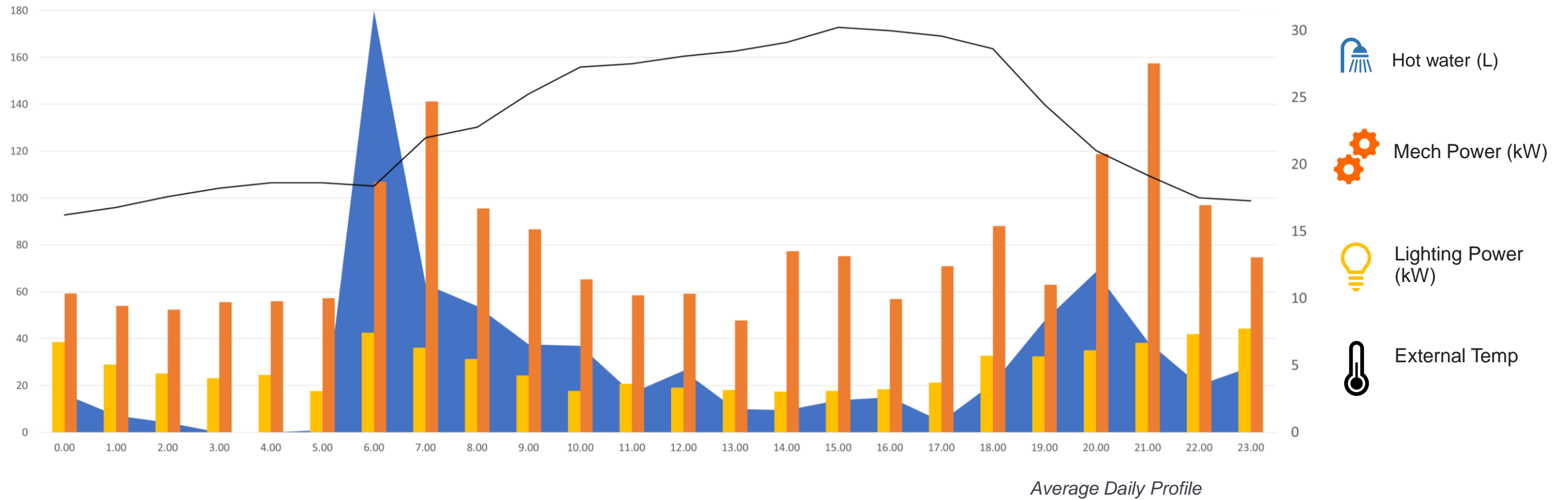
Operator

- Air and water quality
- Water use reduction
- Critical system performance / availability
 - Insurance renewal / procurement
- Access control and occupancy monitoring
 - Environmental control
 - Out of hours operation
- High energy behavior detection

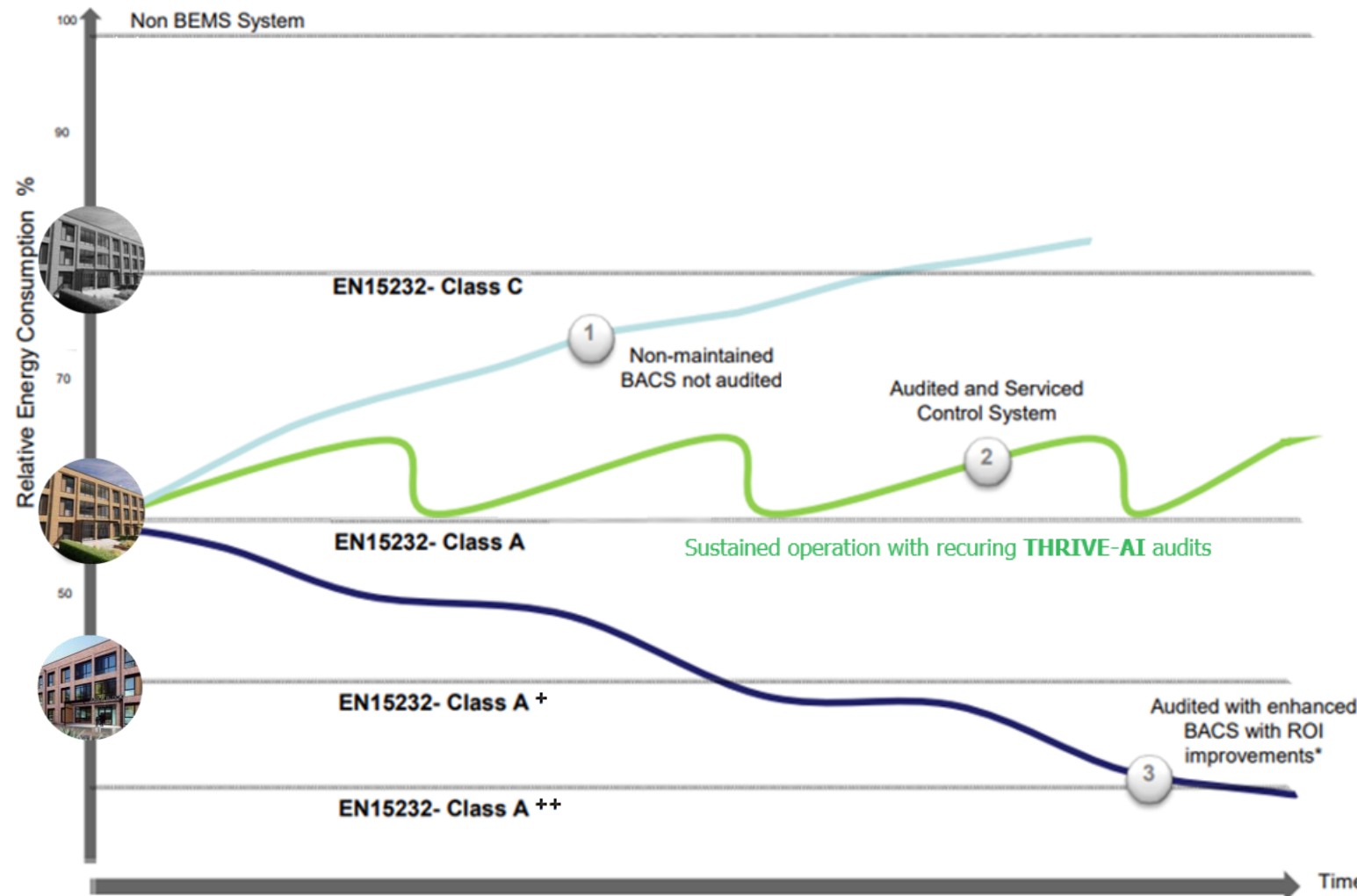
Designer/Contractor

- Enhanced commissioning
- Performance validation / certification
 - Compliance with standards
 - Fitness for use
 - Quality assurance

Heating, Hot Water and User behaviour



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