DALI

Its Role in Connected Networks

“HELLO”

I am Stewart Langdown FSLL, Your Presenter!

I’ve worked in Emergency & Lighting Controls for 28 years and been involved with Lighting for over 30. I sit on several Technical and Commercial committees and am a Fellow of the Society of Light and Lighting.

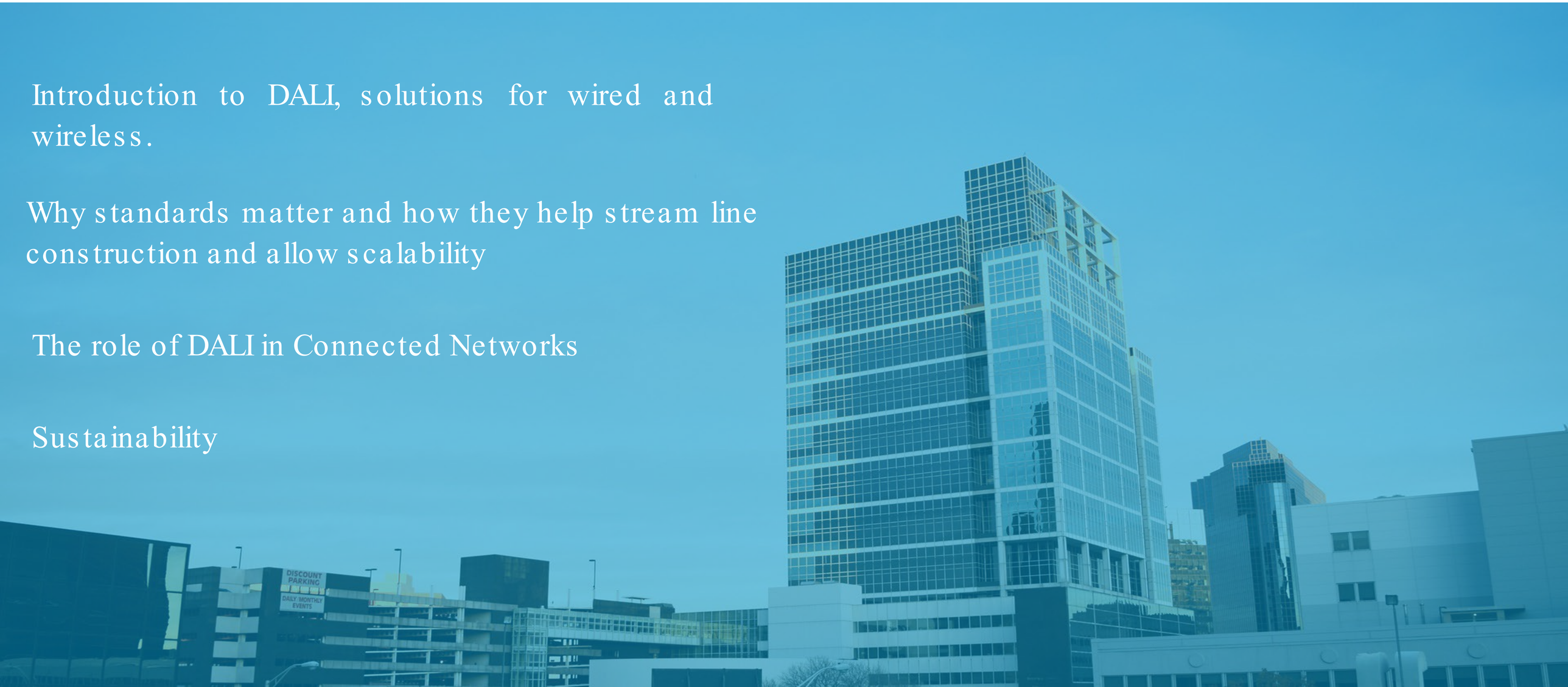
INTRODUCTION

Introduction to DALI, solutions for wired and wireless.

Why standards matter and how they help stream line construction and allow scalability

The role of DALI in Connected Networks

Sustainability



Global Controls Market -Size

The global luminaire and lighting control market size is expected to reach $130.56 billion by 2030 from $72.72 billion in 2020, growing at a CAGR* of 6.44% from 2021 to 2030.

*Compound Annual Growth Rate


IEC
62386
DALI

DALI Alliance Brands

Lighting control
in a wired network

Luminaire level
lighting control

Lighting control in
wireless &IP
networks

DALI Alliance

IEC 62386 is the default standard for lighting control

Parts 101 Covers the wired aspects of DALI and the basic protocol

Part 102 Covers the drivers and emergency inverters

Part 103 Covers the input devices, sensors and switches

All DALI -2 certified products are third party approved and listed on the DALI Alliance website

DALI Alliance-Wireless

IEC 62386 is the default standard for wired and wireless lighting control

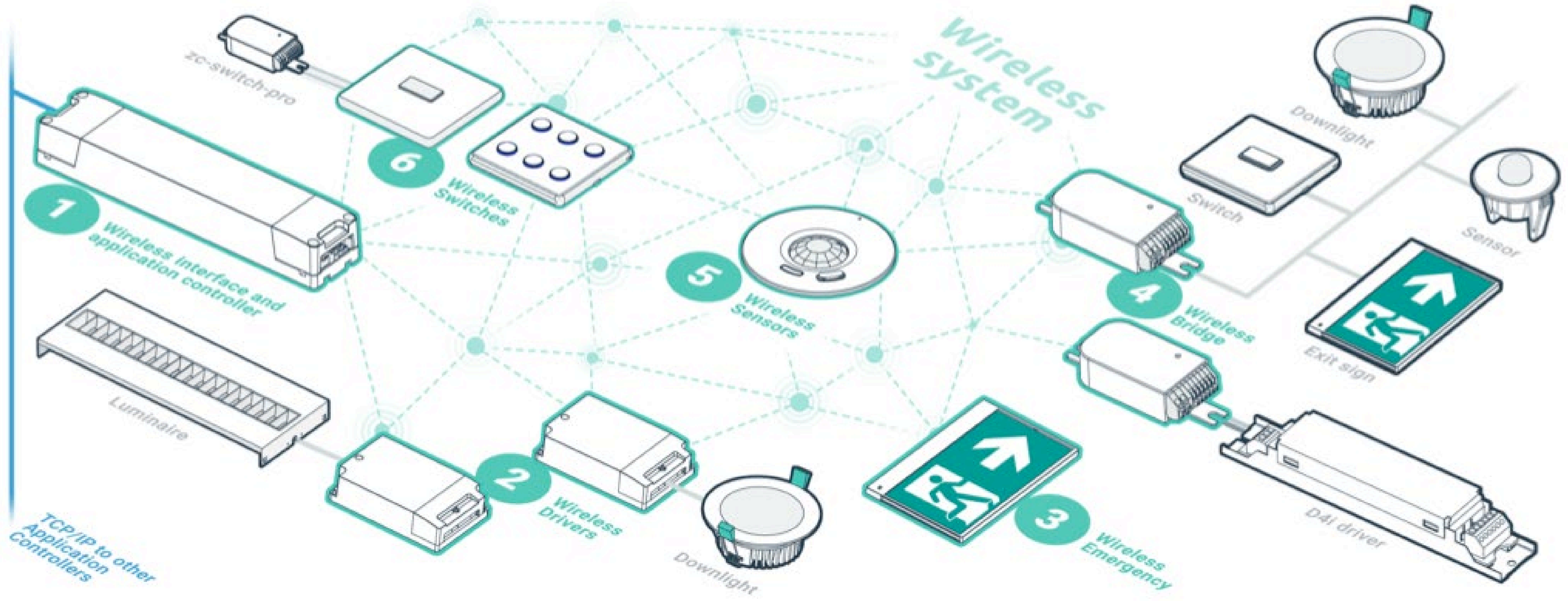
Parts 104 is the standard defining how DALI-2 can be used on different physical mediums.

IEC 62386 Part 104 uses the Thread protocol and will be known as DALI+

DALI also supports gateways to Bluetooth and Zigbee

System components

1. Wireless Application controller
2. Wireless Driver
3. Wireless Emergency
4. Wireless Bridge
5. Wireless Sensors
6. Wireless Switches



Wireless DALI+

Standardised Lighting control built on the international standard IEC 62386 Part 104.

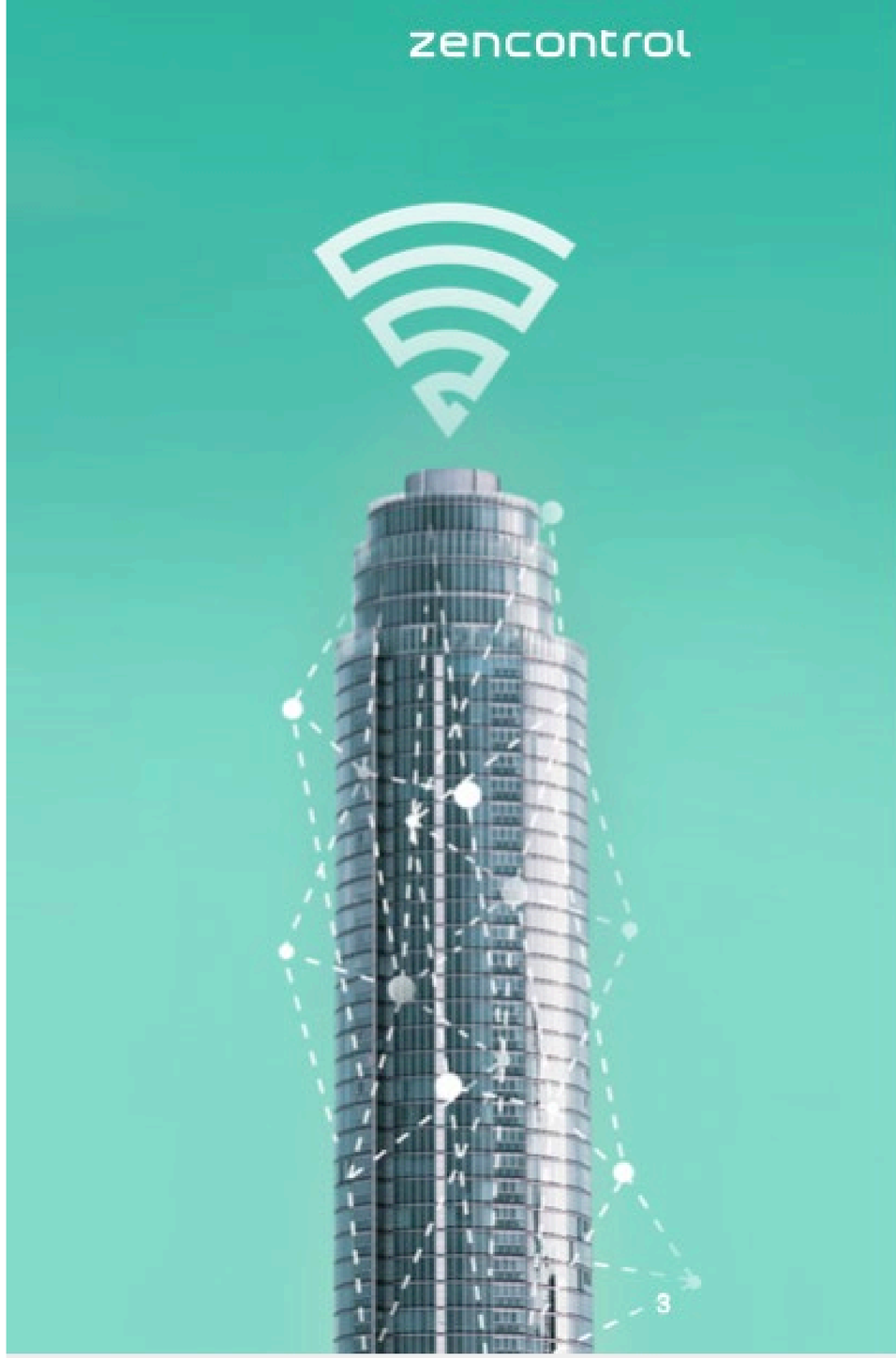
Full bandwidth wireless Mesh network

Allows for standard DALI Protocols over a wireless infrastructure

Allows for interoperability with devices from other manufacturers

Reduces risk and increases competition

Works with wired DALI-2 Application controllers



What is Thread

Thread provides the foundation for a wireless mesh network built on IEEE 802.15.4 and delivers the following

Simplicity: Simple installation, start up and operation.

Security: All devices in a Thread network are authenticated and all communications are encrypted

Reliability: Self healing mesh network, with no single point of failure, and spread spectrum techniques to provide immunity to interference.

Efficiency: Low power Thread devices can sleep and operate on battery power for years.

Scalability: thread networks can scale up to hundreds of devices. Connect multiple networks together to scale across a building

DALI Alliance-Wireless Gateways

- ✓ Part 341 is the Bluetooth to DALI-2 gateway and is the only certified DALI to BLE gateway.
- ✓ Part 342 is the Zigbee to DALI-2 gateway

DiiA specification

Part 341: Particular requirements – Control devices – Bluetooth mesh gateway

DiiA specification

Part 342: Particular requirements – Control devices – Zigbee gateway

Why Standards Matter

Standards

Here are some of the benefits of standardising your lighting control:

- Interoperability: Source hardware from multiple sources
- Cost-effective: Competition keeps pricing regulated
- Protection: Standards are based on an agreed level of attainment

DALI Benefits

Standardised

Scalable

Interoperable

Data rich

Connectivity

DALI Features

Well being

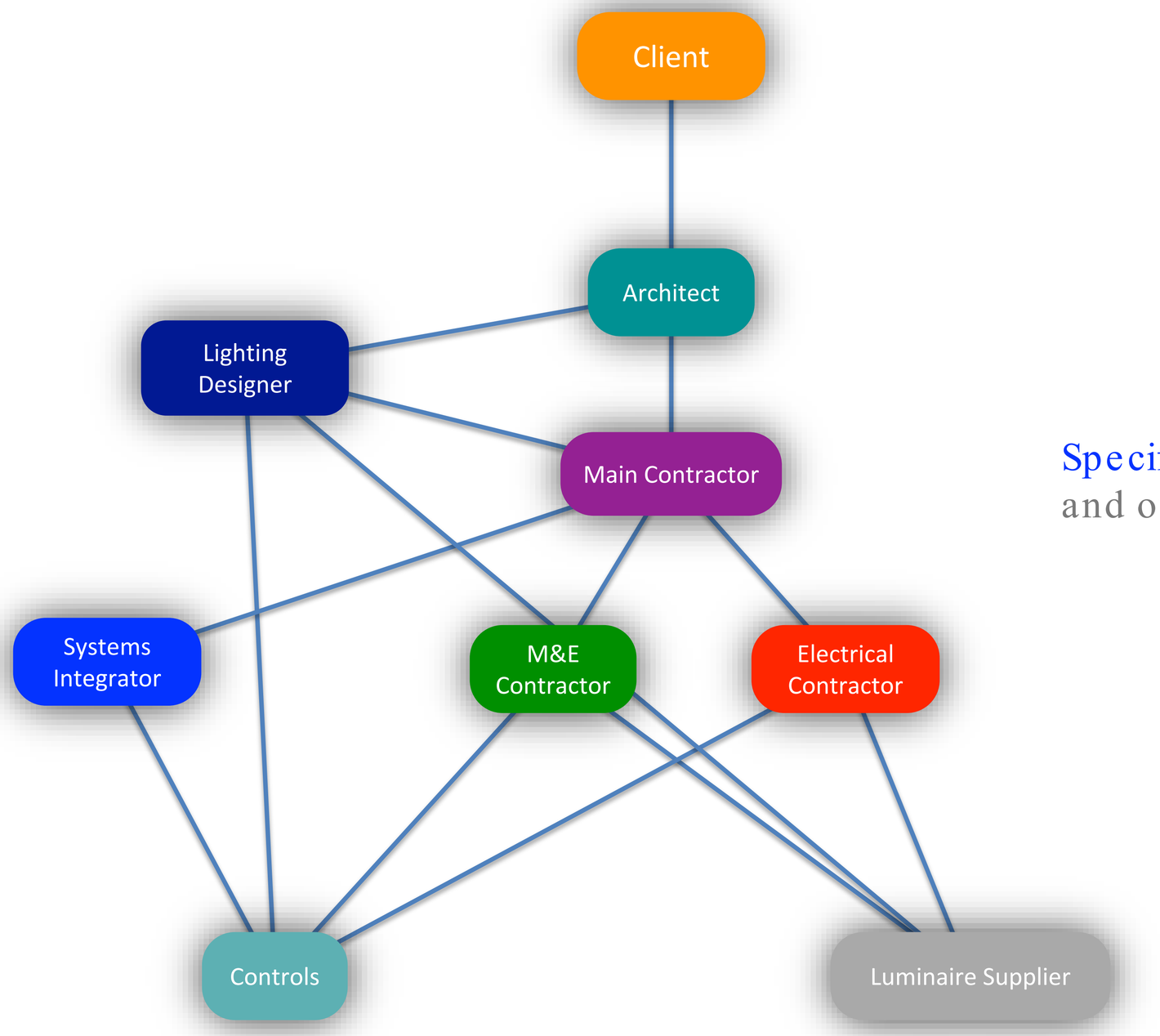
Trustworthy

Track record

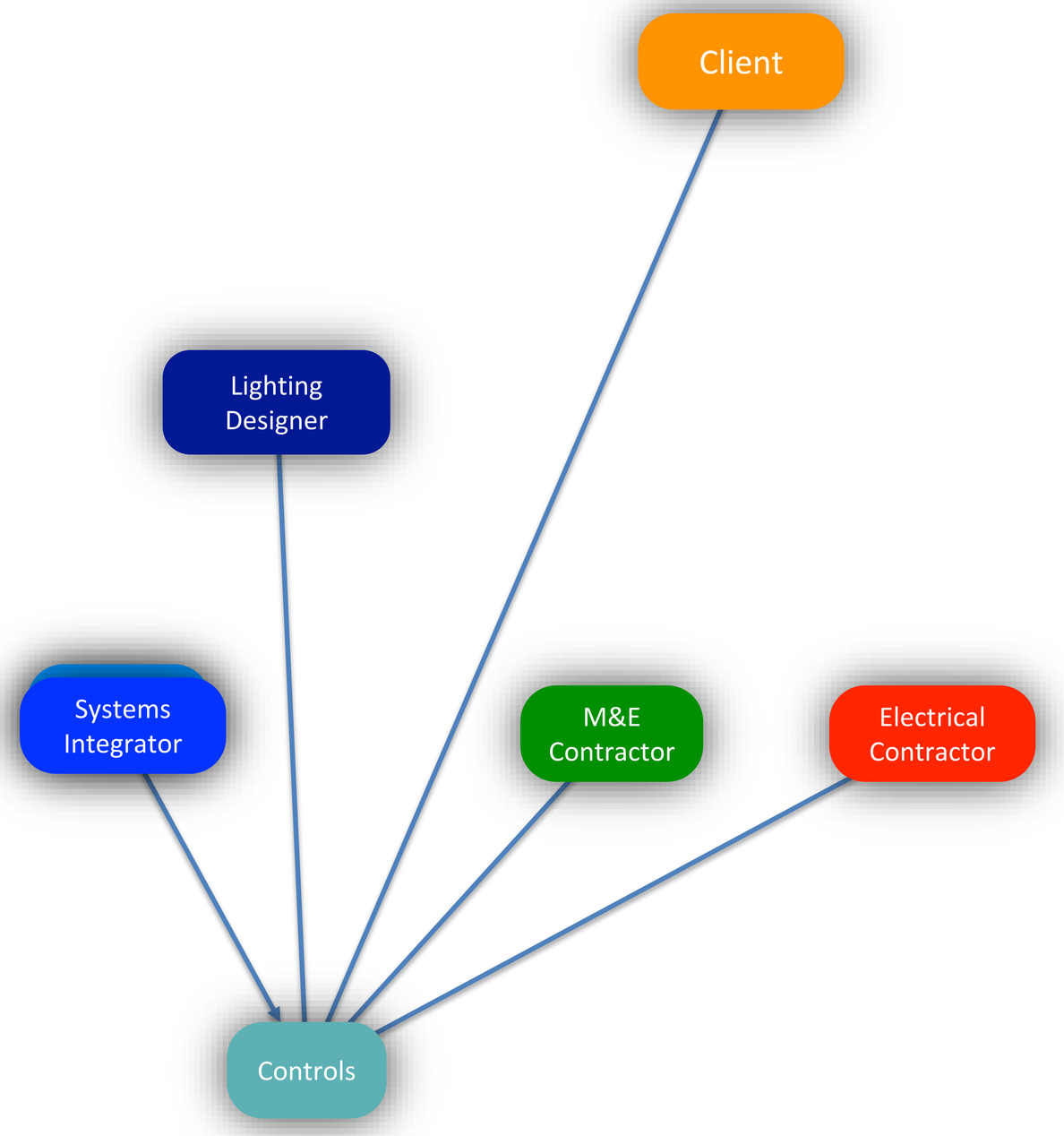
IoT Ready

Energy saving

Specification



Specification who are the influencers and owners of the specification.



Specification who are the influencers and owners of the specification.


Streamline
&
Scalable

Simplify installation

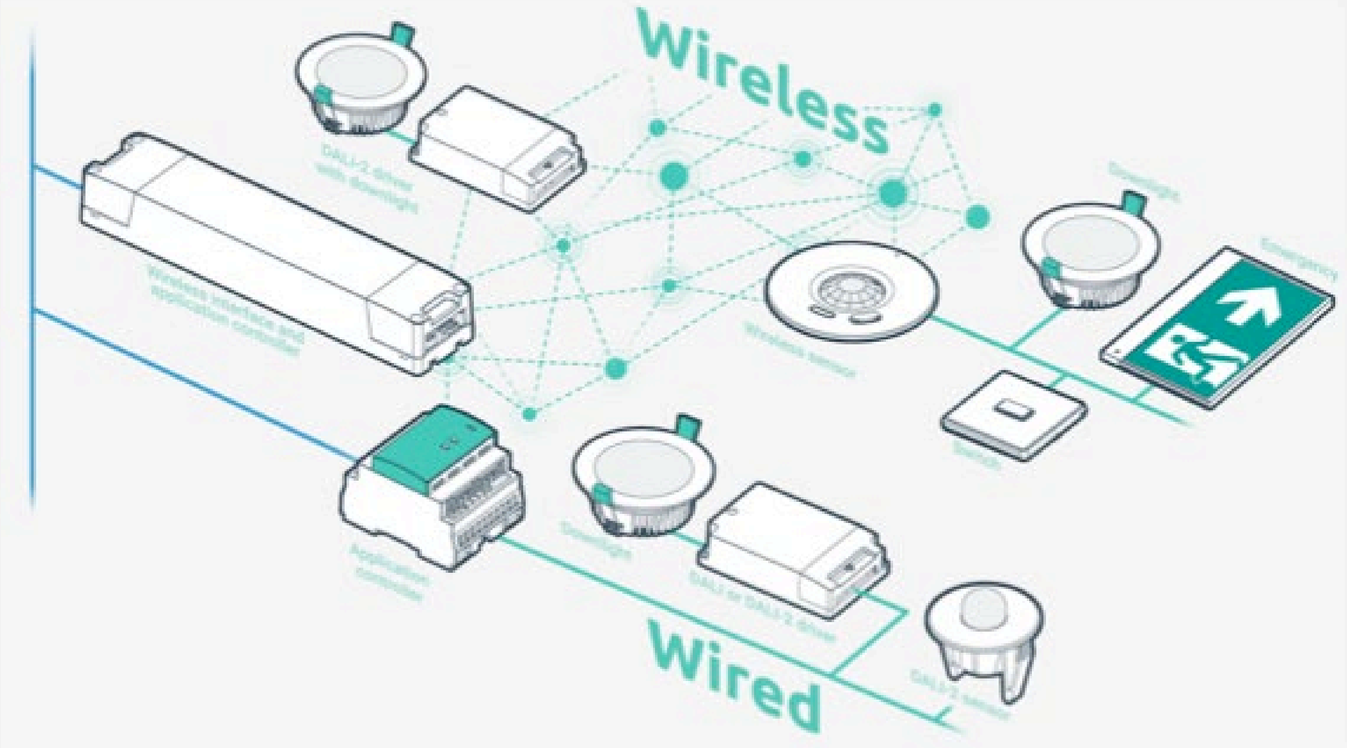
Here are some of the benefits of standardising your lighting control:

- Connectivity: connection standardised
- Choice: Source hardware from multiple vendors
- Hybrid: Reflects trends in controls evolving

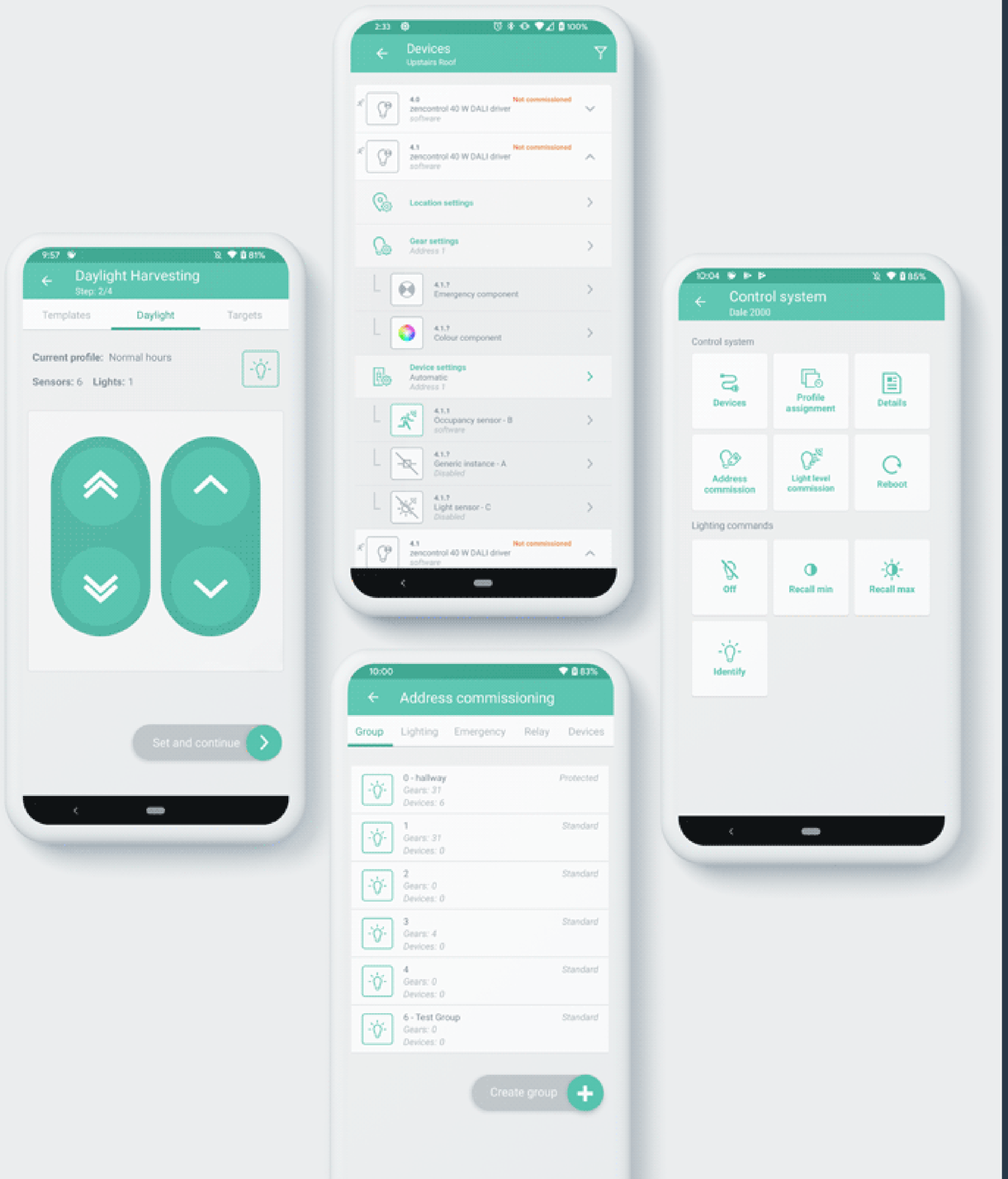
Scalable- hybrid

Not all buildings are the same and customer's requirements can differ

- With a zencontrol system, wired and wireless systems work together seamlessly.
- Creates a fully functioning building with no compromises




Commissioning


Daylight Harvesting
Step: 2/4
Templates
Daylight
Targets
Current profile: Normal hours
Sensors: 6 Lights: 1
Set and continue
Devices
Upstairs Roof
Not commissioned
zencontrol 40 W DALI driver
software
Location settings
Gear settings
Address 1
Emergency component
Colour component
Device settings
Automatic
Occupancy sensor - B
Generic instance - A
Disabled
Light sensor - C
Control system
Dale 2000
Control system
Devices
Profile assignment
Details
Address commission
Light level commission
Reboot
Lighting commands
Off
Recall min
Recall max
Identify
Address commissioning
Group
Lighting
Emergency
Relay
Devices
0 - hallway
Protected
Gears: 31
Devices: 6
1
Standard
Gears: 31
Devices: 0
2
Gears: 0
Devices: 0
3
Gears: 4
Devices: 0
4
Gears: 0
Devices: 0
6 - Test Group
Gears: 0
Devices: 0
Create group


Risk

De-Risk

Individual

Local devices based on an open standard that can be upgraded

01

Multi room

Room control or multi room with some local reporting Part 101, 102, 103 &104

02

03

Automated Lighting

Using software to deliver a solution using protocols such as DALI-2, D4i & DALI+. Full interoperability between manufacturers Integration of emergency lighting

Smart Lighting

Convergence of technology to achieve a better lit environment and better use of services and resources.. Environmental sensing, mapping etc.

04

Building Safety Act

Building Safety Act
2022

Changes in legislation Building Safety Act 2022

- High Risk: 18m high or at least 7 storey. Includes Hospitals/ Prisons/ MOD
- The Golden Thread is a digital record of all project and asset data, detailing how a building was designed, built, managed and operated
- Golden Thread: The golden thread is both the information that allows you to understand a building and the steps needed to keep both the building and people safe.
- Accountable person: Buildings must be registered before first occupation

Building Safety Act Enforcement

Offence	Scope of power	Penalty	Reference
Providing false or misleading information to BSR	Criminal offence Triable as an either way offence	Unlimited fine 1 year imprisonment (magistrates) 2 years imprisonment (crown)	Section 24 BSA22
Contravention of building regulations	Criminal offence Triable as an either way offence No time limit	Unlimited fine Fine for each day the contravention continues (£200)	Section 35 BA84
	Compliance notice Must be served within 12 months	Unlimited fine 1 year imprisonment (upon summary conviction - magistrates) 2 years imprisonment (upon indictment - crown)	Section 35B BA84
	Stop notice		Section 35C BA84
Failure to comply with compliance and stop notice	Criminal offence		Section 35B & C BA84
Removal of offending work	Time limit extended to 10 years	Notice to remove contravening work Chargeable work	Section 36 BA84


Connected
Networks

Manageable networks

Wired or Wireless DALI

64 ECGS (lights / relays)

64 ECDs (switches / sensors) per network.

Each network wired or wireless is connected to an IP gateway which provides an ethernet backbone

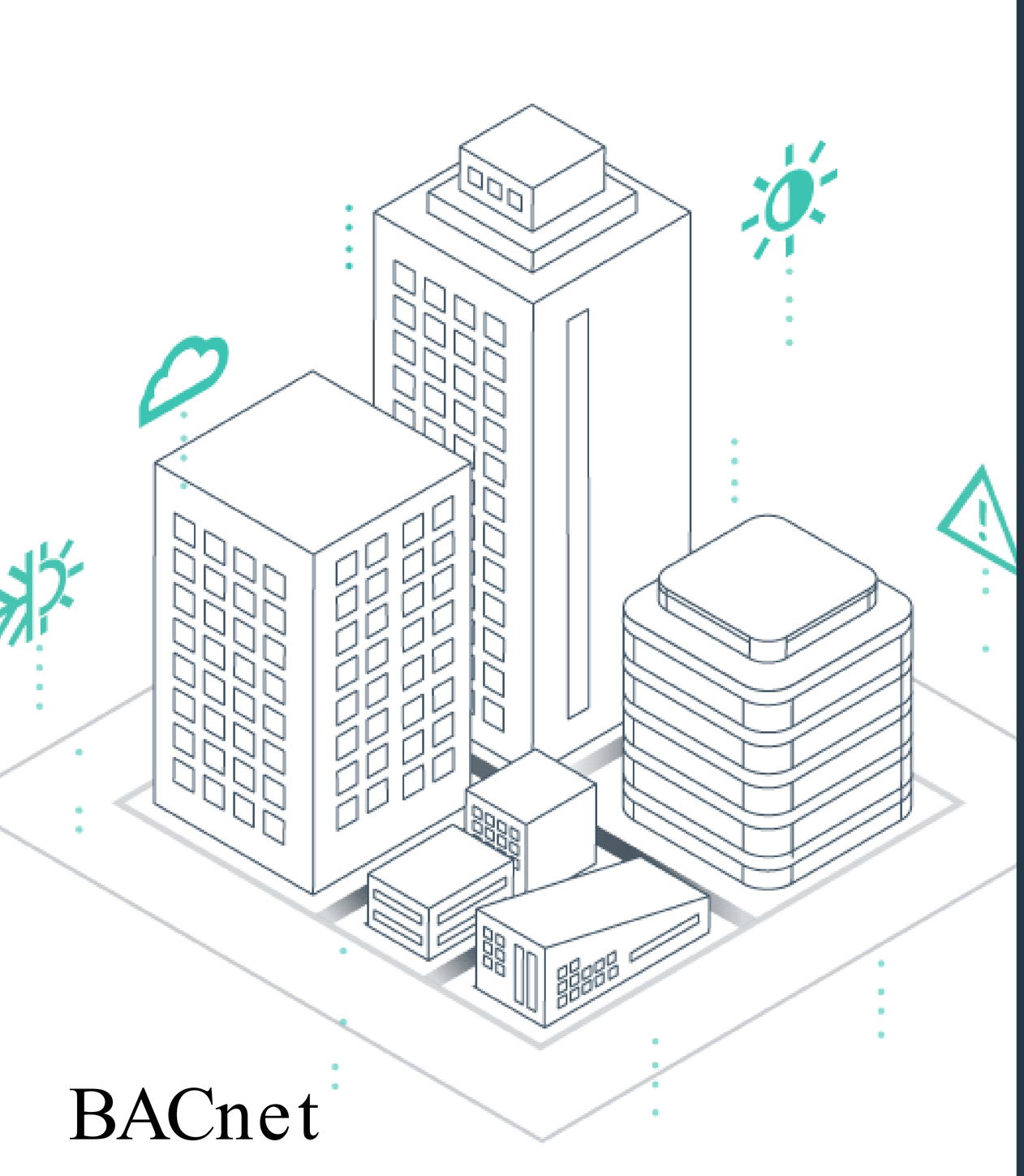
This approach allows for

Standardised deployment and design, as the systems have the same building blocks

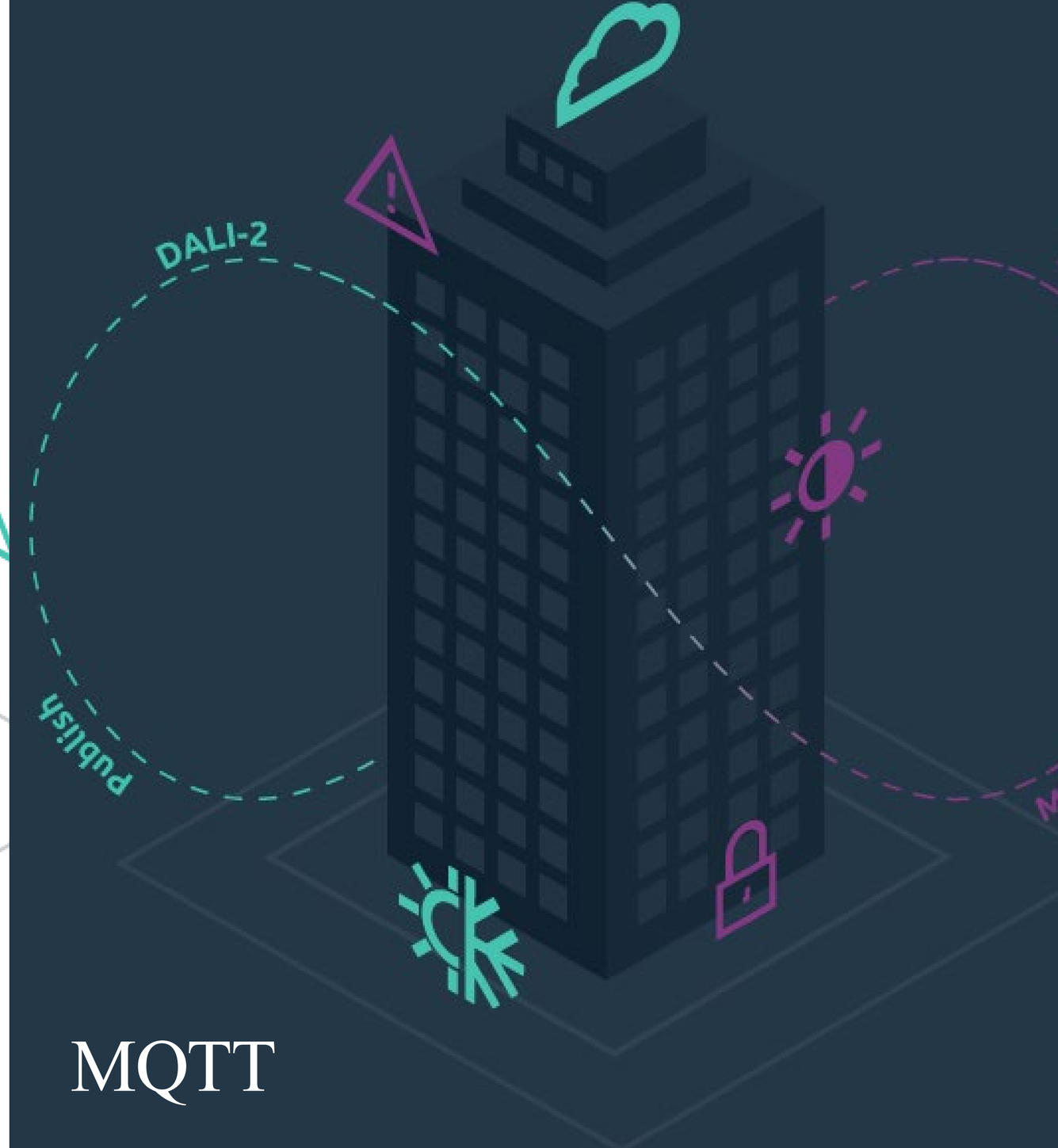
Straightforward fault management,

Easy quoting and specification, design follows that of DALI

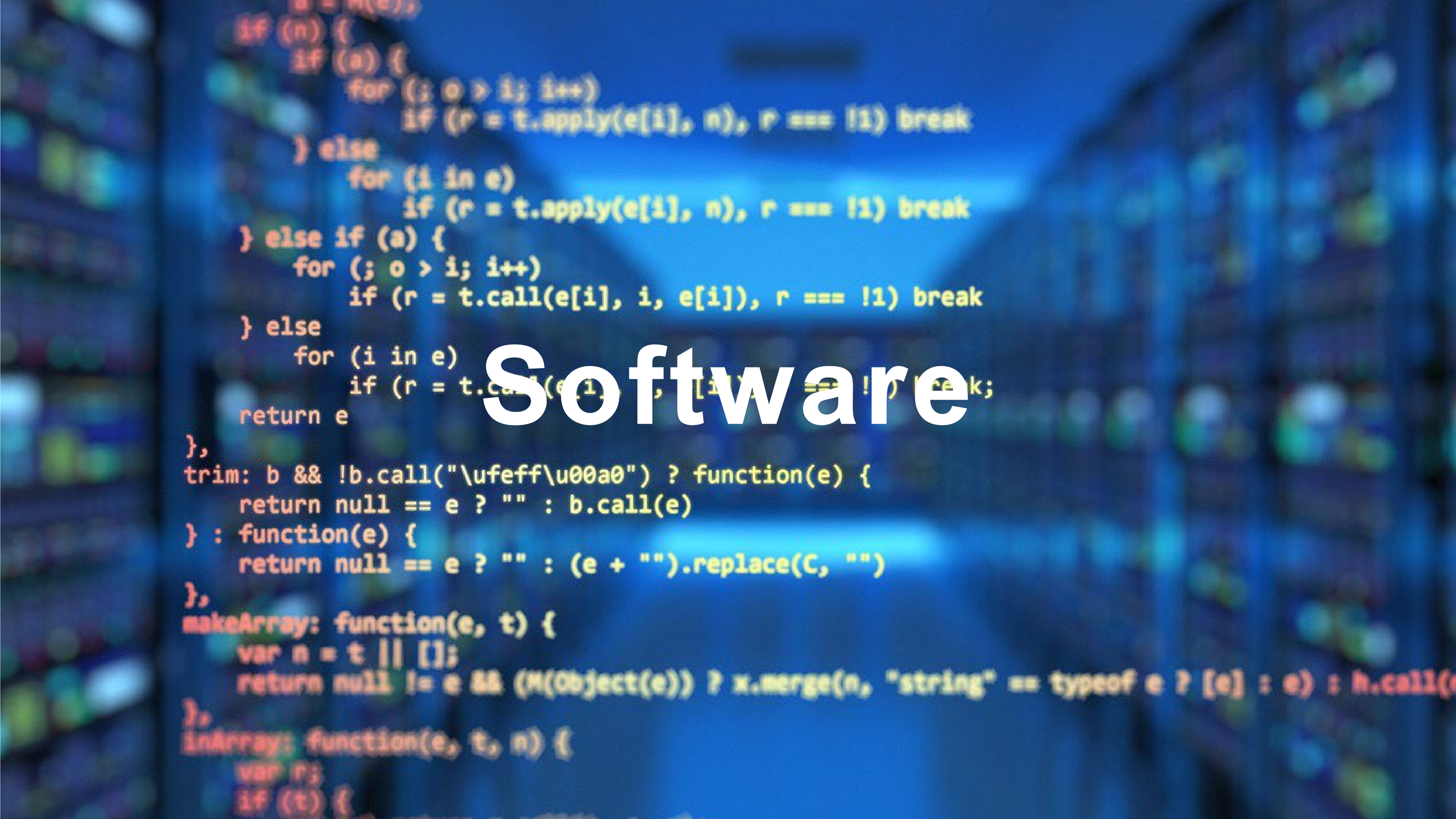
Better security, each network is protected

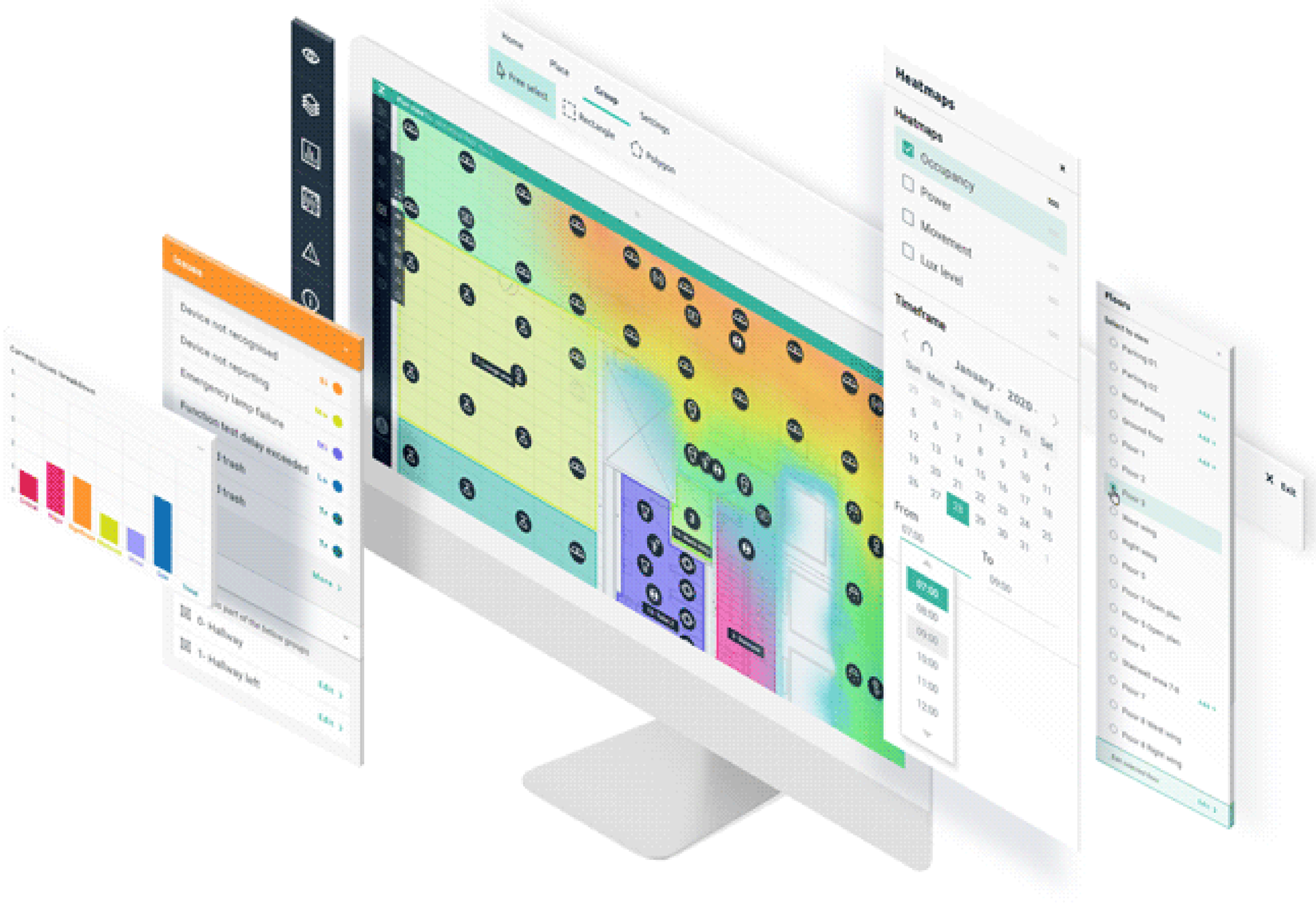


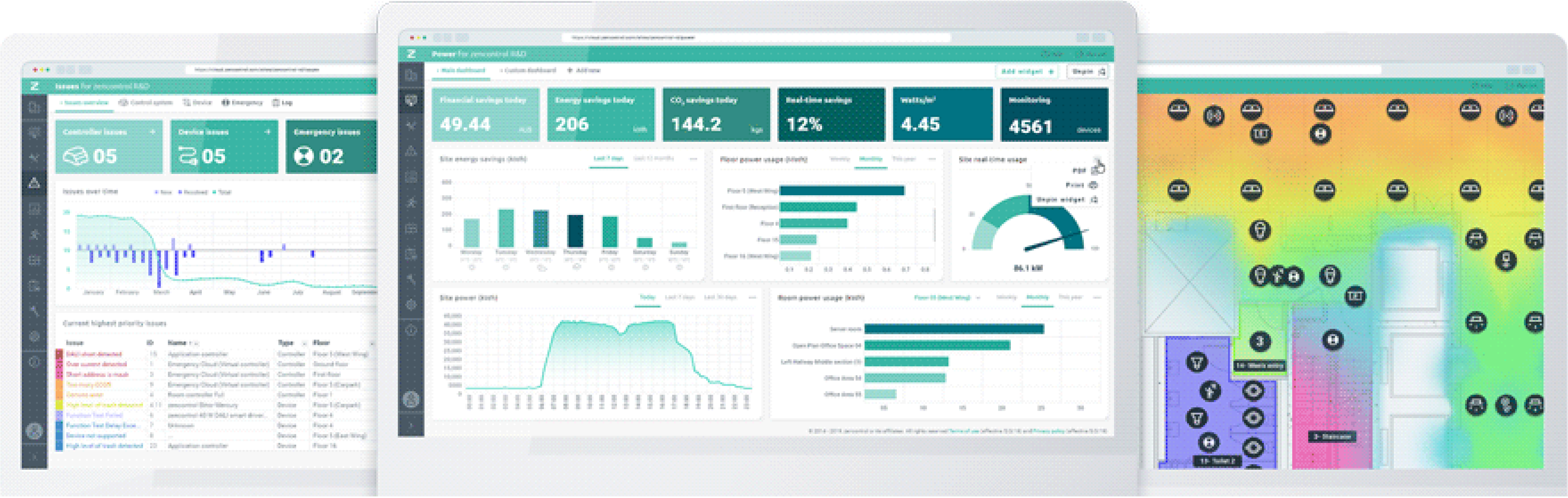
BACnet

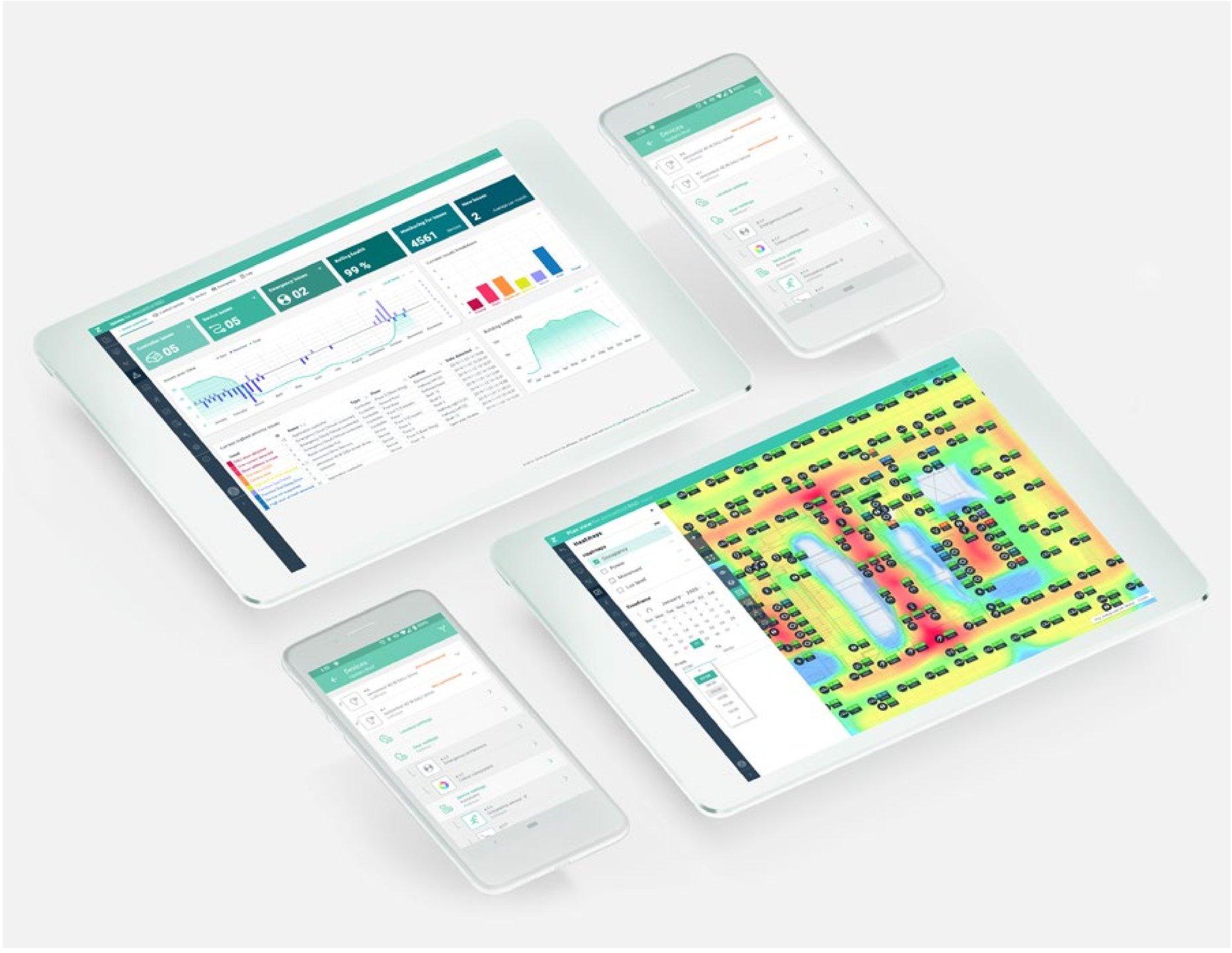


MQTT


Software


Heatmaps
Occupancy
Power
Movement
Lux level
Timeframe
From
To
Floors


Controller issues
05
Device issues
05
Emergency issues
02
Financial savings today
49.44
Energy savings today
206
CO_2 savings today
144.2
Real-time savings
12%
Watts/m²
4.45
Monitoring
4561




Sustainability
&
Wellbeing

Wellbeing

WELL standard

The WELL Building Standard (WELL), is a roadmap for creating and certifying spaces that advance human health and well-being.

WELL sets pathways for accomplishing health-first factors that help every one of us to do our best work and be our best selves by supporting our physical and mental health across 10 core concepts.

WELL works at any scale, from a single interior space to an entire organization.

Change-other factors

Rating systems

NABERS

Office buildings

Productive employees are essential for creating competitive businesses.

Healthy people are essential for creating vibrant societies.

A NABERS Indoor Environment rating is a robust and measurable complement any health and wellbeing initiative.

- Base building Indoor Environment rating
- Tenancy Indoor Environment rating

Rating systems

BREEAM is a sustainability assessment method that is used to measure the environmental performance of buildings.

It assesses buildings across a range of categories, including energy, water, health and wellbeing, pollution, transport, materials, waste, ecology and management processes.

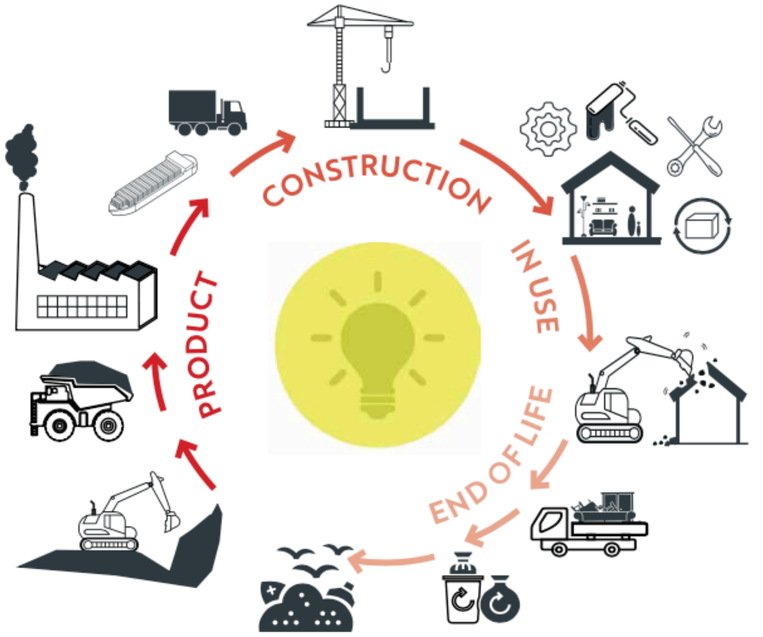
Buildings are rated and certified on a scale of 'Pass', 'Good', 'Very Good', 'Excellent' and 'Outstanding'.

Embodied carbon

The purpose of this guide is to help the industry take a first step together to evaluate embodied carbon emissions in MEP design, alongside operational carbon emissions.

As a first step, this document provides guidance on how to estimate embodied carbon at product level, rather than at system or building level. Guidance on system-level whole life carbon assessment may be included in a subsequent version of this guide.

Embodied carbon in building services: lighting



TM65.2:2023

CIBSE

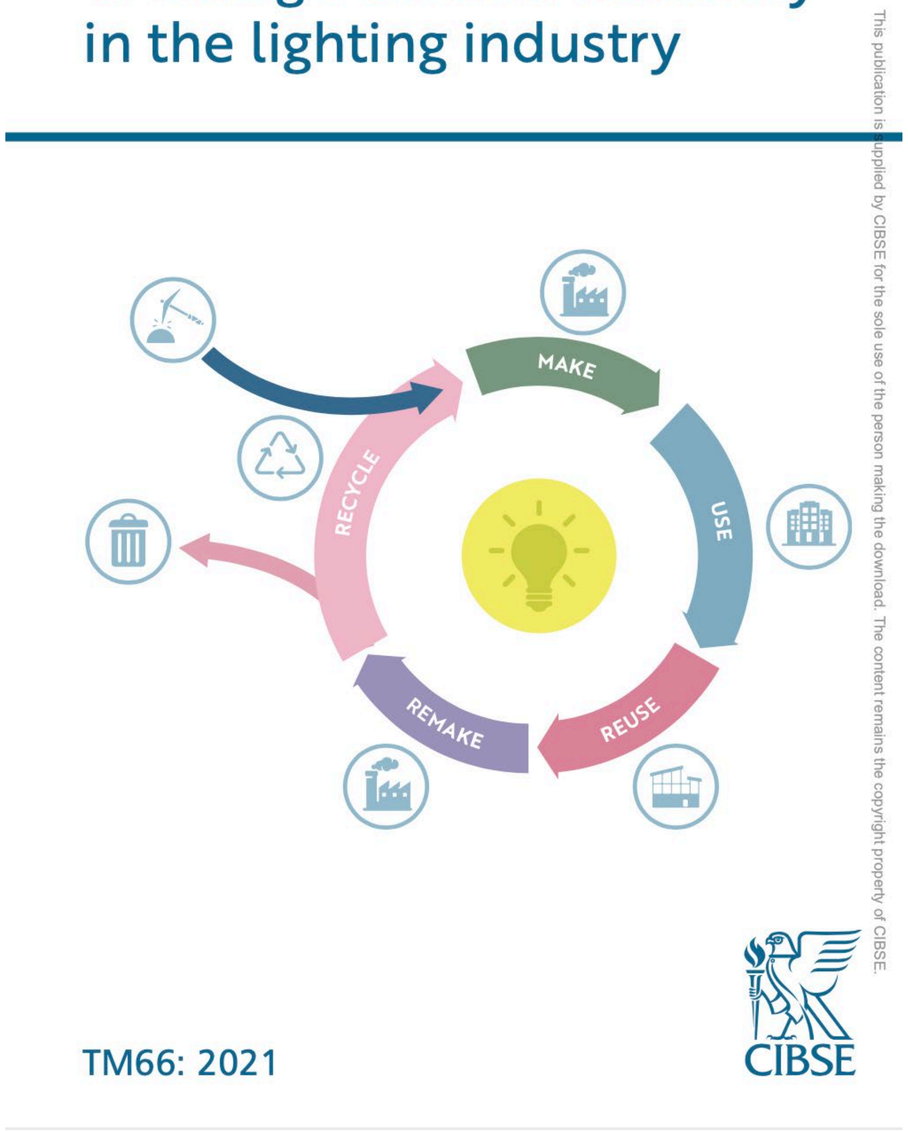
Circular economy

Consistent approach to local devices

DALI has rules that are defined by a standard and not a manufacturer

Long life and availability of spares or new components is essential to avoid waste.

Security of supply



Thank you

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