



# Contractor outlook for Zero Carbon Britain

## How wholesalers can benefit



Excellence in Electrotechnical  
& Engineering Services

[www.eca.co.uk](http://www.eca.co.uk)

Luke Osborne  
Energy and Emerging  
Technology Solutions Advisor

# Net Zero Carbon 2050-Why, When?

## National Policies



PARIS2015  
UN CLIMATE CHANGE CONFERENCE  
COP21·CMP11  
NOV 2015  
UN COP21

Global agreement and call to action on limiting global warming and its impact



NOV 2020  
10 Point Plan

The UK's Net Zero ambitions



DEC 2020  
Sixth Carbon Budget

Policy advice for UK decarbonisation



DEC 2020  
Energy White Paper

Details supporting the 10 Point Plan



JUN 2021  
Legal Commitment

78% fewer emissions by 2035 (vs. 1990 levels)



UN CLIMATE CHANGE CONFERENCE UK 2021

IN PARTNERSHIP WITH ITALY

NOV 2021  
UN COP26

Global commitments on Climate Change

ICE sales ban 2030

Build back better - Green recovery

Starting NOW! – bulk of works must happen within the decade

# What is industry doing



Construction  
Leadership  
Council

ConstructZERO

The Construction Industry's Zero carbon change programme



[www.eca.co.uk](http://www.eca.co.uk)

Luke Osborne  
Energy and Emerging Technology  
Solutions Advisor

# What is industry doing



## 4 key policies

- Business
- Building S
- Climate Cr
- Target
- Industry sl

[www.eca.co.uk](http://www.eca.co.uk)



### GUIDANCE Note

Planning for a Green Pivot v 1.2

## NET ZERO CARBON OPPORTUNITIES FOR ECA MEMBERS

Highlighting new opportunities, training and accreditation for electrotechnical contractors in the world of the 'Green Economy'

#### Key information

- Much of the work in reaching our Net Zero Carbon 2050 targets fall within the scope of the electrical contractor
- Funded schemes may require specific training and accreditations
- Contains guidance on schemes, training and accreditations

# Key focuses

## Flexible stable low carbon electricity

- So what's the solution?
  - Install greater amounts of renewable energy generation than we currently have
    - To allow for reduction in output
  - Increase energy storage capabilities in the system
  - Maximise energy efficiencies and flexibility

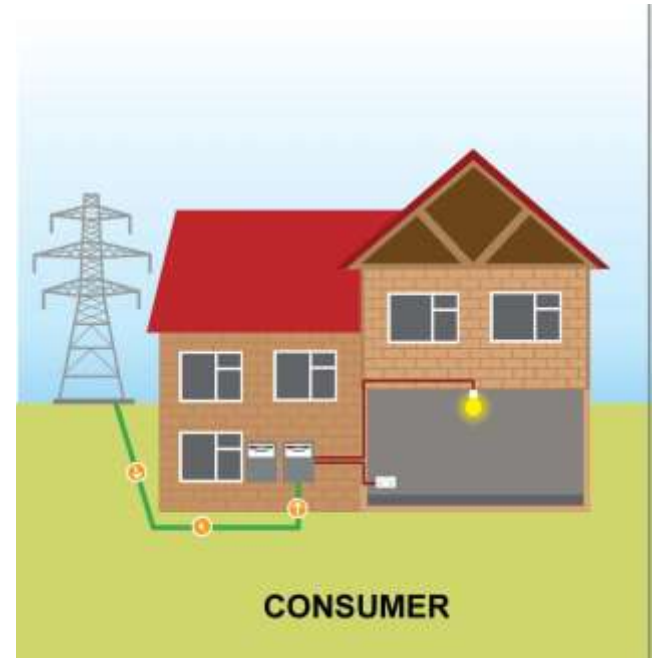


## Transitioning to a net zero energy system

Smart Systems and Flexibility Plan 2021

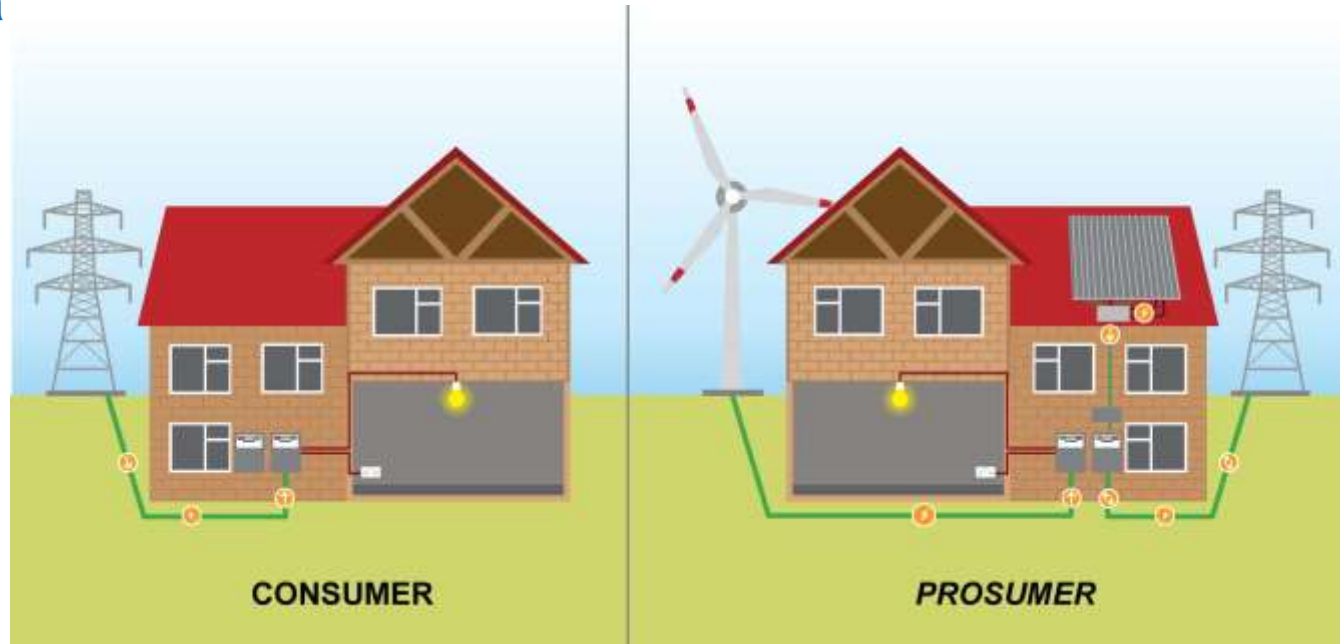
# Integration of systems- 'Prosumer'

- This links into the 'prosumer' concept
  - Moves beyond the single flow of energy into a building:



# Integration of systems- 'Prosumer'

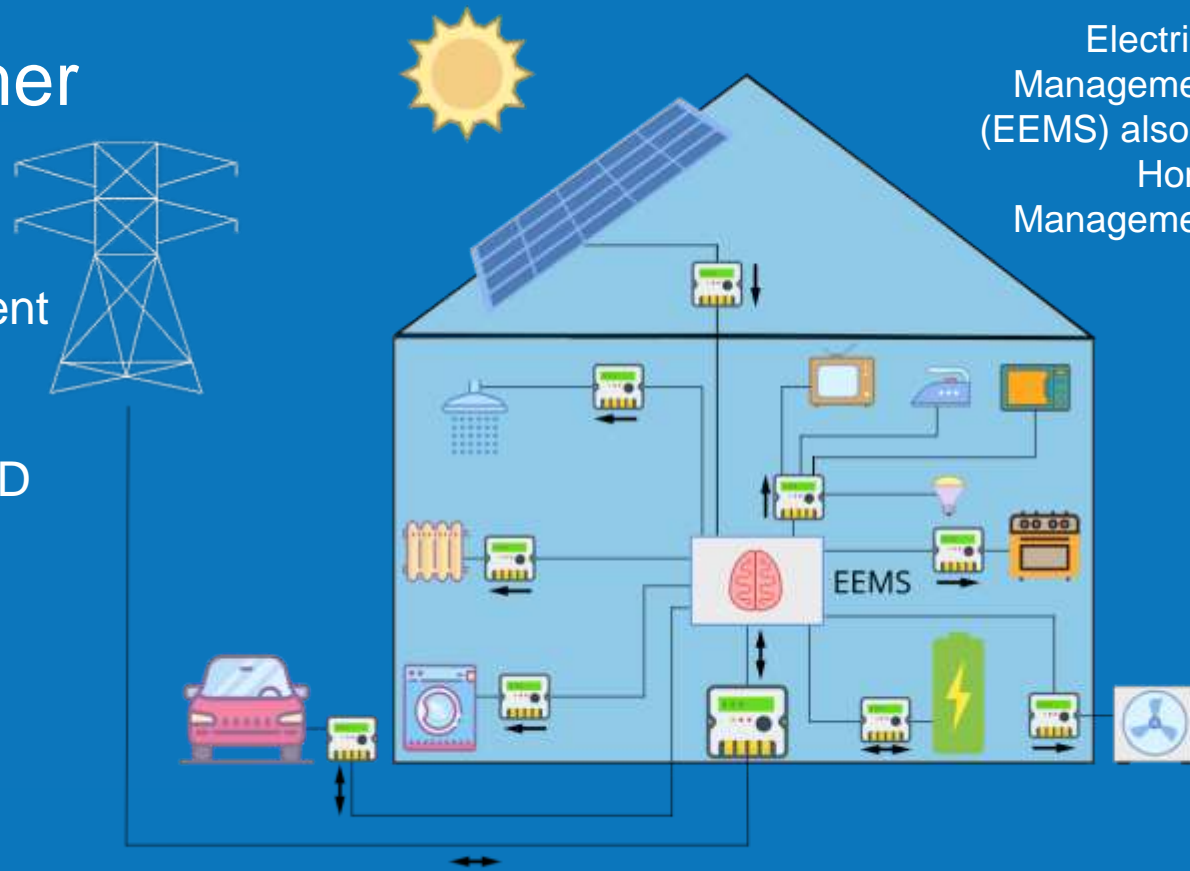
- To a bi-directional flow of energy to and from a building
- Becoming active components of the Electricity Grid
- This *may* become a New Chapter 82 in the wiring regulations BS 7671 Amendment 2
  - (April 2022)
  - Will drive adoption



# The Prosumer

Electrical Energy Management System (EEMS) also termed as Home Energy Management System (HEMS)

- Example:
- Smart management through EEMS
- ALL ABOUT LOAD CONTROL



[www.eca.co.uk](http://www.eca.co.uk)

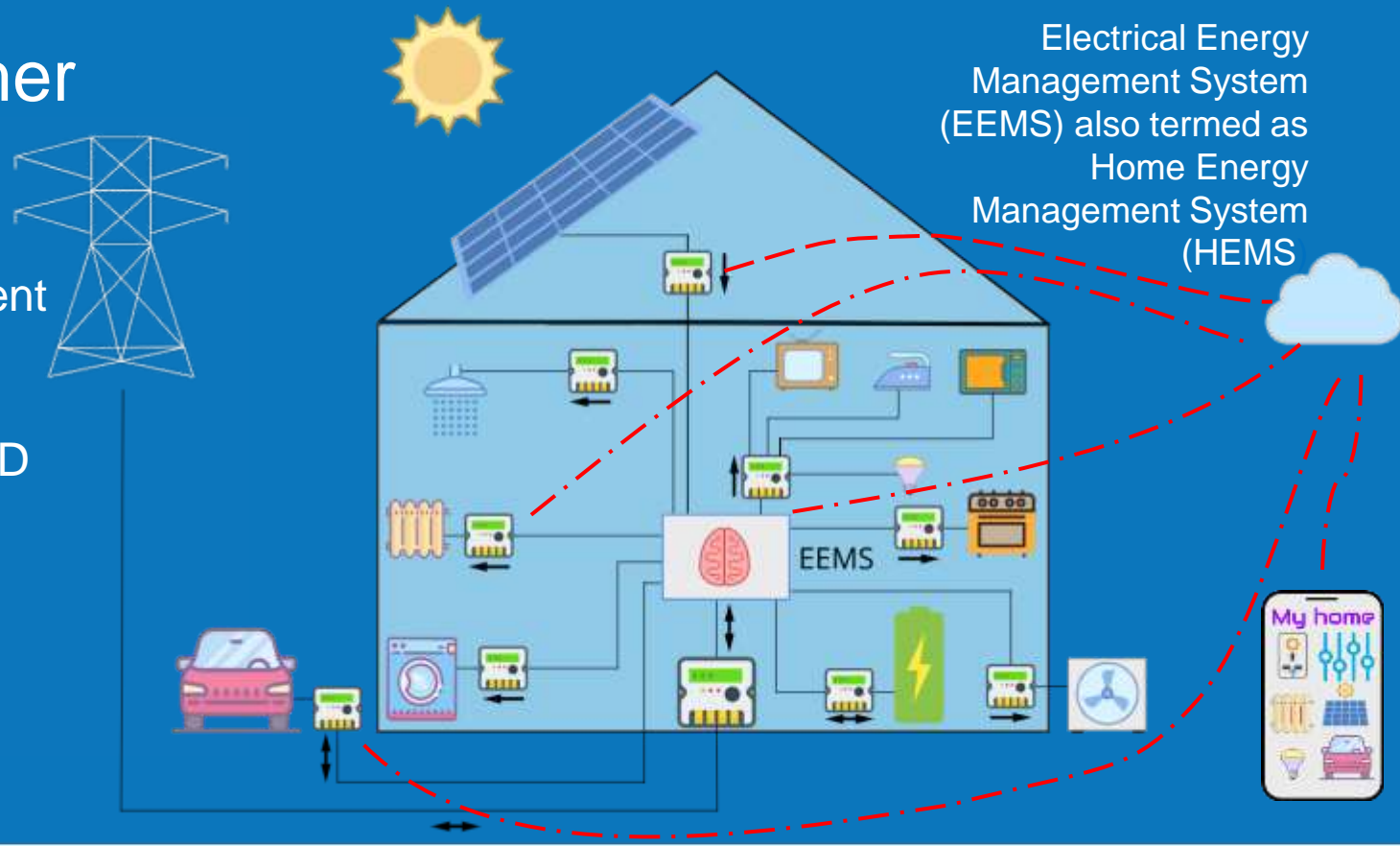
Luke Osborne  
Energy and Emerging  
Technology Solutions Advisor



# The Prosumer

- Example:
- Smart management through EEMS
- ALL ABOUT LOAD CONTROL

Electrical Energy Management System (EEMS) also termed as Home Energy Management System (HEMS)



[www.eca.co.uk](http://www.eca.co.uk)

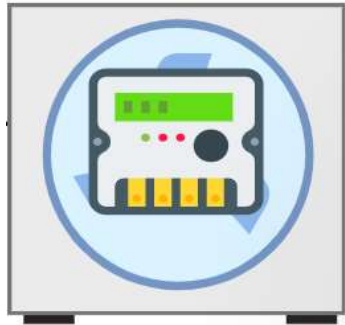
Luke Osborne  
Energy and Emerging  
Technology Solutions Advisor

# Smart Homes- integrated / compatible systems



# Control and Communication

Incorporated into equipment



[www.eca.co.uk](http://www.eca.co.uk)

Luke Osborne  
Energy and Emerging Technology  
Solutions Advisor

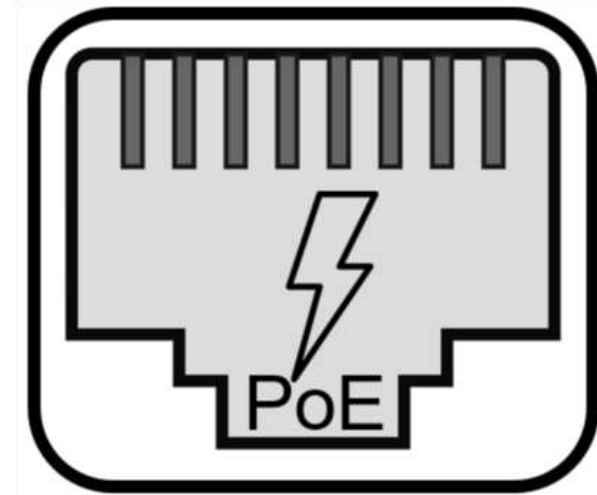
# Power over Ethernet- Is this a big deal?

- Nearly everything in our modern lives runs on DC
- **Internally converted** from AC to DC:
  - TVs
  - Audio equipment
  - LED lighting
- **Or** through 'wall-wart' and external AC-DC transformers:
  - Computers and IT equipment
  - Chargers: mobile phones, tablets, most 'gadgets'
  - Video surveillance
  - Security alarms

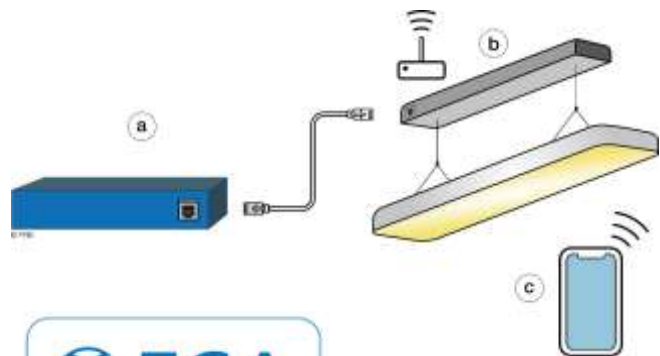
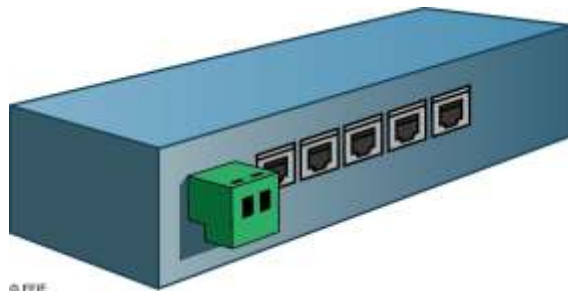
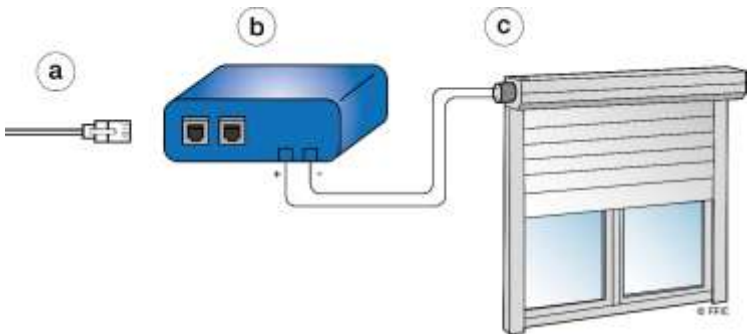


# Smart Buildings- Power over Ethernet?

- Increased Structured Data Cabling solutions (ie CAT 6)
- Power over Ethernet (PoE)
  - Now provides up to **100W** (enough for TVs, laptops, security-cameras, alarms and lighting)
  - Can power USB-C (most laptops and phones)
  - **Single cable** for power and communications
  - More **efficient** in energy use
  - Reduce resources
  - Safer (up to 57v dc)
- **Potential wiring for future buildings!**



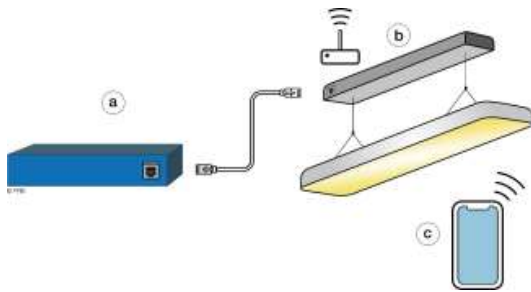
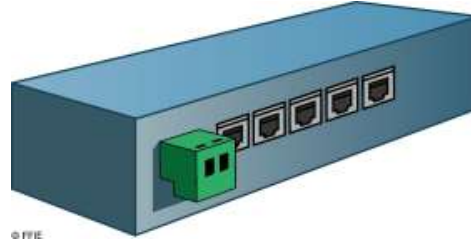
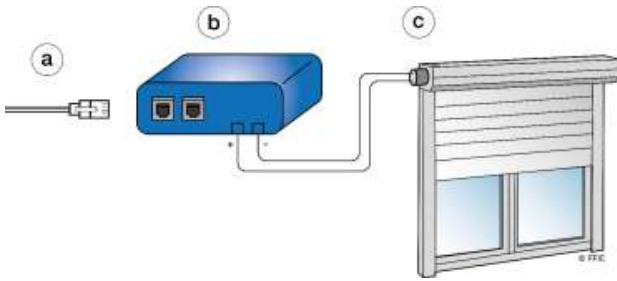
# Communication



PoE connected WiFi-point, data connection and USB charge point- (up to USB-C 90 W)

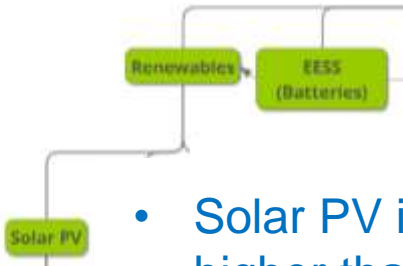


# Communication

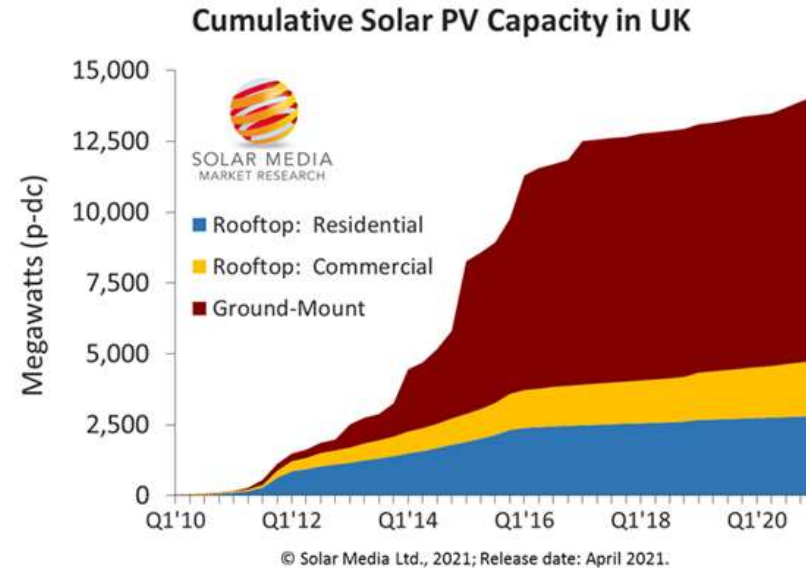


Whether PoE or other solutions, Structured data cabling will feature more within our buildings, for safe, secure and connected equipment.

# On site generation



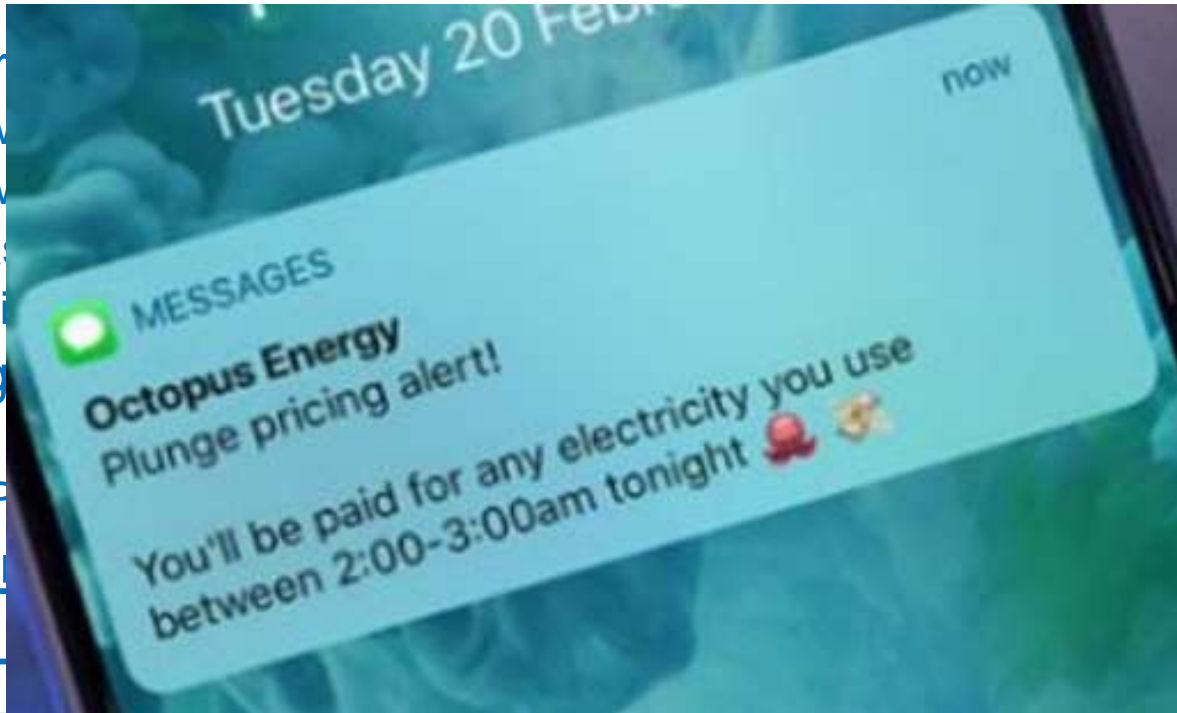
- Solar PV installations are back higher than before the Feed-In-Tariffs were abolished
- Residential and commercial **growing** 14% year on year
- Smart export guarantees (SEGs) pay for exports
- **Increasingly** specified for new builds and retrofits





# EESS (batteries)- changing user base

- Early market
  - Clients v
  - Clients v
    - Area
    - Missi
- Changing
  - Time of
  - Virtual P
- Users do
- Demand



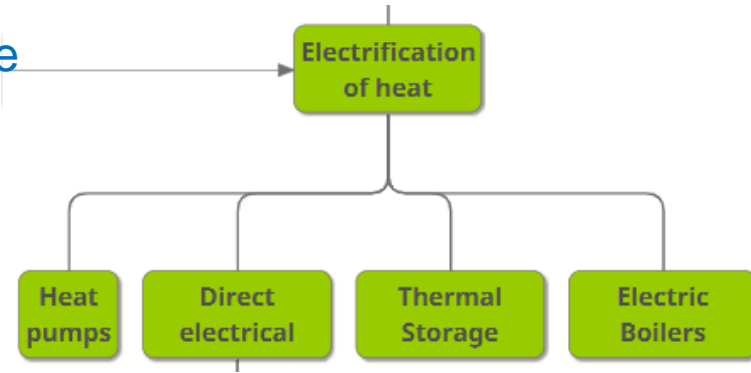
# Batteries- (EESS)

- Ever increasing options:
- Scalable systems
  - Cabinet offerings
  - Stackable systems
  - AC/DC connected



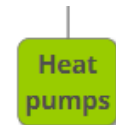
# Electrification of heat

- Top of the Governments decarbonisation program
  - We must move away from all fossil fuels
  - Hydrogen isn't the panacea
  - There are electric solutions already available



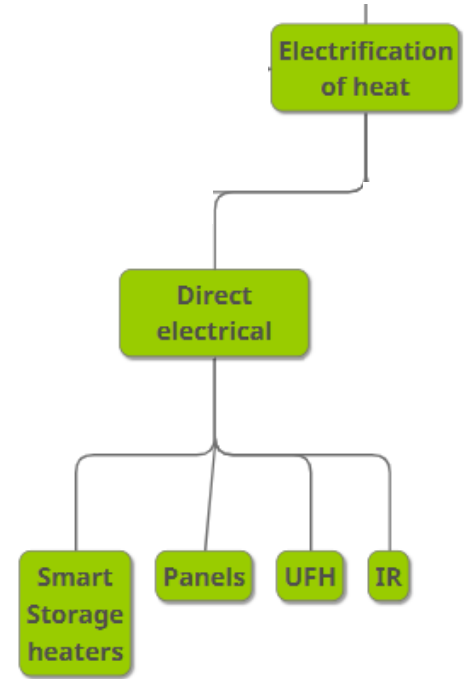
# Electrification of heat- Heatpumps

- Very efficient
  - 1kW electrical input = 3-4 kW heat output
- **600,000** to be installed **every year** by 2028
- Increasingly installed by electrical sector as trades converge
- Upfront funding will be available through the Clean Heat Grant from 2022 (will drive installations)
- **Air-to-air-heatpumps**
- Offers heating and cooling
- Simpler to install
  - No 'wet' radiator works



# Electrification of heat- Direct electrification

- Historically electric heating resulted in a worse Energy Performance Certificate (EPC) for buildings
  - due to old methods of electricity generation
- Now **favoured** through changes in building regulations assessment method
  - Takes into account our greener 'grid'
- Lower install costs
- Quicker and easier to deploy
- No harmful green house gas (F gas)



# Direct electrification of heat- examples

- Smart Storage heaters
  - Lot 20 compliant (efficiency)
  - Aid grid balancing
  - Good with flexible tariffs
- Good solution for highly insulated buildings
- Highly efficient (but not when compared to a heatpump)



# Direct electrification of heat- examples

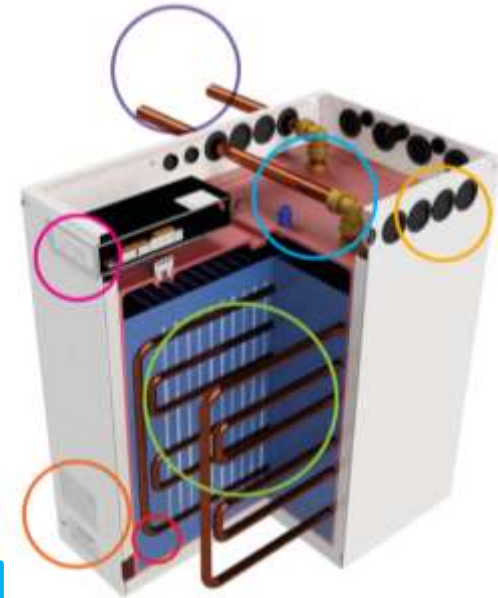
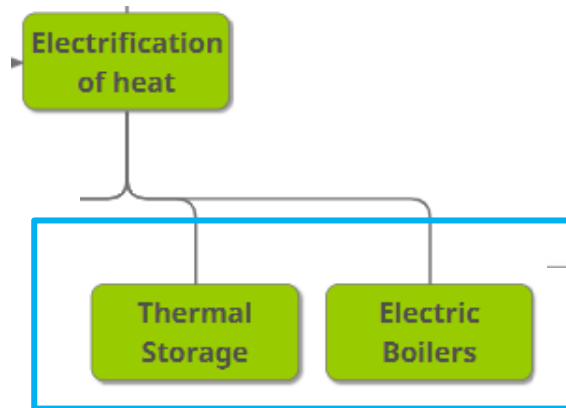
- Infra-red (IR) heating
  - Easy to deploy
    - Wall / ceiling hanging
  - Energy efficient
  - Heat the objects within a room as opposed to the air
    - Less prone to ventilation losses
  - Good solution for highly insulated buildings
  - Highly efficient



Infra-red Panel heater

# Direct electrification of heat- thermal storage and DHW

- Still need to consider domestic hot water (DHW)
- Electric boilers
  - Direct replacement for a gas boiler
- End point delivery (think Zip Water)
  - On demand solution
  - High efficiency
- Thermal storage solutions
  - Phase change materials
    - store 4x more energy than water





# Lighting- Halogen, Fluorescent and fixed lighting ban

## The Ecodesign for Energy-Related Products and Energy Information (Lighting Products) Regulations 2021

- Most halogen lamps will be **banned from sale** from September 2021
  - Expensive and in-efficient
  - HL R7s will remain available
- Traditional fluorescent lighting, common in offices will be banned from sale from September 2023
- All part to the plan to reduce energy demand
  - Zero regret part of the Net Zero Carbon solutions
  - Will cut 1.26 million tonnes of CO2
- **Expect a shift in demand from installers fitting out and upgrading commercial premises.**

# EV Chargepoints (EVCP)

- All units likely to require 'Smart' capabilities
  - Remote monitoring
  - Load control
- Open-PEN protection units
  - Integral to some EV chargepoints
  - **Additional** requirement for others
- Special cabling for data and power now available for EVCP installations



# Commercial Energy Efficiency, Power Quality and smart controls

- Focus on **efficiency**
  - Operational emissions of buildings account for 28% of global emissions
- Governments Energy Savings Opportunity Scheme (ESOS)
  - Medium sized Enterprises coming into focus (more buildings)
  - Enhanced requirements in Parts L & F of the Building regs



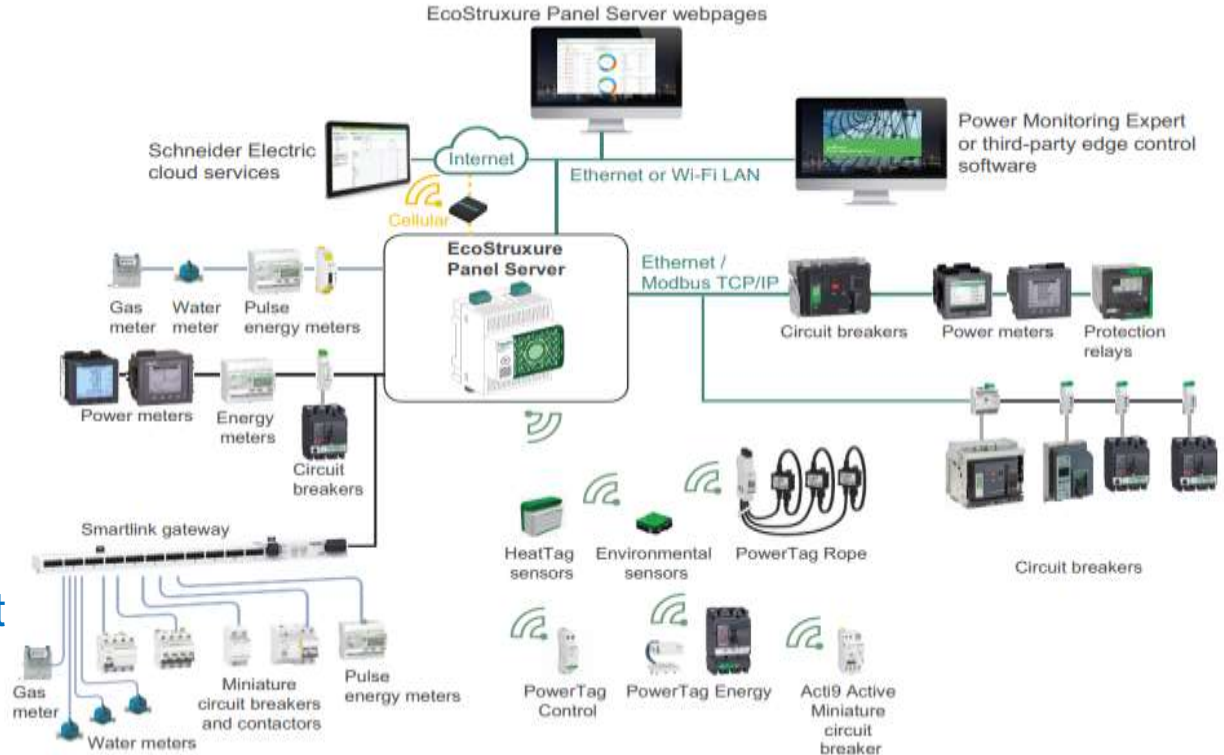
# Commercial Energy Efficiency, Power Quality and smart controls

- **Deploying:**
  - Smarter Building Automated Control Systems (BACS)
    - automation controls for more equipment:
      - Blinds
      - Lighting
      - Windows
      - Occupation of areas
    - MVHR
  - Better energy monitoring
  - Energy storage and generation
- **Replacing:**
  - Outdated and inefficient motors
  - Heating and hotwater systems
    - Including electrical and co-generation solutions
  - HVAC systems and controls
  - Lighting



# Commercial Energy Efficiency, Power Quality and smart controls

- Example system:
- Smart buildings with energy and environmental monitoring are becoming more prevalent and increasingly specified
- Benefits to environment and aiding the path to Net Zero Carbon 2050



# Commercial- Health and Wellbeing- example W-360



## The problem

90%

the average amount of time Europeans spend indoors

3000

new cases of Occupational Asthma diagnosed each year

70%

of workers say poor air quality makes them less productive



1 in 10

cases of adult onset asthmas relate to the workplace

46

minutes more sleep at night for workers in well-lit offices

66%

fall in staff performance when distracted by noise

- Part of new British standards (in development)

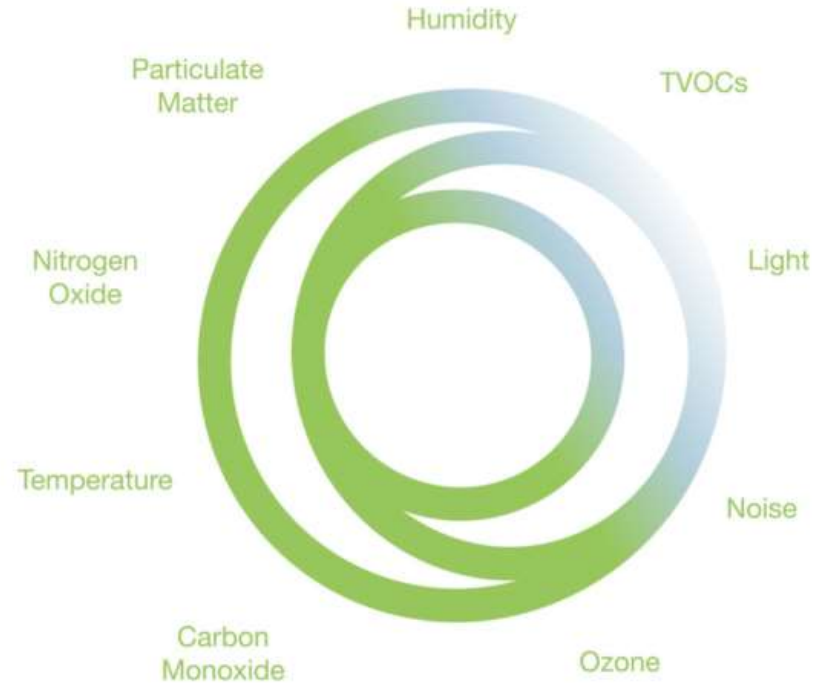
- BS 40101
- BS 40202 (parts 1 & 2)



# Commercial- Health and Wellbeing- example W-360



- Expansion of the BACS system
- **Temperature** zone monitoring
- **Lighting** levels (combat fatigue)
- **Moisture** levels (unintended consequence of high insulation and low airflow)
- **Air flow and quality** (particularly post-Covid)
  - NO<sub>x</sub>, CO, CO<sub>2</sub>, Particulates, VOC etc
- **Noise**



# Conclusion

1. The world is changing and so are the opportunities
2. There are many options available for the electrotechnical contractor and their suppliers
3. The opportunities here are not exhaustive
  - things will continue to evolve as will opportunities
4. Combinations of measures will be installed:
  - Solar PV, EESS, Heat-pumps *plus* EV, smart controls, load control
5. Retrofit works will be immense
6. ECA believe that wiring systems within a building should be considered as per of the deep retro-fit- will lead to **increased sales** of electrical materials.
7. As businesses 'pivot' to delivery of green technologies we will see increasing crossover over of trades.







# 2022



## INCA TRAIL

**SPONSOR ME**

<https://uk.virginmoneygiving.com/LukeOsborne9>

# Questions?

