Planning for a green pivot

Electrotechnical opportunities in the brave new world

ECA
Excellence in Electrotechnical & Engineering Services

www.eca.co.uk

Luke Osborne
Energy & Emerging Technology Solutions Advisor

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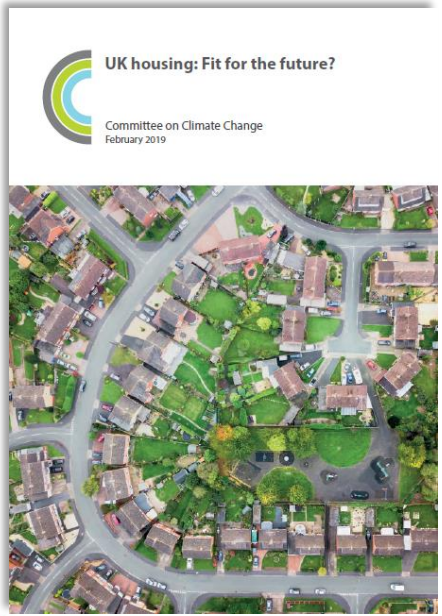
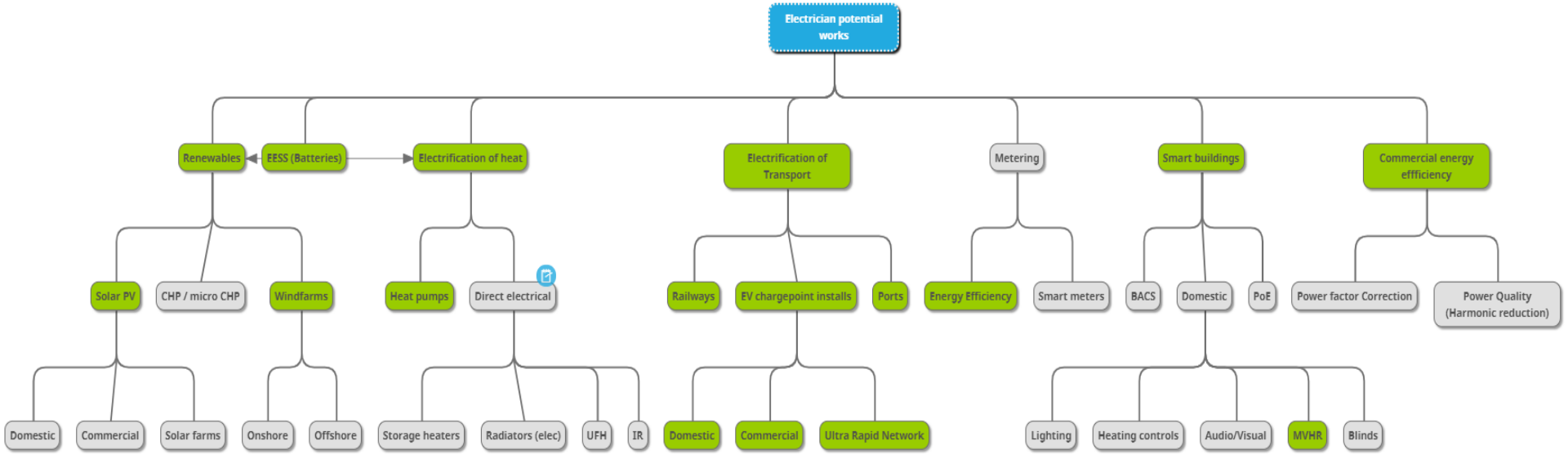
Why, When?

- UK Net Zero Carbon 2050 Commitment
- ICE sales ban 2030
- Build back better- Green recovery
- COP 26
- Starting NOW! – bulk of works must happen within the decade

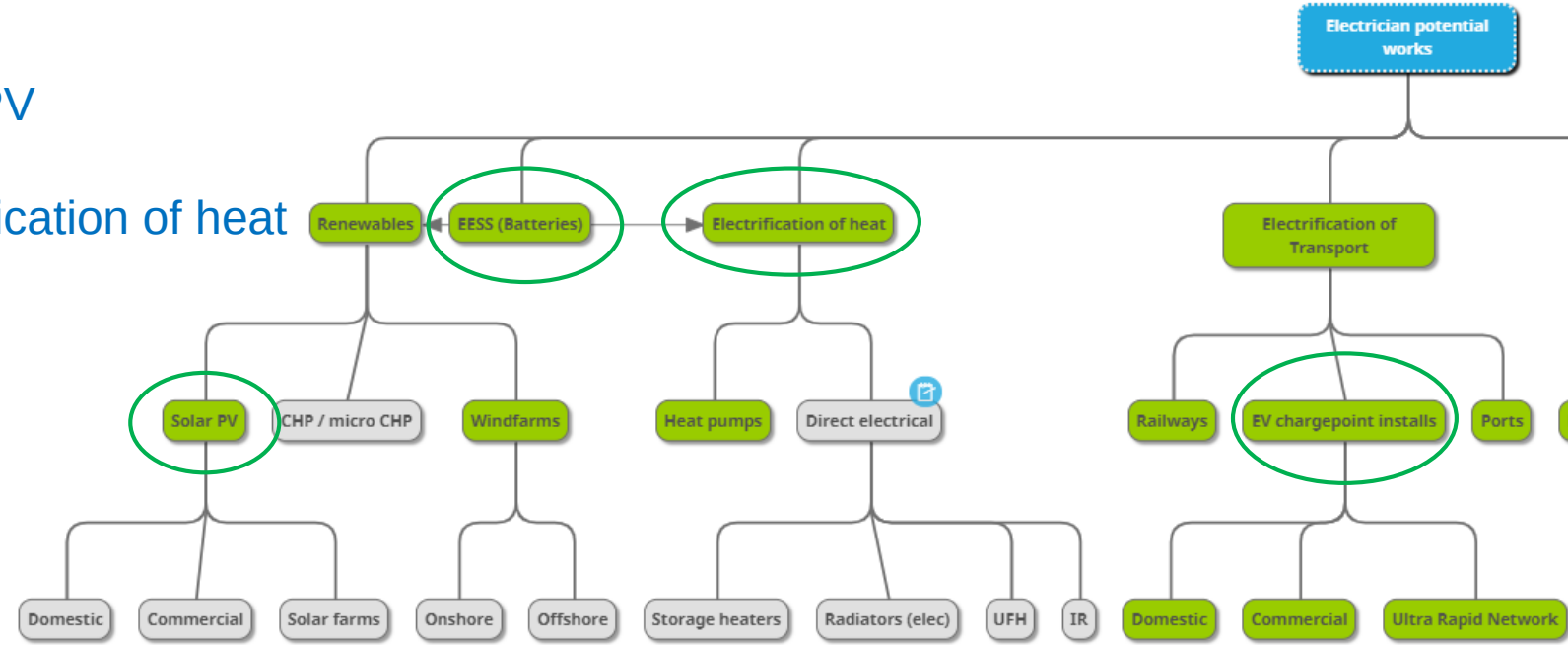


What?- Opportunities



Opportunities

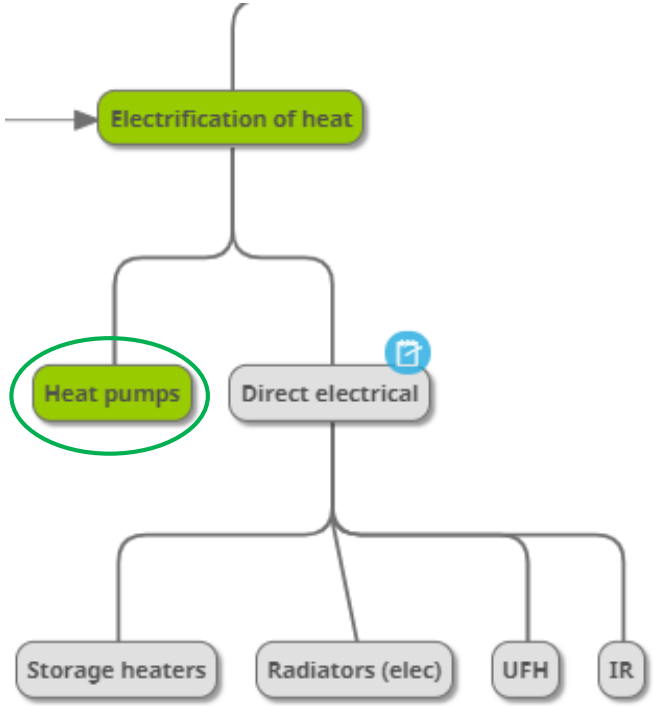
- Easy wins
  - Solar PV
  - EESS
  - Electrification of heat
  - EVCP



Electrification of heat- Heatpumps

Heatpumps

- Very efficient (SCOP 3-4)
    - i.e. 1kW of electrical input = 3-4 kW of thermal output
- Big political drive
- ~~Part of Green Homes Grant voucher scheme (£2 billion- £5000 per installation, £10,000 for vulnerable)~~
    - 600,000 installed every year by 2030
    - True M&E installation
    - Utilising ‘wet’ (traditional) heating system

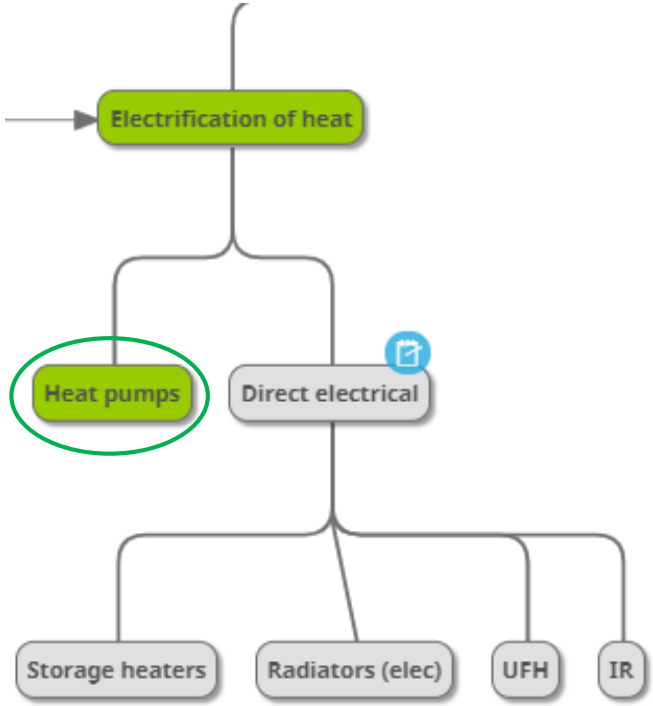


Electrification of heat- Heatpumps

Heatpumps

- What are your options?

1. Full in house installation
   -You become M&E installers
2. You partner with existing Mechanical service installers / heating engineers

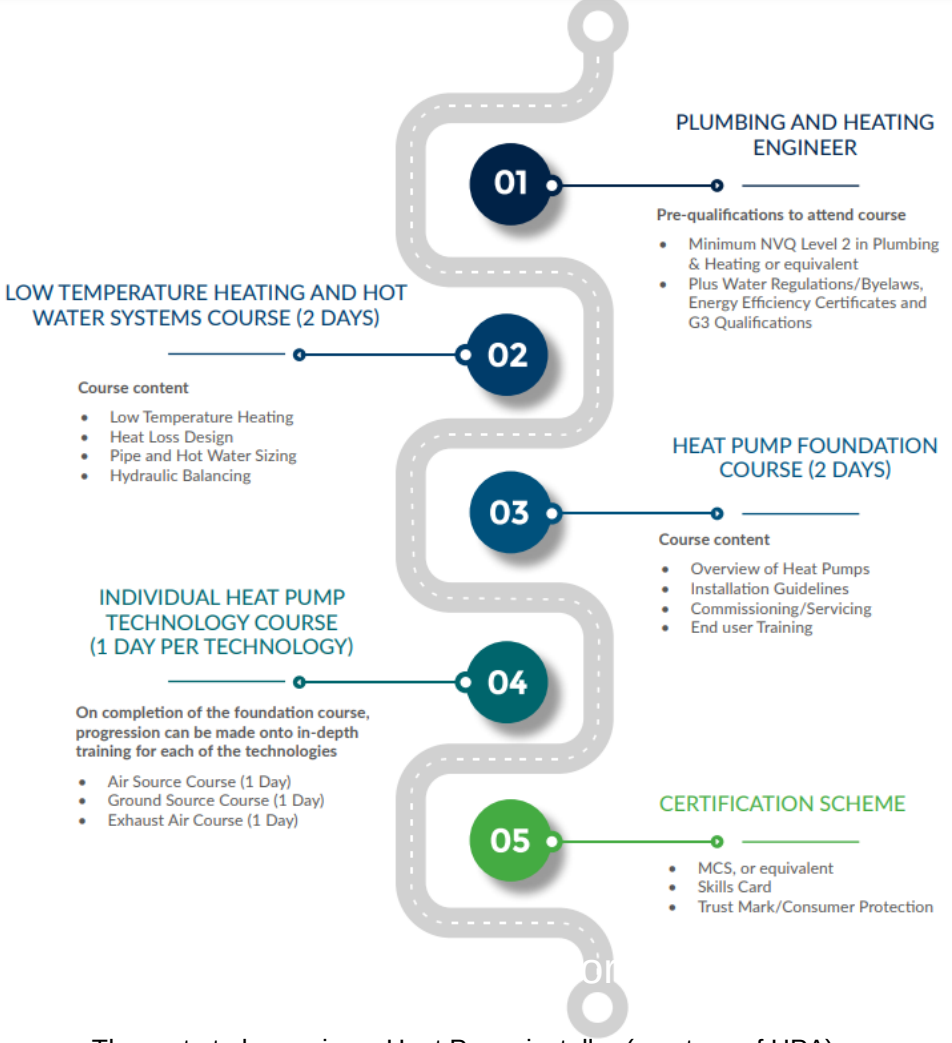


How?- Heat-pumps

Option 1:

Proposed pathway:

1. Attain NVQ level 2 (min) plumbing & heating
2. Take the technologically agnostic, CIPHE heating **design** course (2 days)
3. Take Heat-pump foundation course (2 days)
4. Take individual heat pump course (1 day ea)
5. Gain certification- (MCS or equivalent)



The route to becoming a Heat Pump installer (courtesy of HPA)

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Heat-pumps

Electrical consideration:

- Supply Capacity and condition of the service head and equipment
  - >13.8 kVA prior DNO approval required
- Power installation
- Electrical control systems- multiple sensors, pumps, weather compensation etc
- **Integration** with other system

Correct heat pump sizing design

- Key for correct operation (unlike previous ‘over sizing’)
- Whole building heat loss calcs
- Well within the capabilities of the electrical engineer- used to circuit design

- **MAINTENANCE:** All these will need maintaining- repeat business

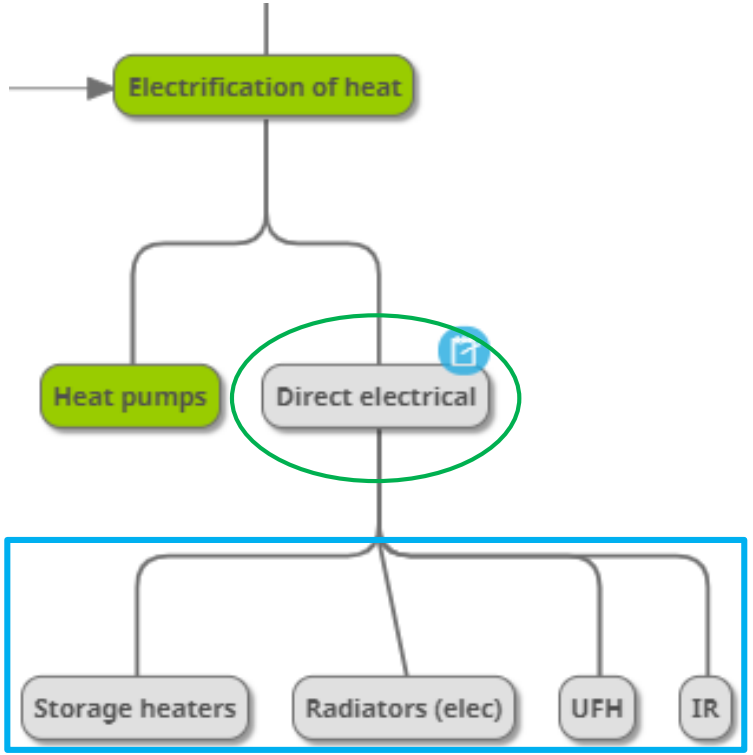
Air-to-air heat-pumps

- Offers heating and cooling
- Simpler to install
  - No ‘wet’ radiator works
  - Split system
- High SCOP values

- **Not** currently applicable for RHI

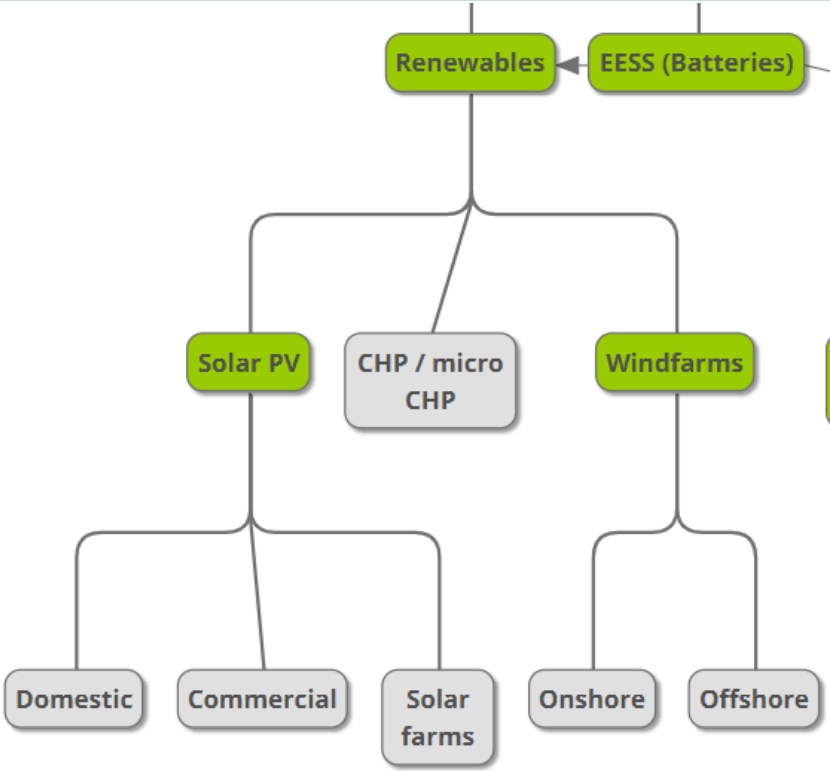
Direct electrification of heat

- Presently impeded by EPC
  - Primary Energy Factors in SAP 2012
- Building regs 2021 just released (+ FHS)
  - SAP 10.1 up to date carbon intensity figures for electricity (SAP 10.2 imminent)
  - Favours electrification of heat
- Lower install costs
- Quicker and easier to deploy
- No ‘F’ gas
- Lower embedded carbon
- Well suited to NZEB new builds



The obvious- Solar PV, EESS and Wind Farms

- Solar PV installations are back higher than before the FITs were abolished
- 175 MW installed in Q1 2021
- Smart export guarantees (SEGs) pay for exports
- Residential and commercial growing 14% year on year



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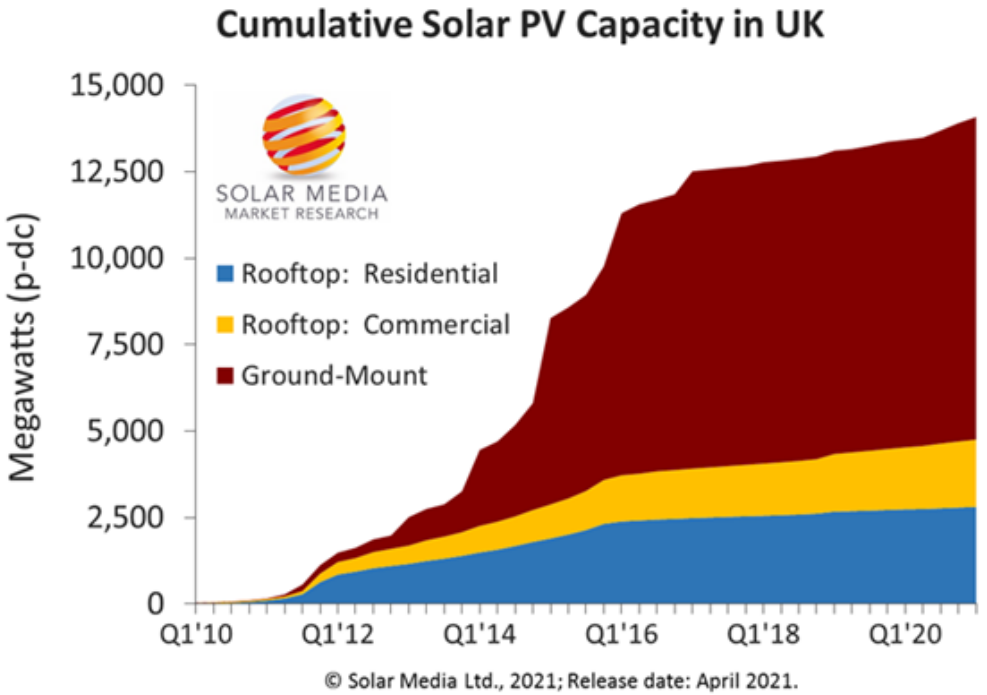


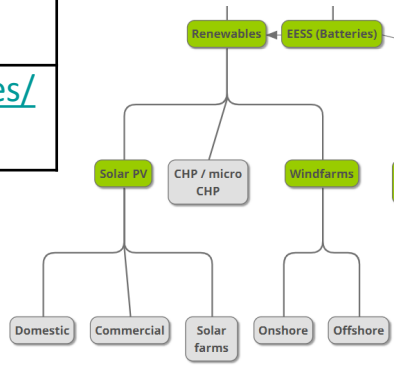
The obvious- Solar PV, EESS and Wind Farms

- BIPV- integrated, aesthetic, displace traditional roofing
- Better use of energy through Electrical Energy Storage Systems
- Windfarms
  - Expansion of offshore windfarms
  - Onshore- now allowed to compete in CfD
  - Increased grid connection works

How? - Solar PV

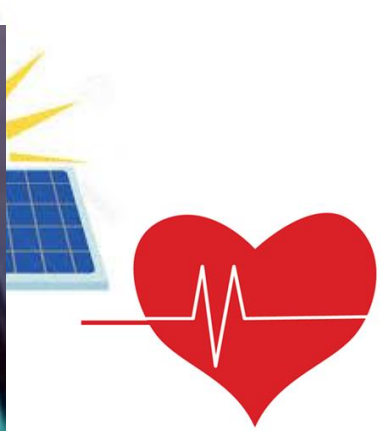
Course	Provider	Duration	URL
Solar PV installers course (EAL)	NICEIC	4 days.	http://www.niceic.com/contractor/training-courses/renewables-courses/solar-photovoltaic-(pv)
Solar PV maintenance course (NICEIC)	NICEIC	2 day	http://www.niceic.com/contractor/training-courses/renewables-courses/solar-photovoltaic-(pv)-maintenance
Solar PV installers course (BPEC)	Trade skills 4 U	5 days	https://www.tradeskills4u.co.uk/courses/bpec-solar-pv

ECA members receive a discount on NICEIC courses



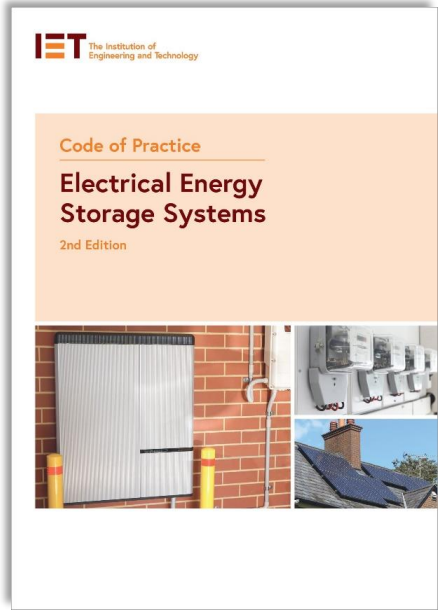
EESS- changing client base

- **Early m**
  - **Client**
  - **Client**
    - **Ar**
    - **Mi**
- **Changi**
  - **Time**
  - **Virtua Energ**
  - **Energ**



EESS- Training

- Mainly manufacturer training
  - TESLA
  - Solar Edge
  - ABB
  - Solax
- IET Code of Practice for Electrical Energy Storage Systems
- Core electrical competency



EESS- Training

- *Typical Time : 2 Days*
- *Introductory Training to Design, Installation and Commissioning of Electrical Energy Storage Systems*
- *Customer Information Pack (inc MCS MIS 3012, AceOn Presentations, Specification Information)*
- *Qualification LCL-E3010: Electrical Energy Storage Systems*
- *Anyone can be trained and upskilled for battery energy storage but will need to be a qualified electrician to* BS 7671:2018(IET Wiring Regulations Eighteenth Edition)
- *Certified by LCL Awards: Level 3 Award in the Design, Installation and Commissioning of Electrical Energy Storage Systems https://lclawards.co.uk/qualifications/rqf/lcl-awards-level-3-award-in-the-design-installation-and-commissioning-of-electrical-energy-storage-systems*
- *You only need to be MCS approved for the smart grid export, green government grants that are run through BEIS*
- *Introduction to Electrician Apprentices*

EESS- Training

www.aceongroup.com

www.gtec.co.uk

Next dates:

15th & 16th June
29th & 30th June
20th & 21st July

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EVCP

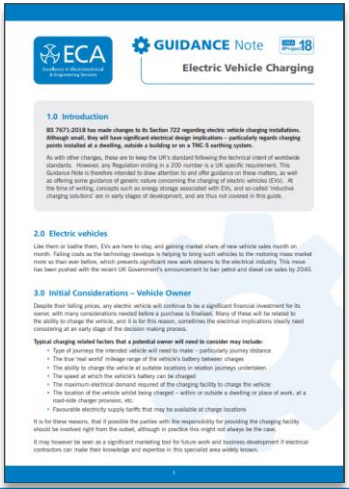
- Electric Vehicle Chargepoints
- Period of exponential growth to meet 2030 targets
- Still £350 grants available towards installation
  - Up to x40 for commercial installations
- Installer needs to have:
  - taken an EVCP chargepoint course
  - be a member of a recognised organisation (such as ECA)
  - be registered with OLEV as an EVCP installer

EVCP- courses and information

EV charging course		NICEIC	1 day	http://www.niceic.com/contractor/training/electrical-courses/electric-vehicle-charging-course
EVE course	C&G 2919-01 or EAL for final exam	Learning lounge	On-line training followed by an exam at a range of centres nationwide	https://www.learninglounge.com/spot/courses/eve/Electric_Vehicle_Charging_Equipment_Online_Course

ECA guidance:

- EV charging
- Process of registration with OLEV


ECA GUIDANCE Note 18
Electric Vehicle Charging

1.0 Introduction

BS 7671:2018 has made changes to its Section 722 regarding electric vehicle charging installations. Although small, they will have significant electrical design implications – particularly regards charging points installed at a dwelling, outside a building or on a TNC-S earthing system.

As with other changes, these are to keep the UK's standard following the technical intent of worldwide standards. However, any Regulation ending in a 200 number is a UK specific requirement. This Guidance Note is therefore intended to draw attention to and offer guidance on these matters, as well as offering some guidance of generic nature concerning the charging of electric vehicles (EVs). At the time of writing, concepts such as energy storage associated with EVs, and so-called 'inductive charging solutions' are in early stages of development, and are thus not covered in this guide.

2.0 Electric vehicles

Like them or loathe them, EVs are here to stay, and gaining market share of new vehicle sales month on month. Falling costs as the technology develops is helping to bring such vehicles to the motoring mass market more so than ever before, which presents significant new work streams to the electrical industry. This move has been pushed with the recent UK Government's announcement to ban petrol and diesel car sales by 2040.

3.0 Initial Considerations – Vehicle Owner

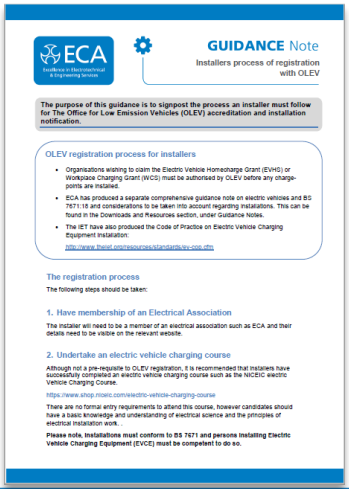
Despite their falling prices, any electric vehicle will continue to be a significant financial investment for its owner, with many considerations needed before a purchase is finalised. Many of these will be related to the ability to charge the vehicle, and it is for this reason, sometimes the electrical implications ideally need considering at an early stage of the decision making process.

Typical charging related factors that a potential owner will need to consider may include:

- Type of journeys the intended vehicle will need to make – particularly journey distance
- The true 'real world' mileage range of the vehicle's battery between charges
- The ability to charge the vehicle at suitable locations in relation journeys undertaken
- The speed at which the vehicle's battery can be charged
- The maximum electrical demand required of the charging facility to charge the vehicle
- The location of the vehicle whilst being charged – within or outside a dwelling or place of work, at a road-side charger provision, etc.
- Favourable electricity supply tariffs that may be available at charge locations

It is for these reasons, that if possible the parties with the responsibility for providing the charging facility should be involved right from the outset, although in practice this might not always be the case.

It may however be seen as a significant marketing tool for future work and business development if electrical contractors can make their knowledge and expertise in this specialist area widely known.


ECA GUIDANCE Note
Installers process of registration with OLEV

The purpose of this guidance is to signpost the process an installer must follow for The Office for Low Emission Vehicles (OLEV) accreditation and installation notification.

OLEV registration process for installers

- Organisations wishing to claim the Electric Vehicle Homecharge Grant (EVHS) or Workplace Charging Grant (WCS) must be authorised by OLEV before any charge-points are installed.
- ECA has produced a separate comprehensive guidance note on electric vehicles and BS 7671:18 and considerations to be taken into account regarding installations. This can be found in the Downloads and Resources section, under Guidance Notes.
- The IET have also produced the Code of Practice on Electric Vehicle Charging Equipment Installation:

http://www.theiet.org/resources/standards/ev-cop.cfm

The registration process

The following steps should be taken:

1. Have membership of an Electrical Association

The installer will need to be a member of an electrical association such as ECA and their details need to be visible on the relevant website.

2. Undertake an electric vehicle charging course

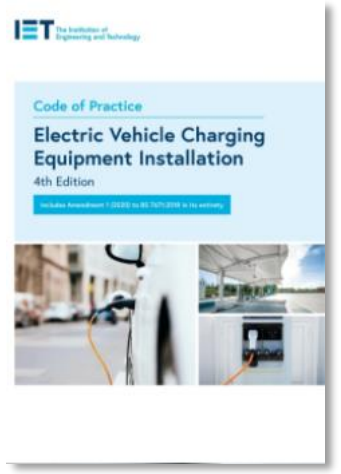
Although not a pre-requisite to OLEV registration, it is recommended that installers have successfully completed an electric vehicle charging course such as the NICEIC electric Vehicle Charging Course.

https://www.shop.niceic.com/electric-vehicle-charging-course

There are no formal entry requirements to attend this course, however candidates should have a basic knowledge and understanding of electrical science and the principles of electrical installation work.

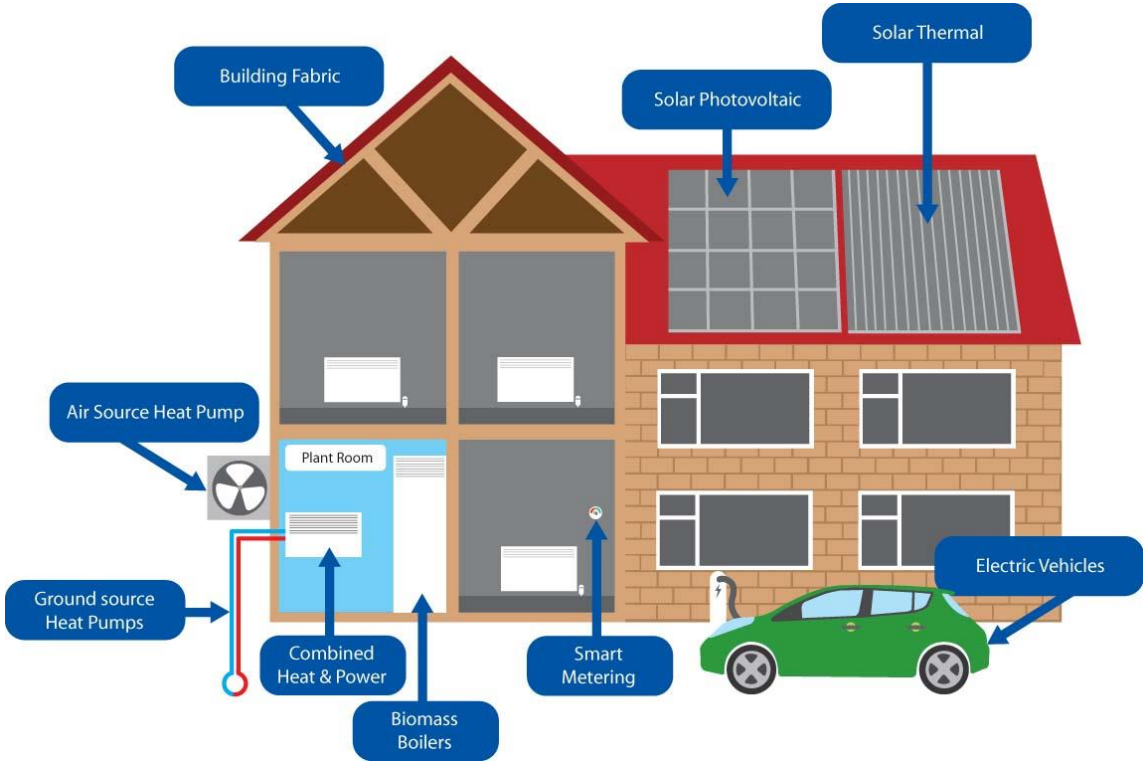
Please note, installations must conform to BS 7671 and persons installing Electric Vehicle Charging Equipment (EVCE) must be competent to do so.

IET
Code of Practice

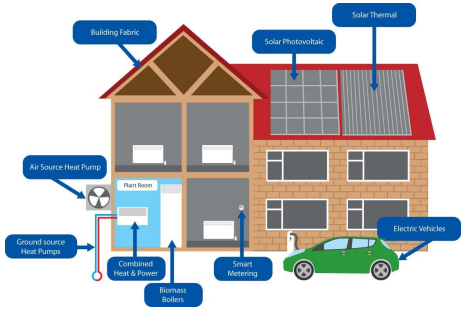


The technologies ‘integrator’

- **Smart integration:**
  - **heating controls, geo-fencing,**
  - **load shifting**
    - **Heating / cooling**
    - **EV**
    - **EESS**
    - **Other demands**



The technologies ‘integrator’



Heating & Cooling

Solar PV & Storage

Blinds and Shades

Entertainment

Electric Vehicles

Lighting

Fire and Security

Environment Control

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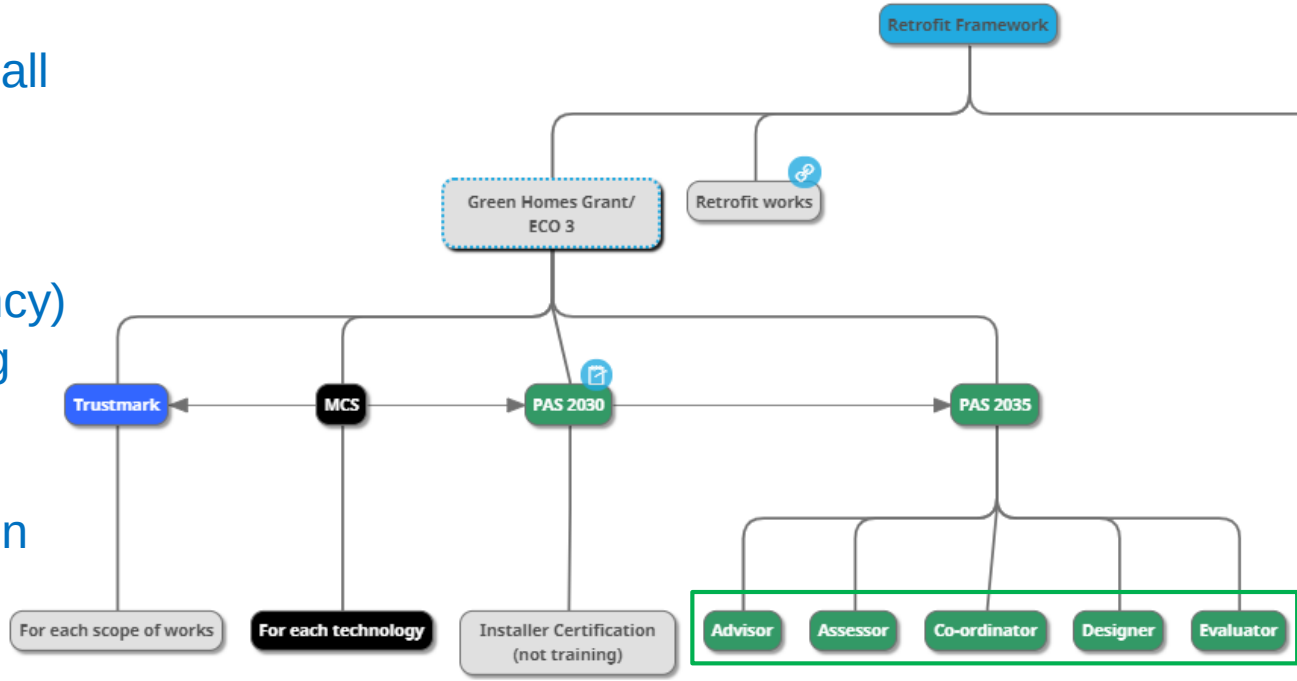
Luke Osborne

Importance of co-ordinated retrofit works

- Buzz word of the year (Covid aside)- ***holistic***
- Co-ordination prevents problems:
  - Over-heating
  - Moisture and air control (damp, VOC build up)
  - Hindrance to installations at a later date
- Must consider a ***fabric-first*** approach:
  - Reduce energy demands and carbon footprint.
  - Correct sizing for heating systems
- Benefits of combination of measures:
  - Solar PV, EESS, Heat-pumps *plus* EV, smart controls, load control
- ECA believe that **wiring systems** within a building should be considered as per of the deep retro-fit

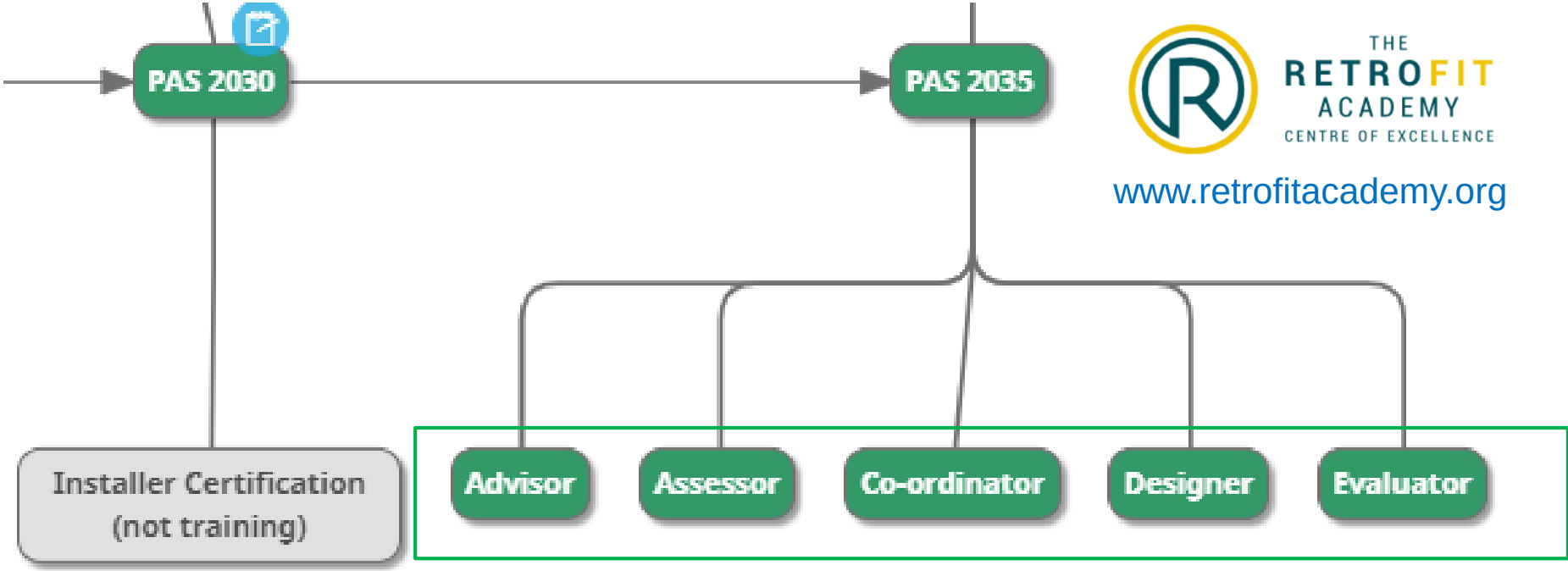
Retrofit Framework

- Likely to be required for all publically funded works
- PAS 2030 is installer certification (QMS management, competency)
- PAS 2035 is overarching framework
  - Multiple roles
  - Can be same person
- MCS- *or equivalent*



PAS 2035 roles can be performed by same person

Retrofit Framework- 6 roles



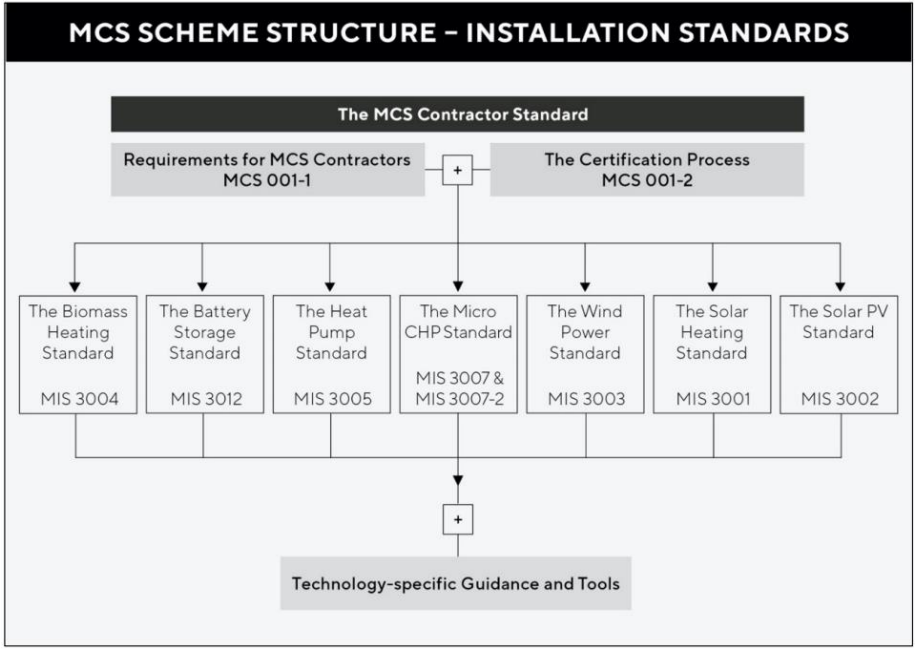
THE RETROFIT ACADEMY
CENTRE OF EXCELLENCE

www.retrofitacademy.org

PAS 2035 roles can be performed by same person

How? – MCS registration

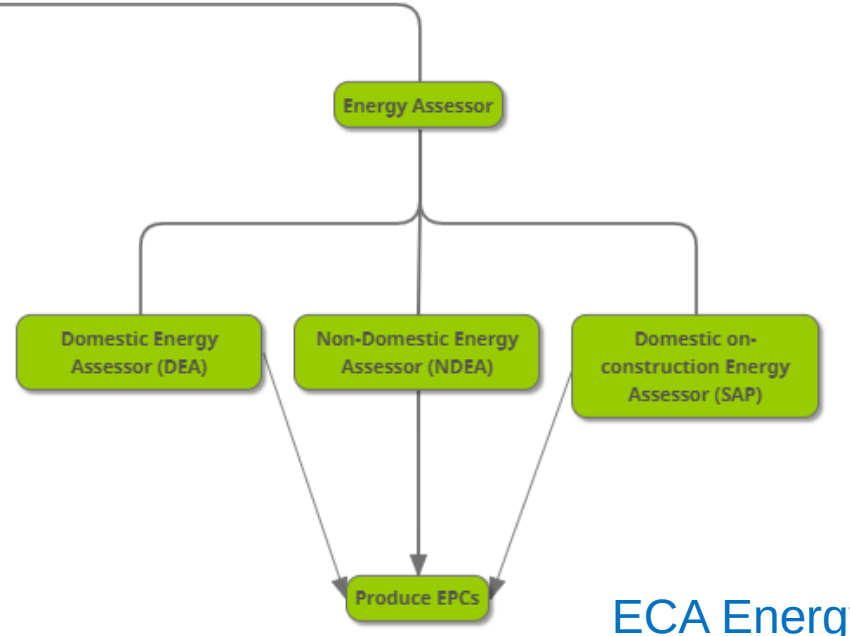
- Look at scheme requirements www.mcscertified.com
- Apply to certification body (NICEIC etc)
- Initial assessment of both office and a recent / current installation of technology being applied for
- If site corrections are requested these need to be rectified and re-assessed
- If QMS and installation are deemed conforming- MCS certification is issued



www.mcscertified.com

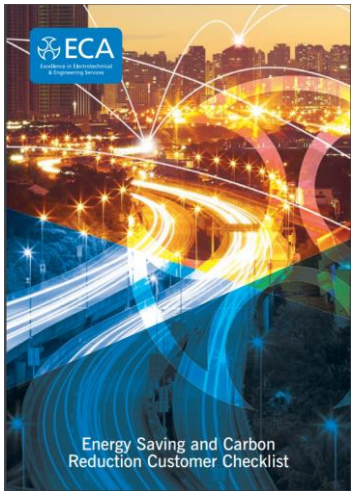
An Additional Consideration

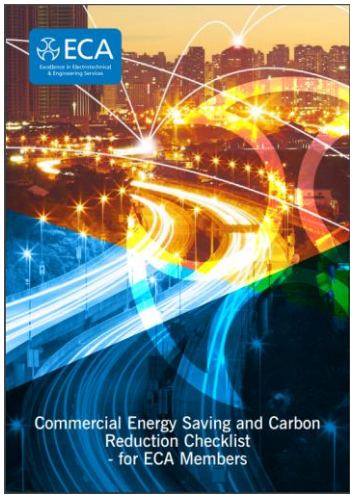
Energy Assessor Schemes and Advice



- Current assessor schemes
- Online and physical training + portfolio of assessments

ECA Energy and Carbon reduction checklists:





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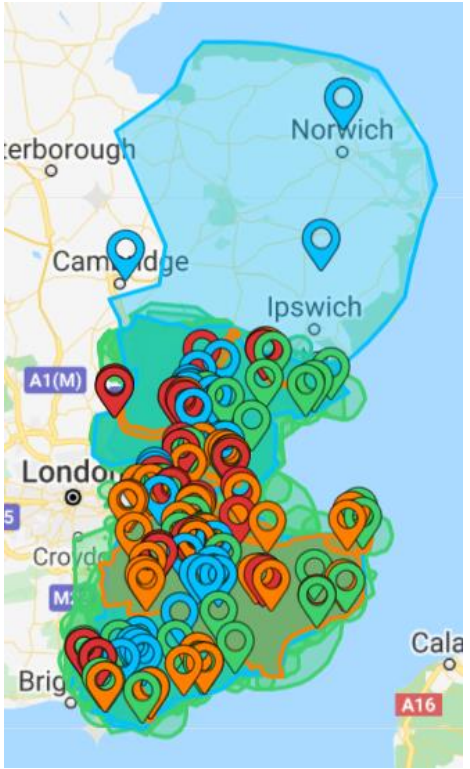
Possible funding

I-Construct

Company eligibility

- Development of a new product / service
- Free mentoring
- Grant of £1k- £20k (30%):
- consultancy, software, hardware and the creation of a new role to manage the project



Company eligibility

- Be considered as an enterprise*.
- Employ fewer than 250 people.
- Have either an annual turnover not exceeding 50m Euros
- Be located within the South East LEP

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So- what now?

1. Decide on what technologies and services you wish to offer
2. Take the relevant industry training course
3. Register with MCS mcscertified.com
4. Register with Trustmark regarding the relevant technologies you wish to install
5. If required get certified with PAS 2030 as an installer: NICEIC (for example)
6. If required get certified with PAS 2035 for various roles Retrofit Academy
7. Consider partnering for the wet heating aspect
8. Consider Energy assessment as an entry point to customers

Conclusion

- The world is changing and so are the opportunities
- There are many options available for the electrotechnical contractor
- The opportunities here are not exhaustive
  - - things will continue to evolve as will opportunities
- Future-proof your business by getting ahead of the competition

Questions?