TECHNICAL GUIDANCE NOTE

The Green Pivot- Low-carbon and energy saving opportunities for the electrotechnical contractor

Opportunities, training and accreditation for low-carbon and energy efficiency solutions

Introduction

The cost of energy, coupled with the UK's commitment to reach net zero carbon by 2050, is driving the demand for low-carbon and energy saving solutions.

Solutions include energy efficient lighting, solar and other renewables, battery storage and 'smart' energy systems. With current energy costs up to five times more than last year, return on investment in energy efficient lighting may be measured in months. The payback for other active solutions – where previously assessed at around ten years - is now two to three years.

Electrotechnical contractors are leading the way in the Green Pivot. They are tackling high energy bills for domestic and business customers, while at the same time reducing the UK's carbon emissions.

Please note:

- Funded schemes may require specific training and accreditations
- Before installing, consider how new technologies may interact and overlap with other installations

ECA wishes to identify and inform the engineering services sector and ECA Members' decisions on what represents 'fair, reasonable and good contractual practice'. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

Table of Contents

ECA wishes to identify and inform the engineering services sector and ECA Members' decisions on what represents 'fair, reasonable and good contractual practice'. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

1. What, Why, When, How?

It can be difficult for the electrical contractor to know what technologies to pursue and what training and accreditation are required. Various government incentives have changed over the years and there has been apprehension in the past, as to whether this is a secure area of focus for a business.

The current energy crisis has emphasised the focus on energy generation, usage, and reduction, with both domestic and commercial clients actively looking for solutions.

Amendment 2 of BS 7671 The Wiring Regulations now incorporates a new Chapter 82- The Energy Prosumer, highlighting how our new electrical energy systems can be configured to give energy flexibility, fit for the future. Approved Document Part L has strenghtened the requirements for energy efficiency and solar PV.

Coupled with the government's commitment to achieving Net Zero Carbon by 2050 and universal acknowledgement that the risk of inactivity in addressing climate change is an existential threat, the industry can be confident in the continued growth in demand for low-carbon and energy efficiency solutions.

This guide aims to highlight some of the key opportunities and outline how contractors can gain training and accreditation, to deliver safe, low-carbon, energy efficient solutions.

Some companies are already incorporating these activities as part of their normal business offering. Others have created a specific 'Renewable/Energy Efficiency' arm of their business. The choice is yours to make, but do make sure customers can see what you offer.

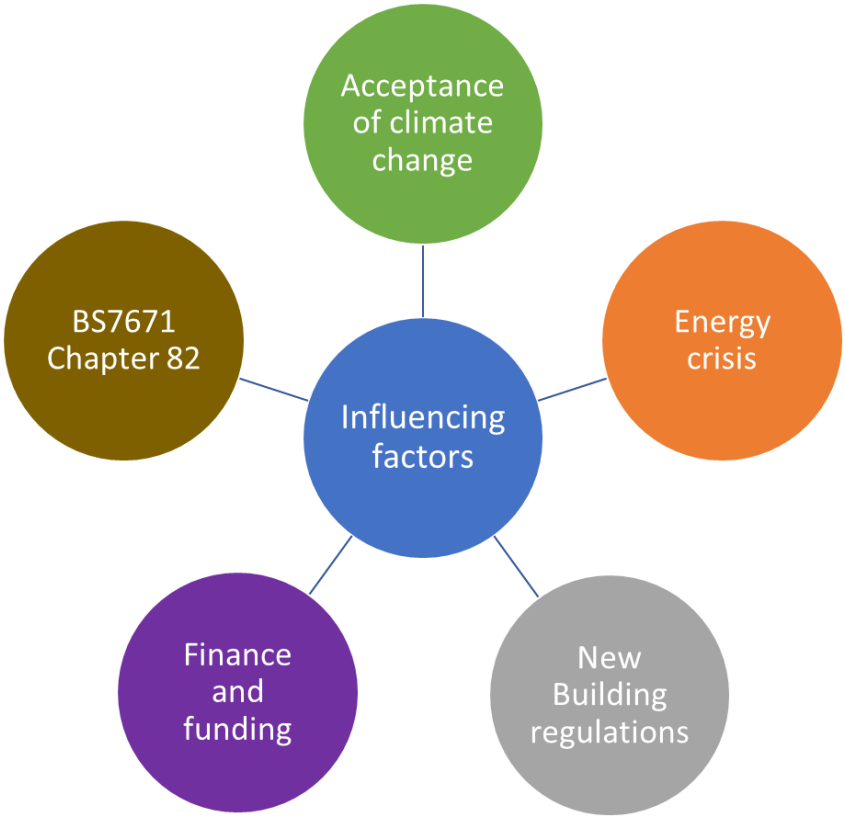


Figure 1 Influencing factors driving low-carbon and energy efficiency adoption

ECA wishes to identify and inform the engineering services sector and ECA Members' decisions on what represents 'fair, reasonable and good contractual practice'. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

2. Opportunities:

Aside from societal change, much of the work required to meet our Net Zero Carbon targets requires the skillset of the electrician. Numerous opportunities are available to the electrical contractor and many of these are depicted in Figure 1: Potential low-carbon works for the electrician.

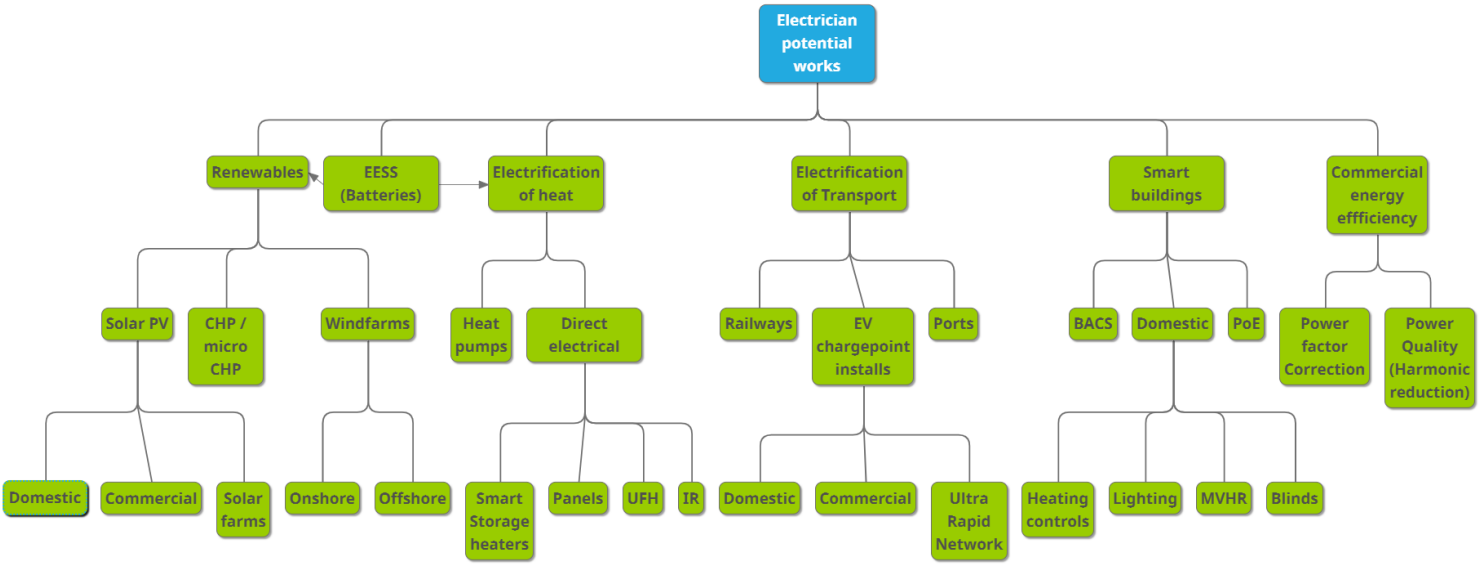


Figure 2 Potential low carbon works for the electrician

This guidance focuses on immediate areas that the electrical contractor can consider as part of their 'green pivot'. It highlights the technologies, training and certification routes and also schemes driving the adoption of these technologies.

3. Electrification of transport:

Electric Vehicles (EV)

Sales of internal combustion vehicles (ICE) will be banned in 2030. This is driving the acceraltion of electric vehicle ownership into the mainstream.

As such there will be ever-increasing demands for supportive infrastructure:

- **Electric Vehicle Chargepoint (EVCP) installations:**
  - Domestic
  - Commercial
  - local authorities
- **Ultra-rapid charging infrastructure**
  - Significant public and private funding are being put into expanding the public ultra-rapid charging infrastructure. Often this is utilising a combination of close-coupled onsite solar PV generation and EESS.
    Note: Gridserve opened the first of 100 dedicated EV charging sites planned for the next 5 years, facilitating the charging of 36 EVs at any one time, in Braintree, Essex. https://www.gridserve.com/2020/12/06/gridserve-opens-uks-first-electric-forecourt/

ECA wishes to identify and inform the engineering services sector and ECA Members' decisions on what represents 'fair, reasonable and good contractual practice'. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

ECA has produced guidance on EV chargepoint installations:

ECA Guidance on Electric Vehicle Charging Installations

ECA Guidance on Building Regulation Approved Document S

ECA/ UKPN Electric Vehicle connection process guide

Comprehensive EVCP risk assessments and checklists can be found in the Editable Certificates section of the ECA website.

Current EV chargepoint installation training courses are listed below in Table 1.

Note: City and Guilds are releasing 3 new EV charging installation training units as part of a suite of EVCP training. (C&G 2921). The first of these, 'Design and installation of domestic and small commercial electric vehicle charging installations' (2921-31) is now available.

The other two units, both relating to largescale EVCP are soon to be released:

- Design and Quality Assurance of largescale electric vehicle charging installations
- Installation and maintenance of largescale electric vehicle charging installations

Information on C&G 2921 and centres delivering the training can be found at:

https://www.cityandguilds.com/qualifications-and-apprenticeships/building-services-industry/electrical-installation/2921-electric-vehicle-charging-installations#tab=information

Rail network

The mass expansion of the full electrification of railways is expected. Currently, only 38% of the UK's rail networks are electrified (https://dataportal.orr.gov.uk/media/1842/rail-infrastructure-assets-2019-20.pdf)

Minor networks are being trialled utilising battery storage and local generation options to mitigate against the deployment of 3rd rail / overhead lines along the duration of the track.

There will be increased opportunities electrifying the rail networks.

Shipping ports

Shipping ports are responsible for more than double the CO_2 emissions created by rail networks. There will be an increase in works to electrify all UK shipping ports, many of which are currently supported through diesel and gas plants.

ECA wishes to identify and inform the engineering services sector and ECA Members' decisions on what represents 'fair, reasonable and good contractual practice'. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

4. Electrification of Heating

There is an increasing focus on moving the majority of our heating in the built environment from fossil fuels (gas/oil) to electricity. This is due to the increasingly decarbonised electrical energy system. The two main options are through heat pumps (favoured by government policy) and through direct electrification of heating.

Deployment of both should be conducted in addition to a fabric first approach to reduce the thermal demands of a building, thereby reducing the electricity demands on the network and balancing the running costs against current gas-fuelled buildings.

> *Note: Arguments exist against the use of electrification of heating due to running costs, however, the Seasonal coefficient of performance (SCOP) factor, for most heatpumps is between 3-4, meaning that for every kW of electricity required in operation, between 3 and 4 kW of heat is output, thereby cancelling this out. Reducing the thermal demand of the building through insulative measures will also reduce the heat required.*
>
> *Additionally, the supply of gas is essentially subsidised, and environmental levies are, in the main, added to the electrical component of our energy supplies. ECA and other leading trade bodies have lobbied to address this through fair taxation on our electricity system, in an open letter to the Prime Minister.*

Heat-pumps

Following the government's 10-point plan, 600,000 heat pumps will be required to be installed *every* year by 2028 leading to an exponential ramp-up in the numbers of installers of this technology over the next decade.

Heat pumps are a true mechanical/electrical (M&E) function. While it is in every sense ‘electrification of heating, in the main a lot of the installation works involve ‘wet’ skills- the plumbing and the traditional heating engineer’s skillset. There is however an abundance of electrical controls within a heat-pump installation. In addition to the electrical connection and evaluation of the suitability of the supply to the building (a pre-requisite for DNO notification of heat-pump installations), these fall within the scope and capabilities of the electrical installer.

ECA propose two options for this:

1. **Have in-house heating engineers or cross-train installers to be able to deliver the full works package.**
2. **Partner with an existing heating engineering company for the ‘wet’ works**

For option 1, the following pathway has been proposed by the Heat Pump Association (HPA) in collaboration with the Chartered Institution for Plumbing and Heating Engineers (CIPHE):

ECA wishes to identify and inform the engineering services sector and ECA Members’ decisions on what represents ‘fair, reasonable and good contractual practice’. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

1. Attain NVQ level 2 (min) plumbing and heating. (16-week course)
2. Take the technologically agnostic, CIPHE heating design course (2 days)
3. Take the heat-pump foundation course (2 days)
4. Take individual heat pump course (1-day ea)
5. Gain certification MCS or equivalent

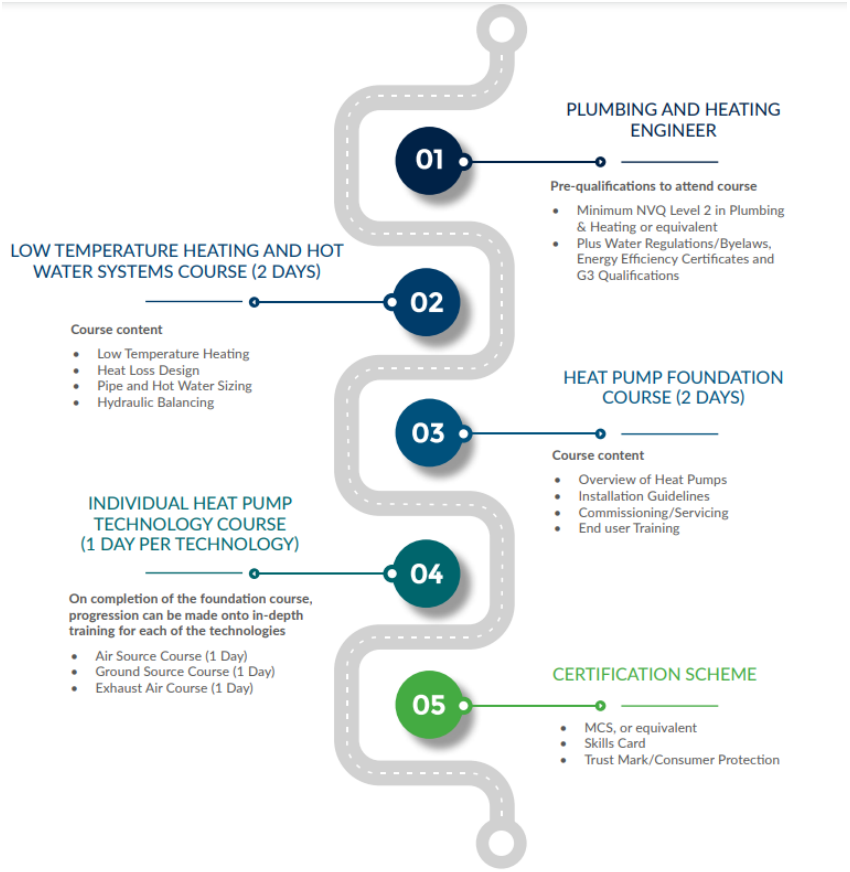


Figure 3 The Route to Becoming a Heat Pump Installer (courtesy of HPA)

Whilst this may be an option for some, partnering up with an existing heating installer/company may prove the easiest route.

Heatpump design

For heat pumps to operate correctly and efficiently, they must be designed accordingly. Historically heating systems were simply oversized to their application, to ensure that there was adequate output. This can no longer occur. As such whole building heat loss calculations must be carried out to ensure that the right-sized heat pump is installed and also that the right-sized heat emitters are used in each room. (Bringing down the thermal demand for the building is key and is why a fabric-first approach should be adopted for all retrofit works).

The electrical engineer is well placed to be able to take on the design side of a heat-pump installation as they are used to the methodology of circuit design. As such the CIPHE heating design course may be something to consider. Further information on heating design can be found in the CIBSE Domestic Heating Design Guide (imminent release of updated version due).

Due to the sheer number of heat pumps intended to be installed to meet our Net Zero Carbon 2050 commitment, the UK will need involvement from both the traditional heating sector and electricians. It is also envisaged that the industry may see an increase in multi-disciplined installers. There is certainly scope for developing Low Carbon Solutions companies or ‘arms’ of existing contracting companies, solely focusing on offering the whole gamut of ‘green technology’ installations.

ECA wishes to identify and inform the engineering services sector and ECA Members’ decisions on what represents ‘fair, reasonable and good contractual practice’. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

ECA has guidance on the changes to the Domestic Low-Carbon Heating Funding Scheme, the Boiler Upgrade Scheme, which provides £5000 and £6000 towards the installation of Airsource Heatpumps (ASHP) and Groundsource Heatpumps (GSHP) respectively.

ECA Technical Bulletin on Changes to Domestic Low-Carbon Heating Funding

Direct Electrification of heat

Often overlooked, the direct electrification of heat can offer a good solution for low-carbon heating.

For well-insulated new buildings (such as those conforming to NZEB or PassivHaus standards) and buildings that have been extensively retrofitted, direct electrification of heat- such as electric underfloor heating (UFH), electric panel heaters and infra-red (IR) heaters offer a low-cost solution. Benefits include low product cost, low installation cost and less disruption during installation to the end-user.

Smart Storage Heaters are another solution for many properties and can work with various time-of-use (ToU) tariffs, offering the ability to 'charge' during off-peak times, which can also benefit DNOs through grid balancing.

> *Note: Previous building regulations relied on **SAP 2012** data, which penalised electric heating due to outdated embedded carbon factors (Primary Energy Factor) of the electricity network. However, newly released Building Regulations Approved Documents Parts L and F cite that the latest version of SAP, **SAP 10.2**, is now to be used which have current embedded carbon factors. This now favours the electrification of heating.*

5. Solar PV & EESS

Solar PV

The current energy crisis is leading to a surge in enquiries from customers keen to cut their imported energy costs. Onsite energy generation and storage are obvious technologies, with the latter also allowing customers to take advantage of time-of-use (ToU) tariffs. Time-of-use tariffs are offered by energy suppliers, to encourage uptake of 'off-peak' electricity and to discourage energy use during peak periods.

The UK Solar PV market had experienced a bumpy ride over the past decade but has gone from virtually none existent to having very visible deployment nationwide.

Since the ending of Feed-in-tariffs (FITs) in 2019, the industry has bounced back to a stable position and solar PV is being included in most new-build and retrofit projects, bolstered by changes in the 2021 amendments to the Building Regulations Approved Document- Part L.

Building Integrated PV (BIPV) is now the preferred installation method for new-build properties, being embedded within the roof, providing increased aesthetics, reducing the consideration for snow and wind loading as well as displacing materials and associated costs from traditional construction. For retrofit installations either rail mounted or BIPV are common.

ECA wishes to identify and inform the engineering services sector and ECA Members' decisions on what represents 'fair, reasonable and good contractual practice'. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

Smart Export Guarantees (SEGs) now exist, offering payments to the user for any energy exported. These average around 5ppkWh, but can be as high as 11ppkWh. Solar Energy UK provides an up-to-date league table of SEG rates on offer. However, the use of Electrical Energy Storage Systems (EESS)- batteries allow generators to make better use of their generated energy.

Solar PV along with certain other energy-saving measures now qualify for **0% rated VAT**.

Innovative group buying schemes are emerging, such as SolarTogether, which works with local councils, to offer their constituents well-priced solar PV and EESS systems. Installers can register as a sub-contractor through the following link: Installers for Solar Together Application

Amendment 2 of BS 7671 The Wiring Regulations includes extensive changes in section 712 Solar Photovoltaic (PV) Power Supply Systems. These are outlined in:

ECA Technical Bulletin: 712 Solar Photovoltaic (PV Power Supply Systems)

The IET Code of Practice for Grid-connected Solar Photovoltaic Systems (2015) is also available.

Several Solar PV training courses are available, and these are listed in Table 1

Electrical Energy Storage Systems (EESS)

As mentioned above EESS allow clients to better utilise their on-site generation. Whilst in the past this was the sole driver for EESS installations, the increasing offerings of time-of-use (ToU) tariffs from energy suppliers, allow users to buy energy when it is discounted, or in some instances be paid to take up excess grid capacity. This can facilitate lower running costs of a property, but the energy can also be sold back to the grid during periods of high demand, at a higher price- thereby enabling 'gaming' and driving adoption.

Further information on the interaction of energy generation, storage and efficiency through the 'Energy Prosumer' model can be found in the ECA Guide on BS:7671 Chapter 82 The Energy Prosumer

The IET the second edition of the Code of Practice for Electrical Energy Storage Systems (December 2020), contains up-to-date information on design, installation and configurations. Members intending on installing EESS are advised to familiarise themselves with this publication.

An MCS accredited LCL Level 3 award in the Design, Installation and Commissioning of Electrical Energy Storage Systems training course is now available.

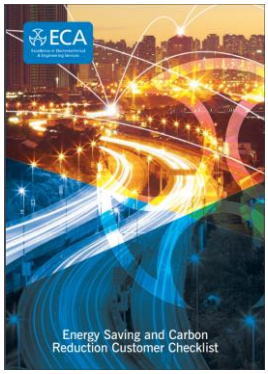
- **EESS qualify for 0% rated VAT when installed as part of a new Solar PV system**
- **This does not currently qualify for retrofitted or standalone EESS**

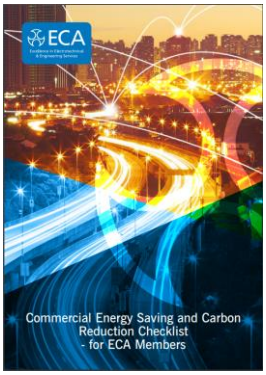
ECA wishes to identify and inform the engineering services sector and ECA Members' decisions on what represents 'fair, reasonable and good contractual practice'. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

6. Energy Efficiency

It is also worth considering energy efficiency training as clients are becoming aware of the need to reduce their energy consumption and the electrical contractor can be key to identifying and facilitating some of this. This could provide a useful conversation piece with clients, potentially leading to additional work.

ECA has produced two checklists available for members and clients to aid with these decisions:





https://www.eca.co.uk/business-industry-support/energy-environment/energy-efficiency-technologies/energy-efficiency-checklists

However, you may wish to have accredited services that to offer in this regard. Courses such as the **Domestic Energy Assessor (DEA), Non-Domestic Energy Assessor (NDEA)** can prove useful, as well as being able to offer **EPC**s.

Training links are provided in Table 1. Low Carbon Technology and Assessment Courses

Power Quality

Commercial entities can likely benefit through power quality analysis. This can identify where power factor correction may be required, in addition to any harmonic distortion and where voltage optimisation may be beneficial.

Power factor correction

Where the active (real) and reactive power are not aligned, the apparent (total imported) power, will be greater than that actually required for the operation of the building. This results in wasted power and avoidable additional costs. Through power factor correction, the reactive power and related charges can be reduced.

Voltage optimisation

Although aligned with the mainland Europe single-phase Voltage of 230V, the actual voltage supplied can be between 207 and 253V (-6/+10%). Most electrical equipment has a wide tolerance range enabling it to operate within 220-250V. In some instances, reducing the incoming supply voltage can reduce energy usage as well as prolong the life of the electrical equipment (LED drivers in particular). However, it is worth bearing in mind, that for resistive heating (panel heaters, kettles, electric ovens), reducing the voltage will increase the amount of time required to deliver the equivalent heat output.

ECA wishes to identify and inform the engineering services sector and ECA Members' decisions on what represents 'fair, reasonable and good contractual practice'. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

Members may wish to employ the services of specialists or undertake training themselves. These specialist companies can provide the analysis and reports required to understand the client's needs.

Specialist companies include:

EnergyAce

Power Quality Expert

Chauvin Arnoux

7. Low Carbon Technology and Assessment Courses

The table below shows a selection of current low carbon technology installation courses along with retrofit (PAS2035) and energy assessor courses that are available. *(Note these are subject to change).*

Table 1 Low Carbon Technology and Assessment Courses

Course	Code	Provider	Remarks	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 (EAL)		Focus Training	5 days	https://www.thefocustraininggroup.com/courses/electrical-1/level-3-award-in-the-installation-of-small-scale-solar-photovoltaic-systems
Solar PV installers course (BPEC)		Trade Skills 4 U	5 days	https://www.tradeskills4u.co.uk/courses/bpec-solar-pv
Electrical Energy Storage Systems (EESS) (LCL)	LCL-E3010	GTEC	2 days(note: a mobile training rig is available for training onsite- min 8 persons)	https://gtec.co.uk/gtec-training-courses/renewable-training-courses/battery-storage-training-course/
Solar thermal hot water		NICEIC / EAL	3 days	http://www.niceic.com/contractor/training-courses/renewables-courses/solar-thermal-hot-water
Heat-pumps		NICEIC / EAL	4 days (more focused at heating and plumbing engineers)	http://www.niceic.com/contractor/training-courses/renewables-courses/heat-pumps

ECA wishes to identify and inform the engineering services sector and ECA Members' decisions on what represents 'fair, reasonable and good contractual practice'. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

Course	Code	Provider	Remarks	URL
Domestic Ventilation		NICEIC	2 day. Useful information for installers- inc MHVR	http://www.niceic.com/contractor/training/health-and-safety-courses/domestic-ventilation.aspx
EV charging course		NICEIC	1 day	http://www.niceic.com/contractor/training/electrical-courses/electric-vehicle-charging-course
EV charging Point installers course	C&G 2921-31	Trade skills for U		https://www.tradeskills4u.co.uk/courses/2921-31-ev-charging
Learning lounge 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
EV charging point installers course	C&G 2919-01	Focus Training	2 days	https://www.thefocustraininggroup.com/courses/electrical-1/city-guilds-2919-01-electric-vehicle-charging
EV charging course	NICEIC EV charging	Focus Training	1 day	https://www.thefocustraininggroup.com/courses/electrical-1/niceic-electric-vehicle-charging
PAS2030 Installer Scheme		NICEIC	Certification scheme for the PAS2030 standard. NOT A TRAINING Course.	https://www.niceic.com/join-us/pas-2030-installer-scheme
PAS2035 Retrofit Coordinator Training			Various training options	https://www.retrofitacademy.org/retrofit-coordinator/
PAS 2035 Assessor training (classroom)		Elmhurst Energy	2 days	https://www.elmhurstenergy.co.uk/training-calendar?eventSearch=Retrofit+Assessor+Training
PAS 2035 Assessor training (online)		Energy Trust		https://www.energy-trust.co.uk/training-courses/32-retrofit-assessor-distance-learning-2-day/
Domestic Energy Assessor (DEA)		Elmhurst Energy	5 days (class room) 3 days (live online) 3 days online + 2 days classroom (hybrid))	https://www.elmhurstenergy.co.uk/training/domestic-energy-assessor-dea-training
Non-Domestic Energy Assessor (NDEA)		Elmhurst Energy	4 days (Level 3) 5 days + (Level 4 & 5)	https://www.elmhurstenergy.co.uk/training/non-domestic-energy-assessor

ECA wishes to identify and inform the engineering services sector and ECA Members' decisions on what represents 'fair, reasonable and good contractual practice'. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

Course	Code	Provider	Remarks	URL
Power Quality Training		Power Quality Training		https://powerqualitytraining.com/

Additional free online training on various aspects of energy efficiency is provided through the ***Schneider Energy University.*** *https://www.schneideruniversities.com/ This is a useful resource and covers a variety of solutions. It is free to register and to use and the solutions presented are manufacturer specific.*

8. Grants and schemes

Public Funded Works

Publicly funded works such as those under ECO 4 or delivered through local authorities are likely to require works to be delivered under the PAS2035 framework.

The installer is required to have the following registration/certification in order to tender for and install under such schemes:

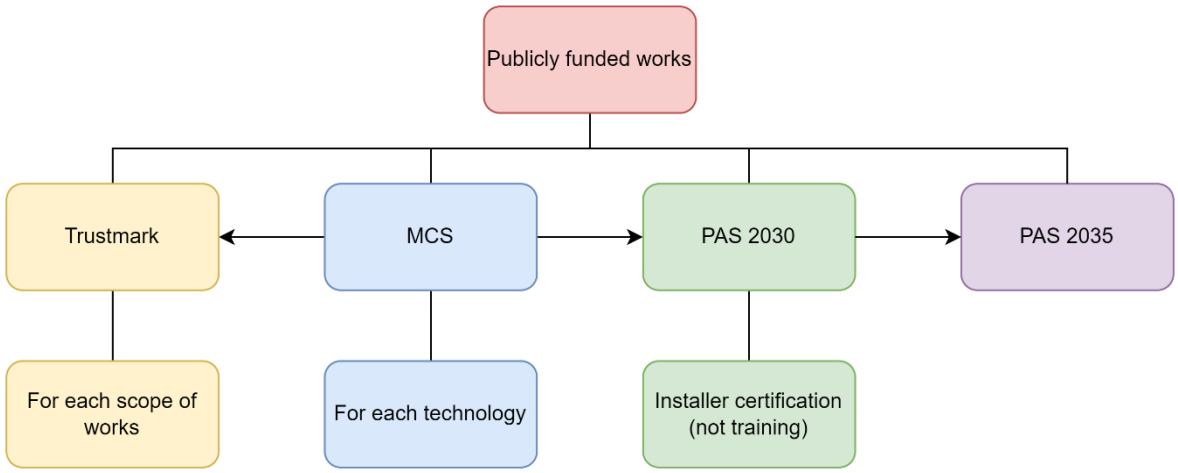


Figure 4 Retrofit Framework Structure

- **Trustmark** registration for types of works being installed
  - (ECA members can obtain TM for **electrical** works. Specific technologies (such as PV), will need additional registration once training and certification has been attained)

- **Microgeneration Certification Scheme** (MCS) registration for each type of technology being installed:
  - Solar PV
  - Solar Thermal
  - Heat pumps (ASHP / GSHP)
- Certified under PAS 2030 (2019+A1:2022)

ECA wishes to identify and inform the engineering services sector and ECA Members' decisions on what represents 'fair, reasonable and good contractual practice'. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

- Certified under PAS 2035: (2019+A1:2022) (for installations on park homes, high rise buildings (HRBs) and buildings that are both traditionally constructed and protected)

MCS Certification

Whilst the requirement for MCS certification came into question following the demise of the Feed-in-Tariffs, ECA deems merit in attaining certification with the scheme for the following reasons:

- Requirement for the client to obtain Smart Export Guarantee (SEG) from solar PV, wind and micro-CHP up to 50kW.
- Requirement for installations installed under PAS 2030 / PAS2035
- Requirement for installations installed under most publically funded schemes

(Note: for all the above schemes equivalent to MCS may be considered. At this moment in time the only alternative is Flexi-orb, which offers similar certification to MCS but may not be recognised by all energy suppliers.)

MCS Installation Standards

The installation standards of MCS are split into core requirements and certification along with standards to each relevant technology, as shown in Figure 5 MCS Scheme Structure.

All scheme documents are freely available from the MCS website.

https://mcscertified.com/standards-tools-library/

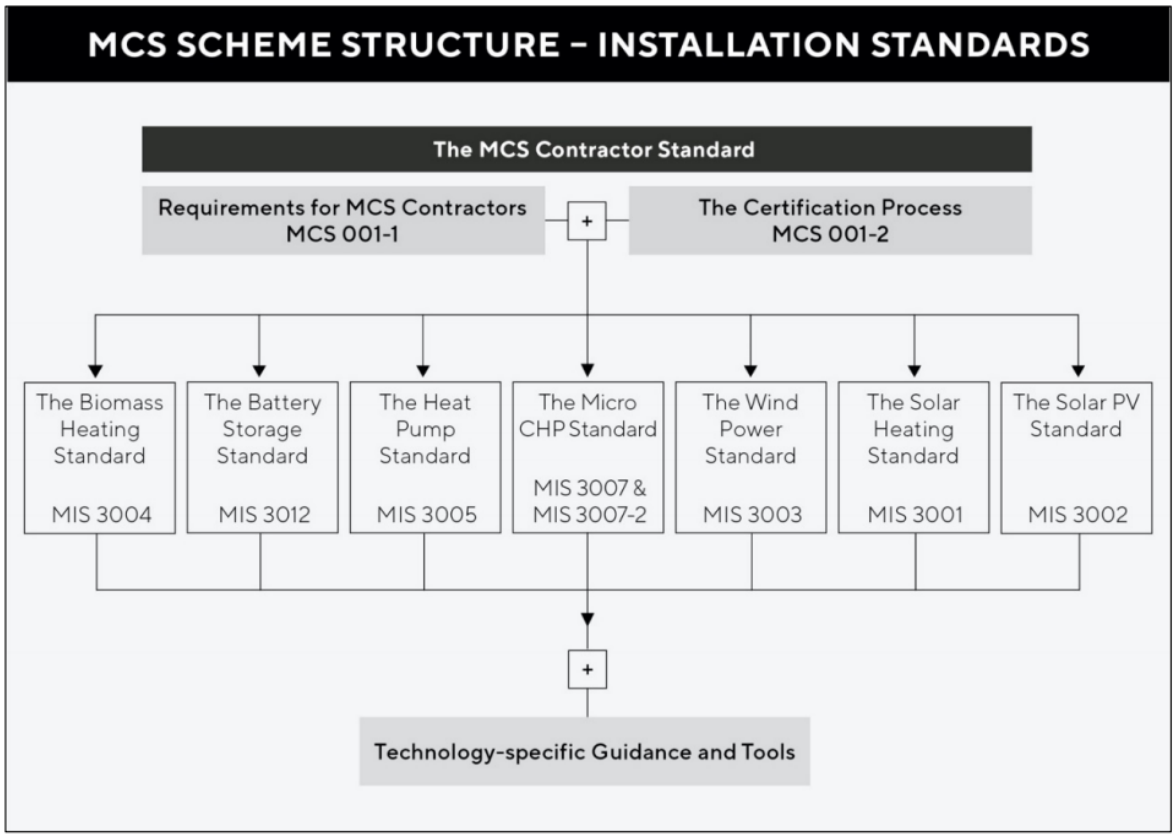


Figure 5 MCS Scheme Structure

ECA wishes to identify and inform the engineering services sector and ECA Members' decisions on what represents 'fair, reasonable and good contractual practice'. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

Contractor requirements within MCS

- An MCS contractor must operate a Quality Management System (QMS) and this should be proportionate to the size and activities of the business.
- The MCS contractor must operate from an identifiable physical trading address.
- The MCS Contractor shall be a member of, and when dealing with domestic customers shall have agreed to comply with a code of practice (consumer code) relevant to the scope of the business.
- All personnel undertaking the design, installation, set to work and/or commissioning activities must have received adequate training, and be able to demonstrate competence in each of the areas/operations in which they are involved.
    - A non-exhaustive list of recognised training courses recognised by MCS is listed within the annexe of MCS Competency Guidance

How to register with MCS

1. Applicants should contact an accredited certification body such as NICEIC who operate the MCS scheme.
2. The accredited certification body will then provide the appropriate application form, notify of applicable fees and the information required. **(Note: applicants may apply for multiple microgeneration technologies at this point.)**
3. The certification body will review the application
4. The applicant shall provide, where requested, details of recent or current installations. Access to installations selected by the certification body should be arranged. **(Note: At this stage, the contractor nor the installation is MCS certified)**
5. Assessment for initial certification will include both office assessment and site assessment covering the technologies applied for.
6. The contractor proposes any corrective actions for non-conformities raised by the certification body.
7. The certification body assesses the corrective actions (if any) and once fully satisfied that the requirements of MCS have been met, certifies the Contractor.
8. The MCS contractor can now re-commission the installation and issue a new commissioning certificate and register the installation on the MCS Installation Database (MID)

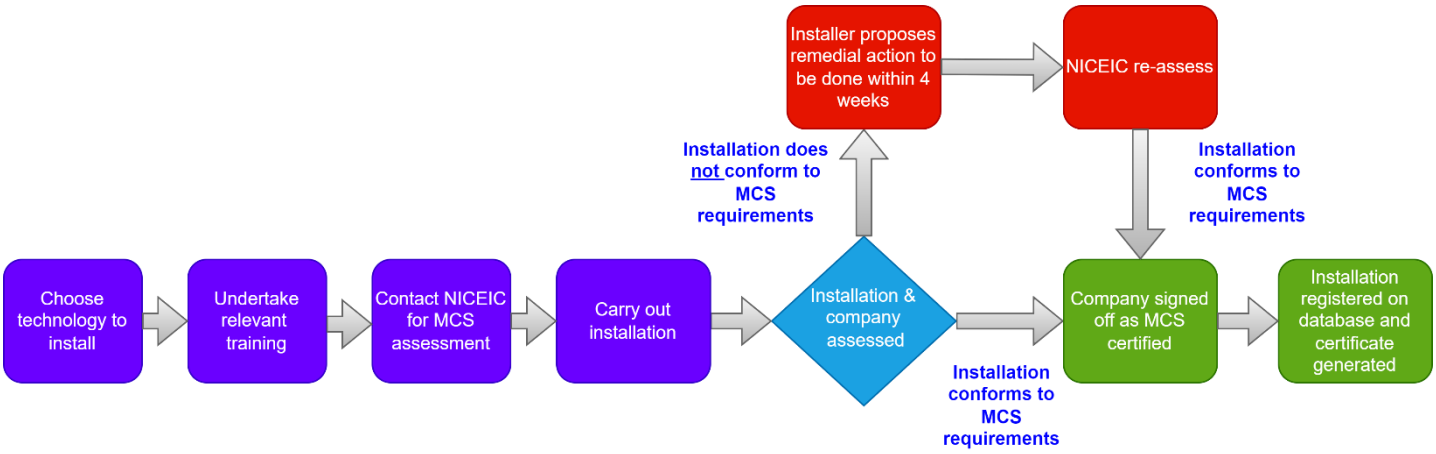


Figure 6 MCS registration process

ECA wishes to identify and inform the engineering services sector and ECA Members' decisions on what represents 'fair, reasonable and good contractual practice'. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

9. Retrofit

The UK has some of the oldest building stock in Europe, the majority of which will remain in service by 2050. These buildings will need to be made as energy efficient as possible.

An energy retrofit should always be led through a ‘fabric-first’ approach, reducing the thermal losses and demands of a building prior to the addition of a low-carbon heating system.

Example:

> If the ASHP is designed and sized for a building prior to additional insulation, improved glazing or other thermal improvements, the system will then be oversized for the thermal requirements. As well as the additional costs associated with a larger system, the ASHP may not operate at its maximum efficiency and the heating emitters may be oversized for the rooms once the thermal improvements have been made.

There are extensive overlapping works which can be considered as part of the retrofit and in conjunction with other devices that will be key for energy flexibility as demonstrated in Figure 7.

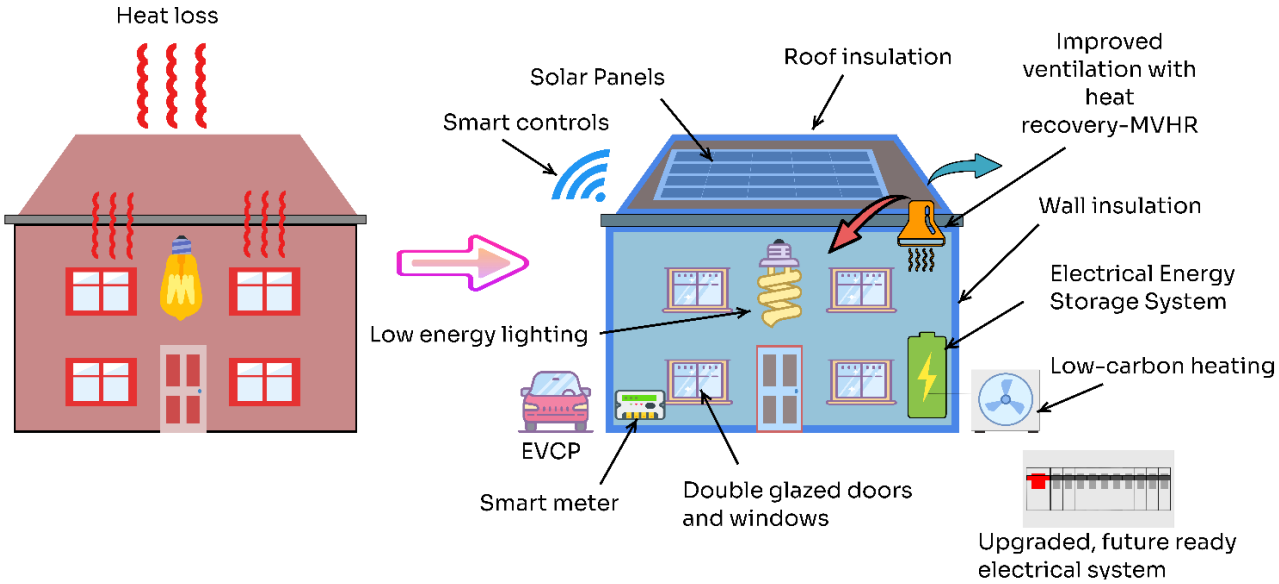


Figure 7 Example Retrofit works

PAS 2030 and PAS 2035

These multiple works must be designed and installed in a coordinated manner to ensure that everything is sized correctly (particularly heating systems) as well as ensuring that one set of works doesn’t adversely affect the installation of other planned works or additions likely to be added in the future. To ensure that this coordination is employed, PAS 2030 and PAS 2035 were developed.

A PAS (Publicly Available Specification) is a fast-track standardization document – the result of expert consulting service from BSI. It defines good practice for a product, service or process.

PAS 2030 and PAS 2035 have been developed to apply this to all energy-related retrofit works in the built environment.

ECA wishes to identify and inform the engineering services sector and ECA Members’ decisions on what represents ‘fair, reasonable and good contractual practice’. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

With an increased focus on retrofit activities, PAS 2030 and PAS 2035 schemes are increasingly being required and are specifically required for any public-funded works and the Energy Companies Obligation (currently ECO4). Compliance is a mandatory requirement of schemes wanting to operate under Trustmark.

ECA anticipate this to be the case for most, if not all, funded works going forward.

PAS 2030

PAS 2030 is a certification for the installer of specified work within the scheme. Examples of the types of work covered by PAS 2030 include:

- **Heating:** including Condensing Boilers (Gas\LPG\Oil) Fired (Domestic and Non-Domestic), Heating Controls. Under-Floor Heating, Flue Gas Recovery, Heating Systems Insulation (pipes and cylinders), Warm Air Units
- **Insulation:** including Cavity Walls, Loft, Pitched Roof, Flat Roof, External Wall, Internal Wall, Hybrid and Floor and Draught Proofing
- **Electrical:** including Lighting Controls (Non-Domestic only), Light Fittings, Storage Heaters
- **Renewable technologies:** including Micro CHP, Ground Source Heat Pumps, Air Source Heat Pumps, Biomass Boilers, Solar Thermal, Solar Photovoltaic

Pricing for the PAS 2030 Installer scheme is based on the number of individual measures you want to be assessed for. Existing registered contractors can benefit from reduced prices by combining scheme assessments.

PAS 2035

PAS 2035 is an over-arching scheme, encompassing the installer (through PAS 2030), in addition to other roles:

- Retrofit Advisor (now a web/phone service)
- Retrofit Assessor
- Retrofit Co-ordinator
- Retrofit Designer
- Retrofit Evaluator

  Note: One person may fulfil multiple roles.

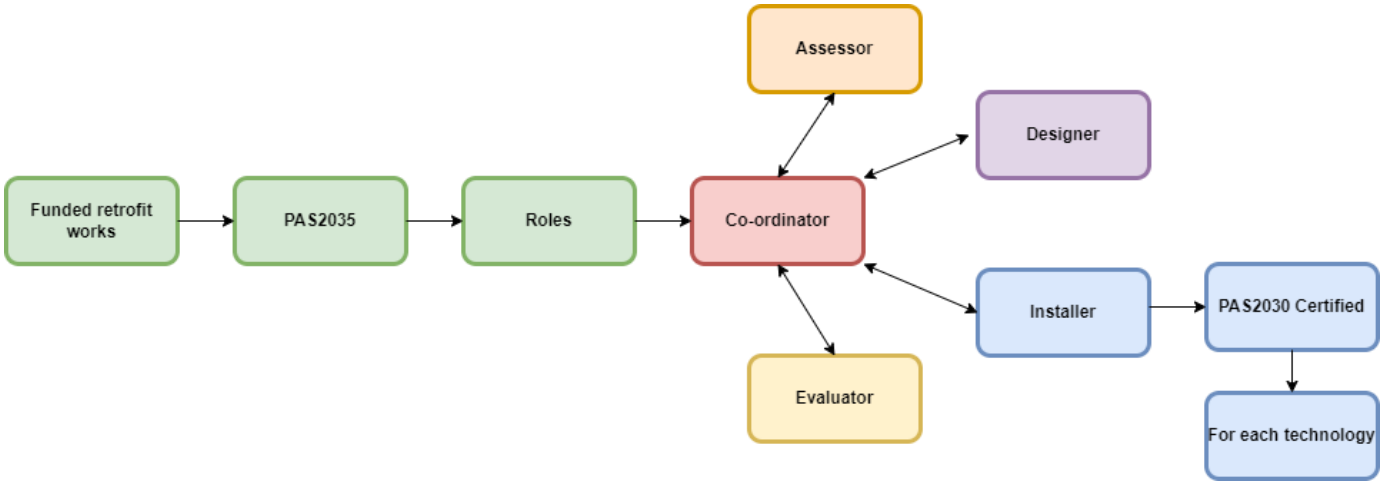


Figure 8 PAS 2035 roles and relationships

ECA wishes to identify and inform the engineering services sector and ECA Members' decisions on what represents 'fair, reasonable and good contractual practice'. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

An overview of the intended operation of the PAS2035 scheme and the role of the retrofit co-ordinator can be viewed in the video: The Retrofit model

The roles, qualifications and accreditations are shown below in Table 2.

Table 2 PAS 2030 /PAS 2035 roles and requirements

Role	Description	Qualifications Required	Accreditations Required
Retrofit Advisor	Deliver retrofit advice to clients and householders.	City & Guilds Energy awareness and energy advice training, or A Green Deal Advisor, registered by a recognised certification body, or Level 5 Diploma in Retrofit Coordination and Risk Management.	
Retrofit Assessor	Carry out Dwelling Assessment and supply data to Coordinator.	Domestic Energy Assessor (Path B&C). or Level 5 Diploma in Retrofit Coordination and Risk Management (Path A) Where dwellings are protected buildings either: Level 3 Award in Energy Efficiency and Retrofit of Traditional Buildings; or Scottish Level 6 Award in Energy Efficiency Measures for Older and Traditional Buildings; or Welsh Level 3 Award in Energy Efficiency Measures for Older and Traditional Buildings	Certified DEA by a UKAS-accredited assessor body (e.g. Elmhurst, Stroma etc.)
Retrofit Coordinator	Overall responsibility for each stage of the project, sometimes also fulfilling specific project roles where they	Level 5 Diploma in Retrofit Coordination and Risk Management.	Once qualified, must be a member of a TrustMark-approved Retrofit Coordinator

ECA wishes to identify and inform the engineering services sector and ECA Members' decisions on what represents 'fair, reasonable and good contractual practice'. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

Role	Description	Qualifications Required	Accreditations Required
	hold the appropriate qualifications.		Scheme (e.g. Elmhurst).
Retrofit Designer	A person qualified to prepare a retrofit design.	For single improvement measures or single proprietary systems, the Retrofit designer shall be a specialist designer or specifier of that particular measure. **(if this is a measure covered by MCS, the designer/specifier shall be MCS certified)** For other projects, as per Retrofit Coordinator. (specific qualifications apply for certain building types. Consult PAS 2035 for more details or a PAS 2035 training provider)	Professional Membership of relevant organisation as per project/building type
Retrofit Installer	A person or organisation that is undertaking the physical placement of energy efficiency measures in an existing building.	As per PAS 2030 (2019).	As per PAS 2030 (2019).
Retrofit Evaluator	A person qualified to monitor and evaluate the effectiveness of a project and provide feedback.	Level 5 Diploma in Retrofit Coordination and Risk Management.	Once qualified, membership of a TrustMark-approved Retrofit Coordinator Scheme (e.g. Elmhurst).

Further information can be found at www.retrofitacademy.org

Retrofit Installer, Assessor and Co-ordinator training is listed in Table 1: Low Carbon Technology and Assessment Courses

ECA wishes to identify and inform the engineering services sector and ECA Members' decisions on what represents 'fair, reasonable and good contractual practice'. ECA remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.

10. Summary

1. Decide on the technologies and services you wish to offer
2. Take the relevant industry training course
3. Consider MCS certification

   Familiarise yourself with criteria requirements: mcscertified.com

   Register with MCS through your certification body (e.g. NICEIC)
4. Register with Trustmark regarding the relevant technologies you wish to install
5. If required, gain certification for PAS 2030 as an installer through your certification body

   (e.g. NICEIC)
6. If required, gain certification for 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

The ECA Logo is a Registered Collective Mark. Information presented is accurate at time of printing.

ECA, Rotherwick House, 3 Thomas More Street, St. Katharine's & Wapping, London E1W 1YZ
Tel: 020 7313 4800 **Email**: info@eca.co.uk **www.eca.co.uk**
Rev: 0922

remains committed to fair and open competition and this document is not designed to in any way dictate what may be an appropriate risk allocation, or act as a substitute for ECA Members obtaining project and context specific legal advice and making their own commercial decisions.