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HEAT PUMPS TODAY
ESSENTIAL INFORMATION FOR INSTALLERS

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Heat Pumps Today & ACR Journal Training Supplement

Graeme Fox, Director of Technical at the BESA Group and REFCOM, explains it is fantastic to see these trade journals producing the first training supplement for the sector in response to the many concerned voices speaking about the sector's needs and how we can address the skills crisis from our side.

Graeme Fox, Director of Technical at the BESA Group and REFCOM

After more than 20 years working across the sector on various committees and working groups I've often said the common thread running through those years has been concerns regarding training delivery – both in terms of availability and quality which varies massively from centre to centre. So congratulations to the ACR Journal and Heat Pumps Today for taking up this battle head on to start discussions and drive the sea change we need to deliver fit for purpose courses and qualifications to ensure a competent, skilled, and compliant workforce of the future.

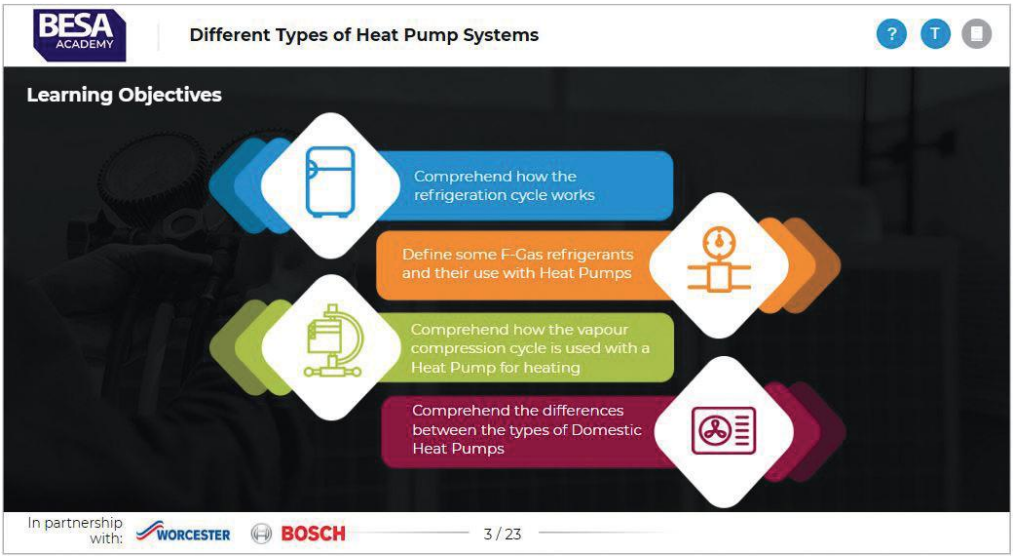
Training Requirements

Why do we find ourselves in this situation in this day and age?

To me it's been a combination of things:

- Employers fed up with training engineers simply for them to be poached for a few quid more in their pay packet by competitors who don't bother investing, and so they simply decide to stop feeding that avenue.
- Colleges and training centres being too rigidly framed that they cannot adapt to new technologies or the varying needs of the employers.
- Colleges and training centres struggling to recruit or retain trainers of a suitable quality and unable to match the spiralling wage demands of highly qualified people.
- An education system that doesn't understand and promote the importance of STEM subjects from an early age and therefore encourages schoolchildren to pursue worthwhile careers in technical sectors.
- That's all before we remember we are a relatively hidden industry competing with seemingly sexier industries from the same talent pool.

But rather than focus on our woes and shortcomings, across the industry we are starting to see more coordinated moves to effect meaningful change for the long-term benefit to all.



Issues with college delivery

The first thing we have to acknowledge is that the traditional method of delivering training is antiquated and rarely fits the requirements of employers these days. The funding mechanism lets down the colleges making it difficult for the college finance teams to guarantee places on courses year on year, and the private training centres don't even have access to that funding in many cases. Lecturers are often tied to only doing training at their primary place of employment, whereas if the colleges could be more flexible as employers it would allow more lecturers and trainers to top-up their income to more attractive levels by taking on additional private training short courses, for example; helping to make the training sector a more attractive prospect to people earning significant base salaries these days even without the overtime and bonuses that are available to good engineers.

And the second thing we need to remember is that the technology across the RACHP sector is rapidly evolving and it has often been difficult for training providers to keep up to date with relevant equipment

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– although a number of manufacturers and suppliers have really stepped up in recent years providing new equipment to colleges free of charge for the students to work on and with, and they should be applauded for their foresight and generosity.

Needs of industry

We also have to consider the actual needs of the industry though, and this is another area where we've had significant comment and debate over the years. The old apprenticeship course content and delivery was criticised as not delivering what employers wanted or needed – and so we saw the advent of the Trailblazer apprenticeships which for the RACHP sector was created and driven by the IOR's education committee with direct input from some employers of engineers.

The delivery of this standard has proven difficult and costly for some colleges however, and coupled with the uncertainty created during the pandemic some centres have been unable to deliver and get students through their end point assessments quickly leading to dissatisfaction across the sector.

On top of this, we've faced the introduction of additional "top-up" training for safe handling of flammable refrigerants and alternatives to HFCs as part of the continuing evolution of the F-Gas Regulations, and an accelerated roll out of heat pumps to the domestic market diverting much needed training skills and resources to these other, similarly critical, areas.

Heat Pump Training

With the roll out of heat pumps as a central part of the Government's decarbonisation of heat agenda and the target of installing 600,000 heat pumps annually by 2028 one of the biggest challenges has always been acknowledged that we lack the required number of suitably trained and competent design and install engineers to deliver this programme effectively and avoiding the design and set-up flaws we have seen with many domestic heat pump installations over recent years which have led to negative publicity of the technology in the mainstream media.

Readers of this publication will of course appreciate the negative mainstream press coverage is unwarranted and unwelcome, but regardless it is clear that we do still need a massive programme of upskilling training or retraining of other related trades to the specific intricacies of heat pump technology if we are to ensure that the roll out programme is done so effectively to maximum the performance and energy efficiency benefits that heat pumps bring to the table.

The last 18 months has seen thousands of technicians and engineers attending heat pump and renewable heating awareness training courses delivered by the BESA and a number of heat pump manufacturers across the UK – all designed to ensure the installers understand the needs of the heat pump to run at lower flow temperatures than traditional wet heating systems have done. It's mainly a case of education – both of the installers themselves to ensure they set the systems up properly, and of the end users to ensure they understand that the heat emitters don't have to be toasty hot and that running the systems for longer at lower temperatures will save them money over time.

That is a difficult one certainly as we are having to

adjust the mindsets of end users who normally have little or no technical understanding of how their heating systems work. In all honesty, most end users understand that they turn up a thermostat and the house warms up after a short period of time, but have no concept of how that process is delivered. So, getting those mindsets changed to taking a few hours instead of an hour will take patience. This is a key element of the upskilling for renewable heating courses – ensuring the installers themselves understand this critical point well enough to be able to articulate that to their clients as part of the handover process.

F-Gas Regulations Review - In-scope refrigerants

And if all of that wasn't significant enough change all at once we also have the on-going F-Gas Regulation review which is looking at severely restricting the availability of most common HFC refrigerants and replacing them with "alternative substances", which in most cases for domestic applications means R290 (propane) or maybe CO_2 for larger duty systems. The problem this is causing already across the sector is the confusion about maintaining the levels of professionalism we're only just starting to see come to fruition after a long period of poor policing of the original regulations by the Government bodies. There is still a huge amount of work to be done on the policing front and this isn't being helped by the uncertainty surrounding what refrigerants we'll be using in the medium to long-term future.

Why is this a problem?

15 years ago – before we had the F-Gas Regulations – I don't think anybody would argue that the unregulated aspect of the sector, especially among the smaller niche ACHP market was riddled with what we used to term the "Bodgit n Scarper" type contractors. F-Gas has helped to at least partially address this issue and we now see far fewer of this type of contractor due to their being at least a semblance of regulatory requirement for competence and compliance with rules and standards. Those of us who were active in the VRF/VRV market tended to be more professional in our approach – mainly due to the astronomical cost implications of getting it wrong! But the mini-split installers often didn't pressure test, evacuate or commission systems properly. This was borne out by the amount of warranty claims the split manufacturers used to talk about.

The advent of the old REFCOM voluntary scheme – now known as REFCOM Elite – helped those of us who did act responsibly to demonstrate our professionalism. This helped us achieve approved installer

status with manufacturers who in turn reported significantly lower warranty claims from REFCOM members. This effect has now been translated to some degree down the chain to the non-Elite REFCOM F-Gas certificated companies which is a testament to the positive effect the F-Gas regulations have had on the wider industry sector. It's still not perfect but we are getting there...

But with the hydrocarbons such as R290 and R600a being out of scope of the regulations, along with CO2, ammonia, and other refrigerants, it is opening the door to the non-qualified cowboy element to thrive again – aided and abetted by certain unscrupulous online sellers who are deliberately marketing these systems as "not needing to be installed by qualified personnel"! What could go wrong with supplying a propane system to a non-competent, non-trained person to install? It has been pointed out that gas barbeques have been on the market for years and set up by non-trained people – but that's an appliance designed to deal with combustion of a low pressure regulated supply of gas, whereas a split system is by design highly pressurising the propane and injecting it into the indoor environment. That is a recipe for disaster clearly.

In discussions with the European Commission for the EU market and DEFRA for the GB/UK market I have introduced the concept of bringing non-HFCs into the scope of the regulations going forward. The reasoning was two-fold:

As we transition increasingly away from high or even medium GWP fluorinated greenhouse gases towards so-called "naturals" it is easy to forget those alternative gases are also greenhouse gases which are not good for the environment. Even Propane (R290) has four times the potency of carbon dioxide as a greenhouse gas. The term "natural" is used to create an aura of environmental friendliness, but the reality is less environmentally friendly in terms of direct emissions when released into the atmosphere than some HFOs, which are ritually slammed by environmental lobbyists. So, the first aspect of the reasoning was to ensure we do not eradicate direct emissions of one refrigerant with another which also has environmental consequences.

The second aspect comes from those sales of systems using non-HFCs and being marketed as "not needing to be installed by a qualified person". When we are talking about highly flammable substances that is simply reckless and not something any responsible industry should be encouraging. I will come onto engineers' competency requirements and evidencing under the Building Safety Act later, but simple good practice would demand a basic level of competency is required before anybody is let loose on a system that by design works at relatively high pressures and temperatures.

So, the changing of what is "in-scope" of the regulations to include all greenhouse gases is necessary for the better enforcement of regulations and is very much on the table right now in discussions with DEFRA about the future UK/GB regulations. The European Commission lawyers are not seriously considering a similar approach simply because the black and white legal text is currently for "fluorinated greenhouse gases" and apparently the removal of the word "fluorinated" is such a fundamental change to the current regulation that it would demand a complete re-write rather than apply common sense and simply amend some text throughout. It is still up for debate of course, and the European contractors' association AREA is very much still pressing for this common sense approach to prevail, but it is heartening to see DEFRA take a far more pragmatic approach here in the UK.

Building Safety Act

The Building Safety Bill received royal assent on 28th April, becoming the Building Safety Act (BSA) 2022.

Does it apply to you? Yes, it does.

The Act uses the term 'buildings in scope', unfortunately, the use of this phrase has caused confusion leading many to dismiss the Act as not being applicable to them. The general provision of the Act applies to everyone and everything in the building and there are additional new and stricter rules for controls on higher-risk buildings (HRBs).

The Building Safety Act names HSE as the new Building Safety Regulator in England. It has three main functions:

- Overseeing the safety and standards of all buildings.
- Helping and encouraging the built environment industry and building control professionals to improve their competence.
- Leading implementation of the new regulatory framework for high-rise buildings.

For our sector that means, evidencing your skills and competence not only as an organisation but for those that you employ. This will and is becoming the norm.

The BSA introduces a new Duty Holders role on those who procure, design, manage and undertake the building work, it is the Duty Holders responsibility to ensure all work complies with all relevant Building Regulations.

Do not forget if carrying out 'controlled services' such as installing a ventilation or air-conditioning system this work is notifiable to Local Authority Building Control under the Building Regulations. If you are not a member of a Competent Person Scheme approval will need to be sought from building control or under third party certification.

It is about accountability, competence and compliance and documented evidence that the work you have done is compliant with the regulations and has been completed by competent individuals.

It is often said that we live in interesting times – and the plethora of regulatory change and the rate at which it is hitting us certainly bears witness to that phrase. But as a collaborative sector, with all the trade bodies currently working together to find long-term solutions and with UK Government seemingly receptive to common sense regulatory change going forward we can ensure a safe, responsible and professional RACHP sector.

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OFTEC services diversify to meet the needs of heating technicians

OFTEC was formed in 1991, replacing the Domestic Oil Burner Equipment Testing Association. Formalised training had stopped, so OFTEC's role was to write new technical standards and training manuals, and to provide a focus for the oil heating industry. OFTEC's services for heating technicians have since diversified significantly and today reflect the needs of an industry pivoting towards renewable technologies.

OFTEC is an organisation that is embracing change. While liquid fuels remain a key priority – reflecting OFTEC's heritage and expertise in this area - it now also offers registration and training for heating technicians working with solid fuel and renewable technologies. This is driven by a wish to support the more diverse off-gas heating industry of today.

Heat Pump Assessments

Technicians had been asking if OFTEC could develop a package of heat pump assessments, so a working group was put together which included manufacturers, industry experts, assessment centres, certification bodies, and other interested parties such as the Microgeneration Certification Scheme (MCS). It was decided that any assessments would be on a modular basis, with four modules, namely:

- Core
- Air source heat pumps
- Ground source heat pumps
- Design of heat pump systems

From this, three assessments would be available - ASHP installation, commissioning and servicing, GSHP installation, commissioning and servicing, and heat pump system design. The core module is common to all three.

A mobile air source heat pump unit used in training at Gastec, Milton Keynes Photo credit: Gastec

The content of the assessments had to cover the Minimum Technical Competencies for heat pump installation and design work, as well as covering the requirements of MCS. By working closely with MCS throughout the development of the course we were able to get the assessments approved as suitable for MCS registration. The assessments were written, trialled, and pilots held to identify any issues before being launched.

The structure of the assessments follows the tested method that we use for both our liquid fuel and solid fuel assessments. We make sure that there is a substantial practical element to the assessments, as well as multiple-choice theory papers. For areas that are difficult to cover either practically or by multiple choice, we have PAWS papers (practically assessed worksheets) which make use of diagrams or written scenarios that the candidate has to comment on.

OFTEC does not run assessment centres itself, the centres we work with are all either colleges or independent training providers. The assessment process is monitored by certification bodies, which are accredited by the United Kingdom Accreditation Service (UKAS) to 17024 standard. It's the certification body that issues the certificate, not OFTEC. We work with seven different certification bodies, and it is the choice of the assessment centre as to which one they work with.

Feedback for the courses from candidates has been excellent. Almost 99% of candidates say that after taking a course they are confident or very confident to undertake a retrofit heat pump installation, and almost 100% have said that they are satisfied or very satisfied with the quality of training.

Upon completion, participants can apply for MCS certification to install heat pumps through government schemes such as the Home Upgrade Grant or Boiler Upgrade Scheme. By registering with OFTEC they will also be able to self-certify their installations as compliant with Building Regulations.

Technical Guides

OFTEC has produced their own technical guide for the course, which covers all three areas. As well as this, the course uses MCS documentation, the Domestic Heating Design Guide published by CIBSE, and Part L of the Building Regulations.

Conclusion

Some have asked why OFTEC is putting resources into heat pump training, rather than defending the liquid fuel heating sector. The answer is simple. It's a service that heating technicians have asked us for, and by doing it we are better placed to fight for liquid fuels. By actively supporting heat pumps we are in a much more credible position to argue that renewable liquid fuels like HVO are not only wanted, but also have an important role to play. If we attempt to obstruct the roll-out of heat pumps or only focus on liquid fuels, it would give the false impression that we are simply a fossil fuel organisation acting purely out of self-interest. The truth could not be more different. At OFTEC we want decarbonisation to succeed in a way that is fair and affordable, and that means a future where renewable liquid fuels play a vital role alongside other low carbon heating options.

www.oftec.co.uk

Looking for heat pump training? Ask OFTEC

Demand for heat pumps is growing, so now is the perfect time to take full advantage with OFTEC's heat pump training courses and registration.

Scopes of registration:

- OFT21-504A - Installation, commissioning and servicing of air source heat pumps.
- OFT21-504G - Installation, commissioning and servicing of ground source heat pumps
- OFT21-504D - Design of heat pump systems.

Our competent person registration includes a range of benefits:

- Self-certification of installation work for building regulations
- Free technical support via phone and email
- Useful technical guides and books
- Searchable online listing of registered businesses
- You can also register with OFTEC for liquid fuel, solid fuel, solar thermal, biomass,electrical (Part P), non-operative, TrustMark, MCS and PAS2030.

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A creative approach to skills and training

Now more than ever, we need a proficient and adaptable workforce capable of not only addressing current issues but also offering resourceful, economic and sustainable cooling solutions for the future, explains **Miriam Rodway**, CEO at Institute of Refrigeration (IOR).

The challenges of adapting to ever-changing refrigerant options, increased demand for cooling and the need to improve efficiency (and reduce escalating energy costs) mean that the long-term skills shortages experienced are really having an impact. Businesses are now having to take a more proactive and creative approach to skills and training. The IOR has put together a series of Education Guidance Notes based on input from employers and businesses who have found their own way of improving skills, developing talent and recruiting technicians and engineers. The Notes are all free to download from the IOR's technical library[1] as a shared resource for the whole industry to suggest practical solutions to skills issues. Providing leadership in education and skills, supporting students and promoting our sector to schools have all been identified as key strategic priorities for IOR members and we encourage you to make use of these resources and contribute to the development of new guidance in the future, whether you are a member or not.

How to attract new talent

Young people considering their future career path are looking for a job that offers varied and interesting work, opportunities to advance their career and to earn good money. The RACHP sector has a lot to offer when this is backed up by good training programmes. There are lots of ways for employers to attract new people and to improve the knowledge of your existing staff.

1. Take on an Apprentice

Apprenticeships are still one of the most popular routes into the cooling industry, providing thorough training and assessment backed by Government funding. If you are considering taking on apprentices, the IOR RACHP Apprenticeships Guidance for Employers (GNET 6) covers the essential factors to consider when selecting a candidate, the responsibilities that employers have to provide suitable on-the-job training and experience and how to work successfully with colleges. The current apprenticeship includes a mix of training, qualifications and work experience carried out over three years, culminating in a practical and theory exam as well as a professional interview. It is a challenging programme for those who need in-depth knowledge to work as a skilled Engineering Technician. Employers can advertise and search for vacancies on the Government apprenticeship website or contact local colleges (see **www.acrib.org.uk** for a list of colleges) to find candidates.

Miriam Rodway, CEO at Institute of Refrigeration (IOR)

2. Take on an improver or mechanic and train them yourself

Traditionally many employers set new technicians to work alongside someone who is experienced to learn practical skills. This should be supported by knowledge and theory training through the study of qualifications such as the City & Guilds 6090 RACHP Level 2. These can be stand-alone courses outside of the apprenticeship and cover the basics of refrigeration systems leading to national qualifications. Alternatively,

the IOR provides a Skills Specification for Mechanics and Operatives (GNET 11) to check what skills, knowledge and behaviours are required at this level if you are planning to organise your own internal training.

3. Offer T Level placements

Introduced in 2020 T-Levels represent the latest post-GCSE education combining practical work at a college and classroom-based learning and include a placement of 45 days with a local employer. The placement is a great way for employers to identify potential technicians and service engineers before committing to taking them on as an employee. The Building Services Engineering T-Level covers core skills such as health and safety and site work, and the Refrigeration Engineering and Air Conditioning Engineering occupational specialism gives specific knowledge. See IOR GNET13 on T Levels for more details.

4. Set up work experience for school pupils

Offering short work experience to a local school will help raise awareness of local employment opportunities by building your connections with local schools, helping you to identify potential trainees and apprentices. The IOR's Work Experience guidance (GNET 9) is based on the experience of businesses that have been doing this successfully and provides a 2-week programme sample. The work experience can be office-based covering administration, marketing etc. not just technical roles.

Upskilling your existing staff

Not only is it vital to make sure that your current workforce is well-equipped to deal with new technologies, but they might also be an untapped resource to fill future vacancies. Developing existing staff is an important part of the drive to tackle skills shortages. These are people already committed to your business, who understand our industry and who possess potential. Are there people in non-technical roles who are willing and interested in retraining in engineering?

The increasing requirements of net-zero and the growth of heat pumps as well as new F Gas legislation will undoubtedly require the acquisition of new skill sets. Formal training is often a legal obligation under your health and safety requirements and new Building Safety legislation will make this even more critical. There are many relevant short courses available but all training should be planned and relevant to the business and personal needs. The IOR Skills Specifications for Design Engineer (GNET5), Engineering Technician, Operative and Green Skills (GNET 10) provide frameworks against which you can assess current and future needs on an individual basis.

Gaining recognition for your skills and development is important. IOR members can achieve this by becoming a Chartered, Incorporated or EngTech Engineer with Engineering Council registration. Registration evidences your commitment to your professional and continued professional development. Guidance is available through regular webinars and the Applying for Registration guidance (GNET 8).

As well as the formal training mentioned above, informal development helps existing staff learn new skills and grow into new roles. The IOR Education Guidance Note on CPD (Continuing Professional Development) GNET 1 offers ideas for widening skill sets and developing new competencies as part of a longer-term career development plan. Membership of the Institute of Refrigeration or its specialist RACHP EngTech Technical mailings for service engineers are routes to access IOR technical materials, publications library and webinars. From just £43 per year, subscribers can get all of this practical information.

It all starts with STEM

Whenever we talk about skills shortages, someone always says that we should be raising awareness of RACHP at a younger age – in schools and with parents. As a key priority for 2023, the IOR has been helping people in the industry to get involved in introducing RACHP STEM (Science, Technology, Engineering and Maths) in schools by:

- Becoming a STEM Ambassador to join a national database of people willing to talk about their careers and schools who want industry visitors. The IOR STEM Learning FAQs bulletin (GNET 2) explains what is involved and how you can sign up.
- Explaining refrigeration science and its importance with online games and science explanations on our schools' website[2]
- Offering a FantasticFridges toolkit with fun games and promotional items to take into schools to make fridges fun and demonstrate science principles. It links back to the schools' website and the Toolkits Guidance Note (GNET 12) which explains how to use the resources and how you can borrow a kit.
- Funding six female IOR members to take part in the STEMAZING Academy to be coached on how to run engaging and fun science clubs for schools.

Want more inspiration? Our Tip of the Iceberg podcast episode 5, titled "Getting the Best People into the Industry," features insights from members sharing their experiences of recruiting to address skills shortages, with examples of opportunities and successes. Listen on your favourite podcast platform or go direct to **www.tipoftheiceberg.podbean.com**.

At last year's Annual Conference a call to industry was issued – We can't just rely on others to help our industry, we are the ones who know about it and we are the ones who care about it, we have to take action ourselves. The IOR encourages everyone to play their part.

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1. www.ior.org.uk
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Pursuing Excellence:

Carrier and CIAT unveil an exciting array of HVAC CPDs

Continuing Professional Development is a means of maintaining excellence, adaptability, and professionalism throughout your career. It's not just about acquiring new knowledge; it's about embracing a mindset of continuous improvement and growth.

This structured approach to learning and skill enhancement enables you to remain current in your field, adapt to new trends, technologies, and regulations.

As a leader in heating, ventilation, and air conditioning (HVAC) solutions, Carrier and CIAT have launched a new range of 11 CPD training courses for 2023 and 2024.

The programme provides a vital platform for all HVAC professionals, whether you are a consultant, installer, or even an end-user, to update your knowledge on key technical and legislative topics.

Carrier and CIAT's 11 new courses are certified by the Chartered Institute of Building Services Engineers (CIBSE). This seal of approval not only underscores the quality of Carrier and CIAT's content but also ensures that you earn valuable credits to enrich your annual CPD learning portfolios.

All CPDs are free and led by seasoned professionals and industry experts who bring learning to life with their insight and experience. Each CPD is interactive and engaging and can be delivered face to face at your premises or in our various office locations across the UK, or, upon request, can be presented as a webinar.

By the end of each course, you will have the knowledge and skills to be able to design HVAC systems that align with environmentally sustainable practices, forging a path towards greener, more responsible buildings.

The 11 new courses are split into two sections.

Hydronic CPDs led Carrier experts

F-Gas Refrigerants & Eco-Design – Level 1

Covering the latest updates relating to the F Gas regulations on the phase down of HFC refrigerants, this CPD focuses on the impact to manufacturers and installers. The session will cover the need for refrigerants in chiller systems to comply with the directive, discuss the use of different refrigerants, look at their impact on the refrigerant phase down, and the development of new low GWP refrigerants.

The final section of this CPD will look at the Eco Design Lot 21 directive. It outlines the energy efficiency of all chiller equipment and details the guidance that all manufacturers need to follow to be able to publish their product energy efficiencies.

Legislation and Chiller Efficiency – Level 2

This CPD looks at the legislation and acronyms that are driving the market for chillers and heat pumps. It provides background information about how to determine chiller and heat pump efficiency and takes a closer look at the application of different compressors, heat recovery, and free cooling and explains their impact on energy efficiency.

Air Source Heat Pumps – Level 2

This CPD takes a high-level look at Air Source Heat Pumps

(ASHP). The course will cover the market drivers for using heat pumps, explore the different types, and provide a clear understanding of how ASHPs operate. There will also be an introduction into the energy efficiencies and metrics of ASHPs and examples of system configurations and applications where they are used.

Water Source Heat Pumps – Level 2
This CPD takes a high-level look at Water Source Heat Pumps (WSHP). The course investigates the market drivers for using heat pumps, different types, and how WSHPs operate. There is an introduction to the energy efficiencies and metrics of WSHPs and the experts will give examples of the types of applications and system configurations for their use.

Heat Pumps – Level 2
This CPD is a high level Look at how to apply air and water source heat pumps. We briefly recap on the market drivers for the use of heat pumps along with a description of an air source and water source, heat pump and where they are used. The main part of this CPD, explores the different applications and system configurations that can be used for both types of heat pumps via the use of system schematics.

Heat Pump Regulations – Level 2
This CPD will take a high-level look at the key regulations that apply to air and water source heat pumps. It will provide insight into the key market drivers that impact the growth and adoption of heat pumps. There will also be a focus on the energy efficiency of heat pumps and how it is calculated. Finally, the course will consider the latest building regulations and what impact these have on the design application of both air source and water source heat pumps.

Airside CPDs led by CIAT experts

AHU Application and Design – Level 2
This CPD explores Air Handling Units. It reveals what an AHU is and the key applications where these systems are used. The course also provides an insight into the key advantages of an AHU and the key components, additional accessories, and options that can be added to enhance the operation of the system. The final part of the CPD considers the contribution a well-designed and installed AHU can have on a healthy building.

AHU Legislation – Level 3
This CPD studies the key legislations that drive the design and application of Air Handling Units. The key elements of legislation include Eco Design Lot 6, Part L of the Building Regulations, and Energy-related Products (ErP) Directive. The course will also discuss why good filtration helps support indoor air quality in a building.

RTU Application and Design – Level 2
This CPD explores Roof Top Units. It reveals what a RTU is and the key applications where this type of system is used. The course also provides insight into the key advantages of an RTU and the key components, the additional accessories, and options that can be added to enhance the operation of the system. The final part of the CPD considers the contribution a well-designed and installed RTU can have on a healthy building.

RTU Legislation – Level 2
This CPD explores the key legislations that drive the design and application of Roof Top Units. The key elements of legislation include Eco Design Lot 21, Refrigerants and Energy-related Products (ErP) Directive. The course also discusses how the application of RTUs can support healthy buildings.

Indoor Air Quality (IAQ) - Level 2
This CPD discusses Indoor Air Quality and the myriad of factors that affect it. The course reviews recent guidance and how HVAC systems can be key contributors in improving IAQ. In addition, the course covers the potential new and existing product innovations to support the quest for cleaner indoor air.

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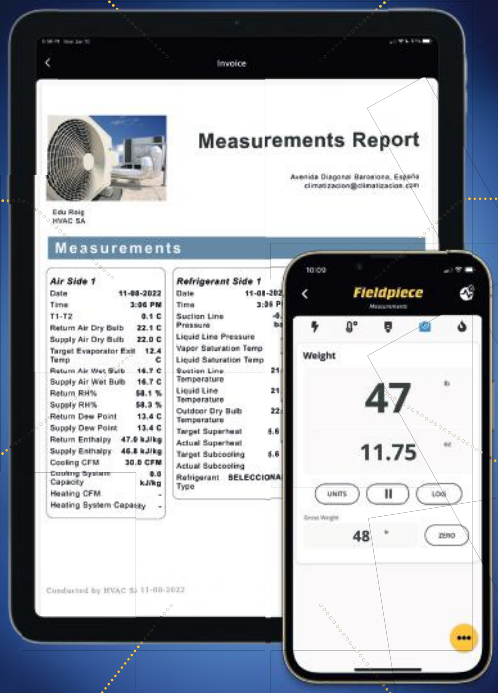

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Training and innovation centre provides comprehensive services

Carter Thermal Industries Group

Carter Group has made significant investments in their Birmingham Head Office since 2019. Most notably these include a purpose-built training and innovation centre. This facility offers a very broad range of training services.

Training is reviewed and designed around the intended audience whether it be our own apprentices, Management and Office staff, client engineering teams, client staff etc.

Examples of the core Training we offer are:

- Refrigeration Systems at basic, intermediate, and advanced levels
- Pipework installation & Brazing
- Core Welding
- Core Electrical safety & systems (Fault finding and diagnosis)
- Heat Pump technology & Controls
- Building Management / BEMS Systems
- Plant Control systems training
- Leak Detection Systems
- Plumbing best practise for Cold room and Case Installation teams
- Cold room / whitewall construction
- Heat Reclaim Installation, Systems and Controls
- General Health & Safety training for installation, service & Maintenance engineers in all elements of HVACR
- Chiller Systems & Controls
- Glycol Systems & Controls
- Net Zero & Sustainability

In addition to the training & innovation centre, we additionally have a purpose built Net Zero/Sustainability training room, Product Showcase and showroom areas as well as our own accredited laboratories for product testing.

Carter Thermal Industries is one of the UK's most respected independent engineering groups. With specialist expertise covered by various companies under the group structure, including Carter Synergy and KB Refrigeration, Carter Retail Equipment, Franklin Hodge Industries, and CPC (UK). Between these, the organisation brings together a wealth of experience across refrigeration, Building Services, HVAC, water storage and water-cooling systems as well as Net Zero & Sustainability consultancy and turnkey solutions.

www.carter-group.co.uk

Training in process at the training and innovation centre

Carter Group purpose-built training and innovation centre

CARTER SYNERGY

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- Air Conditioning supply, install and maintenance.
- Coldstores, fixed and mobile rental units.
- Coldstores repairs, Delap surveys and consultancy.
- Refrigerated cabinets to suit any retail environment.
- Core Electrical, mechanical, and general building service support and solutions.
- Fixed refrigerant leak detection systems to meet with your compliance and legislative requirements.
- A range of controls and energy reduction products and tools.
- Net Zero and Decarbonisation consultancy.

Contact Details:

Miss Sam Parris: 07817 053 291
Enquiry@cartersynergy.com
www.cartersynergy.com

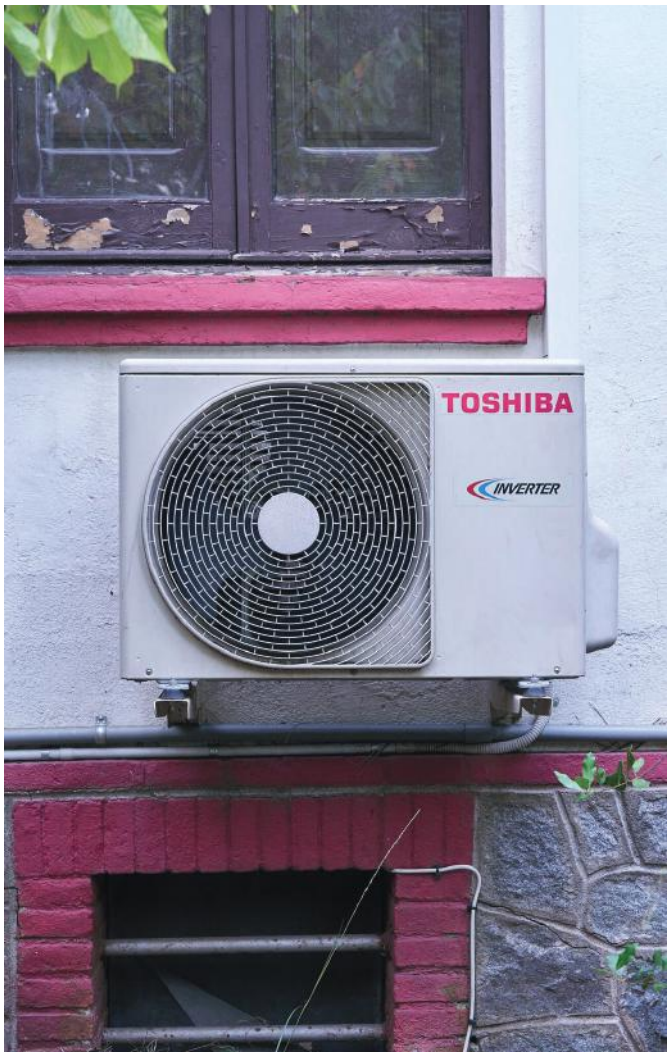
The only non-flammable replacement for R410A

Nicholas Poole, Technical Manager at Refrigerant Solutions, explains why the RS-53 (R470A) is an exciting new development in the quest to replace higher GWP refrigerants both in both existing and new equipment.

Nicholas Poole, Technical Manager at Refrigerant Solutions

RS-53 (R470A) is a new non-flammable drop-in replacement for R410A with a low Global Warming Potential (GWP) less than half that of R410A. RS-53 (R470A) has a similar thermodynamic performance to R410A with matching energy efficiency and cooling capacity. RS-53 (R470A) is compatible with the materials commonly found in R410A equipment. In particular, RS-53 (R470A) contains low-toxicity components already known to have excellent chemical stability in air-conditioning units.

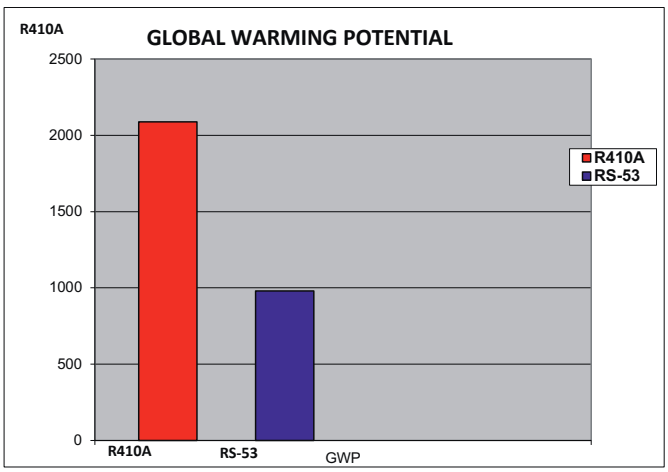
RS-53 (R470A) enables users to replace R410A in existing units with minimal changes and inconvenience at a low cost. RS-53 (R470A) is compatible with lubricants typically used with R410A avoiding the need to change the existing lubricant when retrofitting. RS-53 (R470A) is thus an excellent option to replace R410A, not only in the UK and European Union where F Gas regulations are creating shortages, but also in other countries which are introducing restrictions on the sale and use of refrigerants containing hydrofluorocarbons.



R32 is being introduced as a replacement for R410A in new equipment, but is not suitable for use in existing equipment because it is flammable. In contrast, RS-53 (R470A) is a retrofit solution being non-flammable, has low toxicity, and with similar cooling capacity, pressures and Coefficient of Performance to R410A.

To say that the EU GWP quota system – which the UK is largely following - for regulating widely used HFCs including R410A and R404A and others has belatedly caused consternation in the industry, is an understatement. Shortages of products and very high prices have been the result of the F Gas regulation in the UK and EU and there is much concern about the availability of HFC based refrigerants, which are widely used in the refrigeration and air conditioning industries, over the next decade or so.

The introduction of RS-53 aims to help alleviate the shortfall between what is



available under F Gas and demand in the market by in effect enabling over 2 tonnes of RS-53 to be made available to users for every 1 tonne of R410A. Crucially, RS-53 is non-flammable and therefore can be used in place of R410A in existing equipment and installations, which of course is not possible in the case of R32 which is flammable and so only suitable for use in new equipment.

There are further planned cutbacks in the F Gas quota system which will significantly accentuate the shortage of refrigerants and/or force users to purchase new equipment in the absence of innovations on the supply side. RS-53 should help to alleviate this problem with its much lower GWP compared to R410A.

RS-53 has been specifically designed to mitigate these changes to the refrigerant user by reducing the direct GWP of the refrigerant while not compromising its energy efficiency and technical properties as a suitable Drop-in replacement for R410A.

Summary of the performance characteristics of RS-53 (R470A):

- Low direct GWP Drop-in replacement for R410A
- Similar energy efficiency to R410A
- Close match for R410A in cooling capacity
- Lower discharge pressure than R410A
- Similar discharge temperature to R410A
- No changes to the hardware required during retrofitting
- Compatible with lubricants commonly used with R410A
- Replaces R410A in air conditioning and refrigeration applications
- Similar flow rate to R410A
- Zero Ozone Depletion Potential
- Non-flammable & low toxicity

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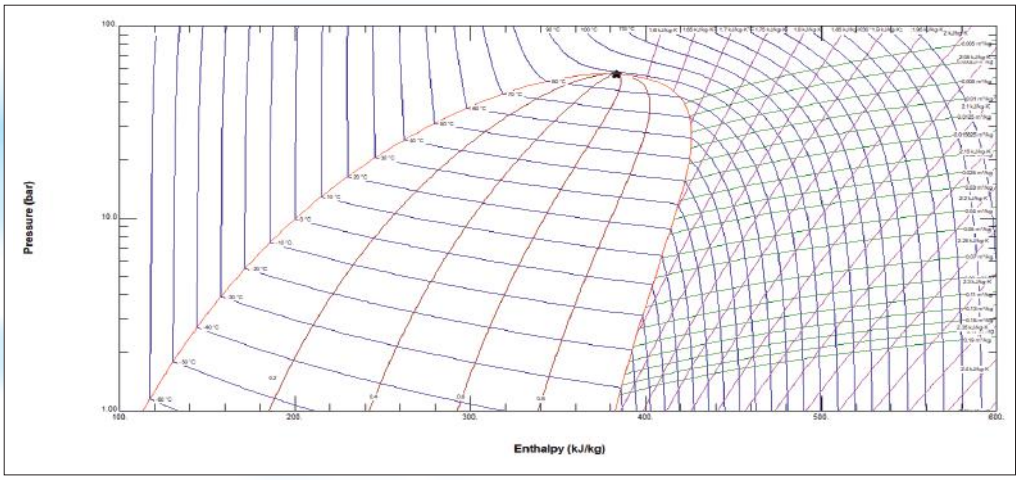

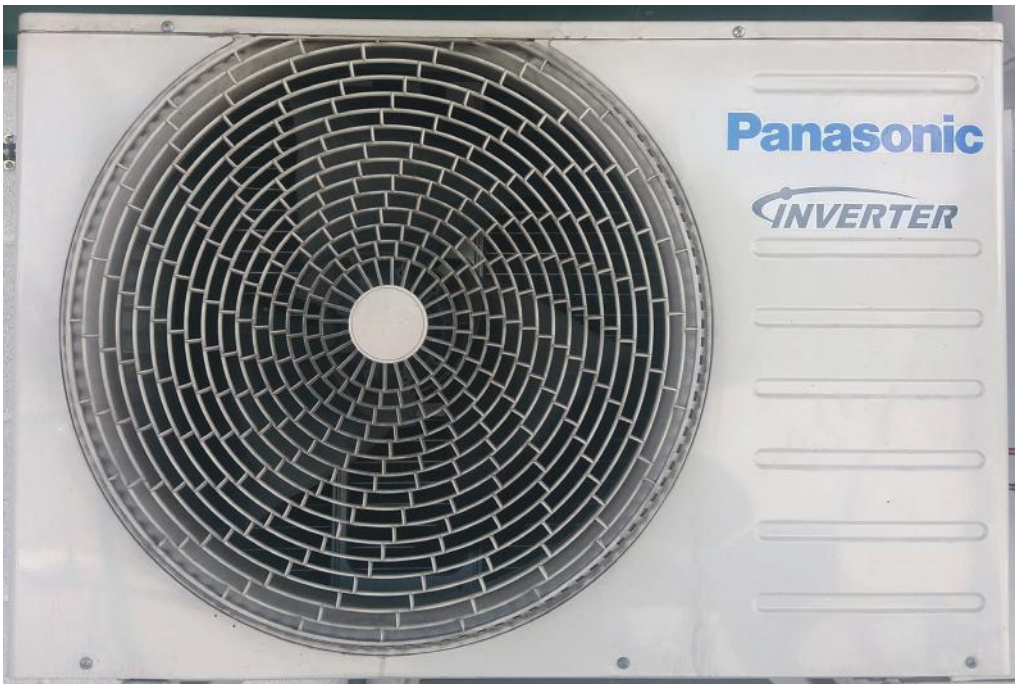

Stock holding massively increased following new head office move

As the UK's largest supplier of heat pumps and ancillaries, Go Geothermal Ltd has been able to further increase its extensive product range following the opening in September 2023 of a new northern head office and warehouse.

The move to state-of-the-art premises in County Durham has enabled us to double the size of our previous premises and the new warehouse in particular provides us with the ability to increase our stock holding capacity by three and half times – equating to £1.6 million worth of renewable energy products, with space to grow to £5 million.

The premises at Maple Way, Newton Aycliffe, will help us maximize distribution into Scotland as well as the rest of England and Wales, and is complemented by our existing commercial office in the Midlands.

Expansion

The expansion of the head office forms part of Go Geothermal's growth strategy and will provide our customers with even more availability and choice on our products, which include air and ground source heat pumps from the world's leading manufacturers, such as CTC, Vaillant, Viessmann, Bosch, Waterkotte, Clausius & Stiebel Eltron, as well as biomass, underfloor heating, solar, MVHR and many other renewable energy technologies.

In addition to the warehouse and offices for our staff, the new premises will also house one of our national heat pump training centres, which provide installers with accredited hands-on training and experience in the installation of CTC heat pumps.

Our entire offering has evolved from working closely with our customers and we actively manage our product ranges, enabling us to provide a first-class service.

With interest and demand in renewable energy products at an unprecedented level, especially in our core business - heat pump technologies - it is imperative that heat pump manufacturers and installers alike have a dependable source for advice and specialist products, especially with the Government's Net Zero targets rapidly approaching.

We offer a friendly, responsive and knowledgeable service to our trade customers, with quick delivery across the UK.

Contact us

Go Geothermal Ltd, Unit 9, Maple Way, Newton Aycliffe, County Durham, DL5 6BF
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Web: www.gogeothermal.co.uk

Revamped heat pump grant will add fuel to skills fire

Government proposals to simplify and extend its heat pump funding scheme could accelerate demand, but would the industry be able to cope? Helen Yeulet, director of training and skills at the Building Engineering Services Association (BESA), says the sector must do more to plug the skills gap.

Helen Yeulet, director of training and skills at the BESA

The Department for Energy, Security and Net Zero (DESNZ) has set out proposals to make it easier and cheaper for homeowners and small businesses to access grant funding under its Boiler Upgrade Scheme (BUS), which has also been extended until 2028.

The plan is to make the £450m scheme more flexible by introducing different levels of grants depending on property type and existing fuel source. The department has also suggested removing the need to install loft or cavity wall insulation before qualifying for a heat pump grant.

Around £81m worth of vouchers has been issued under the scheme so far with homeowners able to claim £5,000 towards the installation of an air source heat pump; £6,000 off a ground source heat pump; and £5,000 off a biomass boiler. The installations are usually VAT zero rated as well, but the UK lags well behind most of the rest of Europe in fitting low carbon heating systems. For example, France installed ten times as many heat pumps last year.

However, the government's net zero review in January confirmed that gas boilers will be banned in all new homes from 2025 and unveiled a 10-year plan to vastly increase heat pump installations. Companies like British Gas have also pledged to compensate consumers if they are unhappy about the performance of their heat pump in a bid to improve public perception of the technology.

Surge

So, next year could see another surge in demand for these installations, but does the industry have the pool of skilled people to meet it?

There are currently around 130,000 Gas Safe registered engineers fitting boilers and doing other gas work. If we were simply going to rely on the existing workforce to deliver the government's target of 600,000 installations a year by 2028, we would need almost all of them to upskill because few will switch over completely as the replacement boiler market is not about to disappear.

Despite the 2025 ban on boilers in new homes, there will still be lots of replacement boiler work for installers for many years to come. More than 1.6 million were fitted in UK homes last year. Gas boilers will still be with us well into the 2030s and they remain installers' bread and butter for now.

Also, there are just 1,500 MCS accredited businesses able to design and install heat pumps which explains why uptake of the BUS grants has been slow so far. Finding local, reputable firms able to fit a heat pump and make it work properly is a huge challenge for consumers.

It would be helpful if the government could support the revamped grant scheme with a nationwide awareness campaign to explain how heat pumps work and how they fit into the bigger picture of building upgrades.

Heat pumps can go on to become the 'heart' of the national programme of whole building retrofits needed to achieve our decarbonisation goals, but to do so they must be part of a holistic approach delivered by a 'new profession' of low carbon installers capable of making multiple changes to buildings. It's not so much the number of heat pumps we manage to fit but what that means for wider energy and carbon goals.

While simplifying access to the grants is welcome and should improve take-up, it is important not to lose sight of the fact that the best way to ensure heat pumps achieve their full energy and carbon saving potential is by making them part of a whole building strategy. That must include considering whether the insulation should be improved and reviewing the whole system including sizing the heat emitters.

At BESA, we have been adapting our training to support this concept of a new type of low carbon installer with a 'hybrid' combined online and hands-on practical approach that addresses the overall performance of the installation.

We were one of the organisations to benefit from the £9.2m of funding provided by the DESNZ following its Home Decarbonisation Skills Training competition and our share means we can deliver more free training for qualified plumbing, heating, refrigeration, and air conditioning engineers looking to upskill. We can also help more businesses develop their technical competence to be guided through the MCS-accreditation process.

We recently launched a training course which was developed in partnership with MCS and our affiliate member the heating equipment manufacturer Worcester Bosh[1]. There are still some fully funded places on this MCS-certified Air Source Heat Pump Installer[2] course available.

Practical

The course blends practical training and online learning, and students are given the skills to correctly specify and install low temperature heating systems, accurately size components, commission, and handover systems properly, as well as carrying out lifecycle maintenance.

It is delivered through the Association's online training Academy[3] and includes a one-day practical element as well as five hours of online theory which can be completed in 'bite size chunks' at the convenience of the student.

The one day practical and final assessment will take place at one of BESA's approved training centres. On completing the training, students will be able to correctly specify and install low temperature heating systems, accurately size components, commission, and handover systems properly, as well as carrying out lifecycle maintenance.

The government has also increased its funding support for Further Education colleges and to help local training providers afford the equipment and skilled trainers needed to deliver courses leading to MCS certification. This will help us to create a significant training legacy as more training centres will be able to support a new generation of engineers with the necessary skills to retrofit homes and commercial buildings. They can then go on training up future generations for the long-term benefit of building engineering businesses and the consumer.

Momentum is building in the heat pump sector and a recent pilot project showed that the technology can be successfully deployed in all types of UK housing. The Electrification of Heat Demonstration Project, which was also funded by DESNZ, did however illustrate the need for more innovation to overcome some of the barriers to a widespread roll out of the technology including cost and disruption.

It also confirmed that we are facing a race against time to keep the decarbonisation of UK heat on track by rapidly scaling up our training provision. But this is also a no brainer for domestic heating businesses wondering how to address a long-term future without gas boilers.

They can future proof their businesses while helping end users reduce their energy bills and contributing to our long-term battle against climate change. They will also inspire a whole new generation of heating installers with more modern skills leading to truly rewarding careers, but this does mean they must be prepared to invest in the development of their workforces themselves. This can't just be about government funding.

Legacy

BESA is also trying to create a long-term legacy of training provision that will support the industry far into the future. Our proposal for 'Training the trainers' was another element of our successful application for additional funding as it is designed to help extend the network of FE colleges and independent training centres able to deliver heat pump courses.

The hands-on practicality of the course and the final assessment process developed with MCS and Worcester Bosch was another element appreciated by the government.

This collaboration and the additional funding will allow us to create an extended network of local training hubs equipped to deliver meaningful, practical training to ensure heat pump technology performs to its full potential.

It will also help installers explain the various options to homeowners and commercial building customers which is a good way to gain a reputation as a knowledgeable and trustworthy business.

That ability to communicate and educate the end user will be essential if we are to overcome some of the lingering suspicion among the public about the reliability of heat pumps so that the full potential of this market can be realised.

To register your interest in BESA's fully funded heat pump training please visit: **https://tinyurl.com/355mr2hd**

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