

Decarbonised Heating & Cooling in Practice

EQF LEVEL 4 CURRICULUM

for adoption by training providers,
employers & public bodies

Curriculum



www.repowerregions.eu

Date:
June 2026

By:
Repower Regions



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the European Union

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1.1 Purpose

This curriculum defines a short continuing professional development (CPD) programme that builds practical skills for supporting the decarbonised heating and cooling transition in buildings. It is designed for technicians and operational staff who contribute to installation,

basic operation, monitoring, documentation and compliance tasks within heating and cooling projects. The programme focuses on applying established procedures, using structured tools and checklists, and recognising when issues should be reported to supervisors or specialists.

The programme covers **seven core competence** areas relevant to heating, cooling and renovation work:

The programme is practice-oriented and focuses on:

1.2 Scope

- Decarbonised heating and cooling transition: basic drivers, main solution pathways and common constraints
- Energy efficiency and standard retrofit measures
- Heat pumps and hybrid systems in everyday practice
- Integration with district heating/cooling and renewable or waste heat sources
- Smart controls and basic digital operation
- Compliance, safety and quality procedures
- Project awareness and task coordination

- Reading and understanding basic performance and operational information
- Applying established procedures and organisational guidelines
- Identifying deviations and reporting or escalating issues when required
- Producing structured, role-relevant documentation to support handover and quality assurance

1.3 Out of scope

This curriculum **does not** train learners to:

- Design systems from first principles
- Complete advanced sizing calculations
- Replace manufacturer training for specific equipment or software platforms

Where specialist competence is required, the programme trains learners to identify what is needed, what evidence to collect, and how to escalate appropriately.





This curriculum is written for external use and may be adopted by:



Training Providers

(VET/CVET centres, industry academies, professional bodies) delivering online, blended, or classroom CPD



Employers

(SMEs, contractors, building operators, municipalities, utilities) running internal upskilling and standardising delivery, documentation and handover practice



Public Bodies & Sector Organisations

supporting workforce development and regional transition plans.

Adopters may localise examples and activities while keeping the learning objectives and minimum assessment approach consistent (see Section 10).

Target learners & occupational relevance

3.1 Target learner profiles



This curriculum is suitable for learners working in operational and technical roles within heating, cooling and renovation projects, including:

- HVAC Technician / Installation Technician
- Site Technician or Assistant Site Supervisor
- Building Services Technician
- Retrofit Installation Technician
- Building Maintenance or Energy Support Technician
- Technical Support Staff (Heating and Cooling Solutions)
- Small contractor team member or working foreperson

The programme is primarily intended for practitioners who carry out or support technical tasks, follow established procedures, and contribute to safe and compliant project delivery under defined supervision or organisational guidelines.

3.2 Occupational Alignment



The programme supports competence development for roles that require basic technical understanding and structured documentation. It is most relevant where the learner is expected to:

- Read and understand basic project and performance information
- Follow commissioning and quality checklists
- Communicate clearly with supervisors, colleagues and other trades
- Recognise system interfaces (e.G. Controls, heat sources, district connections) and report issues
- Apply compliance and safety procedures in daily work

Level, Entry Requirements & Progression

4.1 EQF level

The programme is aligned to EQF 4. Learners are expected to apply practical methods, interpret information from real projects, make reasoned choices within organisational guidelines, and understand when escalation is required.

4.2 Recommended Entry Requirements

Learners should have at least one of the following:

- A relevant basic vocational qualification in HVAC, building services, construction or a related technical field, or
- Practical experience (approximately 1–3 years) in installation, maintenance or operational roles within HVAC, building services, construction or building operation

Learners should be able to:

- Read and follow basic technical documentation such as drawings, datasheets and checklists
- Use standard digital tools, including email, shared documents and simple spreadsheets or reporting templates

4.3 Progression Routes (Examples)

After completion, learners may progress to further technical or specialist training, such as:

- Heat pump installation, commissioning or manufacturer-certified training
- District heating/cooling operation and basic interface supervision
- Advanced building automation or energy monitoring training
- Supervisory training within HVAC or building services
- Further vocational or technical qualifications in construction, HVAC or energy systems



5.1 Structure

The programme
contains 7 modules.

Each module includes:

01

An overall aim



02

Learning objectives



03

Unit-based structure (units aligned to the objectives)



04

Suggested learning activities



05

A short quiz with feedback



06

At least one applied output (a short, work-relevant document or template)



5.2 Nominal workload

- Target workload: **approximately 14–18 hours total** across all modules.
- In many settings, modules are planned as **~2 hours each**, but some modules may require **2.5–3 hours** depending on delivery mode, scenario depth, and local context.
- Providers may add optional time for deeper case work or local regulation briefings.
- **Indicative workload equivalence:** The programme comprises approximately 14–18 hours of learner effort. While ECTS credits are not normally assigned to EQF Level 4 CPD programmes, the workload represents approximately 0.5 ECTS when compared to the standard higher education reference of 25–30 hours per ECTS credit.

Programme Learning Outcomes

By the end of the full programme, learners will be able to:

01**Decarbonisation Principles & Solution Selection**

Describe key concepts and main solution pathways for decarbonised heating and cooling, and recognise the basic information needed before selecting or applying a solution.

02**Energy Performance Evaluation & Diagnosis**

Interpret basic building and HVAC energy performance information using simple indicators, and identify common areas where improvement measures may be required

03**Retrofit Implementation & Constraint Management:**

Identify and apply standard retrofit and optimisation measures based on given criteria, recognising typical constraints and reporting limitations when necessary.

04**System Installation, Commissioning & Handover**

Follow and document key installation, commissioning and handover steps for low-carbon systems and interfaces using established procedures and checklists.

05**Operational Data Analysis & Issue Escalation**

Read and interpret basic operational data (e.g. meter readings, simple BMS trends or dashboards) to recognise abnormal behaviour and report or escalate issues appropriately.

06**Compliance, Quality Assurance & Safety**

Apply compliance, safety and quality procedures using structured tools, templates and documentation requirements.

07**Project Coordination & Team Communication**

Contribute to project coordination by updating task trackers, documenting change requests using templates, and communicating clearly with supervisors and relevant team members.



The curriculum supports:

7.1 Delivery formats

- Self-paced online CPD
- Blended delivery (online + workshop)
- Classroom delivery with digital support materials

Providers should use a mix of:

7.2 Recommended Learning Methods

- Short explainer inputs (video or narrated slides)
- Concise reading (checklists, diagrams, “common pitfalls”)
- Scenario-based tasks (decisions, trade-offs, evidence needs)
- Short quizzes with feedback
- Templates for applied outputs (notes, logs, checklists)

The emphasis should remain on job-relevant application, not long theory sections.

Assessment, Completion & Certification

Assessment is light-touch and suitable for CPD, while still demonstrating EQF-4 application and judgement. Minimum required assessment per module:

A learner is considered to have completed the programme when they have:

Learners may request Recognition of Prior Learning (RPL) for relevant knowledge, skills and competences acquired through formal, non-formal or informal learning.

The RPL process follows four steps:

8.1 Assessment Approach

- **Module quiz** (typically 5–8 items with feedback).
- **One applied output** (a short, structured artefact aligned to module objectives).

8.2 Completion Requirements

- Attempted all module quizzes (recommended pass threshold: 60–70%), and
- Submitted the required applied output for each module (7 outputs), or an agreed combined portfolio where appropriate.

8.3 Recognition of Prior Learning (RPL)

- **Identification** – relevant prior learning and experience are identified.
- **Documentation** – evidence is collected and presented through a portfolio or supporting documentation.
- **Assessment** – evidence is assessed against the learning outcomes and EQF-4 standards of the programme.
- **Recognition and Certification** – where appropriate, credit, exemption from specific assessment requirements, or recognition towards programme completion may be granted.

Providers are responsible for ensuring that RPL decisions are transparent, evidence-based and aligned with programme learning outcomes.

8.4 Evidence Portfolio Outputs

The programme outputs are designed to reflect typical workplace documentation at an operational level. Learners produce structured documents based on templates and checklists.

Typical outputs include:

- A short transition summary note (module 1)
- A structured retrofit action template (module 2)
- Completed commissioning and handover checklists (module 3)
- An interface and integration record (module 4)
- A basic monitoring or QA record with brief performance comments (module 5)
- A task-based method statement template and supporting documentation (module 6)
- An updated task tracker entry, issue/risk log and short status note (module 7)

All outputs focus on correct use of procedures, clear recording of information and appropriate reporting or escalation where required. Providers may issue a certificate of completion based on successful participation and submission of the required documentation.

8.5 Recording the Learning Journey (Europass)

Learners are encouraged to record their learning achievements and professional development through a Europass profile. Europass provides a recognised European framework for documenting qualifications, training, skills and work-related learning experiences.

As part of the programme, learners should:

- Create a Europass profile via the Europass portal.
- Record relevant education, training and professional development activities.
- Update their profile with programme achievements, completed modules and acquired competences.
- Maintain their profile as a lifelong learning record, including formal, non-formal and informal learning experiences where relevant.

Providers should offer guidance on creating and updating a Europass profile and encourage learners to use it as a tool for documenting their learning journey and supporting future employment and training opportunities.

8.6 Certification

Providers may issue a certificate of completion based on successful participation and submission of the required documentation.



To support mixed professional cohorts and non-native English speakers, providers should ensure:

- Clear, gender-neutral language, and consistent terminology that supports inclusive learning across all modules
- A short glossary of key terms per module
- Captions/subtitles for videos and transcripts where feasible
- Readable diagrams (avoid small text, use clear labels)
- Templates that reduce free writing and support structured outputs
- Content that works on common devices (mobile and desktop)

This section defines what may be adapted locally and what should remain consistent to protect the EQF-5 intent and comparability.

10.1 Elements that should remain consistent

- Module titles (minor wording changes allowed only if meaning stays the same)
- Module overall aims
- Module learning objectives
- Minimum assessment model (quiz + applied output per module)
- Core focus on evidence, handover quality, and role-relevant decision-making

10.2 Elements that may be adapted

- National/regional policy references and compliance examples
- Local case studies and typical building types
- System examples (heat sources, district interface arrangements, control platforms)
- Delivery schedule and format (online/blended/classroom)
- Additional optional activities (as long as workload remains reasonable)

10.3 Local Compliance Note

- Where standards and legal requirements vary, providers should teach the principle and expected evidence, then reference local requirements clearly.



To deliver this curriculum, a provider typically needs:

- A learning platform and/or classroom delivery space
- Ability to host videos/slides and short pdfs
- Templates for learner outputs (notes, logs, checklists)
- Scenario briefs and small sample datasets/screenshots (metering, BMS trend snippets, dashboard views)
- A facilitator or reviewer who can review outputs against clear criteria (where assessment is applied)

**Module 01****What is Decarbonised Heating & Cooling Transition?**[Page 17](#)**Module 02****Energy Efficiency & Retrofit Practices**[Page 23](#)**Module 03****Heat Pumps & Hybrid Systems in Practice**[Page 29](#)**Module 04****Integrating with District & Renewable Heat**[Page 35](#)**Module 05****Smart Controls & Digital Operation**[Page 39](#)**Module 06****Compliance, Safety & Quality**[Page 46](#)**Module 07****Decarbonised Heating and Cooling Project Delivery and Coordination**[Page 51](#)



Module 1

What is Decarbonised Heating & Cooling Transition & why is it so important?



Time

Anticipated learner effort, 2 hours per module (including video, reading, activities, and quiz).

2.5 Hours¹



Overall aim of the module (2–3 lines)

What the learner will be able to do, consider the learner profiles above.

This module introduces the transition to decarbonised heating and cooling and explains why it is important for heating and cooling projects across Europe. Learners will understand the main drivers, the key approaches to low-carbon heating and cooling, and what this means for decision-making, planning and delivery in their work



Module Learning Objectives

- include between 3–5 fully formed Learning Objectives

By the end of Module 1, learners will be able to:

1. Explain what the decarbonised heating and cooling transition means for buildings and organisations, using key terms (e.g. decarbonised heat, efficiency-first, electrification, district heating) and describing why it is relevant for projects.
2. Describe the main drivers of the transition (policy, energy security, economics, climate) and recognise common constraints affecting delivery (e.g. building fabric, grid capacity, skills, cost, user needs) and indicate basic actions or when to refer issues.
3. Describe the main approaches to decarbonised heating and cooling at a high level (efficiency-first, heat pumps/electrification, district heating, renewable heat), including typical advantages, limitations and where they are commonly used.
4. Identify key information needed to support decisions (e.g. heat demand, operating temperatures, building constraints, grid capacity, stakeholder needs), including simple use of available data sources.
5. Produce a short note for a given scenario, outlining a suitable next step and summarising implications for delivery and roles (e.g. planning, quality, compliance and communication), following organisational guidelines. .

¹ ECTS (European Credit Transfer and Accumulation System) is primarily used within higher education and is not normally applied to EQF Level 4 vocational education and training programmes. This programme is therefore described in terms of learning outcomes, learner workload and EQF Level 4 descriptors rather than ECTS credits. Where required for reference purposes only, 1 ECTS is generally considered equivalent to approximately 25–30 hours of learner workload.



Module 1



What are the unit titles?

The module is organised into units to make the content easier to follow. As a general approach, you can align one unit with one learning objective. For example, if a module has four learning objectives, it may contain four units. Each unit should include focused content and at least one short activity to support achievement of that learning objective. This alignment is recommended but not mandatory; some objectives may require two shorter units for example.



Briefly describe activities that you suggest deliver on the learning objective proposed above. At this stage it is just a brief description, the content development/storyboard does not take place until after Curriculum is developed (end of feb).

Consider for each learning objectives you have proposed, we suggest to include at least one activity (minimum). Activities suitable for mixed mid-career learners across the heating/cooling and renovation ecosystem.

Unit 1 Defining the decarbonised heating and cooling transition

- Core terms and scope (decarbonised heat, efficiency-first, electrification, district heating)
- What the transition means in practice for buildings and organisations

Unit 2 Drivers and constraints shaping the transition

- Main drivers: policy, energy security, economics, climate
- Common delivery constraints: building fabric, grid readiness, skills, cost, user needs
- Basic prioritisation and when to take action or refer issues

Unit 3 Pathways to decarbonised heating and cooling and where they fit

- Main approaches: efficiency-first, heat pumps/electrification, district heating, renewable heat
- Typical advantages, limitations and suitable contexts

Unit 4 Evidence and information needed to support decisions

- Key information for selecting approaches and planning next steps
- Examples: heat demand profile, operating temperatures, building constraints, grid capacity, stakeholder needs
- Use of simple digital data sources (e.g. metering or BMS summaries)

Unit 5 Project and role implications – applying to a scenario

- Practical implications for delivery: planning, quality, compliance and communication
- Short scenario-based “transition impact note” (next step and implications for role or team)

Unit 1 Defining the clean heat transition

- **Animated video:** “What is the Clean Heat Transition?” (key terms and why it matters)
- **Short activity:** match key terms to definitions (decarbonised heat, efficiency-first, electrification, district heating)

Unit 2 Drivers and constraints shaping the transition

- Animated video on environmental drivers
- Animated video on economic, political and social drivers
- Mini case study (two scenarios): learners identify key drivers, main constraints (e.g. fabric, grid, skills, cost, user needs), and indicate simple actions or when to escalate
- Short input on policy context (overview of direction and key signals)



Module 1



E.g. Short explainer input (video or narrated slides, 5–10 minutes)

e.g. to introduce the key concepts and why they matter in real projects etc.

Targeted reading (brief PDF, 3–6 pages) *E.g. to provide practical guidance, definitions, and “common pitfalls”. You could use checklists, diagrams, and simple tables where possible.*

Scenario or mini case study (1–2 examples)

e.g. Learners review a real-world situation relevant to clean heat delivery (e.g., retrofit constraints, commissioning issue, compliance challenge, stakeholder conflict, system integration problem).

Compare-and-contrast task

e.g. Learners compare two options, two cases, or good vs poor practice, and identify trade-offs (technical, organisational, financial, regulatory).

Unit 3 Pathways to decarbonised heating and cooling and where they fit

- **Short reading (3–6 pages):** overview of main pathways (efficiency-first, heat pumps/electrification, district heating, renewable heat) with focus on typical use
- **Worksheet activity:** learners compare two pathway options for a scenario
- **Tasks include:**
 - describe advantages and limitations
 - assess fit using simple criteria (feasibility, disruption, cost, carbon, constraints)
 - select a suitable option and give a short justification
- **Mini output:** short recommendation statement with reasons

Unit 4 Evidence and information needed to support decisions

- **Short input:** importance of using evidence before making decisions
- **Checklist activity:** learners identify
 - what information is available
 - what is missing
 - where it can be obtained (e.g. site survey, bills, metering, BMS, stakeholders)
- **Example areas:** heat demand, operating temperatures, building constraints, grid capacity, space, stakeholder needs, basic digital data
- **Mini output:** short note identifying key missing information and next steps

Unit 5 Project and role implications – applying to a scenario

- **Short input:** what changes in delivery (planning, quality, compliance, roles, communication)
- **Timeline activity:** learners outline a simple delivery sequence
- **Scenario output:** short “transition impact note” including
 - recommended next step
 - key risks or constraints
 - basic evidence needed for handover
 - short stakeholder message (clear and simple)



Module 1



Short check of understanding via

5–8 item quiz with instant feedback.

Unit 1 Definition and key terms

Which statement best describes the Clean Heat Transition?

- A. Switching from gas boilers to electric heaters only
- B. Producing fossil-free heat only
- C. Reducing heat demand and replacing fossil heat with low-carbon heat sources, supported by good system design and operation
- D. Installing renewable electricity generation on-site

Answer: C

Instant feedback:

Correct. The transition includes both reducing demand and shifting to low-carbon heat, supported by appropriate system design and operation.

Which term best describes the “efficiency-first” approach?

- A. Installing the largest heat pump possible
- B. Reducing heat demand through fabric and operational improvements before changing the heat source
- C. Switching to district heating in all buildings
- D. Increasing flow temperatures for comfort

Answer: B

Instant feedback:

Correct. Efficiency-first focuses on reducing demand before selecting or upgrading the heat source.

Unit 2 Drivers and constraints

Which is an economic driver for the Clean Heat Transition?

- A. Higher refrigerant leakage
- B. Reduced exposure to fuel price volatility and long-term running cost savings
- C. Increased noise from plant
- D. Lower grid capacity

Answer: B

Instant feedback:

Correct. Lower exposure to fuel price changes and potential cost savings are key economic drivers.

Which constraint most commonly affects the feasibility of heat pump electrification in existing buildings?

- A. Paint colour
- B. Building heat demand, required flow temperatures, and fabric condition
- C. Window orientation only
- D. Water hardness only

Answer: B

Instant feedback:

Correct. High heat demand and high temperature requirements are common barriers in existing buildings.



Module 1



Short check of understanding via

5–8 item quiz with instant feedback.

Unit 3 Pathways and fit-for-context

Which list includes the main pathways covered in this module?

- A. Solar PV, wind turbines, batteries
- B. Boilers, radiators, thermostats
- C. Efficiency-first, heat pumps/electrification, district heating, renewable heat
- D. Insulation only

Answer: C

Instant feedback:

Correct. These are the main approaches used to decarbonise heating and cooling.

Unit 4 Evidence and information needed

Before choosing a pathway, which piece of information is most important to collect first?

- A. Brand of existing boiler
- B. Heat demand profile, peak load, and operating temperatures
- C. Number of occupants' pets
- D. Colour of internal walls

Answer: B

Instant feedback:

Correct. Understanding demand and operating conditions is essential for selecting a suitable solution.

Which digital data source can best support early decision-making in larger buildings?

- A. Social media comments
- B. Metering or BMS summaries and trend data
- C. Website analytics
- D. Email signatures

Answer: B

Instant feedback:

Correct. Metering and BMS data provide useful insight into system performance and demand.

Unit 5 Delivery, roles, communication and judgement

In a multi-stakeholder clean heat project, what commonly causes avoidable project issues?

- A. Too many site photos
- B. Poor communication and unclear responsibilities across stakeholders
- C. Too much insulation
- D. Too many data points

Answer: B

Instant feedback:

Correct. Clear communication and defined roles are essential to avoid coordination issues.



Module 1



Accessibility. Suggest how you make the module easy to understand for all learners. For example;

- **Captions:** subtitles on every video.
- **Glossary:** a short list of key terms explained in simple English.
- **Large labels on diagrams:** avoid tiny text; make callouts clear.
- **Avoid dense text:** use short paragraphs, bullets, and white space.

- Captions: subtitles on every video.
- Avoid dense text: use short paragraphs, bullets, and white space.
- Provide texts digital, so using translation apps is easier

ESCO Occupational References

This module contributes to the development of knowledge, skills and competences relevant to the following ESCO occupational profiles:

ESCO 3115.1.5 | ESCO 7126.4 | ESCO 3115.1.17 | ESCO 7411 | ESCO 515 | ESCO 7127.1





Module 2

Energy Efficiency & Retrofit Practices



Time

Anticipated learner effort, 2 hours per module (including video, reading, activities, and quiz).

2 hours



Overall aim of the module (2–3 lines)

What the learner will be able to do, consider the learner profiles above.

This module provides practical skills for carrying out energy audits of buildings and HVAC systems, from the initial inspection to identifying possible improvements. Participants will learn how to read and understand audit results and identify suitable retrofit measures. The training introduces the main regulatory requirements and how to document audit findings for compliance and project approval. The module supports the implementation of decarbonization actions that help reduce carbon emissions and improve system performance. .



Module Learning Objectives

- include between 3–5 fully formed Learning Objectives

By the end of Module 2, learners will be able to,

1. **Recognise and describe** basic building and HVAC energy performance information (energy use, main demand factors, operating conditions and control schedules) in order to identify where inefficiencies may occur.
2. **Use simple indicators and basic benchmarking** (e.g., normalised consumption and before/after comparisons) to highlight possible improvement opportunities and recognise when changes may be influenced by factors such as weather, occupancy or operating hours.
3. **Identify suitable retrofit and optimisation measures** for a given scenario (e.g., building fabric improvements, system upgrades, control adjustments and heat recovery) and outline their main practical considerations such as cost, disruption and expected energy savings.
4. **Use basic digital data sources** (e.g., meter readings, BMS trends, sub-meter data or simple log snapshots) to support initial energy performance checks and identify when additional measurements or checks may be required.
5. **Describe the purpose of key regulatory or voluntary frameworks** related to energy efficiency (e.g., ISO 50001, LEED and relevant legal or environmental requirements) and recognise the types of documentation typically required.
6. **Prepare a short summary note** describing suggested retrofit actions, main constraints, and the basic information required for verification and project documentation.



Module 2



What are the unit titles?

The module is organised into units to make the content easier to follow. As a general approach, you can align one unit with one learning objective. For example, if a module has four learning objectives, it may contain four units. Each unit should include focused content and at least one short activity to support achievement of that learning objective. This alignment is recommended but not mandatory; some objectives may require two shorter units for example.

Unit 1: Interpreting energy audits and performance data

- Recognising the main components and outputs of a typical energy audit report.
- Reading and describing key energy performance indicators (EPIs) such as kWh/m²/year and their general relation to building use.
- Identifying the main energy demand areas shown in audit data (e.g., heating, cooling, ventilation, lighting).
- Reviewing operational parameters and control schedules to recognise possible inefficiencies in system runtime or setpoints.

Activity: Case Study Review – Participants are given a simplified energy audit summary for a small office building. They identify the two most likely areas of inefficiency based on the consumption data and operating schedules and briefly describe why these may require attention.

Unit 2: Benchmarking energy use and prioritising actions

- Using simple normalization methods to adjust energy consumption data for factors such as weather (degree days) or occupancy.
- Applying basic benchmarking approaches to compare a building's energy performance with typical values or previous performance.
- Comparing before-and-after data to observe possible changes following retrofit measures.
- Identifying possible improvement opportunities based on energy use, cost considerations, and carbon reduction potential.

Activity: Weather-normalization exercise – Using a dataset of monthly gas consumption and heating degree days, learners follow a guided calculation to estimate normalized annual consumption and describe how this may affect the interpretation of building performance.

Unit 3: Identifying suitable retrofit measures

- Recognising common retrofit measures, including building fabric improvements, HVAC upgrades, control adjustments, and heat recovery.
- Comparing different retrofit options for a given scenario using simple criteria such as cost, disruption, and expected energy savings.
- Recognising basic constraints and practical considerations that may affect the feasibility of certain measures (e.g., building type or system limitations).
- Describing why a selected measure may be suitable for the given situation.

Activity: Measure selection matrix – For a given building scenario (e.g., a 1980s school with an old gas boiler), learners complete a simple comparison matrix to review several retrofit options and select the most appropriate one based on provided criteria.



Module 2



What are the unit titles?

The module is organised into units to make the content easier to follow. As a general approach, you can align one unit with one learning objective. For example, if a module has four learning objectives, it may contain four units. Each unit should include focused content and at least one short activity to support achievement of that learning objective. This alignment is recommended but not mandatory; some objectives may require two shorter units for example.

Unit 4: Using digital data for basic performance checks

- Identifying common digital data sources, such as utility meters, Building Management Systems (BMS), and sub-metering.
- Reading basic trend data or log snapshots to recognise unusual system behaviour.
- Identifying when additional data or checks may be required to better understand system performance.
- Using available data to record a basic performance reference point before retrofit measures.

Activity: BMS snapshot review – Learners review a one-week trend graph from a BMS showing heating and zone temperatures. They identify one possible operational issue and suggest one additional piece of information that may help confirm the situation.

Unit 5: Compliance, documentation, and the retrofit action plan

- Recognising the purpose of key frameworks related to energy efficiency, such as ISO 50001, LEED/BREEAM, and relevant building regulations.
- Identifying common types of documentation or evidence typically required for projects or organisational reporting.
- Preparing a simple retrofit action summary outlining suggested measures and basic considerations.
- Recognising basic verification steps and documentation requirements for commissioning and handover.

Activity: Evidence checklist creation – Based on a short project description aiming for a specific standard (e.g., EPC Band B), learners prepare a short checklist of the types of documentation and evidence that may be needed for project approval or reporting.



Briefly describe activities that you suggest deliver on the learning objective proposed above. At this stage it is just a brief description, the content development/storyboard does not take place until after Curriculum is developed (end of feb).

Consider for each learning objectives you have proposed, we suggest to include at least one activity (minimum). Activities suitable for mixed mid-career learners across the heating/cooling and renovation ecosystem

Each unit/topic includes a short presentation (up to 10 minutes) followed by a brief knowledge check (3–4 questions).

LO1: Identify basic building/HVAC energy performance information

- **Activity:** Audit Report Annotation
- **Format:** Simple Scenario + Guided Reflection.
- **Description:** Learners receive a short excerpt (about 1–2 pages) from an energy audit report for a small commercial building (e.g., a local library). It includes basic annual energy consumption data, a simple breakdown of main systems, and typical operating hours.
- **Task:** Using a digital or printed copy, learners annotate the document to: 1) Circle the system that uses the most energy, 2) Underline one operational detail that may affect energy use (e.g., long HVAC operating hours), and 3) Write one short sentence describing a possible reason for high energy use.



Module 2



E.g. Short explainer input (video or narrated slides, 5–10 minutes)

e.g. to introduce the key concepts and why they matter in real projects etc.

Targeted reading (brief PDF, 3–6 pages)

E.g. to provide practical guidance, definitions, and “common pitfalls”. You could use checklists, diagrams, and simple tables where possible.

Scenario or mini case study (1–2 examples)

e.g. Learners review a real-world situation relevant to clean heat delivery (e.g., retrofit constraints, commissioning issue, compliance challenge, stakeholder conflict, system integration problem).

Compare-and-contrast task

e.g. Learners compare two options, two cases, or good vs poor practice, and identify trade-offs (technical, organisational, financial, regulatory).

LO2: Use simple indicators to compare energy use

- **Activity:** The Weather Comparison Task
Format: Guided Comparison + Short Explainer Input.
- **Description:** After a short explanation of Heating Degree Days (HDDs), learners review a simple table showing a building's gas consumption for two years. Year 2 shows a small reduction, but the winter was milder (fewer HDDs).
- **Task:** Learners follow a simple guided calculation (or provided example) to adjust the energy use for weather differences. They then answer a short question: “Did the building probably become more efficient, or was the lower consumption mainly due to milder weather?”

LO3: Choose suitable retrofit measures

- **Activity:** Simple Retrofit Choice
- **Format:** Scenario + Guided Comparison.
- **Description:** Learners are given a short description of a 1990s apartment block with an old gas boiler and limited insulation in common areas. They are presented with three possible improvements (e.g., boiler replacement, adding insulation, installing basic controls).
- **Task:** Using a simple table with columns such as Cost, Energy Saving, and Practicality, learners compare the options. They then write two short bullet points explaining why they selected one option as the most suitable.

LO4: Recognise patterns in basic digital building data

- **Activity:** BMS Graph Observation
- **Format:** Mini Case Study + Guided Reflection.
- **Description:** Learners view a simple screenshot of a Building Management System (BMS) graph showing one day of temperature data (e.g., supply air temperature and room temperature). The graph shows a noticeable pattern such as frequent fluctuations or a mismatch between temperatures.
- **Task:** Learners answer two short questions: 1) What unusual pattern can be seen in the graph? and 2) What simple explanation could cause this (e.g., incorrect setpoint or sensor problem)?

LO5: Recognise the purpose of energy frameworks and standards

- **Activity:** Standards Comparison
- **Format:** Short Reading + Simple Comparison Task.
- **Description:** Learners read a short summary explaining two frameworks: one regulatory requirement (e.g., local building energy regulations) and one voluntary standard (e.g., ISO 50001).
- **Task:** Using a simple two-column table, learners identify examples of information required by each framework (e.g., energy records, commissioning reports, or monitoring plans). They then answer a short question about why organisations might use voluntary standards in addition to regulations.



Module 2



Applied reflection / mini output e.g.

Learners produce a short output that mirrors professional practice, such as:

- a decision note (recommended option + rationale)
- a risk/issue log (problem → impact → mitigation)
- a simple checklist (what to verify / what evidence to keep)
- a short client/stakeholder explanation (plain language)

LO6: Write a short energy improvement note

- **Activity:** Draft a Simple Retrofit Note
- **Format:** Scenario + Short Written Output.
- **Description:** Learners receive a short summary of a building case including key energy findings, a simple comparison of improvement options, and a selected measure.
- **Task:** Using a short template, learners write a brief Retrofit Action

Note (around half a page). The note includes: the recommended measure, one expected benefit (e.g., energy saving), and one practical consideration (e.g., cost or disruption). This helps learners practise communicating a basic improvement recommendation.



Short check of understanding via

5–8 item quiz with instant feedback.

1. Given the data on energy consumption and information on building area, what is its Energy Performance Indicator (EPI) in kWh/m²/year, and what is the first step in interpreting this figure?
2. Why is it useful to adjust energy consumption data using Heating Degree Days (HDDs) before comparing a building's energy use between different years?
3. After a boiler retrofit, a building's gas consumption decreased by 15%. However, that winter was also warmer than the previous one. What simple check should be carried out to understand whether the retrofit actually improved efficiency?
4. When considering the installation of a building energy management system (BEMS), what are two common reasons for choosing this type of improvement?
5. A BMS graph shows that the hot water supply temperature frequently moves outside its normal range. What type of problem might this indicate?
6. Why is it useful to know a building's energy use before a retrofit measure is implemented?
7. A retrofit project is linked to an organisation following an energy management standard such as ISO 50001. What kind of documentation might be required to demonstrate good energy management practice?
8. Why is it helpful to include a short "verification steps" section in a retrofit action note?



Module 2



Accessibility. Suggest how you make the module easy to understand for all learners. For example;

- **Captions:** subtitles on every video.
- **Glossary:** a short list of key terms explained in simple English.
- **Large labels on diagrams:** avoid tiny text; make callouts clear.
- **Avoid dense text:** use short paragraphs, bullets, and white space.

1. Subtitles on every video.
2. Subtitle language choice (multilingual captions).
3. Key terms list (short glossary for each unit).
4. Readable diagrams (large labels, high contrast).
5. Simple, structured slides (one idea per slide; clear visuals).
6. Project-based learning with one consistent example (step-by-step calculations, and why each parameter matters).
7. Virtual lab as a “digital twin” (clear schematic, visible sub-station elements, and guided tasks).

ESCO Occupational References

This module contributes to the development of knowledge, skills and competences relevant to the following ESCO occupational profiles:

ESCO 3115.1.5 | ESCO 7126.4 | ESCO 3115.1.17 | ESCO 7411 | ESCO 515 | ESCO 7127.1





Module 3

Heat Pumps & Hybrid Systems in Practice



Time

Anticipated learner effort, 2 hours per module (including video, reading, activities, and quiz).

2 Hours



Overall aim of the module (2–3 lines)

What the learner will be able to do, consider the learner profiles above.

To develop the practical skills and understanding needed to plan, install and support modern low-carbon heating and cooling systems. The programme prepares professionals to carry out work in line with regulations and to help deliver reliable and energy-efficient solutions in both renovation and new-build projects.



Module Learning Objectives

- include between 3–5 fully formed Learning Objectives

By the end of Module 3, learners will be able to:

1. Describe the basic operating principles of heat pumps and common hybrid systems, and recognise how these affect system performance (e.g. temperature lift, defrost cycles and part-load operation).
2. Follow installation and commissioning procedures for heat pump and hybrid systems using technical documentation and manufacturer guidance, ensuring that safety and compliance requirements are met.
3. Read and check key operating data (e.g. flow and return temperatures, pressures, electrical input and delivered heat) to confirm that the system is operating within expected ranges.
4. Identify common faults and incorrect settings and carry out basic troubleshooting checks, applying standard corrective actions or reporting issues to specialist support when needed.
5. Complete commissioning and handover documentation (e.g. commissioning checklist, basic performance record, settings log and maintenance note).



Module 3



What are the unit titles?

The module is organised into units to make the content easier to follow. As a general approach, you can align one unit with one learning objective. For example, if a module has four learning objectives, it may contain four units. Each unit should include focused content and at least one short activity to support achievement of that learning objective. This alignment is recommended but not mandatory; some objectives may require two shorter units for example.

Unit 1: Heat pump and hybrid system fundamentals in practice

- Basic operating principles (temperature lift, part-load operation and defrost cycles)
- Common hybrid system configurations and typical applications
- Recognising what normal system performance looks like in practice

Unit 2: Installation and commissioning procedures and safety

- Main installation and commissioning steps and correct sequence
- Using technical documentation and manufacturer instructions
- Safety requirements, compliance checks and basic commissioning tasks

Unit 3: Performance checks and basic data reading

- Key operating data: flow and return temperatures, pressures, electrical input and delivered heat
- Simple performance indicators (e.g. COP/SCOP estimates) and their practical limits
- Checking readings to confirm normal system operation

Unit 4: Common faults and basic troubleshooting

- Typical faults and commissioning errors (controls, sensors, hydraulics and defrost behaviour)
- Step-by-step troubleshooting checks
- Applying standard corrective actions or reporting issues to specialist support

Unit 5: Documentation and handover

- Completing commissioning records and basic performance notes
- Recording settings, service notes and checklists
- Communicating key information clearly to colleagues and customers



Briefly describe activities that you suggest deliver on the learning objective proposed above. At this stage it is just a brief description, the content development/storyboard does not take place until after Curriculum is developed (end of feb).

Consider for each learning objectives you have proposed, we suggest to include at least one activity (minimum). Activities suitable for mixed mid-career learners across the heating/cooling and renovation ecosystem

Unit 1 – Heat pump and hybrid fundamentals

Hands-on system walkthroughs showing temperature lift, part-load behaviour and defrost cycles, with examples of common hybrid configurations and how they are used in practice.

Unit 2 – Installation, commissioning and safety

Step-by-step installation and commissioning activities using real documentation and manufacturer guidance, with exercises focusing on safety requirements, compliance and correct commissioning procedures.

Unit 3 – Performance checks and data reading

Practical exercises reviewing operating data such as temperatures, pressures, electrical input and heat output to check whether the system is operating within normal ranges.

Unit 4 – Faults and basic troubleshooting

Troubleshooting exercises using common faults and incorrect settings, following structured checks and applying standard corrective actions or reporting issues to specialist support.

Unit 5 – Documentation and handover

Practical completion of commissioning records, basic performance notes, settings logs and checklists, followed by short communication tasks explaining key information to colleagues or customers.



Module 3



E.g. Short explainer input (video or narrated slides, 5–10 minutes) *e.g. to introduce the key concepts and why they matter in real projects etc.*

Targeted reading (brief PDF, 3–6 pages) *E.g. to provide practical guidance, definitions, and “common pitfalls”. You could use checklists, diagrams, and simple tables where possible.*

Scenario or mini case study (1–2 examples) *e.g. Learners review a real-world situation relevant to clean heat delivery (e.g., retrofit constraints, commissioning issue, compliance challenge, stakeholder conflict, system integration problem).*

Compare-and-contrast task *e.g. Learners compare two options, two cases, or good vs poor practice, and identify trade-offs (technical, organisational, financial, regulatory).*

Applied reflection / mini output e.g.

Learners produce a short output that mirrors professional practice, such as:

- a decision note (recommended option + rationale)
- a risk/issue log (problem → impact → mitigation)
- a simple checklist (what to verify / what evidence to keep)
- a short client/stakeholder explanation (plain language)

1. Decision note (recommended option + rationale)

- **Task for learners:** Prepare a 4–6 sentence note recommending an operational or commissioning decision.
- **Example prompt:** “Based on observed flow/return temperatures and compressor cycling, recommend whether to adjust settings or escalate to a specialist. Provide your rationale.”
- **Example output (model):** Recommended action: Adjust flow temperature setpoint and verify system balance.
- **Rationale:** Data shows short cycling at low load and elevated return temperatures, indicating sub-optimal control rather than a component fault. Adjustment likely resolves the issue without requiring specialist intervention.

2. Risk / issue log (problem → impact → risk reduction)

- **Task for learners:** Produce a basic and brief, structured log for one identified installation or performance risk.
- **Template:** Problem/Impact/ (risk reduction) Mitigation/Incorrect sensor placement on buffer tank. Misleading temperature readings leading to poor defrost performance/Relocate sensor; verify against manufacturer guidance; record correction

3. Make a basic checklist (what to verify / what evidence to keep)

- **Task for learners:** Draft a short checklist relevant to commissioning or hybrid-system validation.
- **Example:**
 - ✓ Checklist – Basic commissioning verification
 - ✓ Flow/return temperature differential within expected range. Defrost cycle observed and logged
 - ✓ Electrical input measured and recorded
 - ✓ Settings recorded (curve, limits, schedules)
 - ✓ Baseline performance snapshot saved to handover file

4. Short client/stakeholder explanation (plain language)

- **Task for learners:** Explain a technical finding in simple terms suitable for homeowners or non-technical stakeholders.
- **Example output (model):** “Your heat pump is working normally, but the settings aren’t fully matched to your home. By lowering the flow temperature slightly, the system will run more efficiently and maintain comfort more consistently.”



Module 3



Short check of understanding via

5–8 item quiz with instant feedback.

Heat Pump & Hybrid Systems – Quick Check Quiz

1. What does a large temperature lift usually mean in a heat pump?

- A. High system efficiency
- B. The compressor must work harder and efficiency may drop
- C. Faulty sensors
- D. Incorrect refrigerant charge

Feedback:

Correct: B. A large temperature lift means the heat pump must raise the temperature more, which increases compressor workload.

If incorrect: Temperature lift is the difference between the source temperature and the heating supply temperature.

2. When is a hybrid heat-pump system commonly used?

- A. When heating demand is very low
- B. When no backup heat source is available
- C. When a second heat source helps meet high demand or reduce running costs
- D. When the heat pump is oversized

Feedback:

Correct: C. Hybrid systems combine a heat pump with another heat source to support high demand or improve efficiency.

If incorrect: Hybrid systems provide support during higher loads or colder conditions.

3. During commissioning, what should be checked early?

- A. Final customer documentation
- B. Correct sensor locations and flow direction
- C. Historical SCOP values
- D. Future maintenance schedule

Feedback:

Correct: B. Early commissioning checks include confirming correct flow direction and sensor placement.

If incorrect: Physical system checks are completed before documentation or long-term planning.

4. A system shows frequent on/off cycling and high return temperatures. What could this indicate?

- A. Normal low-load operation
- B. Incorrect control settings or poor system balance
- C. Compressor failure
- D. No electrical supply

Feedback:

Correct: B. Frequent cycling and high return temperatures often indicate control settings or hydraulic balance issues.

If incorrect: Configuration issues are more common than component failures.



Module 3



Short check of understanding via

5–8 item quiz with instant feedback.

5. Which data helps check system performance during operation?

- A. Noise level only
- B. Flow and return temperatures, pressures, electrical input and heat output
- C. Manufacturer brochure COP values
- D. Customer comfort reports only

Feedback:

Correct: B. These measurements help check how the system performs in real conditions.

If incorrect: Brochure values do not show real-world operation.

6. Why record a baseline performance reading at handover?

- A. To diagnose faults many years later
- B. To provide a reference for future service checks
- C. To compare with other manufacturers
- D. To confirm customer billing

Feedback:

Correct: B. The baseline reading provides a starting point for future maintenance and performance checks.

If incorrect: It is mainly used as a reference for service technicians.

7. What should be checked first if defrost behaviour seems unusual?

- A. Replace the expansion valve
- B. Check sensor placement and airflow around the outdoor unit
- C. Increase flow temperature
- D. Check customer heating habits

Feedback:

Correct: B. Many defrost issues are caused by airflow problems or incorrect sensor placement.

If incorrect: Troubleshooting usually starts with simple checks before replacing parts.

8. Which example shows clear communication with a customer?

- A. "Your SCOP proxy indicates a deviation from thermodynamic output."
- B. "The system shows anomalous cycling patterns."
- C. "Your heat pump is working, but the settings can be adjusted so it runs more efficiently."
- D. "Refrigerant pressure is outside specification due to load mismatch."

Feedback:

Correct: C Clear and simple language helps customers understand what is happening and what will be done.

If incorrect: Avoid technical jargon when speaking to non-technical stakeholders.



Module 3



Accessibility. Suggest how you make the module easy to understand for all learners. For example;

- **Captions:** subtitles on every video.
- **Glossary:** a short list of key terms explained in simple English.
- **Large labels on diagrams:** avoid tiny text; make callouts clear.
- **Avoid dense text:** use short paragraphs, bullets, and white space.

Accessibility: What We Incorporated into the Module

To ensure the module is clear, inclusive and easy to understand for all learners, we embedded several accessibility measures throughout the design.

1. **Glossary of key terms** - We included a concise glossary explaining all essential terms in plain English, supported by simple icons and visuals to reinforce meaning.
2. **Clear, accessible diagrams** - All diagrams were designed with large labels, high-contrast colours, and clean callouts. Each visual was accompanied by descriptive alt-text and a downloadable high-resolution version for zooming.
3. **Reader-friendly text structure** - We avoided dense blocks of text by using short paragraphs, bullet points and generous white space. Headings and consistent layout helped learners navigate content easily.
4. **Multiple ways to engage with content** - Explanations were provided in text, visuals and optional audio. Complex processes included narrated walkthroughs, and all audio/video included captions and transcripts.
5. **Plain-language explanations of technical concepts** - For each complex topic, we paired the technical definition with a plain-language explanation and a practical real-world example, making the content accessible to both technical and non-technical learners.
6. **Progressive disclosure for complexity management** - We structured the content so learners could start with simple explanations and expand sections to access more detail only when needed, reducing cognitive load.
7. **Consistent visual cues and iconography** - We used clear, repeatable icons (e.g., ⚠️ for safety, 🔧 for troubleshooting, 📊 for performance data) to help learners quickly identify the purpose of content sections.
8. **Colour-blind-friendly design** - All visuals avoided red/green-only contrasts and used patterns or shapes in addition to colour to ensure information remained identifiable for all learners.
9. **Summaries and checklists** - Each topic concluded with a short summary or checklist to reinforce understanding and provide quick reference points for revision and practical application.
10. **Accessible assessment design** - Quizzes were kept short, focused and provided immediate explanatory feedback to help learners understand not just whether they were correct, but why.
11. **Screen-reader friendly formatting** - We ensured all headings used proper markup, links were descriptive rather than generic, and no tables were used purely for layout, improving compatibility with assistive technologies.
12. **Real-world scenarios with clear context** - Scenario-based tasks were written with clear context and step-by-step

ESCO Occupational References

This module contributes to the development of knowledge, skills and competences relevant to the following ESCO occupational profiles:

ESCO 3115.1.5 | ESCO 7126.4 | ESCO 3115.1.17 | ESCO 7411 | ESCO 515 | ESCO 7127.1



Module 4

Integrating with District & Renewable Heat



Time

Anticipated learner effort, 2 hours per module (including video, reading, activities, and quiz).

2.5 – 3 hours



Overall aim of the module (2–3 lines)

What the learner will be able to do, consider the learner profiles above.

Learners will be able to describe low-temperature district heating concepts, identify where renewable and waste heat sources may be connected, and understand the basic interface between buildings and the network. They will be able to read basic metering and operating data, recognise common integration issues, and follow documentation and coordination steps needed for commissioning and handover.



Module Learning Objectives

- include between 3–5 fully formed Learning Objectives

By the end of Module 4, learners will be able to:

1. Describe the shift from traditional high-temperature networks to low-temperature (4th/5th generation) district heating and cooling, and recognise how this affects building systems and indoor comfort.
2. Identify the main building-level interface components (such as heat interface units, meters and controls) and check their basic function using technical documentation and standard commissioning checks.
3. Check return temperature and temperature difference (ΔT) at the building-network interface and recognise when performance may be outside normal ranges.
4. Read basic metering and control system data to monitor system operation and recognise signs of unusual performance (such as high return temperatures or poor load matching).
5. Prepare a short installation or handover note for a simple system scenario (district heating with renewable or waste heat), recording the main interface arrangement, key checks carried out, and commissioning or documentation requirements



Module 4



What are the unit titles?

The module is organised into units to make the content easier to follow. As a general approach, you can align one unit with one learning objective. For example, if a module has four learning objectives, it may contain four units. Each unit should include focused content and at least one short activity to support achievement of that learning objective. This alignment is recommended but not mandatory; some objectives may require two shorter units for example.

Unit 1 – Low-temperature district heating and cooling principles (4GDH/5GDHC)

- Basic principles of low-temperature district heating and cooling (4GDH and 5GDHC)
- Examples of low-temperature network systems and where they are used

Unit 2 – Building–network interface components and basic checks

- Heat interface units (HIUs) and building substations
- Basic smart metering functions and consumption data
- Typical installation and commissioning checks at the building–network interface

Unit 3 – Return temperature, ΔT and basic performance checks

- Understanding return temperature and temperature difference (ΔT)
- Basic control and automation functions (BMS/EMS) related to system operation
- Using temperature readings and metering data to check system performance

Unit 4 – Integration with renewables and thermal storage

- Basic operation of thermal energy storage (TES)
- Examples of integrating solar thermal and geothermal heat with district systems
- Simple control approaches used to manage system operation

Unit 5 – Waste heat opportunities and system monitoring

- Sources of waste heat in industrial or urban environments
- What to monitor in system data and how to recognise unusual readings
- Practical examples of renewable and waste heat integration in district heating
- Basic commissioning, verification and handover documentation for stakeholders



Module 4



Briefly describe activities that you suggest deliver on the learning objective proposed above. At this stage it is just a brief description, the content development/storyboard does not take place until after Curriculum is developed (end of feb).

Consider for each learning objectives you have proposed, we suggest to include at least one activity (minimum). Activities suitable for mixed mid-career learners across the heating/cooling and renovation ecosystem

E.g. Short explainer input (video or narrated slides, 5–10 minutes)
e.g. to introduce the key concepts and why they matter in real projects etc.

Targeted reading (brief PDF, 3–6 pages) *E.g. to provide practical guidance, definitions, and “common pitfalls”. You could use checklists, diagrams, and simple tables where possible.*

Scenario or mini case study (1–2 examples)
e.g. Learners review a real-world situation relevant to clean heat delivery (e.g., retrofit constraints, commissioning issue, compliance challenge, stakeholder conflict, system integration problem).

Each unit/topic includes a short presentation (up to 10 minutes) followed by a brief knowledge check (3–4 questions).

Presentations are built around one consistent worked example with defined parameters (e.g., heating demand, flow rate, supply/return temperatures, and key equipment). Learning is delivered using a project-based learning approach, where learners solve a realistic system-integration problem step by step.

In addition, learners complete a separate practical task — a Virtual Lab (simulation). The simulation goal is to improve system performance by:

- moving from high-temperature to low-temperature district heating,
- applying a simple control strategy,
- adding renewables and thermal storage.

Presentation content by learning objective:

M LO1 — Low-temperature DHC principles and transition

- Introduction to low-temperature district heating and cooling (4GDH and 5GDHC).
- Typical supply and return temperature ranges and how lower temperatures can reduce network heat losses and support the use of renewable energy.
- Comparison of traditional high-temperature networks and low-temperature networks, including what changes for buildings, substations and daily system operation.

LO2 — Building interface components and basic monitoring

- Labelled diagram showing the main elements: network → substation or heat interface unit (HIU) → building heating and domestic hot water circuits.
- Where metering is carried out (flow measurement, supply and return temperature sensors, heat meter).
- Simple interpretation prompts, for example:
 - “What could high flow and low ΔT indicate?”
 - “What might a high return temperature suggest?”

LO3 and LO4 — Temperature regime, efficiency and basic control approaches

- Relationship between flow temperature, heat output and system performance.
- Basic control approaches such as weather compensation, domestic hot water priority, return temperature limitation and hydraulic balancing.
- How these control approaches help maintain lower return temperatures and stable system operation.

LO5 — Integration of renewables, thermal storage and waste heat

- Overview of how renewable heat sources such as solar thermal and geothermal energy can be connected to district heating systems.
- Purpose of thermal energy storage (TES), such as storing heat and helping manage peak demand.
- Basic principles of waste heat use, including common sources, temperature levels and simple monitoring needs.



Module 4



Applied reflection / mini output e.g.

Learners produce a short output that mirrors professional practice, such as:

- a decision note (recommended option + rationale)
- a risk/issue log (problem → impact → mitigation)
- a simple checklist (what to verify / what evidence to keep)
- a short client/stakeholder explanation (plain language)

Virtual Lab (simulation using predefined system cases)

1. **Baseline system check (high-temperature network)** - Learners read supply and return temperatures, flow rate and heat output. They calculate the temperature difference (ΔT) and identify simple signs of inefficient operation, such as high return temperature.
2. **Transition to a lower-temperature regime** - Learners select a suitable lower supply temperature setting and run the simulation again. They observe how this change affects flow, delivered heat and return temperature.
3. **Basic control adjustment** - Learners apply one simple control adjustment (for example adjusting the weather curve, limiting return temperature or reducing unnecessary flow) and check whether ΔT and return temperature improve.
4. **Renewable or storage integration option** - Learners add a renewable heat source (such as solar thermal or geothermal energy) and thermal energy storage (TES). They apply a simple operating rule, for example storing heat when renewable energy is available and using it during periods of higher demand.



Short check of understanding via

5–8 item quiz with instant feedback.

Example quiz questions:

1. What is one main advantage of lowering district heating supply temperatures?
2. Identify the main substation components shown in a schematic or photo.
3. In a heat meter, which measurements are needed to calculate delivered heat?
4. Use the measured values to calculate flow rate, heat output, or temperature difference (ΔT).
5. What is a common purpose of thermal energy storage (TES) in a district heating system?
6. Which heat source is typically suitable for integration in a low-temperature district heating network?
7. Which control approach can help reduce return temperature in a district heating system?



Accessibility. Suggest how you make the module easy to understand for all learners. For example;

- **Captions:** subtitles on every video.
- **Glossary:** a short list of key terms explained in simple English.
- **Large labels on diagrams:** avoid tiny text; make callouts clear.

1. Subtitles on every video.
2. Subtitle language choice (multilingual captions).
3. Key terms list (short glossary for each unit).
4. Readable diagrams (large labels, high contrast).
5. Simple, structured slides (one idea per slide; clear visuals).
6. Project-based learning with one consistent example (step-by-step calculations, and why each parameter matters).
7. Real-world equipment examples (generic components, no brand-specific content).
8. Virtual lab as a “digital twin” (clear schematic, visible sub-station elements, and guided tasks)

ESCO Occupational References

This module contributes to the development of knowledge, skills and competences relevant to the following ESCO occupational profiles:

ESCO 3115.1.5 | ESCO 7126.4 | ESCO 3115.1.17 | ESCO 7411 | ESCO 515 | ESCO 7127.1



Module 5

Smart Controls & Digital Operation



Time

Anticipated learner effort, 2 hours per module (including video, reading, activities, and quiz).

2 hours (short explainer inputs, targeted reading, activities, and 7-item quiz).



Overall aim of the module (2–3 lines)

What the learner will be able to do, consider the learner profiles above.

This module enables learners to use smart controls and digital tools to monitor and document the performance of heating and cooling systems, follow procedures for basic optimisation, assist with integration with other building services, and apply established practices for secure and compliant remote access.



Module Learning Objectives

- include between 3–5 fully formed Learning Objectives

By the end of Module 5, learners will be able to:

1. Use and adjust smart control parameters (such as setpoints, schedules, and weather compensation) according to given guidelines to support efficient operation of heating and cooling systems.
2. Read and interpret trend logs and dashboard data to identify common faults and deviations and follow procedures to address them.
3. Use digital tools for monitoring and documentation, including producing standard reports and performance summaries from smart control platforms.
4. Describe how smart control systems interact with other building services and assist in resolving basic integration issues using established methods.
5. Follow established routines for secure and efficient remote access in accordance with relevant cybersecurity and data protection requirements.



Module 5



What are the unit titles?

The module is organised into units to make the content easier to follow. As a general approach, you can align one unit with one learning objective. For example, if a module has four learning objectives, it may contain four units. Each unit should include focused content and at least one short activity to support achievement of that learning objective. This alignment is recommended but not mandatory; some objectives may require two shorter units for example.

Unit 1: Control parameters and basic optimisation in practice

- Setpoints, schedules, weather compensation, deadbands and zoning
- Comfort, safety and operational constraints (what can and cannot be adjusted)
- How to follow procedures for adjusting and checking parameter settings
- Producing a short note describing adjustments made (micro-output)

Unit 2: Using trends and dashboards to identify performance issues

- Reading trend logs and recognising normal system behaviour
- Identifying common anomalies (e.g. drift, cycling, overrides, sensor issues)
- Following procedures to address faults and knowing when to escalate
- Preparing a simple fault log (micro-output)

Unit 3: Digital monitoring outputs and documentation for QA/compliance

- What to record: baseline data, key indicators, alerts and issue logs
- Producing standard documentation and performance summaries
- Good documentation practice (clear, concise and consistent)
- Writing a short summary paragraph for QA purposes (micro-output)

Unit 4: Basic interoperability and system integration

- Common integration points (HVAC, DHW, ventilation, renewables, metering/BMS)
- Recognising typical integration issues (protocols, data quality, time sync, naming)
- Assisting with simple fixes and carrying out basic checks during commissioning/handover

Unit 5: Remote access, cybersecurity and data protection in practice

- Roles, permissions, multi-factor authentication and logging
- Following secure procedures for remote monitoring and access
- Basic data handling (storage, sharing, retention and privacy)
- Describing how to balance operational needs with security requirements (micro-output)



Module 5



Briefly describe activities that you suggest deliver on the learning objective proposed above. At this stage it is just a brief description, the content development/storyboard does not take place until after Curriculum is developed (end of feb).

Consider for each learning objectives you have proposed, we suggest to include at least one activity (minimum). Activities suitable for mixed mid-career learners across the heating/cooling and renovation ecosystem

E.g. Short explainer input (video or narrated slides, 5–10 minutes)
e.g. to introduce the key concepts and why they matter in real projects etc.

Targeted reading (brief PDF, 3–6 pages) *E.g. to provide practical guidance, definitions, and “common pitfalls”. You could use checklists, diagrams, and simple tables where possible.*

Scenario or mini case study (1–2 examples)
e.g. Learners review a real-world situation relevant to clean heat delivery (e.g., retrofit constraints, commissioning issue, compliance challenge, stakeholder conflict, system integration problem).

LO1 – Activity 1 **Scenario-based mini case study**

Title: Adjusting a Heat Pump in an Occupied Retrofit

Learners review a short scenario describing a retrofitted multi-residential building with comfort complaints and high energy use. Based on given control settings and constraints (e.g. occupancy patterns, system limits, responsibilities), learners:

- identify which parameters can be adjusted according to guidelines
- identify which parameters should not be changed
- describe what information or evidence is needed before making adjustments

LO2 – Activity 2 **Compare-and-contrast task**

Title: Recognising Normal vs Problematic Trends

Learners compare two simplified dashboard screenshots or trend descriptions:

- one showing normal system behaviour
- one showing common faults

They:

- identify visible anomalies
- suggest likely causes based on known examples
- describe appropriate first actions and when to report/escalate

LO3 – Activity 3 **Applied mini output**

Title: Simple Monitoring & Documentation Checklist

Learners create a short checklist including:

- key performance indicators (KPIs) to record
- required documentation/evidence
- reporting frequency
- responsible role
- The task reflects standard QA and documentation practices.

LO4 – Activity 4 **Targeted reading (PDF)**

Title: Interoperability in Practice

Learners review material introducing:

- common integration points (HVAC, DHW, ventilation, renewables, metering, BMS)
- typical issues (protocols, data quality, naming, time synchronisation, responsibilities)

Learners then:

- describe common integration challenges
- recognise basic measures used to address them



Module 1



Compare-and-contrast task

e.g. Learners compare two options, two cases, or good vs poor practice, and identify trade-offs (technical, organisational, financial, regulatory).

Applied reflection / mini output *e.g.*

Learners produce a short output that mirrors professional practice, such as:

- a decision note (recommended option + rationale)
- a risk/issue log (problem → impact → mitigation)
- a simple checklist (what to verify / what evidence to keep)
- a short client/stakeholder explanation (plain language)

LO5 – Activity 5 Applied mini output

Title: Remote Access & Data Handling Checklist

Learners produce a short checklist covering:

- access permissions and user roles
- logging requirements
- supplier access rules
- basic data storage and retention practices

Virtual Lab (“simulation” based on pre-defined calculations for different cases):

- **Baseline run (high-temperature):** Learners read supply/return temperatures, flow, and heat power, calculate ΔT , and identify a common inefficiency (e.g. high return temperature).
- **Transition to low-temperature:** Learners select a predefined low-temperature setting and rerun the system, observing changes in flow, delivered heat, and return temperature.
- **Control decision:** Learners apply a given control adjustment (e.g. modify weather curve, apply a return-temperature limit, reduce flow) and check for improvement in ΔT and return temperature.
- **Integration option:** Learners add a renewable energy source (e.g. solar thermal or geothermal) with thermal energy storage (TES) and follow a simple operating rule (e.g. charge TES when heat is available, discharge during higher demand).



Module 5



Short check of understanding via

5–8 item quiz with instant feedback.

Question 1 (LO1 – Control parameters & constraints)

In an occupied multi-residential retrofit, occupants complain about cold apartments in the morning. The system uses weather compensation and night setback. .

Which parameter change is MOST appropriate to investigate first?

- A. Increasing the maximum flow temperature beyond manufacturer limits
- B. Adjusting the heating schedule or night setback timing
- C. Disabling weather compensation entirely
- D. Forcing all zones to a constant manual override

Correct answer: B

Instant feedback:

Correct. Adjusting schedules or setback timing addresses comfort issues while respecting system limits and warranties

Increasing maximum temperatures or disabling control strategies can lead to inefficiency, equipment stress, and non-compliance.

Question 2 (LO1 – Evidence-based adjustments)

Before implementing a control parameter change, which evidence BEST supports the decision?

- A. Installer experience on similar projects
- B. Occupant complaints alone
- C. Trend data showing repeated comfort or efficiency issues
- D. A single site visit observation

Correct answer: C

Instant feedback:

Correct. Trend data provides objective and repeatable evidence to support justified changes.

Experience and complaints are useful but not sufficient on their own.

Question 3 (LO2 – Identifying abnormal trends)

Which trend pattern MOST clearly indicates a control or sensor issue?

- A. Gradual modulation of flow temperature following outdoor temperature
- B. Regular on/off cycling every few minutes under stable conditions
- C. Reduced heat output during mild weather
- D. Stable return temperatures during constant load

Correct answer: B

Instant feedback:

Correct. Frequent cycling under stable conditions often indicates control tuning issues, sensor faults, or deadband problems

The other patterns are typical of normal operation.



Module 5



Short check of understanding via

5–8 item quiz with instant feedback.

Question 4 (LO2 – Corrective action vs escalation)

You observe flatlined temperature readings from a zone sensor over several days. **What is the MOST appropriate for first action?**

- A. Immediately replace the heat pump
- B. Ignore it if occupants have not complained
- C. Check sensor status, wiring, and data input before escalation
- D. Increase system setpoints to compensate

Correct answer: C

Instant feedback:

Correct. Sensor and data issues should be checked before making system-level changes or escalating.

Increasing setpoints may hide the issue and increase energy use.

Question 5 (LO3 – Monitoring & QA evidence)

Which combination BEST represents fit-for-purpose QA documentation from a smart control system?

- A. Raw data exports of all available points
- B. Screenshots of dashboards without context
- C. Baseline snapshot, selected KPIs, issue log, and brief performance summary
- D. A detailed manual describing the control software

Correct answer: C

Instant feedback:

Correct. Clear and targeted documentation supports QA and compliance without unnecessary complexity.

Excess or unstructured data reduces usability.

Question 6 (LO4 – Interoperability issues)

A building's heat pump, PV system, and BMS are connected but not optimised. Heating operates at peak times despite available PV generation.

Which issue is MOST likely contributing to this problem?

- A. Incorrect pipe sizing
- B. Poor time synchronisation or data exchange between systems
- C. Oversized heat emitters
- D. Inadequate insulation levels

Correct answer: B

Instant feedback:

Correct. Issues with time synchronisation, data exchange, or control coordination often prevent effective integration.

The other options affect efficiency but not system interoperability.



Module 5



Short check of understanding via

5–8 item quiz with instant feedback.

Question 7 (LO5 – Remote access & data protection)

Which remote access practice BEST aligns with cybersecurity and data protection principles?

- A. Shared contractor login for ease of access
- B. Permanent unrestricted access for suppliers
- C. Role-based access with MFA and activity logging
- D. Disabling logs to reduce data storage

Correct answer: C

Instant feedback:

Correct. Role-based access, multi-factor authentication, and logging support both security and accountability.

Shared or unrestricted access creates significant security and compliance risks.



Accessibility. Suggest how you make the module easy to understand for all learners. For example;

- **Captions:** subtitles on every video.
- **Glossary:** a short list of key terms explained in simple English.
- **Large labels on diagrams:** avoid tiny text; make callouts clear.
- **Avoid dense text:** use short paragraphs, bullets, and white space.

Plain language and structured content

- All written materials will use plain, professional English, avoiding unnecessary technical complexity.
- Content will be broken into short paragraphs, bullet points, and clear headings to reduce cognitive load.
- Key messages and practical takeaways will be clearly signposted (e.g. “What this means in practice”).

Glossary and terminology support

- A short glossary of key terms (e.g. setpoint, weather compensation, trend log, KPI, interoperability, MFA) will be provided and referenced throughout the module.
- Acronyms will be spelled out on first use, with consistent terminology across all units.

Accessible visuals and diagrams

- Diagrams, dashboards, and screenshots will use large, readable labels and clear callouts, avoiding small or dense text.
- Visuals will focus on patterns and relationships, not software-specific interfaces, to support learners from different professional contexts.

ESCO Occupational References

This module contributes to the development of knowledge, skills and competences relevant to the following ESCO occupational profiles:

ESCO 3115.1.5 | ESCO 7126.4 | ESCO 3115.1.17 | ESCO 7411 | ESCO 515 | ESCO 7127.1



Module 6

Compliance, Safety & Quality



Time

Anticipated learner effort, 2 hours per module (including video, reading, activities, and quiz).

2.5 hours



Overall aim of the module (2–3 lines)

What the learner will be able to do, consider the learner profiles above.

This module enables learners to ensure that heating and cooling work is carried out safely, in accordance with relevant regulations, and to a consistent quality standard. Learners will be able to identify applicable compliance requirements and required documentation (including EN 378 and F-Gas where relevant) and use or review basic risk assessments. They will apply standard commissioning procedures and quality checks and prepare simple method statements and handover documentation to support sign-off and audit requirements.



Module Learning Objectives

- include between 3–5 fully formed Learning Objectives

By the end of Module 6, learners will be able to:

1. Identify relevant compliance requirements for a heating or cooling installation or retrofit, including EN 378 and F-Gas where applicable, and recognise the key documentation needed for inspection, handover or audit.
2. Complete or review a basic risk assessment for HVAC work (e.g. pressurised systems, refrigerants, electrical isolation, hot works, working at height), selecting appropriate control measures and recognising when to refer to a competent person.
3. Carry out standard commissioning and functional checks to confirm systems operate safely and as intended, using given criteria and identifying common quality issues (e.g. incorrect settings, poor balancing, missing sensor checks, incomplete documentation).
4. Use standard quality tools (checklists, inspection and test plans, non-conformance records) to record defects, follow up corrective actions, and support consistent work practices.
5. Prepare a simple method statement and handover documentation for a defined task, including work steps, roles, hazards and controls, key checks, and required records for sign-off.



Module 6



What are the unit titles?

The module is organised into units to make the content easier to follow. As a general approach, you can align one unit with one learning objective. For example, if a module has four learning objectives, it may contain four units. Each unit should include focused content and at least one short activity to support achievement of that learning objective. This alignment is recommended but not mandatory; some objectives may require two shorter units for example.

Unit 1 Compliance scope and evidence requirements

- What regulations and standards apply (EN 378, F-Gas where relevant)
- What compliance evidence looks like for inspection, handover and audit

Unit 2 Health and safety risk assessment for HVAC work

- Task-based risk assessment approach
- Key hazards (pressure, refrigerants, electrical isolation, hot works, working at height)
- Control measures and when to refer to a competent person

Unit 3 Commissioning and functional verification

- Acceptance criteria and standard functional checks
- Common quality issues that affect performance
- Recording results using standard formats

Unit 4 Quality management tools in delivery and maintenance

- Use of checklists and inspection and test plans (ITPs)
- Recording non-conformances and following up corrective actions
- Supporting consistent quality across teams and subcontractors

Unit 5 Method statements and handover documentation for sign-off

- Method statement structure (work steps, roles, hazards and controls, hold points)
- Verification steps and records required for sign-off
- Preparing a clear and concise handover documentation set



Briefly describe activities that you suggest deliver on the learning objective proposed above. At this stage it is just a brief description, the content development/storyboard does not take place until after Curriculum is developed (end of feb).

Consider for each learning objectives you have proposed, we suggest to include at least one activity (minimum). Activities suitable for mixed mid-career learners across the heating/cooling and renovation ecosystem

1. The candidate is presented with a "Compliance Pack" for a recently completed (fictional) heat pump retrofit in a commercial building. The pack contains predefined errors and missing elements related to EN 378 and F-Gas requirements. The candidate reviews the material and identifies non-compliances using a checklist or given criteria.
2. The candidate is given a set of site situations and categorises each into one of three actions: standard risk, additional controls required, or stop and report to a supervisor. This reflects practical decision-making using established guidelines.
3. The candidate is presented with three commissioning case files. Each file includes acceptance criteria and supporting evidence (e.g. photos, log sheets, or BMS screenshots). The candidate reviews the evidence and classifies each case as: Pass (operating as intended), Fail (not operating as intended, with a likely cause identified), or Incomplete (missing or unclear evidence).
4. Learners review short explanatory material on inspection and test plans (ITP) and non-conformance reporting (NCR), focusing on purpose and typical use in practice.
5. Learners review short explanatory material on method statements, including basic structure, key verification steps, and required documentation for sign-off.



Module 6



Short check of understanding via

5–8 item quiz with instant feedback.

Q1. According to Unit 1, which specific standard is highlighted as relevant to compliance obligations, particularly where refrigerants are applied?

- A. ISO 9001
- B. BS 7671
- C. EN 378
- D. OSHA 1926

Answer: C) EN 378

Explanation: Unit 1 identifies EN 378 (along with F-Gas requirements) as a key standard for systems involving refrigerants.

Q2. In the context of Unit 2, what is the appropriate action when a high-risk situation exceeds standard controls?

- A. Proceed with extra caution
- B. Escalate to a competent person
- C. Create a new method statement on site
- D. Ignore the hazard if it seems minor

Answer: B) Escalation to a competent person

Explanation: Unit 2 emphasises recognising limits of responsibility and referring to a competent person when required.

Q3. Unit 3 identifies “incorrect settings” and “poor balancing” as examples of what?

- A. Standard operating procedures
- B. Compliance evidence
- C. Health and safety hazards
- D. Common quality issues

Answer: D) Common quality failures

Explanation: These are typical faults that reduce system performance and are identified during commissioning checks.

Q4. Which tool mentioned in Unit 4 is used to manage defects and track corrective actions?

- A. Risk assessment
- B. Non-conformance reporting (NCR)
- C. F-Gas logbook
- D. Method statement

Answer: B) Non-conformance reporting (NCR)

Explanation: NCR is used to record defects and follow up corrective actions as part of quality management.



Module 6



Short check of understanding via

5–8 item quiz with instant feedback.

Q5. According to Unit 5, a method statement should include sequence, roles, hazards and controls, and which additional element?

- A. Budget estimates
- B. Hold points
- C. Marketing plan
- D. HR procedures

Answer: B) Hold points

Explanation: Hold points define stages where work must be checked before continuing.

Q6. What is the primary focus of Unit 3?

- A. Drafting contracts
- B. Commissioning and functional verification
- C. Designing HVAC systems
- D. Procuring materials

Answer: B) Commissioning and functional verification

Explanation: Unit 3 focuses on checking that systems operate safely and as intended.

Q7. Unit 4 states that using tools like ITPs supports what outcome across teams and subcontractors?

- A. Faster installation
- B. Reduced costs
- C. Consistent quality
- D. Less documentation

Answer: C) Consistent quality

Explanation: Standard tools help ensure consistent work practices and quality across different teams.

Q8. Which list correctly identifies key hazards in HVAC work from Unit 2?

- A. Slips and manual handling only
- B. Noise and dust
- C. Chemical and biological agents
- D. Pressure, refrigerants, electrical isolation, hot works, height

Answer: D) Pressure, refrigerants, electrical isolation, hot works, height

Explanation: These hazards are explicitly listed in Unit 2 as the main risks to consider.



Module 6



Accessibility. Suggest how you make the module easy to understand for all learners. For example;

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Module 7

Decarbonised Heating & Cooling Project Delivery & Coordination



Time

Anticipated learner effort, 2 hours per module (including video, reading, activities, and quiz).

2 hours



Overall aim of the module (2–3 lines)

What the learner will be able to do, consider the learner profiles above.

This module enables learners to support coordination of clean heat projects using practical methods for collaboration and information sharing. Learners will be able to follow project processes, track dependencies and information flow, and handle change requests using established procedures. They will use digital collaboration tools to communicate with stakeholders in a clear and structured way. They will produce simple coordination outputs (e.g. tracker updates, issue and risk logs, and stakeholder notes) to support timely and consistent project delivery.



Module Learning Objectives

- include between 3–5 fully formed Learning Objectives

By the end of Module 7, learners will be able to:

1. Describe the clean heat project lifecycle, typical stakeholder roles, and key points where coordination is required (e.g. handover, commissioning, interfaces).
2. Support coordination of tasks by tracking scope, schedule, quality, risks and dependencies, and updating a project tracker or simple progress summary for a defined work package.
3. Follow a structured approach to change control by recording a change request, identifying main impacts (time, cost, quality, risk), and reporting or escalating as required.
4. Use digital collaboration tools (shared documents, task boards, meeting notes and action logs) to record information, assign tasks, and maintain clear and up-to-date records.
5. Produce a short coordination output for a given scenario (e.g. an issue or risk log and a stakeholder update note), following organisational guidelines and timelines.



Module 7



What are the unit titles?

The module is organised into units to make the content easier to follow. As a general approach, you can align one unit with one learning objective. For example, if a module has four learning objectives, it may contain four units. Each unit should include focused content and at least one short activity to support achievement of that learning objective. This alignment is recommended but not mandatory; some objectives may require two shorter units for example.

Unit 1 Project lifecycle, roles and integration points

- Typical clean heat project phases (plan–design–deliver–commission–handover–operate)
- Roles and responsibilities (client, designer, installer, operator, authority, funder)
- Key integration points (interfaces, dependencies, handover)
- Commissioning and handover expectations (basic overview)
- Common causes of delays and rework (e.g. unclear roles, late decisions)

Unit 2 Coordinating tasks, dependencies and progress reporting

- Work packages and deliverables
- Dependencies and basic critical path awareness
- Short-term planning (look-ahead planning)
- Progress tracking and simple reporting summaries
- Basic monitoring of quality, time and cost
- Issue escalation routes (who to inform and when)

Unit 3 Integrated project information and change control

- Overview of scope, schedule, cost, risk and quality
- Basic version control and document management
- Change requests (when they are needed and what they include)
- Identifying main impacts (time, cost, quality, risk)
- Recording decisions and approvals
- Recognising assumptions and constraints

Unit 4 Collaboration practices and digital project tools

- Meeting structure and action tracking
- Simple collaboration methods (check-ins, short meetings)
- Shared documentation (folders, naming, templates)
- Basic use of task boards and trackers
- Clear and structured communication practices
- Sharing information across teams

Unit 5 Stakeholder engagement, communication and professional judgement

- Identifying stakeholders and their needs
- Communicating with different audiences (technical and non-technical)
- Managing expectations and simple conflict situations
- Using issue and risk logs with basic mitigation actions
- Writing short stakeholder updates (status, decisions, next steps)
- Following escalation procedures and timelines



Module 7



Briefly describe activities that you suggest deliver on the learning objective proposed above. At this stage it is just a brief description, the content development/storyboard does not take place until after Curriculum is developed (end of feb).

Consider for each learning objectives you have proposed, we suggest to include at least one activity (minimum). Activities suitable for mixed mid-career learners across the heating/cooling and renovation ecosystem

E.g. Short explainer input (video or narrated slides, 5–10 minutes)
e.g. to introduce the key concepts and why they matter in real projects etc.

Targeted reading (brief PDF, 3–6 pages) *E.g. to provide practical guidance, definitions, and “common pitfalls”. You could use checklists, diagrams, and simple tables where possible.*

Scenario or mini case study (1–2 examples)
e.g. Learners review a real-world situation relevant to clean heat delivery (e.g., retrofit constraints, commissioning issue, compliance challenge, stakeholder conflict, system integration problem).

Unit 1 Project lifecycle, roles and integration points

Short explainer input – set the frame

- Introducing lifecycle stages as decisions and handovers
- Roles understood as accountability, not job titles
- Integration points as where work passes between people or teams

Scenario / Mini Case Study

Scenario 1: New Commercial Office Building – HVAC Installation Shows lifecycle stages, roles, and where coordination is required

- Concept and design: system designed to meet requirements
- Procurement: contractor selected, equipment ordered
- Installation: systems installed
- Commissioning: testing and adjustment
- Handover: documentation and training provided

Scenario 2: Retrofit HVAC Upgrade in an Existing Hospital Shows coordination in a live environment

- Integration with existing systems required
- Commissioning carried out in stages
- Poor coordination can lead to delays and rework

Applied reflection / mini output

Examples:

- Map roles at each stage
- Identify integration points where delays may occur
- Describe responsibility for handover between stages

Compare-and-contrast

- Early vs late integration
- Clear vs unclear roles
- Different lifecycle approaches

Outputs:

- Relate to own project experience
- Identify where coordination challenges occurred



Module 7



Compare-and-contrast task

e.g. Learners compare two options, two cases, or good vs poor practice, and identify trade-offs (technical, organisational, financial, regulatory).

Applied reflection / mini output e.g.

Learners produce a short output that mirrors professional practice, such as:

- a decision note (recommended option + rationale)
- a risk/issue log (problem → impact → mitigation)
- a simple checklist (what to verify / what evidence to keep)
- a short client/stakeholder explanation (plain language)

Unit 2 Coordinating tasks, dependencies & progress reporting

Short explainer

- Work packages, tasks and deliverables in HVAC work
- Basic coordination concepts

Scenario / Case Study

Scenario 1: Multi-storey residential HVAC installation

- Dependencies between trades (framing, electrical, HVAC)
- Look-ahead planning and coordination
- Regular progress tracking

Scenario 2: Retail fit-out with fixed deadline

- Coordination with multiple contractors
- Monitoring quality, time and cost

Applied reflection

- Reflect on use of short-term planning
- Identify dependencies with other trades
- Consider how progress is reported

Compare-and-contrast

- Informal vs structured escalation
- Impact on time, cost and coordination

Unit 3 Integrated project information and change control

Short explainer

- Overview of scope, schedule, cost, risk and quality
- Importance of keeping information aligned

Scenario / Case Study

Change request in HVAC project

- Change in building use affects system requirements
- Need to record and assess impacts

Version control case

- Use of outdated drawings leads to rework
- Importance of using correct documents

Applied reflection

- Identify impacts of a change (time, cost, quality, risk)
- Reflect on how to reduce negative effects

Compare-and-contrast

- Decision logging and approvals
- Managing assumptions and constraints



Module 7



Unit 4 Collaboration practices and digital project tools

Short explainer

- Simple principles for collaboration
- Use of basic digital tools

Scenario / Case Study

Improving coordination on an HVAC project

- Use of meetings and check-ins
- Clear communication between teams

Shared documentation case

- Use of common folder structure
- Naming conventions and templates
- Access to up-to-date information

Applied reflection

- Use of task boards and trackers
- Benefits for individual and team work

Compare-and-contrast

- Different communication channels
- Structured vs unstructured information sharing

Unit 5 Stakeholder engagement, communication and professional judgement

Short explainer

- Identifying stakeholders and their needs
- Adapting communication to audience
- Managing expectations and issues
- Recording risks and actions
- Escalation and responsibility

Scenario / Case Study

Tailored communication example

- Technical vs non-technical audiences
- Adjusting level of detail

Applied reflection

- Managing expectations and delays
- Recording risks and mitigation actions

Compare-and-contrast

- Different ways of providing updates
- Importance of escalation and accountability



Module 7



Short check of understanding via

5–8 item quiz with instant feedback.

Question 1 – Unit 1: Project Lifecycle, Roles and Integration Points

Which stage of a project lifecycle focuses on defining objectives, scope, and stakeholders?

- A. Execution
- B. Initiation
- C. Monitoring & Control
- D. Closure

Answer: B

Instant Feedback:

- Correct. The initiation stage defines the project's purpose, scope, and key stakeholders.

Question 2 – Unit 1

Who is primarily responsible for ensuring different teams' activities are aligned in a clean heat project?

- A. Project sponsor
- B. Project manager
- C. Technical consultant
- D. Procurement officer

Answer: B

Instant Feedback:

- Correct. The project manager coordinates teams and supports alignment across the project.

Question 3 – Unit 2: Coordinating Tasks, Dependencies and Progress Reporting

Which of the following best describes a task dependency in a project?

- A. A team member reporting progress
- B. One task that must be completed before another can start
- C. A budget review meeting
- D. A stakeholder approval

Answer: B

Instant Feedback:

- Correct. Task dependencies show how activities are linked and must be sequenced.



Module 7



Short check of understanding via

5–8 item quiz with instant feedback.

Question 4 – Unit 2

What is the main purpose of progress reporting in project coordination?

- A. To advertise the project
- B. To track task completion and identify delays
- C. To evaluate team performance only
- D. To design new tasks

Answer: B

Instant Feedback:

- Correct. Progress reporting helps monitor work and identify delays so action can be taken.

Question 5 – Unit 3:

Integrated Project Information and Change Control

Why is change control important in project coordination?

- A. To prevent all changes
- B. To record, assess and communicate changes
- C. To delay decisions
- D. To assign tasks randomly

Answer: B

Instant Feedback:

- Correct. Change control ensures that changes are recorded and assessed before action is taken.

Question 6 – Unit 4:

Collaboration Practices and Digital Project Tools

Which digital tool is most useful for team collaboration and tracking tasks?

- A. Word processor
- B. Project management software (e.g. task boards)
- C. Spreadsheet for personal finances
- D. Email signature generator

Answer: B

Instant Feedback:

- Correct. Project management tools support task tracking and team coordination.



Module 7



Short check of understanding via

5–8 item quiz with instant feedback.

Question 7 – Unit 5:

Stakeholder Engagement, Communication & Professional Judgement

What is the main reason to engage stakeholders regularly in a project?

- a. To reduce costs immediately
- B) To keep them informed and manage expectations
- C) To replace the project manager
- D) To delegate decisions

Answer: B

Instant Feedback:

- Correct. Regular communication helps manage expectations and maintain support.

Question 8 – Unit 5

Professional judgement in project delivery mainly involves:

- A. Following rules without question
- B. Making informed decisions based on knowledge and guidance
- C. Delegating all tasks
- D. Ignoring stakeholder concerns

Answer: B

Instant Feedback:

- Correct. Professional judgement involves making informed decisions within given guidelines.



Module 7



Accessibility. Suggest how you make the module easy to understand for all learners. For example;

- **Captions:** subtitles on every video.
- **Glossary:** a short list of key terms explained in simple English.
- **Large labels on diagrams:** avoid tiny text; make callouts clear.
- **Avoid dense text:** use short paragraphs, bullets, and white space.

1. Video and Multimedia Accessibility

- **Captions/Subtitles:** Every video should have accurate captions.
- **Audio Descriptions:** For complex visuals or diagrams, provide an audio description explaining what's on the screen.
- **Transcript:** Provide a full transcript for each video so learners can read along or refer back.
- **Clear Audio:** Use a clear, calm voice and avoid background noise or music that makes comprehension harder.
- **Consistent Layout:** Keep video interfaces predictable, with play/pause buttons easy to locate.

2. Language and content clarity

- **Plain English:** Avoid jargon; explain technical terms simply.
- **Glossary:** Include a glossary of key terms with simple definitions and examples.
- **Short Paragraphs:** Break text into digestible chunks.
- **Bullet Points:** Use lists for steps, processes, or key points.
- **Headings and Subheadings:** Organize content logically so learners can scan quickly.

3. Visual accessibility

- **Large Labels on Diagrams:** Use readable fonts and clear callouts; avoid tiny text.
- **Colour Contrast:** Ensure high contrast between text and background (e.g., dark text on light background).
- **Avoid Colour Reliance:** Don't rely on colour alone to convey meaning; use patterns, shapes, or labels.
- **Alt Text for Images:** Every image, diagram, or chart should have descriptive alt text explaining it in words.
- **Simplified Diagrams:** Keep diagrams uncluttered and highlight the most important elements.

4. Interaction and navigation

- **Keyboard Navigation:** Make sure all content can be accessed without a mouse.
- **Clear Buttons and Links:** Label buttons and links with descriptive text (e.g., "Download Project Template" rather than "Click Here").
- **Progress Indicators:** Show learners where they are in the module and how much is left.
- **Consistent Layout:** Keep menus, navigation, and learning tools in consistent locations.



Module 7



Accessibility. Suggest how you make the module easy to understand for all learners. For example;

- **Captions:** subtitles on every video.
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- **Large labels on diagrams:** avoid tiny text; make callouts clear.
- **Avoid dense text:** use short paragraphs, bullets, and white space.

5. Supporting different learning styles

- **Multiple Formats:** Offer content in text, video, and audio formats.
- **Summaries:** Include a “Key Points” section at the end of each module or lesson.
- **Interactive Elements:** Use quizzes, drag-and-drop, or scenario-based exercises to reinforce learning.
- **Real-World Examples:** Link theory to practical, everyday examples to help understanding.

6. Cognitive accessibility

- **Avoid Dense Text:** Use white space generously; don’t cram information.
- **Step-by-Step Instructions:** Break processes down into simple steps.
- **Highlight Important Points:** Use bold or callout boxes for critical information.
- **Repetition and Reinforcement:** Repeat key concepts in different ways to aid memory.

7. Technical accessibility

- **Screen Reader Friendly:** Ensure your content is readable by screen readers.
- **Responsive Design:** Module should work on desktop, tablet, and mobile devices.
- **File Formats:** Use widely accessible file formats (PDFs, HTML, MP4) and avoid proprietary software.
- **Downloadable Resources:** Provide handouts, templates, or cheat sheets for offline study.

ESCO Occupational References

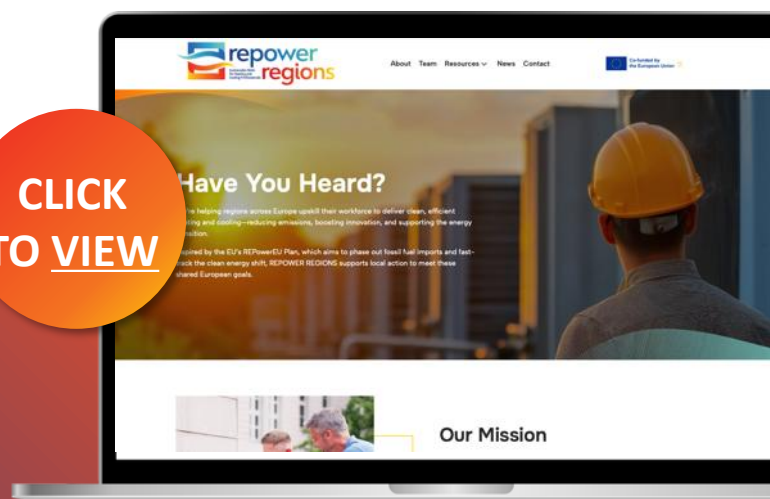
This module contributes to the development of knowledge, skills and competences relevant to the following ESCO occupational profiles:

ESCO 3115.1.5 | ESCO 7126.4 | ESCO 3115.1.17 | ESCO 7411 | ESCO 515 | ESCO 7127.1





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