

Decarbonised Heating & Cooling in Practice

EQF LEVEL 5 CURRICULUM

for adoption by training providers,
employers and public bodies

Curriculum



www.repowerregions.eu

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By:
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1.1 Purpose

This curriculum defines a short continuing professional development (CPD) programme that builds practical competence for the **decarbonised heating and cooling transition** in buildings. It

supports mid-career professionals who contribute to planning, delivery, operation, quality assurance, compliance and coordination of heating and cooling projects.

The programme covers **seven core capability areas** needed across the heating/cooling and renovation ecosystem:

The programme is **practice-oriented**. It focuses on:

1.2 Scope

- Decarbonised heating and cooling transition: drivers, pathways, constraints and evidence needs
- Energy efficiency and retrofit practices
- Heat pumps and hybrid systems in practice
- Integrating with district heating/cooling and renewable/waste heat
- Smart controls and digital operation
- Compliance, safety and quality
- Project delivery and coordination

- Interpreting basic performance and operational information
- Making decisions within organisational guidelines
- Knowing when to escalate to specialists
- Producing clear, role-relevant documentation for 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 across heating/cooling and renovation delivery, including:

- HVAC Project Manager / Site Manager
- Senior HVAC Technician / Systems Supervisor
- Construction or Building Services Manager
- Energy Retrofit Coordinator / Renovation Manager
- Building Energy or Sustainability Officer
- Technical Sales / Client Advisor (Heating and Cooling Solutions)
- HVAC / Construction SME Owner / Operations Manager

3.2 Occupational Alignment



The programme supports competence development for roles that combine technical understanding with coordination and documentation responsibilities. It is most relevant where the learner must:

- Interpret project and performance information
- Oversee quality and commissioning evidence
- Communicate clearly across multiple stakeholders
- Manage interfaces (systems, controls, district networks)
- Support compliance and safe delivery

Level, Entry Requirements & Progression

4.1 EQF level

The programme is aligned to **EQF Level 5**. 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 vocational qualification, or
- 1–3 years of experience in HVAC, building services, construction delivery, retrofit coordination, energy management, building operations, or technical client advisory

Learners should be able to:

- Read basic technical documentation (drawings, datasheets, checklists)
- Use standard digital tools (email, shared documents, basic spreadsheets/tables)

4.3 Progression Routes (Examples)

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

- Heat pump commissioning and optimisation (manufacturer or sector programmes)
- District heating/cooling operation and interface management
- Energy management systems and organisational certification support (e.G., ISO 50001 implementation roles)
- Formal project management qualifications for construction/renovation delivery

05

Programme structure & nominal workload



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.

Programme Learning Outcomes

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

01

Decarbonization Pathways

Explain key concepts and pathways for decarbonised heating and cooling and identify the information required for decisions.

02

Energy Performance Interpretation:

Interpret basic building/HVAC energy performance information and prioritise improvement opportunities using simple indicators.

03

Retrofit Selection and Trade-offs:

Select and justify retrofit and optimisation measures, describing constraints and trade-offs.

04

Commissioning and Handover Management:

Plan, verify or supervise key installation, commissioning and handover steps for low-carbon systems and interfaces.

05

Operational Data Analysis:

Use basic operational data (metering, BMS trends, dashboards, snapshots) to identify abnormal behaviour, likely causes, and corrective actions or escalation routes.

06

Quality and Safety Compliance:

Apply compliance, safety and quality practices using structured tools and documentation.

07

Coordination and Communication:

Coordinate dependencies, change requests, documentation flow and stakeholder communication using standard collaboration tools.





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-5 application and judgement. Minimum required assessment per module:

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

The programme outputs are designed to mirror real work documentation.

Typical outputs include:

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 Evidence Portfolio Outputs

- Transition impact note (module 1)
- Retrofit action note (module 2)
- Commissioning and handover evidence pack elements (module 3)
- Integration and handover note (module 4)
- Monitoring/QA evidence and performance summary (module 5)
- Method statement and handover documentation set (module 6)
- Tracker update plus issue/risk log and stakeholder note (module 7)

Providers may issue a certificate of completion based on the criteria above.

Accessibility & Inclusive Delivery Requirements



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

- Clear language and consistent terminology across 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)



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

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 16](#)**Module 02****Energy Efficiency & Retrofit Practices**[Page 22](#)**Module 03****Heat Pumps & Hybrid Systems in Practice**[Page 28](#)**Module 04****Integrating with District & Renewable Heat**[Page 34](#)**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 hours minimum to address all learning objectives in an appropriate manner.



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 Decarbonised Heating and Cooling Transition and why it matters for heating and cooling projects across Europe. Learners will understand the main drivers, the high-level pathways to decarbonised heat, and what this means for decision-making, planning and delivery in their professional roles.



Module Learning Objectives

- include between 3–5 fully formed Learning Objectives

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

1. Explain and interpret what the Decarbonised Heating and Cooling Transition means for buildings and organisations, using key terms correctly (e.g., decarbonised heat, efficiency-first, electrification, district heat) and describing why it matters for heating and cooling projects.
2. Analyse the main drivers of the transition (policy, energy security, economics, climate) and prioritise common constraints affecting delivery (building fabric, grid readiness, skills, cost, user needs), indicating practical mitigation or escalation actions relevant to their role.
3. Compare and justify the main pathways to decarbonised heating and cooling at a high level (efficiency-first, heat pumps/electrification, district heating, renewable heat), outlining typical advantages, limitations and suitable contexts.
4. Identify the key information and evidence needed to choose between pathways and to plan next steps for a project (e.g., heat demand profile, operating temperatures, building constraints, grid capacity, stakeholder priorities), including where basic digital data sources may be used.
5. Produce a short “transition impact note” for a simple scenario, recommending an appropriate next step and summarising implications for delivery and roles (planning, quality, compliance evidence and stakeholder communication), demonstrating judgement and responsibility within organisational guidelines.



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 heat)
- What the transition means in practice for buildings/organisations

Unit 2 Drivers and constraints shaping the transition

- Main drivers: policy, energy security, economics, climate
- Common delivery constraints: fabric, grid readiness, skills, cost, user needs
- Basic prioritisation and mitigation/escalation thinking (role-relevant)

Unit 3 Pathways to decarbonised heat and where they fit

- High-level pathways: efficiency-first, heat pumps/electrification, district heating, renewable heat
- Advantages, limitations, and suitable contexts (what fits where)

Unit 4 Evidence and information needed to make decisions

- What information is needed to choose pathways and plan next steps
- Examples: heat demand profile, operating temperatures, building constraints, grid capacity, stakeholder priorities
- Where basic digital data sources can support decisions (metering/BMS summaries, simple performance data)

Unit 5 Project and role implications -applying judgement to a scenario

- Practical implications for delivery: planning, quality, compliance evidence, stakeholder communication
- Short scenario-based “transition impact note” (recommended next step + implications for role/team)

Unit 1 Defining the Clean Heat Transition

- Animated video: “What is the Clean Heat Transition?” (key terms + why it matters).
- Quick check activity (short): match key terms to definitions (decarbonised heat, efficiency-first, electrification, district heat).

Unit 2 Drivers and constraints shaping the transition

- Animated video - ecological drivers.
- Animated video - economic/political/social drivers.
- Mini case study (two scenarios): learners identify:
 - ✓ key drivers (benefits/reasons), and
 - ✓ top 2–3 constraints (fabric, grid readiness, skills, cost, user needs),
 - ✓ and a basic mitigation/escalation response (what can be addressed now vs what needs escalation/support).
- Short slide input (policy context, awareness only): replace the old standalone “EU regulations” unit with a brief “policy signals and direction of travel” input here (5 minutes max).



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 heat and where they fit

- Targeted reading (brief PDF, 3–6 pages):
Introduce the four pathway options at a high level, focusing on “where they fit” rather than technical design:
 - ✓ efficiency-first (demand reduction)
 - ✓ heat pumps / electrification
 - ✓ district heating
 - ✓ renewable heat (high-level examples)
- Compare-and-contrast worksheet (main activity, 15–20 minutes):
Learners complete a short worksheet for one scenario (or two short scenarios, if time allows). The worksheet prompts learners to:
 1. select two pathway options to compare;
 2. describe the main advantages and limitations of each option for that scenario;
 3. assess “fit” using simple criteria (feasibility, disruption, cost implications, carbon impact, and key constraints);
 4. choose the better-fit option and provide a short justification (3–5 sentences).
- Mini output (5 minutes): “Recommendation note”
Learners write a short recommendation statement:
 - ✓ “For this scenario, the best-fit pathway is ___ because ___.”
 - ✓ Include 2–3 criteria used (e.g., feasibility, disruption, constraints).

Unit 4 Evidence and information needed to make decisions

Short input (slides or narrated video, 5–7 minutes): Introduce the idea of “evidence before decisions” and explain why clean heat pathway choices need basic technical and operational information (not assumptions).

Evidence checklist worksheet (main activity, 10–15 minutes): Learners complete a simple checklist for a given scenario (building type / project context). The checklist asks them to identify:

- what information is already available
- what information is missing
- where it could be obtained (e.g., site survey, utility bills, meter data, BMS summary, stakeholder interview)

Example checklist items (use as headings):

- Heat demand profile / peak load (approximate is fine)
- Operating temperatures and emitter suitability (radiators/UFH/air systems)
- Building fabric constraints (insulation level, glazing, airtightness indicators)
- Electrical / grid constraints (available capacity, upgrade risk)
- Space/noise constraints (plant room, outdoor unit location)
- Stakeholder priorities (comfort, disruption, budget, timing)
- Basic digital evidence (metering or BMS summary, if available)



Module 1



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)



Short check of understanding via

5–8 item quiz with instant feedback.

Mini output (5 minutes): “Evidence request note”. Learners write 4–6 lines stating:

- the top 3 missing evidence items for the scenario, and
- the next step to obtain each (who/where/how).

Unit 5 Project and role implications – applying judgement to a scenario

(Topics: delivery implications, roles, quality/compliance evidence, stakeholder communication; scenario-based output.) Suggested activities:

Short presentation - what changes in delivery for clean heat projects (planning, QA, evidence for sign-off/handover, roles/responsibilities, communication).

Timeline activity- learners create a simple delivery timeline and produce a short scenario-based “transition impact note” including:

- ✓ recommended next step
- ✓ key constraints/risks
- ✓ evidence needed for sign-off/handover (high-level)
- ✓ a short stakeholder message (plain language) relevant to their role.

Unit 1 Definition and key terms

1. 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

Correct: C

2. 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

Correct: B

Unit 2 Drivers and constraints

3. Which is an economic driver for the Clean Heat Transition? (select one)

- 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

Correct: B



Module 1



Short check of understanding via

5–8 item quiz with instant feedback.

Unit 2 Drivers and constraints

4. Which constraint most commonly affects the feasibility of heat pump electrification in existing buildings?
- a. Paint colour
 - b. Building heat demand / high required flow temperatures and fabric condition
 - c. Window orientation only
 - d. Water hardness only

Correct: B

Unit 3 Pathways and fit-for-context

5. Which list includes the main high-level 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

Correct: C

Unit 4 Evidence and information needed

6. 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 current operating temperatures
 - c. Number of occupants' pets
 - d. Colour of internal walls

Correct: B

7. Which digital data source can most directly support early decision-making in larger buildings?
- a. Social media comments
 - b. Metering or BMS summaries/trend snapshots
 - c. Website analytics
 - d. Email signatures

Correct: B

Unit 5 Delivery, roles, communication and judgement

8. In a multi-stakeholder clean heat project, what is a common cause of 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

Correct: B



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





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 conducting and applying energy audits of buildings and HVAC systems, from initial assessment to verified improvements. Participants will learn to interpret audit findings, select and justify retrofit measures, and use digital data to support their decisions. The training covers key regulatory frameworks and how to document audit-based evidence for compliance and project sign-off. Ultimately, it builds the capability to implement decarbonization plans that reliably reduce carbon footprints and enhance 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. Interpret basic building/HVAC energy performance information (energy use, demand drivers, operating conditions, control schedules/parameters) to identify where the main inefficiencies are likely to sit.
2. Apply simple indicators and benchmarking logic (e.g., normalised consumption, before/after comparison) to prioritise improvement opportunities and avoid misleading conclusions (e.g., changes driven by weather, occupancy, or operating hours rather than measures).
3. Select and justify appropriate retrofit and optimisation measures for a given scenario (fabric, system upgrades, controls/commissioning optimisation, heat recovery), explaining key trade-offs (cost, disruption, carbon impact, feasibility, and performance risk).
4. Use basic digital data sources (meter/BMS trends, sub-metering, log snapshots) to support diagnosis and define what additional data or checks are needed for a confident decision (e.g., zone-level metering, trend duration, commissioning evidence).
5. Recognise the purpose and practical implications of key regulatory/voluntary frameworks relevant to energy efficiency (e.g., ISO 50001, LEED, and applicable legal/ecological requirements), identifying the types of evidence and documentation they typically expect at project or organisational level.
6. Produce a short retrofit action note summarising recommended measures, constraints/risks, required verification/commissioning steps, and the evidence needed for sign-off/hand-over



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

- Understanding the core components and deliverables of a professional energy audit report.
- Analyzing key energy performance indicators (EPIs) like kWh/m²/year and their relation to building use.
- Identifying primary energy demand drivers from audit data (e.g., heating, cooling, ventilation, lighting).
- Reviewing operational parameters and control schedules to spot inefficiencies in system runtime and setpoints.
- **Activity: Case Study Diagnosis** – Participants are given a simplified energy audit summary for a small office building. They must highlight the two most likely inefficiencies based on the provided consumption data and operating schedules, and justify their choices.

Unit 2: Benchmarking Energy Use and Prioritizing Actions

- Applying normalization techniques to adjust consumption data for variables like weather (degree days) and occupancy.
- Using simple benchmarking logic to compare a building's performance against typical values or its own historical data.
- Conducting before-and-after analyses to isolate the impact of retrofit measures from other influencing factors.
- Prioritizing improvement opportunities based on potential energy savings, cost, and carbon reduction.
- **Activity: Weather-Normalization Exercise** – Using a provided dataset of monthly gas consumption and heating degree days, learners calculate the normalized annual consumption. They then discuss how this adjusted figure changes the interpretation of the building's performance compared to the raw data.

Unit 3: Selecting and Justifying Retrofit Measures

- Categorizing retrofit measures: building fabric, HVAC system upgrades, controls optimization, and heat recovery.
- Applying selection criteria for different scenarios, balancing energy savings, carbon impact, cost, and disruption.
- Understanding key performance risks and feasibility constraints for various measures (e.g., heat pump suitability).
- Structuring a justification for chosen measures, linking them directly to audit findings and decarbonization goals.
- **Activity: Measure Selection Matrix** – For a given building scenario (e.g., a 1980s school with an old gas boiler), learners complete a quick matrix to evaluate and rank three potential retrofit measures against criteria of cost, carbon savings, and feasibility.



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: Leveraging Digital Data for Diagnosis and Verification

- Identifying and accessing basic digital data sources: utility meters, Building Management Systems (BMS), and sub-metering.
- Interpreting trend data and log snapshots to diagnose operational faults (e.g., simultaneous heating/cooling).
- Defining the specific additional data or monitoring required to move from a hypothesis to a confident decision.
- Using data to establish a pre-retrofit baseline and to define Key Performance Indicators (KPIs) for post-retrofit verification.
- **Activity: BMS Snapshot Analysis** – Learners review a one-week trend graph from a BMS showing heating and zone temperatures. They identify one clear operational fault and propose one specific piece of additional data needed to confirm the root cause.

Unit 5: Compliance, Documentation, and the Retrofit Action Plan

- Recognizing the purpose and scope of key frameworks: ISO 50001, LEED/BREEAM, and local building regulations.
- Identifying the specific types of evidence required by these standards at the project and organizational levels.
- Structuring a professional retrofit action note: executive summary, recommended measures, and risk assessment.
- Defining clear verification steps, commissioning protocols, and handover requirements for quality assurance.
- **Activity: Evidence Checklist Creation** – Based on a brief project description aiming for a specific standard (e.g., EPC Band B), learners draft a 5-item checklist of the evidence they would need to compile to demonstrate compliance and secure project sign-off.



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: Interpret basic building/HVAC energy performance information

- **Activity:** Audit Report Annotation & Diagnosis
- **Format:** Scenario/Mini Case Study + Applied Reflection.
- **Description:** Learners receive a 2-page excerpt from an energy audit report for a small commercial building (e.g., a local library). It includes annual consumption data, a breakdown of end-uses, and a summary of operating hours and setpoints.
- **Task:** Using a digital or printed copy, learners annotate the document to: 1) Circle the two highest energy-consuming systems, 2) Underline one clear operational inconsistency (e.g., HVAC runtime vs. occupancy), and 3) Write a one-sentence hypothesis for the most likely source of inefficiency. This mirrors the initial review a manager or technician would perform.



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: Apply simple indicators and benchmarking logic

- **Activity:** The Weather-Normalization Detective
- **Format:** Compare-and-Contrast Task + Short Explainer Input.
- **Description:** After a 5-minute video explaining Heating Degree Days (HDDs) and normalization, learners review a simple table showing a building's gas consumption for two consecutive years. Year 2 shows a 10% reduction, but it was also a milder winter (15% fewer HDDs).
- **Task:** Learners perform a basic normalization calculation (or follow a guided formula) to adjust Year 2's consumption. They then answer: "Did the building's efficiency improve, or did the weather mask a performance issue?" This highlights the risk of using raw data for decisions.

LO3: Select and justify appropriate retrofit measures

- **Activity:** The Retrofit Selection Panel
- **Format:** Scenario + Compare-and-Contrast Task + Applied Reflection.
- **Description:** Learners are given a one-page profile of a 1990s apartment block with an aging gas boiler and poor common area insulation. They are presented with 3-4 retrofit options (e.g., boiler replacement, heat pump, insulation + controls upgrade).
- **Task:** Using a simple decision matrix template (with columns for Cost, Carbon Impact, Disruption, Feasibility), learners score each option. They then write a 3-bullet-point justification for their top choice to present in a simulated "funding panel," forcing consideration of trade-offs.

LO4: Use basic digital data to support diagnosis

- **Activity:** BMS Snapshot Analysis & Data Request
- **Format:** Mini Case Study + Applied Reflection.
- **Description:** Learners view a screenshot of a Building Management System (BMS) trend graph showing a one-day plot of supply air temperature and a zone temperature, revealing an instability or setpoint mismatch.
- **Task:** First, they identify the probable fault (e.g., "The system is short-cycling" or "There's a sensor offset"). Second, they complete a template for a "Data Request" to the maintenance team, specifying: 1) What additional data is needed (e.g., valve actuator signal for the same period), 2) Over what duration (e.g., one week), and 3) Why it's needed (e.g., "to confirm control loop instability").

LO5: Recognise purpose and implications of key frameworks

- **Activity:** Evidence Mapping to Standards
- **Format:** Targeted Reading + Compare-and-Contrast Task.
- **Description:** Learners read a brief 3-page PDF summarizing the evidence requirements of two frameworks: one regulatory (e.g., local building code Part L equivalent) and one voluntary (e.g., ISO 50001 Energy Management).
- **Task:** Using a Venn diagram or two-column table, learners map which types of project evidence (e.g., as-built drawings, commissioning reports, metering plans, management review minutes) are required by the regulation, by the standard, or by both. This clarifies the added layer of documentation for voluntary certification.



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: Produce a short retrofit action note

- **Activity:** Draft the Handover Note
- **Format:** Scenario + Applied Reflection / Mini Output.
- **Description:** This is the capstone activity. Learners synthesize learning from previous units. They receive a consolidated package on a single building: the audit summary (LO1), normalized savings estimates (LO2), their chosen measure (LO3), and the required verification data (LO4).
- **Task:** Using a provided template, learners draft a one-page Retrofit Action & Handover Note. They must complete sections for: Recommended Measures, Key Constraints/Risks, Required Commissioning Steps, and Evidence for Sign-Off. This creates a tangible professional output that encapsulates the module's aim.



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 essential to normalize energy consumption data using Heating Degree Days (HDDs) before comparing a building's year-on-year performance?
3. After a boiler retrofit, a building's gas consumption decreased by 15%. However, that winter was also 10% warmer than the previous one. What analysis must be done to accurately assess the retrofit's true impact?
4. When justifying the selection of a building energy management system (BEMS) as a retrofit measure, which two justifications are most directly supported by the module's framework?
5. A weekly BMS trend shows that the hot water supply temperature fluctuates wildly outside its set range. What is the most likely root cause category, and what would be a logical next step for diagnosis?
6. What is the critical purpose of establishing a pre-retrofit baseline using sub-metering or detailed BMS data?
7. A retrofit project aims to contribute to an organization's ISO 50001 certification. What is one key type of evidence this standard would require that goes beyond simple energy savings calculations?
8. What are the two primary purposes of including a "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;

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- **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).





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 build the practical competence, decision-making confidence and cross-disciplinary understanding required to plan, install, supervise and optimise modern low-carbon heating and cooling systems. The programme equips professionals to deliver high-quality, compliant and energy-efficient solutions across renovation and new-build contexts.



Module Learning Objectives

- include between 3–5 fully formed Learning Objectives

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

1. Explain the operating principles of heat pumps and common hybrid configurations and relate these to typical system performance behaviours (e.g., temperature lift, defrost impact, part-load operation).
2. Plan and verify installation and commissioning steps for heat pump and hybrid systems using technical documentation and manufacturer guidance, ensuring that safety and compliance requirements are met (performing the steps directly or supervising/validating them, depending on role).
3. Interpret key operational data (e.g., flow/return temperatures, pressures, electrical input, delivered heat, COP/SCOP proxies) to determine whether performance is within expected ranges and to identify likely causes of deviation.
4. Diagnose and respond to common faults and sub-optimal settings by selecting appropriate troubleshooting checks, deciding when to apply corrective actions, and when to escalate to specialist support.
5. Produce a commissioning and handover evidence pack (e.g., commissioning checklist, baseline performance snapshot, settings record, maintenance/service note) that supports quality assurance and stakeholder communication.



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.



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 system fundamentals in practice

- Operating principles (temperature lift, part-load, defrost)
- Typical hybrid configurations and when they are used
- What “good performance” broadly looks like in practice

Unit 2 Installation and commissioning, planning, verification and safety

- Key installation/commissioning steps and sequencing
- Using technical documentation and manufacturer guidance
- Safety, compliance and basic commissioning checks
- Role-based focus: perform, supervise, or verify

Unit 3 Performance monitoring and data interpretation

- Key metrics: flow/return temperatures, pressures, electrical input, delivered heat
- COP/SCOP proxies and practical limitations
- Interpreting trends to judge normal vs abnormal operation

Unit 4 Faults, sub-optimal settings and response decisions

- Common faults and commissioning errors (controls, sensors, hydraulics, defrost behaviour)
- Structured troubleshooting checks (what to check first)
- Corrective actions vs escalation routes (when to involve specialists)

Unit 5 Quality assurance, documentation and handover evidence

- Commissioning records and baseline performance snapshot
- Settings record, service notes, checklists and evidence for sign-off
- Communicating findings to technical and non-technical stakeholders

Unit 1 – Heat pump and hybrid fundamentals

Hands-on system walkthroughs analysing temperature lift, part-load behaviour and defrost cycles, plus comparison of hybrid configurations to identify indicators of good practical performance.

Unit 2 – Installation, commissioning, planning, safety

Step-through installation sequencing using real documentation, role-based task simulations, and scenario checks focusing on safety, compliance, and correct commissioning steps.

Unit 3 – Performance monitoring and data interpretation

Live or simulated data review exercises interpreting temperatures, pressures, electrical input and heat output to recognise normal patterns, COP proxies, and early signs of abnormal operation.

Unit 4 – Faults, settings and response decisions

Troubleshooting drills using common faults and mis-settings, applying structured diagnostic checks, then selecting appropriate corrective actions versus escalation to specialists.

Unit 5 – Quality assurance and documentation

Practical completion of commissioning records, baseline performance snapshots, settings logs and checklists, followed by short communication tasks translating findings for technical and non-technical audiences.



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 → mitigation)

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

3. Simple 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 indicate in a heat pump?

- a. High system efficiency
- b. Greater compressor workload and reduced efficiency
- c. Faulty sensors
- d. Incorrect refrigerant charge

Feedback:

Correct: B. A high temperature lift generally means the compressor is working harder, reducing efficiency.

If incorrect: Temperature lift is the difference between source and supply temperatures. Large lifts strain performance.

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

- a. When peak demand is very low
- b. When backup heat is unavailable
- c. When a secondary heat source helps meet high loads or reduce costs
- d. When the heat pump is oversized

Feedback:

Correct: C. Hybrid systems combine the heat pump with a secondary source to support peak loads, resilience, or cost control.

If incorrect: Hybrids are about flexibility, not oversizing or low loads.

3. During commissioning, what is one of the first things to verify?

- a. Final customer handover pack
- b. Correct sensor locations and flow direction
- c. Historical SCOP values
- d. Future service schedule

Feedback:

Correct: B. Basic physical checks, including flow direction and sensor placement, are early-stage commissioning essentials.

If incorrect: Commissioning begins with foundational system verification—before documentation or longer-term planning.

4. A system shows short-cycling and higher-than-expected return temperatures. What does this likely indicate?

- a. Normal low-load operation
- b. Improper control settings or hydraulic imbalance
- c. Compressor failure
- d. Lack of electrical input

Feedback:

Correct: B. Short-cycling with elevated return temperatures often reflects sub-optimal control or imbalance, not component failure.

If incorrect: Mechanical failure is less common than configuration issues.



Module 3



Short check of understanding via

5–8 item quiz with instant feedback.

5. Which metric combination helps you judge real-world operating performance?

- a. Noise levels only
- b. Flow/return temperatures, pressures, electrical input, heat output
- c. Manufacturer brochure COP values
- d. Customer comfort reports only

Feedback:

Correct: B. These are core performance-monitoring metrics in practice.

If incorrect: Brochure COPs don't reflect in-situ performance.

6. What is the purpose of a “baseline performance snapshot” at handover?

- a. To diagnose faults that might occur years later
- b. To provide a reference for future service and performance checks
- c. To compare with competitors' products
- d. To confirm the customer understands billing

Feedback:

Correct: B. It provides an initial, verified benchmark for future comparisons.

If incorrect: It's not primarily for diagnostics or marketing.

7. What should you check first when troubleshooting unusual defrost behaviour?

- a. Replace the expansion valve
- b. Inspect sensor placement and airflow around the outdoor unit
- c. Raise flow temperatures
- d. Check customer usage patterns

Feedback:

Correct: B. Many defrost issues stem from airflow or sensors—simple early checks.

If incorrect: Troubleshooting starts with the basics, not major component changes.

8. Which of the following best reflects good plain-language communication with a client?

- a. “Your SCOP proxy indicates a deviation from expected thermodynamic output.”
- b. “Your system shows anomalous cycling patterns consistent with controller misconfiguration.”
- c. “Your heat pump is working, but some settings need adjusting so it can run more efficiently.”
- d. “Your refrigerant pressures are outside spec due to latent load mismatch.”

Feedback:

Correct: C. Clear, simple, outcome-focused language is best for non-technical stakeholders.

If incorrect: Avoid jargon; explain impact and next steps plainly.



Module 3



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

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- **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 reasoning. Optional simplified explanations supported learners who benefited from additional scaffolding.



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 explain low-temperature district heating concepts, identify opportunities for integrating renewables and waste heat, and understand the building-network interface. They will be able to interpret basic metering/operational data, recognise common integration risks, and specify the evidence and coordination steps needed for reliable 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. Explain the transition from high-temperature networks to 4th/5th generation low-temperature district heating/cooling, including implications for building systems and user comfort.
2. Identify and verify the purpose and correct functioning of key building-level interface components (HIUs/substations, metering, controls), using technical documentation and basic acceptance checks appropriate to the learner's role.
3. Analyse return temperature and ΔT performance at the building-network interface and select practical improvement actions (controls adjustments, hydraulic balancing checks, commissioning steps) or escalation routes where needed.
4. Interpret smart metering and basic control/BMS outputs to monitor performance, detect abnormal behaviour (e.g., high return temperatures, poor load matching), and define what additional data is needed for diagnosis.
5. Produce a short integration and handover note for a scenario (district + renewables/waste heat), outlining: recommended interface approach, key risks/constraints, required commissioning/verification evidence, and stakeholder responsibilities (demonstrates responsibility/autonomy).



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)

- Low-temperature district heating and cooling (DHC) principles (4GDH & 5GDHC)
- Case examples of low-temperature network approaches (intro level)

Unit 2 Building–network interface components (HIUs and substations) and acceptance checks

- Heat interface units (HIUs) and sub-stations
- Smart metering and consumption data (basic metering purpose and checks)
- What “good” installation/commissioning evidence looks like at interface level (high level)

Unit 3 Return temperature, ΔT , and performance optimisation at the interface

- Optimising return temperatures and ΔT
- Control logic and automation (BMS/EMS) as it relates to ΔT and stability
- Smart metering and consumption data (using returns/temperatures as performance signals)

Unit 4 Flexibility and integration with renewables and thermal storage

- Thermal energy storage (TES) operations
- Integrating solar thermal and geothermal heat
- Control logic and automation (BMS/EMS) for scheduling/optimisation (high level)

Unit 5 Waste heat opportunities, monitoring, and applied integration scenario

- Waste-heat recovery (industrial and urban sources)
- Smart metering and consumption data (what to monitor, what “abnormal” looks like)
- Case studies: successful renewable/waste heat integration into district heating
- Practical handover/verification evidence (what stakeholders need for sign-off)



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:

LO1 - Low-temperature DHC principles and transition

- Concept walkthrough: 4GDH and 5GDHC.
- Typical supply/return temperature ranges and why lower temperatures reduce network losses and improve renewable compatibility.
- A “before/after” transition narrative: high-temperature vs low-temperature networks (what changes for users, substations, and operation).

LO2 - Building interface components and basic monitoring

- Labelled diagram: network → sub-station/heat interface unit (HIU) → building heating/DHW circuits.
- Where and how metering is performed (flow, supply/return temperatures, heat meter).
- Quick interpretation prompts, e.g.:
 - “What might high flow + low ΔT indicate?”
 - “What could an unusually high return temperature suggest?”

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

- Flow and heat-power relationships under different temperature regimes.
- Basic control approaches (concept level): weather compensation, DHW priority effects, return temperature limitation, balancing.
- Linking control choices to improved ΔT , lower return temperature, and better system efficiency.

LO5 - Integration of renewables, thermal storage, and waste heat

- Integration overview: temperature suitability of solar thermal and geothermal sources.
- Thermal energy storage (TES) purpose (peak shaving, load shifting, demand-side flexibility).
- Waste heat basics: source temperature levels, availability profiles, monitoring needs, and basic integration logic.



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)
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- a simple checklist (what to verify / what evidence to keep)
- a short client/stakeholder explanation (plain language)

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

1. **Baseline run (high-temperature):** Learners read supply/return temperatures, flow, and heat power; calculate ΔT and identify the main inefficiency (e.g., high return temperature).
2. **Transition to low-temperature:** Select a suitable low-temperature regime and rerun the system; observe impacts on flow, delivered heat, and return temperature.
3. **Control decision:** Apply one basic control approach (e.g., adjust weather curve, add a return-temperature limit, reduce unnecessary flow) and verify improvement in ΔT and return temperature.
4. **Integration option:** Add solar thermal or geothermal energy source in combination with TES and define a simple operating rule (e.g., charge TES when renewable/waste heat is available, discharge during peak demand).



Short check of understanding via

5–8 item quiz with instant feedback.

Some examples of possible questions:

1. What is the main advantage of lowering district heating supply temperatures?
2. Identify sub-station components on a schematic / photo.
3. In a heat meter, which measurements are essential to calculate delivered heat?
4. Calculate flow-rates, power or other parameters based on measured values.
5. Which option is a typical purpose of thermal energy storage (TES) in district heating?
6. Which heat source is usually most suitable for low-temperature DH integration?
7. Which control approach most directly supports lower return temperature?



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

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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).



Module 4



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Module 5

Smart Controls & Digital Operation



Time

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

Approx. **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, optimise, and document the performance of heating and cooling systems**, while managing integration with other building services and applying secure, compliant remote-access practices.



Module Learning Objectives

- include between 3–5 fully formed Learning Objectives

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

1. Interpret and adjust smart control parameters (such as setpoints, schedules, and weather compensation) to optimise heating and cooling system performance within operational constraints.
2. Analyse trend logs and dashboard data to identify anomalies, diagnose faults, and propose corrective actions that improve system efficiency and reliability.
3. Apply digital tools for monitoring and documentation, including generating compliance-ready reports and performance summaries from smart control platforms.
4. Evaluate interoperability and integration issues between smart control systems and other building services, recommending practical solutions to ensure seamless operation.
5. Implement secure and efficient remote access practices in line with cybersecurity and data protection principles when managing smart control systems.



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 optimisation in practice

- Setpoints, schedules, weather compensation, deadbands and zoning
- Comfort, safety and operational constraints (what you can and cannot change)
- How to specify or validate parameter changes (not just “tuning knobs”)
- Producing a short decision note (micro-output)

Unit 2 Using trends and dashboards to diagnose performance

- Reading trend logs: what “normal” looks like
- Spotting anomalies (drift, cycling, overrides, sensor issues)
- Likely causes, corrective actions and escalation routes
- Preparing a simple fault log (micro-output)

Unit 3 Digital monitoring outputs and evidence for QA/compliance

- What to capture: baseline snapshot, KPIs, alerts, issue logs
- Producing handover/QA evidence and performance summaries
- Good documentation practice (clear, concise, repeatable)
- Drafting a short summary paragraph for QA (micro-output)

Unit 4 Interoperability and system integration across building services

- Common integration points (HVAC, DHW, ventilation, renewables, metering/BMS)
- Interoperability issues: protocols, data quality, time sync, naming, responsibilities
- Practical fixes and commissioning/handover checks

Unit 5 Remote access governance, cybersecurity and data protection

- Roles/permissions, MFA, logging and supplier access
- Secure remote monitoring workflows (what is acceptable in practice)
- Data handling basics (storage, sharing, retention, privacy)
- Balancing operational and security needs in remote-access workflows (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: *Optimising a Heat Pump in an Occupied Retrofit*

Learners review a short scenario describing a retrofitted multi-residential building experiencing comfort complaints and high energy use. Given a snapshot of control settings and constraints (occupancy patterns, system limits, contractual responsibilities), learners identify which parameters can be adjusted, which cannot, and what evidence would justify a change.

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

Title: *Normal vs Problematic Trends*

Learners compare two simplified dashboard screenshots or trend descriptions:

- One showing healthy system behaviour
- One showing emerging faults

They identify anomalies, likely causes, and first-line corrective actions, noting when escalation is required.

LO3 – Activity 3 **Applied mini output**

Title: *Simple Monitoring & Evidence Checklist*

Learners create a short checklist of:

- KPIs to capture
- Evidence to retain
- Reporting frequency
- Responsible party

Designed to mirror real professional QA practice.

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

Title: *Interoperability in Practice*

Introduces common integration points (HVAC, DHW, ventilation, renewables, metering, BMS) and typical issues (protocols, data quality, naming conventions, time synchronisation, unclear responsibilities), with practical examples.

LO5 - Activity 5 **Applied mini output**

Title: *Remote Access & Data Handling Checklist*

Learners produce a short checklist covering:

- Access permissions
- Logging requirements
- Supplier access rules
- Data storage and retention basics



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 max temperatures or disabling control strategies risks inefficiency, equipment damage, and non-compliance

Question 2 (LO1 – Evidence-based adjustments)

Before implementing a permanent 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, repeatable evidence that supports justified and auditable changes.

Experience and complaints are important, 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. Rapid or regular cycling under stable conditions often points to poor control tuning, sensor faults, or deadband issues.

The other patterns are typical of normal system behaviour



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 or data issues should be verified before making system-level changes or escalating.

Compensating with higher setpoints hides the problem and increases 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, targeted evidence supports QA, commissioning, and compliance without unnecessary complexity.

Too much or poorly structured data reduces usability and audit value.

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. Interoperability issues such as time sync, data quality, or control priorities commonly prevent effective system coordination. The other options affect performance but not system integration.



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, MFA, and logging balance operational efficiency with 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.



Module 5



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. 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).





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 equips learners to ensure heating and cooling works are delivered safely, legally and to a consistent quality standard. Learners will be able to identify relevant compliance requirements and evidence (including EN 378 and F-Gas where applicable), complete or review risk assessments, and apply commissioning and quality checks. They will also be able to prepare method statements and concise handover documentation to support sign-off and audit readiness. .



Module Learning Objectives

- include between 3–5 fully formed Learning Objectives

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

1. Identify and verify the compliance obligations relevant to a heating/cooling installation or retrofit, including EN 378 and F-Gas requirements where refrigerants apply, and specify the key evidence required for inspection, handover or audit.
2. Complete or review a task-specific health and safety risk assessment for HVAC works (pressurised systems, refrigerants, electrical isolation, hot works, working at height), selecting practical control measures and defining when escalation to a competent person is required.
3. Apply commissioning and functional verification checks to confirm systems operate safely and as intended, using clear acceptance criteria and identifying common quality issues that lead to poor performance (e.g., incorrect settings, poor balancing, missing sensor validation, incomplete documentation).
4. Use quality management tools (standardized checklists, inspection and test plans, non-conformance reporting) to manage defects, track corrective actions and support consistent delivery across teams and subcontractors.
5. Prepare a method statement and a concise handover documentation set for a defined work activity, including work sequence, roles and responsibilities, hazards and controls, hold points, verification steps, and records needed 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/standards apply (EN 378, F-Gas where relevant)
- What “compliance evidence” looks like for inspection, handover, audit

Unit 2 Health and safety risk assessment for HVAC work

- Task-based risk assessment approach
- Key hazards (pressure, refrigerants, electrical isolation, hot works, height)
- Controls and escalation to competent persons

Unit 3 Commissioning and functional verification

- Acceptance criteria and functional checks
- Common quality failures that reduce performance
- Recording results for verification

Unit 4 Quality management tools in delivery and maintenance

- Checklists, inspection and test plans (ITPs)
- Non-conformance reporting (NCR) and corrective actions
- Consistent quality across subcontractors/teams

Unit 5 Method statements and handover documentation for sign-off

- Method statement structure (sequence, roles, hazards/controls, hold points)
- Verification steps and records needed for sign-off
- Compiling a 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 is deliberately flawed. It will contain safety violations based on EN 378 and F-Gas regulations. The candidate must act as "External Auditor" to identify the violations.
2. The candidates will be given specific site situations and must instantly categorize them into one of three actions: standard risk, additional controls required and stop & escalate to superior. This mimics the split-second decision-making required on a job site.
3. The candidates are presented with 3 commissioning case files. Each file contains an Acceptance Criteria (the rule) and a piece of Evidence (photos, log sheets, or BMS screenshots).
4. The candidates must evaluate the evidence and stamp the file as: Pass (System is safe and operating as intended), Fail (system is not operating, also identify the root cause), incomplete (the evidence is missing, or something does not coordinate well)
5. Short narrative slides on inspection and test plans (ITP) and Non-conformance reporting (NCR).
6. Short narrative slides on structure of method of statement, steps need for verification and documents needed for signing.



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 explicitly cites EN 378 and F-Gas requirements as the key standards relevant to heating/cooling installations where refrigerants apply.

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

- a. Proceeding with extra caution
- b. Escalation to a competent person
- c. Creating a new method statement on the spot
- d. Ignoring the hazard if it seems minor

Answer: B) Escalation to a competent person

Explanation: Unit 2 defines the need for controls and specifically mentions "escalation to competent persons" as a critical step in managing safety risks.

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 failures

Answer: D) Common quality failures

Explanation: Unit 3 lists these issues as common quality failures that lead to poor system performance.

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: Unit 4 explicitly identifies Non-conformance reporting (NCR) as the tool used for managing defects and tracking corrective actions.



Module 6



Short check of understanding via

5–8 item quiz with instant feedback.

Q5. According to Unit 5, a Method Statement structure should include sequence, roles, hazards/controls, and which another key element?

- a. Budget estimates
- b. Hold points
- c. Marketing plan
- d. HR disciplinary procedures

Answer: B) Hold points

Explanation: Unit 5 lists "hold points" as a specific component of the method statement structure, indicating stages where work must stop for inspection.

Q6. What is the primary goal of the activities described in Unit 3?

- a. Drafting legal contracts
- b. Commissioning and functional verification
- c. Designing the HVAC system
- d. Procuring materials

Answer: B) Commissioning and functional verification

Explanation: The title and content of Unit 3 focus entirely on commissioning, functional checks, and verifying that the system works as intended.

Q7. Unit 4 suggests that using quality management tools like ITPs helps achieve what outcome across teams and subcontractors?

- a. Faster installation speeds
- b. Reduced material costs
- c. Consistent quality
- d. Elimination of all paperwork

Answer: C) Consistent quality

Explanation: Unit 4 states that these tools support "consistent delivery across teams and subcontractors."

Q8. Which of the following lists correctly identifies the key hazards for HVAC work mentioned in Unit 2?

- a. Slips, trips, falls, and manual handling only
- b. Noise, vibration, and dust
- c. Chemical spills and biological agents
- d. Pressure, refrigerants, electrical isolation, hot works, height

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

Explanation: This list perfectly matches the key hazards provided in the text for Unit 2.



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 coordinate and support clean heat projects by applying practical project integration and collaboration methods. Learners will be able to manage dependencies, information flow and change requests, use digital collaboration tools effectively, and communicate clearly with stakeholders. They will produce coordination outputs (e.g., tracker updates, issue/risk logs and stakeholder notes) to support timely, high-quality delivery.



Module Learning Objectives

- include between 3–5 fully formed Learning Objectives

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

1. Map the clean heat project lifecycle and typical stakeholder roles, and identify key integration points where coordination is critical (handover, commissioning, evidence, interfaces).
2. Coordinate cross-functional tasks by maintaining an integrated view of scope, schedule, quality, risks and dependencies, and update a project tracker or progress summary for a defined work package.
3. Apply a structured change-control approach by documenting a change request, assessing impacts (time/cost/quality/risk), and communicating decisions or escalation needs clearly.
4. Use digital collaboration tools (shared documents, task boards, meeting notes/action logs) to capture decisions, assign actions, and maintain version control and transparency across teams.
5. Produce a short coordination output for a scenario (e.g., an issue/risk log plus a stakeholder update note), demonstrating professional judgement, accountability for timely outputs, and appropriate escalation within organisational guidelines.



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 (high level)
- Common causes of delays and rework (role confusion, late decisions)

Unit 2 Coordinating tasks, dependencies and progress reporting

- Work packages and deliverables
- Dependencies and critical path (basic)
- Short-term planning (look-ahead planning)
- Progress tracking and reporting summaries
- Quality, time and cost basics (what to monitor)
- Issue escalation routes (who to involve, when)

Unit 3 Integrated project information and change control

- Integrated view: scope, schedule, cost, risk, quality
- Version control and document control basics
- Change request (what triggers it, what it contains)
- Impact assessment (time/cost/quality/risk)
- Decision logging and approvals
- Managing assumptions and constraints

Unit 4 Collaboration practices and digital project tools

- Meeting structure and action tracking
- Collaboration techniques (workshops, check-ins, stand-ups)
- Shared documentation (folders, naming, templates)
- Task boards and trackers (basic use)
- Communication channels and etiquette (clear, concise, traceable)
- Transparency and information sharing across teams

Unit 5 Stakeholder engagement, communication and professional judgement

- Stakeholder mapping (interest, influence, needs)
- Tailored messages (technical vs non-technical audiences)
- Managing expectations and conflict (basic)
- Risk/issue log and mitigation actions
- Writing short stakeholder updates (status, decisions, next steps)
- Escalation and accountability (timely, evidence-based)



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

1. Short explainer input – set the frame:

- Introducing lifecycle phases/Lifecycle stages as decisions and handovers
- Naming standard roles/Roles as accountability, not job titles
- Explaining what “integration points” means/Integration points as where work crosses people or teams

2. Scenario/Mini case study – to show:

- Who is involved when,
- Where handovers happen,
- Where things break if roles aren’t clear.

Scenario 1: New Commercial Office Building – HVAC Installation

- A classic end-to-end project shows lifecycle stages, multiple roles, and integration points where things often go wrong.

Project lifecycle stages shown

- Concept & design: Mechanical engineer designs HVAC system to meet comfort and energy targets
- Procurement: HVAC contractor selected, equipment ordered
- Installation: Ductwork, plant, controls installed
- Commissioning: Testing, balancing, and controls tuning
- Handover: O&M manuals, training, warranties provided

Scenario 2:

Retrofit HVAC Upgrade in an Existing Hospital. It demonstrates:

- HVAC must integrate with existing systems
- Commissioning must be staged to avoid disruption
- Poor coordination causes delays and rework in live environments

3. Applied reflection / mini output – make learners do the thinking, e.g. mapping, short explanation, role identification.

Examples:

- “Map the roles involved at each lifecycle stage”
- “Identify two integration points where failure would cause delays”
- “Explain who owns the handover from design to delivery”

4. Compare-and-contrast – deepen understanding

Comparisons:

- Waterfall vs Agile lifecycle integration points
- Clear role ownership vs shared ownership
- Early vs late integration

Contrasts:

- Differences between roles (e.g. Sponsor vs Project Manager)
- Differences between lifecycle stages
- Centralised vs distributed integration

Outputs

- “Map this to a project you’ve worked on”
- “Where did roles blur or collide?”
- “Which integration point caused the most friction?”



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

1. Short explainer – shared language (minimal)

Common language:

- What a work package looks like on an HVAC job
- Difference between:
 - ✓ Tasks (“Run pipework”)
 - ✓ Work packages (“Install refrigerant pipework to spec in Zone A”)
 - ✓ Deliverables (“Pressure-tested & insulated pipework, signed off”)
- Simple coordination models

2. Scenario / case study – recognition and diagnosis

Scenario 1: Multi-Storey Residential Apartment – HVAC Rough-In Phase

Scenario overview

An HVAC contractor is responsible for installing ductwork, FCUs, and exhaust systems across a 6-storey apartment building. Works must be coordinated with framing, electrical, and plumbing trades. The site supervisor tracks progress weekly and reports to the project manager.

Coordinating Tasks and Dependencies - Key dependencies

- Framing must be complete before duct installation
- Electrical rough-in must follow duct placement
- Ceiling close-up cannot occur until HVAC inspections are passed

Coordination activities

- Daily coordination with site supervisor
- Weekly look-ahead schedule (2–3 weeks)
- Toolbox talks to align crews with upcoming work

Scenario 2: Retail Fit-Out – HVAC Installation with Fixed Opening Date

Scenario overview

An HVAC team is installing split systems and mechanical ventilation in a shopping centre tenancy. The store opening date is fixed, and delays will result in liquidated damages. The HVAC contractor must coordinate tightly with ceiling, electrical, and fire services contractors.

What to Monitor - Quality

- Equipment installed to manufacturer requirements
- Correct refrigerant pipe sizing and insulation
- Condensate drainage tested before ceiling closure

What to Monitor - Time

- Equipment delivery dates
- Installation duration per system
- Testing and commissioning milestones

What to Monitor - Cost

- Expedited freight costs
- Additional labour for after-hours work
- Rectification costs due to rushed installs



Module 7



Unit 2 Coordinating tasks, dependencies & progress reporting

3. Applied reflection – personal relevance

Guided Reflection Questions: Short-Term (Look-Ahead) Planning

Reflection 1:

Personal Understanding of Look-Ahead Planning

- What does short-term or look-ahead planning mean in your HVAC role?
- Can you describe a time when a lack of planning caused delays or rework on a job?
- How could look-ahead planning have reduced the impact of that situation?

Reflection 2:

Applying Look-Ahead Planning to Your Daily Work

- How do you currently plan your HVAC tasks for the next one to three weeks?
- What information do you need before committing to upcoming work (e.g. drawings, materials, access)?
- How does short-term planning help you manage your time and workload more effectively?

Reflection 3:

Managing Dependencies and Coordination with Other Trades

- Which trades does your HVAC work most commonly depend on?
- How do delays or changes from other trades affect your planned activities?
- How can look-ahead planning help you identify and manage these dependencies earlier?

Reflection 4:

Progress Reporting and Communication

- How do you usually report progress on your HVAC tasks?
- How does short-term planning improve the quality of progress reports you provide?
- What information about upcoming work or risks should be communicated to supervisors or project managers?

Reflection 5:

Personal Responsibility and Continuous Improvement

- What role do you personally play in short-term planning on site?
- How can you contribute to identifying risks or constraints in upcoming work?
- What changes will you make to your own planning approach on future projects?



Module 7



Unit 2 Coordinating tasks, dependencies & progress reporting

4. Compare and contrast – deepen judgment

Issue Escalation Routes in HVAC Projects:

Approach 1: Informal or Delayed Escalation

Who is involved

- HVAC installer only
- Possibly another tradesperson on site

When escalation occurs

- After work has already been delayed
- When the issue becomes critical or causes missed deadlines

How the issue is handled

- Verbal discussions on site
- No formal reporting or documentation
- Assumption that someone else will resolve the problem

Impact on the project

- Delays to commissioning
- Idle labour and wasted time
- Increased costs due to overtime or rework
- Frustration between trades

Approach 2: Structured and Timely Escalation

Who is involved

- HVAC installer → HVAC supervisor
- Site supervisor or project manager
- Electrical contractor (if required)

When escalation occurs

- As soon as the issue is identified
- During look-ahead planning or daily progress reporting

How the issue is handled

- Issue recorded in progress report or site diary
- Raised at coordination meetings or toolbox talks
- Clear responsibility assigned and follow-up actions agreed

Impact on the project

- Delays minimised or avoided
- Better coordination between trades
- Improved productivity and cost control
- Clear communication and accountability

Comparison summary - Reflection Questions:

- Which escalation approach is more effective for managing HVAC dependencies, and why?
- How can early escalation improve safety, quality, time, and cost outcomes?



Module 7



Unit 3 Integrated project information and change control

1. Short explainer – shared understanding

Integrated View: Scope, Schedule, Cost, Risk, and Quality
– six narrated slides

- **Scope** - What is being delivered. It includes system capacity, equipment types, controls, energy performance, and compliance requirements.
- **Schedule** - When work happens. HVAC installation depends on design approvals, material lead times, coordination with other trades, and commissioning windows.
- **Cost** - What the project will spend. HVAC costs include equipment, labour, commissioning, testing, and future operating costs.
- **Risk** - What could go wrong. Common HVAC risks include clashes with other services, supply chain delays, performance shortfalls, and compliance issues.
- **Quality** - How well the system performs. This includes comfort, efficiency, reliability, and meeting standards and specifications.
- **Integrated across all five areas.**

2. Scenario / case study – recognition and consequence

Scenario: Change Request in an HVAC Project

Project Background

You are working as part of the HVAC team on a mixed-use building (retail on the ground floor, offices above). The HVAC system has already been designed and approved, and installation of ductwork has started on Levels 1 and 2. The project is being managed using formal change control procedures.

The Situation (Trigger for Change)

During a site walk-through, the client decides to:

- Convert part of Level 1 from open-plan retail space into food service units

This change affects:

- Cooling load requirements
- Ventilation rates
- Exhaust systems
- Fire and compliance requirements

The existing HVAC design no longer meets the new use of the space. In this scenario, the trigger is a client-initiated change in building use.



Module 7



Unit 3 Integrated project information and change control

Case study: Version Control and Document Control Basics in an HVAC Project

Project Background

You are part of the HVAC team on a new commercial office building. The project involves multiple stakeholders: the client, consultant, main contractor, electrical contractor, and HVAC subcontractor. All drawings and documents are shared through a common data environment (CDE). During the design phase, several updates are made to the HVAC layout to improve energy efficiency and meet revised client requirements.

The Situation

An updated mechanical services drawing is issued by the consultant.

- The drawing includes changes to duct routing and air handling unit specifications.
- The file name looks similar to earlier versions, but it is not clearly marked as the latest revision.
- On site, one HVAC installer downloads an older version of the drawing that is still stored in a local folder.
- Installation begins based on the outdated drawing.

Two weeks later, during a coordination meeting, it becomes clear that:

- Installed ductwork clashes with electrical services
- The AHU capacity does not meet the updated design
- Rework is required, causing delays and extra costs

Key Issues Identified

This problem occurred due to poor version control and document control, not technical HVAC skills.

Common issues include:

- Multiple versions of drawings stored in different locations
- Unclear revision numbers or dates
- Team members using “what they had saved” instead of checking the approved source
- No confirmation that the latest version was being used on site



Module 7



Unit 3 Integrated project information and change control

3. Applied reflection – personal relevance

Context

You are part of the HVAC team on a commercial office building. A recent change request has been approved: the client wants to upgrade the air handling units (AHUs) to higher capacity models to improve indoor air quality. This change affects multiple aspects of the project. Before implementing it, you are asked to reflect on the potential impacts.

Reflection Activity

Step 1: Identify the impact areas

For this change, consider each of the following areas:

1. Time (Schedule)
 - How might the change affect the installation timeline?
 - Could delivery or commissioning be delayed?
2. Cost (Budget)
 - What additional costs could arise from the higher capacity AHUs?
 - Include equipment, labour, and possible rework.
3. Quality (Performance / Compliance)
 - Will the new AHUs meet design and comfort specifications?
 - Could system performance or energy efficiency be affected?
4. Risk (Safety / Coordination / Compliance)
 - What risks are introduced by the change?
 - Examples: space constraints in mechanical rooms, clashes with ductwork or electrical systems, compliance with fire/ventilation codes.

Step 2: Reflect and Write

Answer the following questions in 3–5 short sentences each:

1. Which area (time, cost, quality, risk) is most affected by this change and why?
2. How could the team mitigate negative impacts in each area?
3. What lessons can be applied to future changes to avoid surprises on site?

4. Compare-and-contrast – judgment and decision-making

Decision logging ensures accountability for choices, while assumptions and constraints ensure practicality and feasibility. Both work together to prevent costly mistakes and delays.

Decision Logging and Approvals

Example in HVAC:

- Approval of switching AHU models to a higher capacity.
- Decision logged with rationale, date, approver, and affected systems.

Managing Assumptions and Constraints

Example in HVAC:

- Assumption: AHUs can fit in existing mechanical rooms.
- Constraint: Maximum ductwork height cannot exceed 3 meters due to ceiling clearance.



Module 7



Unit 4 Collaboration practices and digital project tools

1. Short explainer – shared principles

Clear collaboration using simple digital project tools - such as shared calendars, task lists, messaging apps, or job management software.

Shared principles with illustrations/examples:

- Clear purpose
- Right people, right time
- Simple structure
- One action = one owner
- Visible action tracking
- Follow-up matters

2. Scenario / case study – recognition and consequence

Scenario 1.

Using collaboration techniques to keep an HVAC project on track

Project background

An HVAC company is responsible for installing a new heating and ventilation system in a medium-sized office building.

The project involves:

- Office-based project managers
- On-site HVAC technicians
- An electrical subcontractor
- A supplier providing equipment and ducting

Early in the project, problems start to appear:

- Drawings are interpreted differently on site
- Equipment deliveries are missed or late
- Technicians are unsure who to contact when issues arise

To improve coordination, the team introduces three collaboration techniques:

1. Start-up workshop (planning and alignment)
2. Weekly check-ins (progress and problem-solving)
3. Daily stand-ups (on-site coordination)



Module 7



Unit 4 Collaboration practices and digital project tools

Case study: Using shared documentation to improve coordination on an HVAC project

Project overview

An HVAC company is contracted to install and commission new systems in a refurbished healthcare facility.

The project involves:

- Multiple HVAC technicians working across different zones
- A project manager and office administrator
- External contractors (electrical and controls)
- Strict documentation requirements for compliance and handover

At the start of the project, documentation is stored in different places:

- Drawings are emailed as attachments
- Photos are saved on personal phones
- Commissioning sheets exist in multiple versions

This leads to confusion, rework, and time wasted searching for the correct information.

The challenge

- Technicians are unsure which drawings are the latest version
- File names are inconsistent (e.g. “final”, “new final”, “use this one”)
- Handover documents are incomplete or missing information
- Office staff spend time chasing files instead of managing the project

The solution: Shared documentation standards

The team agrees to use a shared digital folder system with clear rules.

1. Shared folder structure

A standard folder structure is set up in a shared cloud platform:

- 01_Project overview
- 02_Drawings and specifications
- 03_Install photos
- 04_Testing and commissioning
- 05_Change requests
- 06_Handover documents

Everyone uses the same structure on every project.

2. Clear file naming rules

The team agrees on a simple naming convention:

- Project name – Area/Zone – Document type – Date – Version
- **Example:** HealthCentre_Level2_AHU_Commissioning_2026-01-15_v1
- This makes it easy to identify the latest and correct document at a glance.



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Unit 4 Collaboration practices and digital project tools

3. Standard templates

To reduce variation and missing information, the company introduces templates for:

- Site checklists
- Commissioning reports
- Change requests
- Service and maintenance notes

Templates are stored in the shared folder so everyone starts from the same format.

How it works in practice

- Technicians upload photos and reports directly from site
- The project manager reviews and updates documents in real time
- Older versions are archived automatically
- Everyone can access the latest information from any location

3. Applied reflection – personal/team relevance

Task boards and trackers – personal and team relevance. This reflection focuses on how basic task boards and trackers can support personal and team's daily work.

Individual reflection:

- Current practice
- Personal benefit
- Ease of use

Team reflection:

- Team coordination
- Shared visibility
- Consistency

4. Compare-and-contrast – sharpen judgement

Communication channels and etiquette in HVAC projects

Effective collaboration in HVAC work depends not just on what is communicated, but how and where it is communicated.

Different communication channels serve different purposes:

1. Face-to-face or verbal communication
Examples: On-site conversations, toolbox talks, phone calls
2. Messaging apps (texts, team chat)
Examples: SMS, WhatsApp, Teams chat
3. Digital project tools
Examples: task boards, shared logs, comments

Comparison summary

Transparency and information sharing across HVAC teams:

the right information is visible to the right people at the right time

Different approaches to information sharing produce very different outcomes.

- Limited or informal information sharing
- Shared but unstructured information sharing
- Structured and transparent information sharing



Module 7



Unit 5 Stakeholder engagement, communication and professional judgement

1. Short explainer – shared principles and boundaries - described by

- Stakeholder Mapping to identify who needs information, how much influence they have, and what they care about.
- Tailored Messages in technical vs non-technical communication adjusting language to your audience.
- Managing Expectations and Conflict to prevent issues before they escalate coming mostly from misunderstood scope, timeframes or costs.
- Risk / Issue Log and Mitigation by tracking problems before they become failures.
- Writing Short Stakeholder Updates covering status, decisions, next steps
- Escalation and Accountability so that to raise issues at the right time.

2. Scenario / case study – real-world pressure points

Tailored messages for technical vs non-technical audiences

Technical audiences:

- Engineers, inspectors, senior technicians
- Expect precise details, readings, standards, and terminology
- Communication can include schematics, data logs, and technical justifications

Non-technical audiences:

- Clients, building managers, end users
- Interested in outcomes, comfort, safety, timelines, and cost
- Avoid jargon or explain terms in simple language

Scenario: Tailoring Your Message

- **Context:** You are the lead HVAC technician replacing an air-handling unit (AHU) in a commercial building. During commissioning, you notice that the ductwork configuration deviates from the original design, which could affect airflow efficiency.
- **Technical Audience – Site Engineer:**
You send an email with technical details:
- **Subject:** AHU Ductwork Issue – Airflow Impact
Details: Observed duct deviation at branch B12. Pressure drop exceeds 25 Pa above design. CFD simulation indicates potential 12% reduction in airflow to zone 3. Recommend adjusting elbows and dampers to restore design performance.
- **Attached:** duct layout diagram and pressure readings.
- **Why it works:**
 - Precise data, technical terminology, and supporting documentation.
 - Allows the engineer to make informed technical decisions



Module 7



Unit 5 Stakeholder engagement, communication and professional judgement

Non-Technical Audience – Building Manager:

- **You provide a simple, outcome-focused update:**
- **Subject:** AHU Installation – Minor Duct Adjustment Required
Update: During commissioning, we noticed a small deviation in the ductwork that could slightly reduce airflow in one area. We recommend minor adjustments to ensure optimal comfort and efficiency. Work can be completed without major disruption.

Case study: Tailored Messages for HVAC Stakeholders

Background:

You are an HVAC technician on a project replacing an air-handling unit (AHU) in a mid-size office building. During commissioning, you notice that one branch of the ductwork has been installed incorrectly, which could affect airflow and energy efficiency.

- **The stakeholders involved are:**
- **Technical audience:** Site engineer and design consultant
- **Non-technical audience:** Building manager and office tenants. Your role is to communicate the issue, its impact, and recommended actions appropriately for each audience while demonstrating professional judgement.

It covers:

- Step 1: Identifying Stakeholder Needs
- Step 2: Tailored Messages
- Step 3: Reflection on Professional Judgement

3. Applied reflection – personal judgement practice

Managing Expectations and Conflict (Basic)

Scenario for Reflection

You are servicing a commercial HVAC system. During maintenance, you discover a significant fault in one of the AHUs that will delay completion by two days. The client expects the work to be finished today.

Stakeholders include:

- **Client:** Wants minimal disruption, concerned about comfort and operational impact.
- **Site Supervisor:** Needs accurate timeline updates to coordinate other trades.
- **Your Team:** Relies on your guidance to plan resources and avoid overtime.

Reflection Framework:

These steps can reflect on how your judgement affects communication and conflict management:

1. Identify the Issue & Potential Conflict.
2. Document and Learn.
3. Consider Options & Consequences.
4. Apply Personal Judgement



Module 7



Unit 5 Stakeholder engagement, communication and professional judgement

Risk/Issue Log and Mitigation Actions

Scenario for Reflection

You are leading the installation of a new rooftop HVAC unit in a commercial building.

During setup, you discover:

- The structural support is weaker than specified in the design.
- Delivery of a replacement duct section has been delayed by two days.
- The client has requested commissioning by Friday.

Stakeholders affected:

- Client: Concerned about completion date and operational impact.
- Site Supervisor: Needs accurate updates to coordinate other trades.
- Your Team: Requires guidance to adjust workflow safely.
- Your task: record the risks/issues and decide on mitigation actions, using professional judgement to balance safety, compliance, and timelines.

Reflection Framework:

1. Identify Risks and Issues
2. Consider Mitigation Actions
3. Apply Personal Judgement
4. Document and Review

4. Compare-and-contrast – sharpen decision-making

Writing Short Stakeholder Updates

Approaches to Short Updates need concise communications that keep stakeholders informed about:

- Status – what has been completed, what is in progress
- Decisions – agreements, approvals, or changes made
- Next Steps – planned actions, timelines, and responsibilities

Example:

Comparison based on scenario about AHU commissioning at a commercial site.

Escalation and Accountability

In HVAC projects, escalation ensures that issues beyond your authority or skill level are addressed promptly, while accountability ensures that actions and decisions are documented and traceable. Both are critical for safety, compliance, quality, and stakeholder trust. Different scenarios and audiences require different purpose, levels of details, timing, evidence, and communication style, which can be compared and contrasted.



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

Instant Feedback:

- **Correct (B):** Right! The Initiation stage defines project objectives, scope, and identifies stakeholders.
- The correct answer is **B – Initiation**. This is when the project's purpose, scope, and key stakeholders are first defined.

Question 2 – Unit 1

Who is primarily responsible for ensuring different teams' activities are aligned in a decarbonised heating and cooling project?

- a. Project Sponsor
- b. Project Manager
- c. Technical Consultant
- d. Procurement Officer

Instant Feedback:

- **Correct (B):** Correct! The Project Manager coordinates teams and ensures alignment throughout the project lifecycle.
- The correct answer is **B – Project Manager**. They oversee coordination and integration across roles.

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

Instant Feedback:

- **Correct (B):** Yes! Task dependencies show which tasks rely on the completion of others.
- The correct answer is **B – One task must be completed before another can start**. This ensures proper scheduling.



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

Instant Feedback:

- **Correct (B):** Correct! Progress reporting monitors task completion and helps address delays promptly.
- The correct answer is **B – To track task completion and identify delays**. It ensures the project stays on schedule.

Question 5 – Unit 3:

Integrated Project Information and Change Control

Why is change control important in project management?

- a. To prevent all changes from happening
- b. To evaluate, approve, and document changes to scope or plans
- c. To delay project decisions
- d. To assign tasks randomly

Instant Feedback:

- **Correct (B):** Exactly! Change control ensures changes are assessed and documented, keeping the project on track.
- The correct answer is **B – To evaluate, approve, and document changes**. It prevents uncontrolled changes.

Question 6 – Unit 4:

Collaboration Practices and Digital Project Tools

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

- a. Word processor
- b. Project management software (e.g., MS Project, Asana)
- c. Spreadsheet for personal finances
- d. Email signature generator

Instant Feedback:

- **Correct (B):** Correct! Project management software helps teams collaborate and monitor tasks effectively.
- The correct answer is **B – Project management software**. It's designed for task tracking and team collaboration.



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 key reason to engage stakeholders regularly in a project?

- a. To reduce costs immediately
- b. To keep them informed, manage expectations, and gain support
- c. To replace the project manager
- d. To delegate all decision-making

Instant Feedback:

- **Correct (B):** Yes! Regular engagement ensures stakeholders are informed and supportive of project decisions.
- The correct answer is **B – To keep them informed, manage expectations, and gain support.**

Question 8 – Unit 5

Professional judgement in project delivery primarily involves:

- a. Following rules without question
- b. Making informed decisions based on experience, knowledge, and ethics
- c. Delegating all tasks to others
- d. Ignoring stakeholder concerns

Instant Feedback:

- **Correct (B):** Correct! Professional judgement balances knowledge, experience, and ethical considerations to make project decisions.
- The correct answer is **B – Making informed decisions based on experience, knowledge, and ethics.**



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.
- **Color Contrast:** Ensure high contrast between text and background (e.g., dark text on light background).
- **Avoid Color Reliance:** Don't rely on color 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



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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.





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