Heat Network Technical Assurance Scheme

New Build Heat Networks

Technical Specification

Energy Centre

Phase 1: Feasibility

HNTAS-NB-TS-EC-P1

Version History

Revision	Notes	Date
V0.4	Draft issue	05/12/25

Disclaimer

The following HNTAS Code document is published in draft format. This document is intended to give the sector early sight of HNTAS requirements in their current stage of development for the purpose of facilitating sector understanding of the scheme.

Draft Code documents, including Technical Specifications and Assessment Procedures, have been reviewed and consulted on through a series of technical workshops with participation from a range of experts from across the heat network industry. The content of this document is still in development and subject to change. Requirements should not be considered as fixed at this stage.

Changes which may be made to this document in future include those to:

- reflect learnings from the New Build and Existing network pilot programmes;
- align with aspects of HNTAS which are subject to public policy consultation;
- align with new requirements in TS1 and MMS;
- align the terminology of this document with that used in other HNTAS documentation;
- rectify errors in this draft version; and
- improve clarity of contents.

The Key Failures set out in the draft Code documents have been identified as a specific area for review, to ensure that:

- all Key Failures enable a binary assessment;
- Key Failures are only included for genuine issues presenting major risks to KPIs, and that moderate or lower risks are considered via non-conformity processes; and
- Key Failures do not duplicate Technical Requirements unless there is a clear justification to do so.

DESNZ will be welcoming feedback on the information in this document via a change management process. This process will run in parallel to the HNTAS policy consultation and DESNZ invites stakeholders to engage with both, once they are open. You can sign up to receive updates on future detailed draft technical documents as they are published by contacting: heatnetworks@energysecurity.gov.uk.

Please be advised that this document references other HNTAS draft Code documents which have not yet been published. References to other documents will also be subject to change following the publication of updated standards. The final version of this document will be released before the launch of HNTAS.

Note on Phase 4: Operation (initial) and Phase 5: Operation (ongoing)

The New Build Technical Specification and Assessment Procedures Overview (Phase 0) documents indicate that there are separate New Build Code Documents for Phase 4: Operation (initial) and Phase 5: Operation (ongoing).

These documents have since been consolidated to reduce the number of Code Documents, so the Phase 4: Operation documents cover requirements for New Build networks during both initial and ongoing operation.

This change does not impact the assessment of New Build networks in operation, which still occurs:

- after 1 year of operation; and
- after 2 years of operation.

Contents

Foreword **5**
Scope **8**
References **10**
Normative references 10
Informative references 10
Terms and Definitions **11**
1. Requirements for Stage 1: Concept Design **12**
1.1. Technical Requirements 12
1.2. Performance Monitoring Requirements 16
1.3. Key Failures 18
1.4. Evidence Requirements 21

Foreword

This Technical Specification forms part of the UK Government's Heat Network Technical Assurance Scheme (HNTAS, The Scheme) delivered by the Department for Energy Security and Net Zero, in partnership with the Scottish Government and Ofgem. The Department for Energy Security and Net Zero appointed FairHeat as technical author for this document.

The Scheme has been designed and developed in consultation with a range of experts across the heat network industry in the form of Technical Sub-Working Groups, culminating in a series of Technical Specifications and Assessment Procedures to facilitate the validation and verification of performance outcomes of Elements within a Heat Network.

This document specifies HNTAS Requirements for an Energy Centre Element within a New Build Heat Network in Phase 1: Feasibility.

This document sits within a series of Technical Specifications for an Energy Centre, which features within a wider Code documentation structure, as outlined in Table 1.

This Technical Specification has been issued in draft format and will be updated prior to scheme launch.

For further information on the use of this document within the Heat Network Technical Assurance Scheme, please refer to the Heat Network Technical Assurance Scheme – New Build Heat Networks – Scheme Rules – Assessment Regime (HNTAS-NB-SR-XX-AS) document.

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Code Document Structure

Technical Specifications

Document Type	Element		Part/Phase				
			Overview	Phase 1: Feasibility	Phase 2: Design	Phase 3: Construction	Phase 4: Operation
			P0	P1	P2	P3	P4
Technical Specification	Energy Centre	EC	HNTAS-NB-TS-EC-P0	HNTAS-NB-TS-EC-P1	HNTAS-NB-TS-EC-P2	HNTAS-NB-TS-EC-P3	HNTAS-NB-TS-EC-P4
	District Distribution Network	DD	HNTAS-NB-TS-DD-P0	HNTAS-NB-TS-DD-P1	HNTAS-NB-TS-DD-P2	HNTAS-NB-TS-DD-P3	HNTAS-NB-TS-DD-P4
	Substation	SS	HNTAS-NB-TS-SS-P0	HNTAS-NB-TS-SS-P1	HNTAS-NB-TS-SS-P2	HNTAS-NB-TS-SS-P3	HNTAS-NB-TS-SS-P4
	Communal Distribution Network	CD	HNTAS-NB-TS-CD-P0	HNTAS-NB-TS-CD-P1	HNTAS-NB-TS-CD-P2	HNTAS-NB-TS-CD-P3	HNTAS-NB-TS-CD-P4
	Consumer Connection	CC	HNTAS-NB-TS-CC-P0	HNTAS-NB-TS-CC-P1	HNTAS-NB-TS-CC-P2	HNTAS-NB-TS-CC-P3	HNTAS-NB-TS-CC-P4
	Consumer Heat System	CH	HNTAS-NB-TS-CH-P0	HNTAS-NB-TS-CH-P1	HNTAS-NB-TS-CH-P2	HNTAS-NB-TS-CH-P3	N/A

Table 1: New Build Network Technical Specification structure

Scope

This document specifies the HNTAS Requirements for an Energy Centre within a New Build Heat Network in Phase 1: Feasibility.

An Energy Centre is defined as a plant room that contains heat generation equipment; and/or equipment connecting to an energy source; or a Substation which contains heat generation equipment (e.g. building connection with heat pumps or top-up boilers).

A detailed definition of the Energy Centre is contained within the Heat Network Technical Assurance Scheme – New Build Heat Networks – Technical Specification – Energy Centre – Overview (HNTAS-NB-TS-EC-P0) document.

New Build Heat Networks

There is one stage within Phase 1: Feasibility, which is Stage 1: Concept Design. This is outlined in Figure 1.

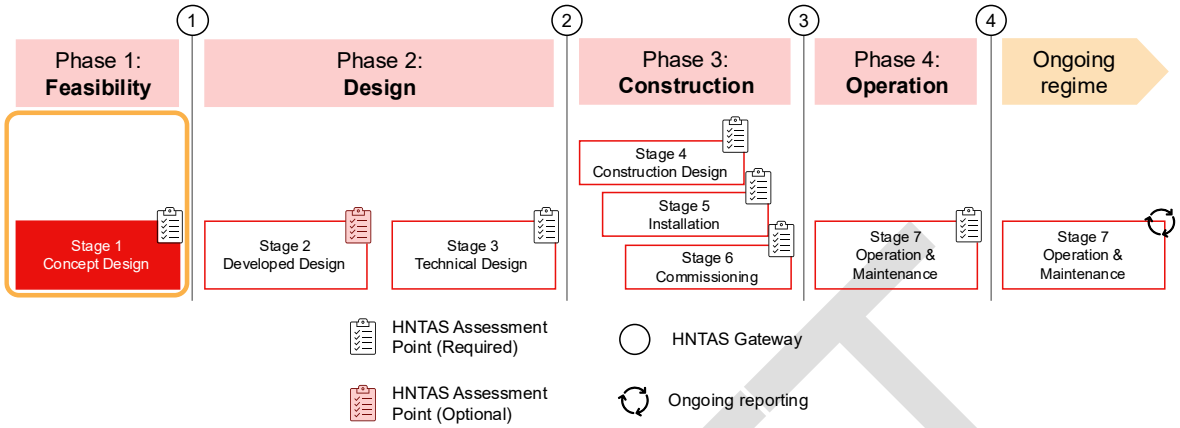

Figure 1: HNTAS New Build regime phases and stages

References

Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- Heat Network Technical Standard (TS1) (HNTAS, 2025)
- Heat Network Metering and Monitoring Standard (MMS) (HNTAS, 2025)
- Heat Network Technical Assurance Scheme – New Build Heat Networks – Scheme Rules – Assessment Regime (HNTAS-NB-SR-XX-AS)
- Heat Network Technical Assurance Scheme – New Build Heat Networks – Technical Specification – Energy Centre – Overview (HNTAS-NB-TS-EC-P0)

Informative references

The following informative references apply to this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- RIBA Plan of Work (RIBA, 2020)

Terms and Definitions

For the purposes of this document, the terms and definitions given in the Heat Network Technical Assurance Scheme – Terms and Definitions (HNTAS-XX-TD) document apply.

1. Requirements for Stage 1: Concept Design

1.1. Technical Requirements

The applicable HNTAS Technical Requirements in Table 2 shall be fulfilled.

Technical Requirement		Applicable technical standard(s)	Evidence Requirement(s)
1.1.1.	Peak heat demands, heat demand profiles and annual heat consumption shall be estimated in accordance with the applicable technical standard(s).	TS1 1.1.1 TS1 1.1.2 TS1 1.1.3 TS1 1.1.4 TS1 1.1.5 TS1 1.1.6 TS1 1.1.7 TS1 1.1.8 TS1 1.1.9 TS1 1.1.10 TS1 1.1.11 TS1 1.4.10 TS1 1.5.1 TS1 1.7.4	EC-S1-E02
1.1.2.	A phasing plan shall be developed in accordance with the applicable technical standard(s).	TS1 1.1.12 TS1 1.3.2	EC-S1-E03 EC-S1-E04
1.1.3.	Operating temperatures shall be determined in accordance with the applicable technical standard(s).	TS1 1.4.1 TS1 1.4.2 TS1 1.4.3 TS1 1.4.4 TS1 1.4.5 TS1 1.4.6 TS1 1.4.7 TS1 1.4.8 TS1 1.4.9 TS1 1.4.10 TS1 1.4.11 TS1 1.4.12 TS1 1.7.16 TS1 1.8.4 TS1 1.10.1	EC-S1-E05 EC-S1-E06 EC-S1-E07
1.1.4.	Working pressures shall be assessed in accordance with the applicable technical standard(s). *Note: it is expected that this assessment is undertaken with consideration for the other Elements present in the Heat Network.*	TS1 1.6.1 TS1 1.6.2 TS1 1.6.3 TS1 1.6.5 TS1 1.16.1	EC-S1-E08

Technical Requirement		Applicable technical standard(s)	Evidence Requirement(s)
1.1.5.	The heat source(s) and heat generation technology/technologies shall be selected in accordance with the applicable technical standard(s).	TS1 1.7.6 TS1 1.7.7 TS1 1.7.8 TS1 1.7.9 TS1 1.7.12 TS1 1.7.23 TS1 1.7.24 TS1 1.7.25	EC-S1-E06
1.1.6.	The size of each heat source and thermal storage shall be determined by producing an operating model in accordance with the applicable technical standard(s).	TS1 1.7.1 TS1 1.7.2 TS1 1.7.3 TS1 1.7.5 TS1 1.7.15	EC-S1-E05 EC-S1-E09
1.1.7.	The location of top-up/standby boilers and the use of existing boilers shall be determined in accordance with the applicable technical standard(s).	TS1 1.7.9 TS1 1.7.14 TS1 1.8.1 TS1 1.8.2 TS1 1.9.3	N/A
1.1.8.	The hydraulic arrangement and control intent of the Energy Centre shall be outlined to ensure that the low carbon heat supply source is maximised and KPIs can be achieved.	TS1 1.8.1 TS1 1.8.2 TS1 1.8.3 TS1 1.8.4 TS1 1.8.5	EC-S1-E10 EC-S1-E11
1.1.9.	The lifecycle costs (CapEx, OpEx, RepEx) and revenues for all Energy Centre components, including the Metering and Monitoring System, shall be assessed in accordance with the applicable technical standard(s) and used to inform design decisions.	TS1 1.7.2 TS1 1.7.13 TS1 1.7.17 TS1 1.12.2 TS1 1.15.1 TS1 1.15.2	EC-S1-E12 EC-S1-E13
1.1.10.	The fuel supply requirements for the heat generation equipment shall be identified in accordance with the applicable technical standard(s).	TS1 1.7.18	EC-S1-E14
1.1.11.	An initial heat tariff structure shall be determined, including consideration for energy import and export tariff structures in accordance with the applicable technical standard(s). This shall consider the mix of energy sources and time-based input energy costs.	TS1 1.7.20	N/A
1.1.12.	Carbon dioxide emissions shall be estimated in accordance with the applicable technical standard(s).	TS1 1.7.21 TS1 1.7.22	EC-S1-E15

Technical Requirement		Applicable technical standard(s)	Evidence Requirement(s)
1.1.13.	A Resilience Strategy shall be developed in accordance with the applicable technical standard(s). *Note: it is expected that this assessment is undertaken with consideration for the other Elements present in the Heat Network.*	TS1 1.9.1 TS1 1.9.2	EC-S1-E16
1.1.14.	A repair and replacement strategy shall be developed in accordance with the applicable technical standard(s). The strategy shall include: • estimated timeframe for replacement of major plant and equipment within the Substation to support long-term planning; • consideration of long-term carbon-reduction implications of repair and replacement decisions.	TS1 1.15.2 TS1 1.15.3	EC-S1-E17
1.1.15.	A Water Quality Statement shall be produced in accordance with the applicable technical standard(s). *Note: it is expected that this is undertaken with consideration for the other Elements present in the Heat Network.*	TS1 1.11.1	EC-S1-E18

Technical Requirement		Applicable technical standard(s)	Evidence Requirement(s)
1.1.16.	The Energy Centre site(s) and spatial requirements shall be determined in accordance with the applicable technical standard(s). Spatial requirements shall consider: 1. the space required for all equipment (heat generation, water treatment equipment, ancillary equipment, metering and monitoring equipment etc.); 2. maintenance requirements for all equipment; 3. equipment replacement requirements; 4. access and egress requirements; 5. requirements for insulation (ensuring enough space for required thickness); 6. spatial requirements for thermal storage; 7. Resilience Strategy requirements.	TS1 1.3.1 TS1 1.3.2 TS1 1.7.12 TS1 1.9.3 TS1 1.9.5 TS1 1.11.1 TS1 1.15.3	EC-S1-E03 EC-S1-E19
1.1.17.	The Technical Parameters Schedule shall be completed with accurate information and references to relevant documentation.		EC-S1-E20

Table 2: Technical Requirements for the Energy Centre at Stage 1: Concept Design

1.2. Performance Monitoring Requirements

The applicable Performance Monitoring Requirements in Table 3 shall be fulfilled.

Performance Monitoring Requirement		Applicable technical standard(s)	Evidence Requirement(s)
1.2.1.	A Metering and Monitoring Strategy shall be developed in accordance with the applicable technical standard(s).	TS1 1.12.1	EC-S1-E21
1.2.2.	The KPIs to be measured and reported for the Energy Centre shall be identified. A KPI Schedule shall be produced as part of the Metering and Monitoring Strategy. The KPI Schedule shall contain: 1. the identified applicable KPIs to be measured and reported by the Metering and Monitoring System; 2. the thresholds for each KPI in operation (based on the level of information available at this stage); 3. the Monitoring Points required to measure each KPI.	TS1 1.12.1 MMS 4.1.12	EC-S1-E22
1.2.3.	The Monitoring Points required for measuring the applicable Energy Centre KPIs shall be identified and included in a Monitoring Points Schedule, as part of the Metering and Monitoring Strategy. The Monitoring Points Schedule shall contain: 1. the required Monitoring Points to measure KPIs; 2. the location of each Monitoring Point (which identifies the applicable Element); 3. a unique ID code, which follows a determined naming convention.	TS1 1.12.1 MMS 4.1.13	EC-S1-E22 EC-S1-E23 EC-S1-E24

Performance Monitoring Requirement		Applicable technical standard(s)	Evidence Requirement(s)
1.2.4.	Schematic(s) shall be produced which contain each Monitoring Point in the required location, each labelled with its unique ID code.	TS1 1.12.1 MMS 4.1.14	EC-S1-E10 EC-S1-E23

Table 3: Performance Monitoring Requirements for the Energy Centre at Stage 1: Concept Design

1.3. Key Failures

The applicable Key Failures listed in Table 4 shall not be present.

Key Failure		Outcome to avoid	Evidence Requirement(s)
1.3.1.	Inappropriate selection of temperature profiles at Energy Centre given the end user requirements and heat generation technology selection.	Temperatures being set higher than necessary to deliver heat to end users, resulting in higher heat losses and increased energy consumption.	EC-S1-E07
1.3.2.	Lack of working pressure assessment undertaken, specifically in tall buildings, with mitigation measures not applied when high operating pressures are present (e.g. hydraulic breaks to protect equipment at a lower pressure rating).	Spatial footprint not sufficient enough to accommodate any mitigation measures (e.g. hydraulic breaks).	EC-S1-E08
1.3.3.	Inappropriate and/or inaccurate methodology used to estimate peak demand and annual heat consumption.	Inaccurate sizing of equipment (oversized or undersized).	EC-S1-E02
1.3.4.	Inappropriate and/or inaccurate sizing of equipment, including under sizing of thermal storage.	Oversized or undersized equipment, resulting in inaccurate CapEx model, in addition to not being able to maximise benefit of low carbon heat source through thermal storage. Spatial requirements also impacted, resulting in inaccurate layout drawings and space constraints during design stages.	EC-S1-E05 EC-S1-E09
1.3.5.	Unnecessary hydraulic breaks in the Energy Centre (i.e. plate heat exchangers which are not required for either contractual separation or pressure breaks).	Hydraulic breaks specified where not necessary, increasing complexity, CapEx, OpEx etc.	EC-S1-E08 EC-S1-E10 EC-S1-E19

Key Failure		Outcome to avoid	Evidence Requirement(s)
1.3.6.	Unnecessary use of an Energy Centre across a development (e.g. separate Energy Centres in each block of a residential development rather than single plant).	Energy Centres specified where not necessary, increasing complexity, CapEx, OpEx etc.	EC-S1-E10 EC-S1-E19
1.3.7.	Insufficient consideration given to controls intent during initial hydraulic design development and equipment selection.	Overcomplex or hydraulic design choices made at the Concept Design stage which limits changes or development of design into the Developed and/or Technical Design stage. Additionally impacts spatial assessment and CapEx model.	EC-S1-E10 EC-S1-E11
1.3.8.	Monitoring Points required to measure KPIs not identified at Concept Design stage, impacting the ability to accurately estimate spatial and access requirements.	Spatial footprints being developed which do not consider space and access requirements for expected Monitoring Points.	EC-S1-E10 EC-S1-E19 EC-S1-E22 EC-S1-E23
1.3.9.	Spatial requirements not accurately determined or inappropriate. Note this includes internal and external spatial requirements. Spatial requirements are to consider: 1. the space required for all equipment (heat generation, water treatment equipment, ancillary equipment, metering and monitoring equipment etc.); 2. maintenance requirements for all equipment; 3. equipment replacement requirements;	As changes to spatial allocations are limited once into the Developed Design and Technical Design stages, the assessment at the Concept Design stage needs to be accurately undertaken to avoid underestimating spatial requirements, which then results in lack of space for equipment, installation requirements, maintenance requirements, access and egress, health and safety requirements.	EC-S1-E03 EC-S1-E19

Key Failure		Outcome to avoid	Evidence Requirement(s)
	4. access and egress requirements; 5. requirements for insulation (ensuring enough space for required thickness); 6. spatial requirements for thermal storage.		
1.3.10.	Insufficient consideration given to environmental impacts of heat generation at the Concept Design stage (e.g. cold air plumage, acoustics, etc.).	Specifically for air source heat pumps (ASHP), impacts of cold air plumage, acoustics, and refrigerant use need to be considered at the Concept Design stage as this can impact efficiencies, Energy Centre location, techno-economic feasibility etc.	EC-S1-E03 EC-S1-E15
1.3.11.	Insufficient consideration given to the Resilience Strategy (how to supply heat in the case of failure of Heat Network).	Impacts spatial allocations at this stage. Want to avoid not having sufficient space allocated to enable temporary plant location in the case that it is required due to a failure of the Energy Centre.	EC-S1-E03 EC-S1-E16 EC-S1-E19
1.3.12.	Insufficient consideration given to electrical infrastructure requirements and local grid capacity within operating models and spatial requirements.	Lack of electrical infrastructure requirements within spatial assessment for the Energy Centre. Progressing with design without confirmation that electrical grid capacity can deliver the electrical load required for Energy Centre operation, specifically relevant to electric heat generation solutions.	EC-S1-E03 EC-S1-E14 EC-S1-E19

Table 4: Key Failures for the Energy Centre at Stage 1: Concept Design

1.4. Evidence Requirements

The applicable Evidence Items listed in Table 5 shall be provided to demonstrate fulfilment with the Technical Requirements, Performance Monitoring Requirements, and avoidance of Key Failures.

Evidence Item		Detailed description and requirements
EC-S1-E01a	Energy Masterplan	Document which identifies the heat solution for a defined network or area. Shall include: • existing anchor heat loads; • existing major energy sources and existing or planned Heat Networks; • planned new developments; • existing and potential energy sources and technologies, including waste heat/cooling sources; • the defined focus area (red line boundary), where recommended from a heat mapping study; • opportunity areas, area action plan areas or other growth areas; • regeneration area boundaries; • options appraisal and conclusions. *Note: Evidence Items listed as part of this table may form part of the Energy Masterplan.*
EC-S1-E01b	Energy Strategy	Shall include: • existing major energy sources and existing or planned Heat Networks; • existing and potential energy sources and technologies, including waste heat/cooling sources; • options appraisal and conclusions. *Note: Evidence Items listed as part of this table may form part of the Energy Strategy.*
EC-S1-E02	Peak and annual heat demand calculations and schedule	Methodology, calculations, data, and assumptions used to estimate peak and annual heat demands shall be provided. To include a schedule outlining the expected peak and annual heat demand for each end consumer and the overall Energy Centre. For annual heat demands, rationale for occupancy patterns shall be outlined. Sensitivity analysis shall be provided where applicable.

Evidence Item		Detailed description and requirements
EC-S1-E03	Energy Centre location and spatial footprint assessment	An assessment on the location and spatial footprint of the Energy Centre. This shall demonstrate that the allowed footprint accommodates the requirements of the Energy Centre. The location assessment shall include considerations for planning constraints, phasing of network, future expansion, acoustic impacts, proximity to heat loads, visual impact, air quality impact, viability of energy supply and electricity connection, spatial requirements, fresh air supply, cold air plumage, resilience strategy and temporary heat, access for plant installation, maintenance, and removal/replacement.
EC-S1-E04	Phasing Plan	Shall include which buildings will be connected, by when, and how the heat demand will build up over time. Shall also outline considerations for temporary plant and space requirements. The Phasing Plan shall include the following: • phase name and description including the number of connections; • notable areas describing significant aspects of each phase, such as the use of temporary equipment for heat production or the connection of air-source heat pumps (ASHP) once all phases are complete. Considerations for temporary plants and space requirements should be outlined; • proposed heat on date for all connections shall be specified to show how heat demand will be built up overtime; • annual demand and peak load of each phase.
EC-S1-E05	Operating Model	A model outlining the historic or predicted heat demand on the network on an hourly basis. This shall show how heat generation equipment and thermal storage are expected to operate, outlining the energy balance for the system, heat losses and carbon emissions. An example graphical demonstration is given in TS1 2025 Figure 14 (TS1, 2025). All inputs and assumptions shall be outlined.
EC-S1-E06	Heat generation strategy and options appraisal	Heat generation strategy proposal. Shall include an options appraisal for heat generation technology to justify the selected approach.

Evidence Item		Detailed description and requirements
		The options appraisal shall include an evaluation matrix covering the following as a minimum: • whole-life costs, including CapEx, OpEx and RepEx; • the cost of heat (generated and supplied); • the carbon intensity of heat; • local environmental impacts (e.g. cold air plumage, emissions, noise); • spatial and access requirements; • the energy supply (sustainability credentials, transport requirements, security of supply). *Note this may be part of the Energy Masterplan or Energy Strategy.*
EC-S1-E07	System operating temperature assessment	Report highlighting the operating temperature design criteria. This shall include rationale for the temperatures specified.
EC-S1-E08	System pressure assessment	Assessment of working pressures in the system. Shall include: • calculation of the System Maximum Working Pressure; • calculation of the Local Maximum Working Pressure; • identification of the risks that arise as a result of calculated working pressures; • assessment of the likelihood and impact of the identified risk; • mitigation of the risks posed by working pressures (where appropriate).
EC-S1-E09	Equipment sizing calculations	Calculations, methodology and assumptions used to estimate equipment sizing, including thermal storage and electrical infrastructure. Shall indicate equipment redundancy requirements.
EC-S1-E10	Schematic(s)	Energy Centre schematic(s) to the detail expected at RIBA Stage 2 (RIBA, 2020) as a minimum. The schematic(s), or a separate schematic(s), shall include the locations of the Monitoring Points as required by the Metering and Monitoring Strategy, with the unique ID code included.
EC-S1-E11	Controls Strategy	Shall include a high-level description of the Energy Centre controls intent.

Evidence Item		Detailed description and requirements
EC-S1-E12	Cost Model	A cost model and assessment which contains lifecycle costings (CapEx, OpEx, RepEx etc.) used to inform design decisions. All inputs and assumptions shall be outlined. This may be in the form of a techno-economic model.
EC-S1-E13	Parasitic Energy Consumption Calculations	Shall include the methodology, calculations, and assumptions used to estimate parasitic energy consumption for use within the operating model and cost model.
EC-S1-E14	Fuel supply requirements	Shall include evidence of engagement with energy suppliers and requirements of energy supply, specifically in relation to size of connection, availability, and spatial requirements.
EC-S1-E15	Carbon dioxide emissions assessment	An assessment on the total carbon dioxide emissions. The calculation shall include heat losses from the network and parasitic electricity use.
EC-S1-E16	Resilience Strategy	Shall outline the Resilience Strategy for the Heat Network, including: • the key threats to system and equipment failure; • the risk score of each threat without resilience measures in place; • the redundancy and recovery measures implemented across the system; • the risk score of each threat with resilience measures in place; and • any residual risks associated with each threat. Shall demonstrate that suitable provision is made for the required spatial allowances and connection points necessary to successfully implement the Resilience Strategy.
EC-S1-E17	Repair and Replacement Strategy	Shall include how repair and replacement is considered within the Heat Network to aid justification of equipment selection, spatial requirements, and Energy Centre location.
EC-S1-E18	Water Quality Statement	Shall include: • the type of water quality system to be followed; • preliminary selection of fill water source; • preliminary selection of the material of plant, equipment, and distribution pipework; • initial performance specification for water treatment and conditioning; and

Evidence Item		Detailed description and requirements
		• a spatial assessment of the plant room considering the spatial dimensions and maintenance requirements for water quality equipment, transportation and storage of chemicals and equipment and plant room accessibility requirements.
EC-S1-E19	Drawing(s)	Energy Centre drawing(s) to the detail expected at RIBA Stage 2 (RIBA, 2020) as a minimum. This shall include layouts, plan, and elevation drawings. The drawings, or a separate drawing, shall include the locations of the Monitoring Points as required by the Metering and Monitoring Strategy, with the unique ID code included.
EC-S1-E20	Technical Parameters Schedule	Schedule which outlines all technical parameters in one location, with reference to applicable documents.
EC-S1-E21	Metering and Monitoring Strategy	The Metering and Monitoring Strategy shall contain a high-level description of how data required to calculate KPIs will be measured, extracted, recorded, and stored at the required read frequency, how the raw data will be transformed, and how KPIs will be calculated and reported. The strategy shall also include: 1. a KPI Schedule (item EC-S1-E22); 2. a Monitoring Points Schedule (item EC-S1-E23); 3. a Monitoring Points unique ID code naming methodology (item EC-S1-E24); 4. a Schematic with labelled Monitoring Points.
EC-S1-E22	KPI Schedule	A schedule of all KPIs required to be measured by the Metering and Monitoring System. The KPI Schedule shall contain: 1. the identified applicable KPIs to be measured and reported by the Metering and Monitoring System; 2. the thresholds for each KPI in operation (based on the level of information available at this stage); 3. the Monitoring Points required to measure each KPI.
EC-S1-E23	Monitoring Points Schedule	A schedule of all Monitoring Points required to measure KPIs. The Monitoring Points Schedule shall contain:

Evidence Item		Detailed description and requirements
		1. the required Monitoring Points to measure KPIs; 2. the location of each Monitoring Point (which identifies the applicable Element); 3. a unique ID code, which follows a determined naming convention.
EC-S1-E24	Unique ID code naming convention	Methodology used to label each Monitoring Point with a unique ID code.

Table 5: Evidence Requirements for the Energy Centre at Stage 1: Concept Design