KNOWLEDGE PROPOSAL

Proposer Name and Organisation: Iain MacDougall - CIBSE Data Centre Special Interest Group

Topic/ Title: ‘**Sustainability (including heat export) within the data centre sector and exporting of heat to local neighbourhoods, considering how this may be achieved for different areas, buildings or other use cases’**

Date received:

1. Justification: Why is this guidance needed?

Heat export from Data Centres is one of the largest untapped energy sources (Heat) in the UK. However, the prevailing regulatory and technical frameworks in the UK do not assist in realising in energy source. Guidance is needed to allow multiple DC operators and heat off takers (District Heating operators) to align to a common approach and standardised solutions which can help create efficiency and effective low carbon heating.

1. Format: What format will the guidance take?

|  |  |
| --- | --- |
| [x]  | a traditional publication with words and diagrams to be produced for CIBSE’s Knowledge Delivery Platform, and in PDF |
| [ ]  | a data set |
| [ ]  | a digital tool or software application |
| [ ]  | something else (please elaborate) |

1. Content: If guidance, please list proposed chapter and section headings. If a data set, digital tool, software application, or something else, please detail your proposed plan.

Development of CIBSE Guides and Recommendations

1. Readership: Who is likely to read this guidance?

Data centre Special Interest Group members and the wider membership. Also, Data Centre operators / investors / designers, District Heating operators / investors / designers, planners / planning authorities.

1. Authoring: Are authors in place? If so, please list them below.

No authors are currently in place. CIBSE Technical Committee and wider members to contribute, based on this proposal. The CIBSE DCSIG Executive Committee are seeking authors and contributors, based on the content of this proposal. Additional assistance will be requested from CIBSE Sustainability SIG.

1. Timescale: When would you expect to complete the project? Please provide a rough timeline.

12 months

Fees: Will authors require funding? If so, how much?

Potentially yes, budget fee £2000.00

1. Landscape: Does any similar or complementary guidance exist, published by CIBSE or elsewhere?

No

1. **Collaboration**: Are there any organisations that may wish to be involved in the production of this guidance? (For example: membership organisations, trade associations, contractors, consultants, government departments).

MEUC (Major Energy Users Council), ASHRAE, tech UK (DC operators representation), UK NZ BS

1. Are there any organisations that may wish to sponsor the production financially?

Potentially.

1. Categorisation: CIBSE has created a taxonomy of building services, the Knowledge Matrix. On the following pages, please tick the topics and sub-topics that will be covered in this project.

**Topic:**

[ ]  Mechanical

[x]  Heating

[ ]  Ventilation

[x]  Refrigeration and air conditioning

[ ]  Extract/ exhaust systems

[ ]  Smoke control

[x]  Pipeline distribution systems (natural gas, liquid fuels, medical gas, compressed air & vacuum)

[ ]  Electrical

[ ]  Extra low voltage

[ ]  Low voltage

[ ]  Medium voltage

[ ]  High voltage

[ ]  Local power generation & standby power

[ ]  Earthing & bonding/ Lightning protection

[ ]  Communications

[ ]  Audio-visual

[ ]  Electric vehicle charging

[ ]  Public Health

[ ]  Water

[ ]  Drainage

[ ]  Gas

[ ]  Lighting

[ ]  Daylight/ sunlight

[ ]  Electric lighting

[ ]  Lighting energy

[ ]  Fire safety

[ ]  Fire life safety

[ ]  Fire protection

[ ]  Fire detection

[ ]  Fire notification

[ ]  Building fabric

[ ]  Façades

[ ]  Access & maintenance

[ ]  Transportation systems in buildings

[ ]  Lifts

[ ]  Escalators

[ ]  Moving walks

[ ]  Stairlifts and lifting platforms

[ ]  Building intelligence

[ ]  Controls

[ ]  Smart buildings

[ ]  Security

[ ]  Physical security

[ ]  Security systems (access control, surveillance, intruder alarm)

[ ]  Cyber security

[ ]  Digital

[ ]  Building information modelling (BIM)

[ ]  Digital engineering

[ ]  Digital construction

[ ]  Sustainability & ESG

[x]  Climate change mitigation

[ ]  Climate change adaptation

[x]  Circular economy

[ ]  Biodiversity & natural capital

[ ]  Diversity & inclusion

[ ]  Social value

[ ]  Health, wellbeing and safety

Structure:

[ ]  Introduction of project

[x]  Purpose (strategic/design context)

[x]  Project management (inc info requirements)

[x]  Drivers

[ ]  Commercial

[ ]  Contracts

[ ]  BIM

[ ]  Digital information management

[ ]  Fundamentals

[x]  Physics

[x]  Design conditions/ data

[x]  Calculations and methods

[x]  Sustainability (key considerations)

[x]  Health, wellbeing and safety

[ ]  Retrofit and refurbishment

[ ]  Condition surveying

[ ]  Modification/ adaptation

[ ]  System selection

[x]  Selection (regulations, best practice, finance, operational energy, whole-life carbon)

[x]  Systems, plant, equipment (terminal equipment)

[x]  Systems, plant, equipment (network level, central plant, distribution)

[ ]  System design principles

[x]  System sizing

[x]  System design conditions/ data

[x]  System sizing calculations

[x]  Health, wellbeing and safety

[ ]  Modern methods of construction

[ ]  Access and maintenance

[ ]  Construction

[ ]  Installation

[x]  Modern methods of construction

[ ]  Health, wellbeing and safety

[ ]  Records (drawings, operation and maintenance)

[ ]  Controls

[x]  Strategy

[x]  Controls as specified, installed and commissioned

[x]  Commissioning

[x]  Plans

[ ]  Procedures

[ ]  Operation

[x]  Facilities management

[ ]  Training

[ ]  Maintenance

[ ]  Health, wellbeing and safety

[ ]  Performance (energy, carbon, water)

[ ]  Performance (IEQ)

[x]  End of life

[ ]  Reuse

[x]  Repurpose

[x]  Recycle

[ ]  Demolition

Building Type:

[ ]  **Residential**

[x]  Single dwelling

[x]  Multiple dwelling

[ ]  Non-residential

[x]  Office

[x]  Education

[x]  Higher education

[x]  Healthcare

[x]  Retail

[x]  Leisure

[ ]  Aviation

[ ]  Road and rail

[x]  Government

[x]  Industrial

[x]  Logistics

[x]  Data centre

[ ]  Heritage

[ ]  Defence

[x]  Infrastructure

[x]  Utilities

[ ]  Other

Intended Reader:

[x]  Owner

[x]  Occupier

[x]  Designer

[x]  Developer

[ ]  Constructor

[ ]  Installer

[ ]  Commissioning engineer

[x]  Operator/ Facilities manager

[x]  Manufacturer

[ ]  Apprentice

[ ]  Student

[x]  Researcher

[ ]  Expert witness

[ ]  Other - please specify:

Original brief:

**Scope of Work: Sustainability Including Heat Export within the Data Centre Market**

**1. Introduction**

* **Objective**: To explore and develop strategies for sustainability in data centres, focusing on heat recovery and export to local neighbourhoods for various use cases.
* **Context**: Addressing the increasing need for sustainable practices in the data centre industry, considering environmental regulations, carbon reporting, and the impact of AI Growth zones.

**2. Limits of Work**

* **Expertise**: Restricted to the expertise of CIBSE membership, specifically MEP consultants, contracting, and engineering professionals.
* **Focus Area**: Heat recovery from data centres only, excluding other forms of energy recovery or sustainability measures.

**3. Topics to Cover**

* **Heat Recovery Technologies**: Overview of current and emerging technologies for heat recovery in data centres.
* **Implementation Strategies**: Practical approaches for integrating heat recovery systems within existing and new data centres.
* **Heat Export Mechanisms**: Methods for exporting recovered heat to local neighbourhoods, including infrastructure requirements and potential challenges.
* **Use Cases**: Different scenarios for heat export, such as residential heating, district heating systems, and industrial applications.
* **Environmental Impact**: Analysis of the environmental benefits and potential drawbacks of heat recovery and export.
* **Regulatory Considerations**: Review of relevant environmental regulations, carbon reporting requirements, and compliance strategies.
* **AI Growth Zones**: Examination of how AI Growth zones may influence heat recovery and export practices.
* **Case Studies**: Examples of successful heat recovery and export implementations in the data centre industry.

**4. Format of Output**

* **Report Structure**:
	+ **Executive Summary**: Brief overview of findings and recommendations.
	+ **Detailed Analysis**: In-depth exploration of each topic covered.
	+ **Recommendations**: Practical advice for data centre operators and stakeholders.
	+ **Appendices**: Supporting data, case studies, and references.

**5. Audience**

* **Primary Audience**: Data centre sector professionals, including operators, designers, and engineers.
* **Secondary Audience**: CIBSE membership, wider data centre sector supply chain, and regulatory authorities.