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?

|  |  |
| --- | --- |
|  | 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

Heating

Ventilation

Refrigeration and air conditioning

Extract/ exhaust systems

Smoke control

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

Climate change mitigation

Climate change adaptation

Circular economy

Biodiversity & natural capital

Diversity & inclusion

Social value

Health, wellbeing and safety

Structure:

Introduction of project

Purpose (strategic/design context)

Project management (inc info requirements)

Drivers

Commercial

Contracts

BIM

Digital information management

Fundamentals

Physics

Design conditions/ data

Calculations and methods

Sustainability (key considerations)

Health, wellbeing and safety

Retrofit and refurbishment

Condition surveying

Modification/ adaptation

System selection

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

Systems, plant, equipment (terminal equipment)

Systems, plant, equipment (network level, central plant, distribution)

System design principles

System sizing

System design conditions/ data

System sizing calculations

Health, wellbeing and safety

Modern methods of construction

Access and maintenance

Construction

Installation

Modern methods of construction

Health, wellbeing and safety

Records (drawings, operation and maintenance)

Controls

Strategy

Controls as specified, installed and commissioned

Commissioning

Plans

Procedures

Operation

Facilities management

Training

Maintenance

Health, wellbeing and safety

Performance (energy, carbon, water)

Performance (IEQ)

End of life

Reuse

Repurpose

Recycle

Demolition

Building Type:

**Residential**

Single dwelling

Multiple dwelling

Non-residential

Office

Education

Higher education

Healthcare

Retail

Leisure

Aviation

Road and rail

Government

Industrial

Logistics

Data centre

Heritage

Defence

Infrastructure

Utilities

Other

Intended Reader:

Owner

Occupier

Designer

Developer

Constructor

Installer

Commissioning engineer

Operator/ Facilities manager

Manufacturer

Apprentice

Student

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.