DfE Energy Pods for Schools

Market Engagement Briefing Document

3 November 2022

Introduction

Are you a supplier, contractor, part of a supply chain, school responsible body, trust or Local Authority? If so, we want your views!

The Department for Education (DfE) have commissioned a team of experts to deliver a research and innovation project known as Energy Pods and we need your help.

Arcadis is leading the market engagement on behalf of the DfE.

The DfE are seeking engagement from end users, potential Contractors, Suppliers and other interested parties about the DfE's proposals for off-site Energy Pods for schools. This will cover the enclosure/MEP equipment and extend to the enabling works required on site to receive the Energy Pod.

The objective of this engagement is to research and assess the off-site opportunities, establish the extent of current solutions and technologies available and understand the appetite and scale from the market. This will help inform procurement planning in readiness for future delivery to meet the strategic direction.

Market engagement will comprise a presentation which will delivered on three occasions, on 22, 23 and 24 November 2022, followed by questionnaires to be completed by attendees. A recording of the presentation will be made available. The engagement will explore other influential drivers of this research project such as practicalities of delivery, embodied carbon, material resource/sources, buildability and sequencing. Long-term requirements such as warranties and maintenance will need to be covered as well.

The feedback from the questionnaires will be reviewed critically to ensure that the quality and requirements of the Energy Pod are preserved, whilst incorporating useful and pragmatic outcomes/observations. This will be part of a wider discussion within the team during design development.

How can you help?

- The DfE are undertaking research and seeking innovation in the provision of proposed energy pods at schools and wish to engage with the market.
- The DfE will be delivering an online presentation, on three occasions as follows. Links to register via Eventbrite are available below.
  - 22 November 2022, 9am to 11am
  - 23 November 2022, 3pm to 5pm
  - 24 November 2022, 9am to 11am
- We have created a list of questions for our stakeholders to respond to and provide information, which are detailed in the attached briefing document. Links to the online questionnaires will be provided after the presentation, which should be completed by 30 November 2022. The questionnaires are tailored to the following groups (definitions for each questionnaire grouping are provided below):
  - Questionnaire 1 – Suppliers
  - Questionnaire 2 – Main Contractors, MMC and MEP Supply Chain
  - Questionnaire 3 – School Responsible Bodies, Trusts and Local Authorities
  - Questionnaire 4 – Other Organisations
- Links to the online questionnaires will be provided after the presentation and we would like to hear from you by 30 November 2022.

Where to sign up for more details

- You can register to attend an online presentation on one of the following dates:
  - 22 November 2022, 9am to 11am
  - 23 November 2022, 3pm to 5pm
  - 24 November 2022, 9am to 11am
- You can register through Eventbrite, using the following link:
  - https://www.eventbrite.co.uk/e/department-for-education-energy-pods-market-engagement-tickets-460826754227
- If you are unable to attend on these dates, you can request a recording of the presentation through the following email link:
  - Request recording

What is an Energy Pod

- An Energy Pod is a modular off-site manufactured package plant room which is low or zero carbon. The Energy Pod project will engage with industry leaders to develop a standard solution to decarbonisation heat across existing site settings. The development of standard plant rooms will likely range from heating only application, all the way through to total plant room replacement. The total project will deliver multiple standard designs solutions and the construction of up to two non working prototype 'Energy Pods'.
- The Energy Pod concept presents a perfect opportunity to support innovation in the retrofit market. Building on from a previous piece of research and development work; to design and develop a 'Gen Zero' new build school, GenZero ethos is centred around a platform approach to construction using repeatable and standard solutions which offer the highest quality outputs. Energy Pods take a 'Gen Zero' solution to the retrofit of main plant and equipment. Pods would be available in a selection of standard sizes, completely manufactured off-site from low carbon materials, and likely house solar panels and will be integrated with the landscape. Their installation will cause minimal operational building disruption, acting like a zero-carbon plug and play technology to existing site settings. The pods will also be designed to provide an education benefit to the students, allowing them to engage with new technology and providing insights into what a zero-carbon retrofit looks like.
- The Energy Pod has been designed to be standardized and modularized to encourage repeatability, enforcing the overarching influential principles from The Platform Playbook. This aim has been protected by introducing set Design and Construction principles such as waterproofing as well as embedding the specification requirements derived from the OS21, i.e. the 7.8m x 3.6m grid.
- Standard solutions will be based on a range of factors such as condition, carbon intensity, scale, capital cost, economic benefits, and operational impact. The range of standard energy pods will need to be tailored to suit and applicable for 80% of site scenarios to maximise their value, realising there will be some abnormal circumstances. Therefore, some pods will assume no ancillary upgrades need to take place across secondary distribution systems wither now or in the future, others may place a long-term plan in place and others will address the full extent of condition works required within for the pod application.
- To extend its reach across the public sector, Energy Pod solution development will include consultation across OGD's and strategic stakeholder, such as the Manufacturing Technology Centre (MTC), MMC1, CF21 framework suppliers to develop standard designs which are applicable across all public sector settings. The project will also look outside of our core supply chain partners to try and identify if there are already any key players within this space to support the proposals.

What are the strategic aims?

- Support the government's agenda around design for Manufacturing and Assembly (DfMA)
- Reduce waste and health and safety risks by production in a controlled environment
- Increase speed of delivery by creating an off the shelf product which will minimise disruption to the schools by carrying out minimum on-site works out of school hours as well as reducing timescales for reactive maintenance
- Provide large scale repeatability and standardisation to increase quality and reduce repeat design
- Through demand aggregation provide value for money and pipeline, which allows supplier to drive innovation
- Addressing condition, energy efficiency and greenhouse gas emissions
- Provide strategic direction for education and public sector zero carbon retrofit
- Inform the upcoming MMC framework review
- Upskill supply chain to think more innovatively in retrofit settings
- Prepares a solution for up and coming Off Gas Grid
- Regulations (expected 2023) for the circa 2000 coal and oil boilers which exist across the estate
- Assists in the development of a long term and coherent strategy to support the recently published BEIS Heat and Building Strategy and the expected 2030 - 2035 phase out of gas boilers

GDPR

Responses from the market by way of this engagement will be received by Arcadis. Information will be reviewed by Arcadis and shared with members of the DfE team that include Cundalls, Atkins and Mott McDonald amongst other government bodies and research establishments. The information and contact details will only be used in connection with the work associated with Energy Pods for the DfE and not used for other purposes. Data will be held in accordance with the policies of Arcadis and in compliance with GDPR.

How to find out more

Please register and attend one of the presentation sessions to find out more; any questions can be raised at one of the sessions. however, should you have any queries regarding access to the presentation session or extraordinary queries please email dfe-energypods@arcadis.com.

1 Questionnaire 1 – Suppliers

The DfE are seeking engagement from suppliers in the market that could provide one of the main components of the energy pod. This could include internal heating components such as heat pumps, buffer vessels and the like and/or external components such as framing and waterproof envelope and / or packaged plant assemblies. Suppliers could be manufacturers or merchants with direct access to such products.

Contractors or sub-contractors should complete questionnaire 2.

These questions are provided for information. Please do not complete the questions in this document; a link will be provided to an online questionnaire.

Group Specific Questions

1. Do you provide a product that could be used as a main component of the energy pod as described above?
    - If 'yes', please outline your product and briefly explain its purpose. Also indicate the energy source and kW inputs and outputs and any pros and cons against alternative solutions. Please specify the SEER (UK conditions) at the following temperatures; Most efficient F&R (please also specify temp), 80/60degC F&R, 45degC F&R + operating ΔT. Please consider: Modularisation / turn down ratio, Cooling generation equipment - SEER (UK Conditions).
    - If 'yes', who is tends to be responsible for the enclosure of the MEP equipment?
    - (Specialist, Contractor, School)
    - If 'yes' is the Energy Pod a volumetric or panellised solution? Does it apply to the MEP equipment as well?
    - If 'yes' is the Energy Pod sequenced? E.g. built in a factory and delivered by others?
2. What innovations do you have in the pipeline in the next few years that could have a beneficial impact on the energy pods?
3. Where is your product manufactured (Town/City) or likely to be manufactured in the future?
4. Do you have the capacity to deliver standardised products in the volume anticipated? (500 – 2000 energy pods per year are anticipated to be required)
5. If 'yes', from placing an order, how long does it typically take to be delivered (in weeks)?
6. In the next two or three years, do you anticipate that the delivery period could be improved upon? If so, by what percentage improvement?
7. If procured in the volumes indicated, do you anticipate the price of the product would reduce and, if so, by what percentage?
8. Do you measure the embodied carbon of your products? If so, how can you evidence this?

Generic Questions:

9. Do you have any examples of any air source or ground source heat pumps installed at schools or at buildings in other sectors?
    - If 'yes, please provide a brief description and the pros and cons of the installation.
10. Do you have any examples of any other innovative heat source solutions installed at schools or at buildings in other sectors?
    - If 'yes, please provide a brief description and the pros and cons of the installation.
11. What would you consider are the most significant (say top three) factors that the DfE should consider in the design, installation and/or operation of energy pods?
12. Are you aware of any funding initiatives that support large scale deployment of energy pods?
    - If 'yes', please provide details on why this may be useful to the DfE.

2 Questionnaire 2 – Main Contractors, MMC and MEP supply chain

The DfE are seeking engagement from main contractors and mechanical and electrical supply chain sub-contractors in the market that could provide an assembled energy pod. It is anticipated that orders may be placed with a company that can design, manufacture off-site and install energy pods. This could be with main contractor(s). MMC contractors or direct with mechanical and electrical contractors(s).

Internal heating component and external envelope suppliers should complete questionnaire 1.

These questions are provided for information. Please do not complete the questions in this document; a link will be provided to an online questionnaire.

Group Specific Questions

1. Please outline how you would anticipate energy pods might best be assembled off-site for rapid deployment
2. Do you have a facility/factory that could be used to assemble either the energy pods enclosure and / or the plant & equipment installation on a large scale to the numbers indicated?
    - If 'yes', please outline the size, location and current purpose of the building and your view on scalability for assembling energy pods for rapid deployment
    - Is the Energy Pod sequenced? E.g., built in a factory and delivered by others?
    - Is the Energy Pod a volumetric or panellised solution? Does it apply to the MEP equipment as well?
    - If yes, Is the Energy Pod a volumetric of panellised solution?
    - If 'no', please indicate if you have plans to develop such a facility or have alternative solutions in mind
3. Please provide examples of where you may have provided something similar before such as packaged plant facilities and provide any preferred dimensions that are driven by steel or timber manufacturing dimensions.
4. Who do you currently see as the main manufacturers and suppliers of heat pumps and related LZC equipment in the marketplace and how can this be evidenced?
5. What products are there in the market that you consider could work well for the MEP plant and equipment of the energy pod including those that reduce the heat demand of HWS generation?
6. What modularity of MEP systems could be offered to assist with MMC?
7. Who is tends to be responsible for the enclosure of the MEP equipment?

   (Specialist, Contractor, School)
8. A key requirement would be the rapid deployment of energy pods. What would you consider to be, say, the top three factors that would be critical for the success of this?
9. What considerations would you recommend in order to make energy pods an attractive proposition for your organisation? What type of contract do you see as the best solution to meet the clients' objectives and deliver value for money?
10. Who do you currently see as companies that are developing new innovative products that could be usefully applied to the energy pods design development?
11. Who are the companies you currently partner with (either formally or informally) that could add value to the development of energy pods?
12. If procured in the volumes indicated, do you anticipate your price would reduce and, if so, by what percentage?
13. Do you measure the embodied carbon of your installations? Is so, how can you evidence this?

Generic Questions:

14. Do you have any examples of any air source or ground source heat pumps installed at schools or at buildings in other sectors?

- If ‘yes, please provide a brief description and the pros and cons of the installation.

15. Do you have any examples of any other innovative heat source solutions installed at schools or at buildings in other sectors?
    - If ‘yes, please provide a brief description and the pros and cons of the installation.
16. What would you consider are the most significant (say top three) factors that the DfE should consider in the design, installation and/or operation of energy pods?
17. Are you aware of any funding initiatives that support large scale deployment of energy pods?
    - If, ‘yes’ please provide details on why this may be useful to the DfE.

3 Questionnaire 3 – School Users, Responsible Bodies, Trusts and Local Authorities

The DfE are seeking engagement from school users, trusts and local authorities who wish to provide information and insight into the potential opportunities and constraints presented by the energy pods. We are interested in case studies or similar low or net zero carbon solutions that may help to inform the energy pod design development.

Other organisations should complete questionnaire 4.

These questions are provided for information. Please do not complete the questions in this document; a link will be provided to an online questionnaire.

Group Specific Questions

1. What data or information do you have that may support the energy pod proposition at schools? Is this something you would be willing to share with the DfE?
2. Please can you describe your current level of engagement with the Public Sector Decarbonisation Scheme (PSDS) including any barriers you find with decarbonising your school estate?
3. Please provide examples of your existing maintenance regimes that may be useful for the energy pod proposition or suggested ways of improvement.
4. How do you typically manage the replacement of boiler plant - Is it planned from available funds or typically an emergency arrangement?
5. Who looks after your energy and sustainability plan? Please identify role/organisation.
6. What guidance or additional support do you consider necessary for decarbonising your school estate?
7. Is there an educational pedagogy or ethos that you wish to link with the proposed energy pod, i.e. should the pod perform an intrinsic educational purpose to the school estate? Should it have an external play/education element, i.e. tactile surfaces, outdoor shelter etc.
    - If 'yes', please provide details on why this may be useful to the DfE.

Generic Questions

8. Do you have any examples of any air source or ground source heat pumps installed at schools or at buildings in other sectors?
    - If 'yes, please provide a brief description and the pros and cons of the installation.
9. Do you have any examples of any other innovative heat source solutions installed at schools or at buildings in other sectors?
    - If 'yes, please provide a brief description and the pros and cons of the installation.
10. What would you consider are the most significant (say top three) factors that the DfE should consider in the design, installation and/or operation of energy pods?
11. Are you aware of any funding initiatives that support large scale deployment of energy pods?
    - If 'yes', please provide details on why this may be useful to the DfE.

4 Questionnaire 4 – Other organisations

We are seeking engagement from other organisations and the wider education sector (other government departments, research establishments, consultant organisations and universities) who wish to provide information and insight into the potential opportunities presented by the energy pods. We are interested in case studies or similar low or net zero carbon solutions that may help to inform the energy pod design development.

School users, responsible bodies, trusts and local authorities should complete questionnaire 3.

These questions are provided for information. Please do not complete the questions in this document; a link will be provided to an online questionnaire.

Group Specific Questions

1. What data or information do you have that may support the business case for energy pods at schools including data on decarbonising buildings? Is this something you would be willing to share with the DfE?
2. Please can you describe your current level of engagement with the Public Sector Decarbonisation Scheme (PSDS) including any barriers you find with decarbonising your school estate?
3. How do you approach funding the decarbonising your estate?
4. Are there other programmes and initiatives that you are developing that are similar to the energy pod solution being developed by the DfE?
    - If 'yes', please provide details on why this may be useful to the DfE.
5. Are there any programmes and initiatives that would benefit from the energy pod solution being developed by the DfE?
    - If 'yes', please provide details on why this may be useful to the DfE.

Generic Questions

6. Do you have any examples of any air source or ground source heat pumps installed at schools or at buildings in other sectors?
    - If 'yes, please provide a brief description and the pros and cons of the installation.
7. Do you have any examples of any other innovative heat source solutions installed at schools or at buildings in other sectors?
    - If 'yes, please provide a brief description and the pros and cons of the installation.
8. What would you consider are the most significant (say top three) factors that the DfE should consider in the design, installation and/or operation of energy pods?
9. Are you aware of any funding initiatives that support large scale deployment of energy pods?
    - If 'yes', please provide details on why this may be useful to the DfE.