Decarbonisation Strategy

This document summarises the strategy for the decarbonisation of the Impact Education Multi Academy Trust estates.

Impact Education
Multi Academy Trust

Contents

Introduction

The purpose of the Decarbonisation Strategy is to describe how Impact intends to replace fossil fuel reliant systems with low carbon alternatives (e.g. Heat Pumps) in order to support the UK objective to have a net zero carbon economy by 2050. To meet the challenge of net zero, organisations throughout the UK need to decarbonise their buildings.

The aim is to provide a high-level strategy which can be used to aid procurement and decision making to ensure that any actions or inactions are aligned with long term sustainability goals with a view to becoming or working towards being net zero.

Given the varied nature of the Trust estate it is almost certain that a “one size fits all” approach to decarbonisation will not be possible – the needs of a new large secondary school will not be the same as for a small Victorian village primary.

On the other hand, attempting to decarbonise by requiring each school to develop its own plan is not likely to be an effective route. It is therefore important to understand the likely challenges, how they can be effectively addressed, and to what extent existing knowledge, projects and data can support the decarbonisation journey.

What is Scope 1, 2 and 3?

Scope 1 emissions— This covers the Green House Gas (GHG) emissions that an organisation makes *directly* — for example while running its boilers.

Scope 2 emissions — These are the emissions it makes *indirectly* – like when the electricity or energy it buys for heating and cooling buildings, is being produced on its behalf.

Scope 3 emissions — These are all the emissions associated, not with the company itself, but that the organisation is indirectly responsible for, in its supply chain. (Source: Deloitte)

For the purposes of this strategy scope 1 and 2 will be the main focus.

This strategy is not intended to be a specific operational plan for improvement; rather it is intended to provide a framework or best practice process to enable operational plans to be devised.

Plans of work are devised based largely on building conditions surveys and whilst sustainability (be that financial, environmental or social) is at present often at the forefront of decision making it is usually carried out informally and without a collective strategy.

Heating and cooling

All schools use mains gas and well maintained, central boilers. Boilers are replaced as and when needed with the focus on keeping schools operational at all times. A/C cooling is present in a proportion of buildings not only for cooling of IT server equipment, in some classrooms for comfort heating and cooling.

Impact Education will conduct estate-wide heating and cooling system surveys supported by the site teams. Including how each are controlled, set points for each and whether all are aligned with operational hours and behavioural use. Where there is a BMS in place this will also be surveyed.

Lighting

The majority of lighting across the estate is fluorescent with LED lighting being used to replace existing lighting as and when lighting fails. Impact Education will continue discussions of school wide or estate wide LED lighting replacements. No details are available regarding lighting controls e.g. occupancy and/or lux sensors or any sub metering.

Impact Education will conduct a lighting controls survey LED survey to determine existing energy consumption and carbon emissions, with a cost and carbon benefit analysis of a new proposed LED lighting and controls rollout.

Building fabric

This includes the full envelope of the building such as walls, floor, ceilings, roofs, windows and doors. The condition of each is highlighted in the building condition reports. The efficiency of these elements are usually inherent in the original building design which is dictated by the building regulations of the build year with more recent builds being generally progressively more efficient. Any retrofit works will be compliant with current building regulations unless otherwise stated. This can be used to form an assessment regarding the efficiency and U values of each component.

Methodology

A prioritised approach will be used to determine:

Any no or low-cost measures have been considered before any capital improvements are undertaken.

These basic measures often realise worthwhile monetary and carbon savings and include:

- Ensuring heating controls are aligned with operational hours
- Set points are checked and optimised for efficiency
- Any manual thermostats are set correctly and not overriding cooling systems or other controls for example
- Space heating isn't on with windows open
- Lighting isn't on when rooms are vacated
- Is there reasonable switch off behaviour? Could this be improved as this doesn't require capital?

Essentially this is ensuring the existing systems are aligned with the needs of the building and the people within.

Next steps:

Wherever possible a fabric first approach will be adopted when considering capital improvements to decarbonise the estate. This includes improvements to the thermal efficiency and air tightness of the building. This has the effect of reducing the demand on the (low carbon) heating systems and ensures that they can be sized correctly from the outset.

The existing heating will most likely form the largest proportion of the carbon footprint but will also most likely be the most expensive to replace with a low carbon alternative. Therefore, the need to reduce the heating demand as much as possible by improving insulation and air tightness is paramount as this maximises the long-term saving of both capital expenditure and carbon.

Heating networks and opportunities on site

Impact Education will consider the following when assessing the suitability of low carbon heating options:

- Are there any existing or planned heat network developments located close to the sites that your buildings could connect to?
- Is there scope for the school to provide a potential baseload for a future heat network to benefit the wider community?
    - Are there any other sources of secondary heat in proximity to the site(s)? These may include:
    - Heat Sources such as: water, air, ground
    - Heat recovery opportunities from neighbouring businesses for example sewer, industrial sites or anywhere where there is waste heat such as data centres or battery storage sites
    - Energy from waste e.g., potential for anaerobic digestion

Renewables

What opportunities are there onsite for including renewable forms of heating and power generation?

Impact Education will conduct an estate wide solar survey to determine the potential for installations across the estate, the surveys will consider initial outlay, payback terms, C02 savings and annual savings potential.

- E.g., solar PV, solar thermal, heat pumps (ground, air, water)
- Are roofs in good condition, less than ten years old and structurally capable of having solar PV and/or solar thermal on them?
- Is there land available that can be used for ground source heat pumps?
- Is there a water course, pond or lake nearby for water source heat pumps?
- What is the average wind speed at 10M height? Is wind a useable resource?

Electrical load:

- It is important to establish the existing and required electricity capacity to support any planned move from current heating systems to an electrical heating solution.
- We will determine what our current assigned electrical capacity is and what the required capacity will be.
- We will check if the local network has capacity available in case, we require a capacity upgrade? This is typically only found out upon submitting an upgrade request to the network.
- We will determine if there are there any further significant measures that can be considered to reduce electricity demand of the buildings?
- We will consider the use of monitoring packages to analyse and shape behavioural efficiencies in utility use?

Procurement of energy:

Once the energy demand has been reduced as much as possible and any energy generation has been accounted for then any remaining energy that must be procured should be done so as optimally as possible:

- How is energy currently procured? Are there cost savings (albeit not carbon savings) for collective energy procurement across the estate?
- Is the energy procured from certified renewable sources – electricity and gasDoes the supply rating match the actual requirement? The Trust energy broker will assist with metering, sub-metering and data access requirements?

Conclusion

This strategy attempts to summarise the steps required to decarbonise the Impact estate. It's by no means prescriptive and is open to change. It is designed to serve as a signpost and best practice tool to enable steps to be taken to facilitate a decarbonised and net zero estate. Annual reviews of this strategy will be carried out in order to ensure that the information it contains and the recommendations provided remain relevant and current.

Summary

Heating and cooling

Conduct estate-wide heating and cooling system surveys. Implement monitoring solutions where possible and analyse usage. Efficiencies can be put in place for cooling e.g., prevent solar gain by using external blinds, solar film, improve natural ventilation or planting of deciduous trees.

Lighting

Switch out lighting to LED where possible, implement controls and analyse/alter behavioural usage.

Building fabric

This includes the full envelope of the building such as walls, floor, ceilings, roofs, windows and doors. The condition of each is highlighted in the building condition reports. Determine the U values of each of these elements in each school as this will determine the potential for improvement.

Methodology

Before any capital improvements are undertaken any no or low-cost measures should be considered in the short term. Wherever possible a fabric first approach should be adopted when considering capital improvements to decarbonise the estate. This includes improvements to the thermal efficiency and air tightness of the buildings.

Heating networks and opportunities onsite

We will consider whether there are any existing / planned heat network developments nearby, the potential of the school providing a baseload for a future heat network to benefit the wider community, or whether there are any other sources of secondary heat nearby when assessing the suitability of low carbon heating options:

Renewables

Look at opportunities on-site for renewable energy sources e.g. are the roofs in condition to support solar PV/thermal, is land available for ground source heat, water sources available for water source heat, average wind at 10M height suitable?

Electrical load

Take into account new electrical load requirements if switching over from gas – can efficiencies be found to reduce the load requirement and can the network support an upgrade?

Procurement of energy

Any remaining energy that must be procured should be done as optimally as possible. Can energy be procured from certified renewable sources, are your energy supplies rated in line with your actual power requirement and are you able to monitor usage via energy data?