



March 2022.

Summer Works 2022 Heating Upgrade Decarbonisation Pathway Pilot

Dear Principal,

Further to your notice of approval for your summer works heating project this year and the recent phone call with the Department's Senior Engineer Michael Walsh, I write to confirm that your school has been selected to participate in a heating decarbonisation pathway pilot project.

The option of participation is with the school. If you wish to be part of the fully funded Pathway pilot then you need to confirm this by email to myself immediately and we will issue you with a document to be included in the tender documents as part of the brief for the tender of your consultant so that their fee reflects the service required to deliver requirements below.

If the Consultant has or is in the process of appointment then let us know and Michael will have a call meeting with them on increasing their scope as required and associated fees. Note this pilot is 100% funded by the Department.

The objective of this pilot is to install a heating system where heat pump capacity is provided and designed to address a portion of the heating load and a high efficiency gas boiler (which has 30 to 39% lower carbon emissions than oil) makes up the remaining load (this is known as a bivalent heating arrangement).

With older buildings with less than modern levels of insulation, heat pumps alone cannot efficiently and in a cost effect manner in terms of capital and running costs provide sufficient heat on their own, thus a supporting high temperature boiler is necessary to provide adequate heat for the colder winter weather when external temperatures drop below the 2 to 3 degrees area (typically less than 5% of the year), outside of normal average conditions until such times as the overall building heat losses can be made compatible with heat pump operating characteristics.

This approach will optimise the heat pump usage with supporting heat from the high efficiency gas boiler. This will enable the heat pump(s) to heat the school during frequent moderate heating season temperatures, where heat pumps operate most efficiently and enable the most effective use of the investment and minimise the running costs to the school.

Bearing the above in mind, this heat pump decarbonisation pathway pilot will dovetail with the existing electrical infrastructure capacity of your school utilising available building electrical capacity known as the maximum import capacity (MIC). The appointed consultant will need to evaluate the potential capacity and apply to the ESB Network noting how much extra capacity they want without triggering a meter/ cable change. i.e. above 49 kVA in typically medium size schools.

This approach will support the phased integration of air source heat pump (ASHP) systems in your school in a risk controlled and reliable manner, enable existing grid electrical infrastructure to be maximised early, enable future suitable phasing of heat loss reduction programme while ensuring school operation continue.

It will also enables optimum return on embodied carbon in existing infrastructure, improved comfort levels for teaching and learning with greater system reliability, controls and response time, and will be compatible with this maturing industry's developing supply chain and ability to deliver in conjunction with appropriate future phasing of a heat loss reduction programme while ensuring school operation continues.

See our FAQ section in Appendix One for further details.

If you have any further questions please do not hesitate to contact Michael Walsh at michael_walsh@education.gov.ie.

Yours,

Michael Walsh

Senior Engineer

Appendix One

Frequently Asked Questions

1. What are the 2030 and 2050 climate action targets?

The Climate Action Plan follows the Climate Act 2021, which commits Ireland to a legally binding target of net-zero greenhouse gas emissions no later than 2050, and a reduction of 51% by 2030. The plan includes for increasing the proportion of renewable electricity to up to 80% by 2030 and sets specific targets for different emitters of carbon, for example electricity, transport and buildings.

Further details: <https://www.gov.ie/en/campaigns/2f87c-climate-action-plan-2021/>

2. What is decarbonisation?

It is the term used for removal or reduction of carbon dioxide (CO₂) emission into the atmosphere. Decarbonisation is achieved by switching to usage of low carbon energy sources or renewable energy.

3. How will above targets be met in schools?

By different methods depending on school and building, but mostly likely to involve large improvements to building insulation and air permeability, installation of low carbon heating systems, solar photovoltaic systems and efficient lighting and ventilation.

4. What is an Air Source Heat Pump (ASHP)

ASHP is an electrical appliance that delivers heat to heat emitters. It operates in a similar but reverse way to a domestic fridge in that it uses a refrigeration cycle to remove heat from the outside air, and upgrade it in terms of temperature through a compression cycle to a higher temperature which is introduced into the building heating system. It is an efficient heating method as it typically uses one unit of electricity to produce about three units of heat.

5. Why may larger radiators be required for ASHPs?

Heat pumps cannot produce heat at such a high temperature as traditional gas or oil boilers. The maximum economical practical temperature a heat pump can provide is 55°C, whereas a boiler can provide 80°C or above. Due to this lower temperature the radiators or heaters in school will output less heat at the lower system temperature.

6. What is available building electrical capacity and maximum import capacity (MIC)

Available building electrical capacity is the maximum amount (power) of electricity that can be provided to a building within the existing electrical infrastructure i.e. incoming cable and fuse. Capacity is measured in kilovolt-amps (kVA). A kilovolt-amp is similar to a kilowatt (kW). It is limited by the physics of the electrical system.

Maximum Demand is the maximum rate (power) at which the school actually consumes electricity over a given period such as a month or year.

Maximum Import Capacity (MIC) is the kVA that the utility company has agreed to notionally supply to the school. It should be slightly higher than the annual Maximum Demand. In reality, there is sometimes a mismatch and there may be spare MIC or insufficient MIC.

Typically, this will appear as a separate line on the schools energy supply invoice and is charged regardless of energy consumption.

It important that the school are on the capacity that meets its needs because inappropriate MICs result in an unnecessary cost as if a building goes above the MIC then extra charges will be automatically applied to the bill.