

INNOVATION GATEWAY

Challenge Selection
Round 2, 2018

Innovator Briefs – Building heating systems



Contents

INNOVATION CATEGORY	3
BUILDING HEATING SYSTEMS	4
Ageing Heating Systems.....	4
Efficient domestic electric heating.....	5
Heat pumps for domestic heating.....	6

Innovation Category

Theme: Building heating systems

Challenges:

- Ageing heating systems
- Efficient domestic electric heating
- Heat pumps for domestic heating

Building heating systems

Ageing Heating Systems

The challenge

The Innovation Gateway Partners operate a large number of ageing heating systems in a diverse range of buildings across their estates. As these systems age, they suffer from reduced reliability and energy efficiency.

Some of these systems have only simple time clock control, and it is not currently possible to centrally monitor or control their operation.

Detecting issues that lead to reduced efficiency or system failure is therefore limited to expensive programmes of inspection and preventative maintenance.

The solutions we are seeking

The Innovation Gateway Partners are looking for innovative solutions that can be retrofitted to existing heating systems to extend their life, improve energy efficiency, reduce maintenance costs and prevent system failures.

Innovative solutions may come in the form of low cost monitoring / controls, or as physical additions / alterations to existing systems.

Further information

Many of the smaller systems are 30kW – 100kW in size, although there are also a number of larger systems that range between 100kW and 20mW in size. Smaller systems are single pipe with standard radiators.

There may be access issues for the sites, but all should have some form of connectivity even if it is basic.

Selection criteria

- Cost effective.
- Demonstrable ability to reduce energy use, maintenance costs.
- Demonstrable ability to extend life of existing systems.
- <5 year payback period.

Efficient domestic electric heating

The challenge

The Innovation Gateway Partners have found that IR heaters used in conjunction with better, more sophisticated controls offer a measurable energy saving in comparison to traditional electric convector heaters.

Whilst Infra-Red panels also present benefits to occupants over traditional convection panel heaters, including a cleaner feeling heat and a faster heat-up time, many of the available solutions are difficult to justify on a cost basis.

The solutions we are seeking

The Innovation Gateway Partners are looking for innovative Infra-Red heating solutions that offer a price-performance advantage when compared with the majority of available IR heating panels.

The Partners will consider wall mounted or ceiling mounted panels, ceiling tiles, or other solutions such as films and fleeces that can be incorporated into walls, ceilings or floors.

Any solution will have to demonstrate how it will comply with the new EU Lot 20 regulations.

Solutions may have their own control solutions, be bundled with IR controls, or be capable of easy integration with existing control systems such as Prefect controls.

Further information

Ideally, solutions will come in a variety of power outputs. The most common application will be heating a room of around 12m² with 2m high ceilings. For this purpose, it is assumed that around 600w of IR heating is required.

The solution may also be applied to smaller outbuildings, such as home offices, sheds and cabins.

Selection criteria

- 3-4 year payback when compared to convector heaters.
- Lot 20 compliant.
- A mature solution from an organisation with established manufacturing operations.

Heat pumps for domestic heating

The challenge

The Innovation Gateway Partners are looking for innovative, high performance domestic sized heat pumps, that can be easily retrofitted to provide domestic heating and/or hot water.

Solutions they have previously considered have suffered from the following issues:

- Real world performance too low to be financially attractive.
- Need for a great deal of expert advice to specify a retrofit solution.
- Insufficiently user-friendly controls.
- Too noisy in close proximity to other buildings.

The solutions we are seeking

The Innovation Gateway Partners are looking for innovative domestic-sized heat pump solutions that can overcome some of the drawbacks with many of the solutions that are available.

The ideal solution will have the following characteristics:

- Easy for a non-specialist to specify as a replacement for traditional domestic heating, hot water or cooling equipment.
- Able to be installed by a competent and qualified person.
- Intuitive, smart controls that make it easy for occupants to use.
- Low noise operation.
- Comes in a range of sizes.

Air to air, air to water or ground source heat pumps will be considered. Air source solutions should be low noise, and ground source systems should overcome issues associated with complexity of installation.

Further information

Our Partners are looking to apply this solution across the UK and Europe (including Ireland, France, Spain, Germany, Poland, Portugal), with varying building regulations and differing housing market trends. The biggest requirement will be in the UK and France.

The solution may also be applied to smaller outbuildings, such as home offices, sheds and cabins.

Selection criteria

- Easy to specify, install and use.
- Ability to supply in different European countries.
- <10 years payback, ideally when replacing an existing system which is not end of life.