

INNOVATION GATEWAY

Challenge Selection
Round 2, 2018

Innovator Briefs - Energy use and metering



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Innovation Category

Theme: Energy use and metering

Challenges:

- Energy monitoring and metering
- Energy batteries and storage funding options
- Reduce energy usage of hot food stands
- Innovative BMS solutions

Energy use and metering

Energy monitoring and measurement

The challenge

The Innovation Gateway Partners want to increase the use of more granular energy monitoring across their estates. They already have a range of AMR solutions in place, but have only adopted sub-metering of energy use to a limited extent due to the high costs of traditional solutions.

The Partners wish to increase their energy monitoring capability in order to gain more granular data on utility usage for the purposes of:

- Understanding and optimising building energy consumption.
- Project performance analysis.
- Anomaly detection.

The solutions we are seeking

The Innovation Gateway Partners are looking for energy monitoring solutions that by virtue of their innovative nature are lower cost and easier to install than standard solutions.

The Partners are particularly interested in solutions that:

- Don't require a qualified electrician to install.
- Have a range of wireless and mobile connectivity options.
- Provide non-intrusive load monitoring for disaggregated energy consumption measurement.

Selection criteria

- Low cost per monitoring channel.
- Minimal disruption for installation.
- Able to provide data to existing systems (Analytics / AM&T).
- Accurate measurement of usage.
- Security certification for internet accessible systems.

Energy batteries and storage funding options

The challenge

The Innovation Gateway Partners have been investigating the use of behind the meter batteries or flow machines, predominantly in order to avoid periods of peak charging and to participate in Demand Side Management schemes.

However, due to the risk of changes to legislation and demand response revenue streams, it has proved difficult to build a business case to support the high capital costs of battery solutions.

The solutions we are seeking

The Innovation Gateway Partners are looking for behind the meter battery solutions that present a better balance between risk and reward, in order to unlock the commercial opportunity.

These solutions will offer one or both of:

- An innovative commercial model that offers greatly reduced commercial risk to the building owner / electricity consumer. Important to achieving this will be the assumption of commercial risk by the solution provider.
- Innovative battery technology that provides a better balance between cost and performance in order to make the solution commercially attractive.

The energy storage solutions should be able to work in conjunction with existing and planned renewable energy schemes across our Partners' estates.

Further information

The known revenue streams for these solutions are non-commodity costs (NCC). NCCs account for ~65% of the Partners' electricity bills.

Our Partners have tens of commercial building sites where they would consider the installation of battery technology if a suitable balance between commercial risk and reward could be achieved.

Previous business cases have specified batteries of 250 kWh or less at individual sites. The average kVA for a typical site during the peak power consumption period (November – December) is around 240 kVA.

PV has been rolled out across many sites, with further roll-outs planned. The majority of this solar power is currently used on site.

Selection criteria

- Truly Innovative technology or commercial model.
- Better risk reward balance than previously available solutions.
- Flexible in regard to existing and future legislation changes.
- Small form factor or scalable.

Reduce energy usage of hot food stands

The challenge

The Innovation Gateway Partners have thousands of hot food stands in their shops. At present it is not possible to ensure that these are turned off when there are no products in them. The operation of these stands when not required impacts energy costs and reduces the lifetime of the equipment.

Time clocks have been trialled in the past however these proved hard to maintain and keep up-to-date with the correct timings. Difficulty in accessing and operating the timers has in some cases led to them being removed or bypassed in order to operate the units.

The solutions we are seeking

The Innovation Gateway Partners are looking for a retrofittable solution that can be used to control existing stands and counters, ensuring that these switch off when they are empty.

We are interested in two types of solution:

- Solutions that can turn off the power to the hot food stands when all of the food is removed from them.
- A solution that switches the power to hot foods stands based on the time of day, but doesn't suffer from the maintenance problems of local timers.

Additional information

In some cases, the hot food stands are plugged into a standard 13amp socket, but this is often difficult to access. In other cases, the stands are hard wired into a circuit fed by the distribution board.

The power consumption of a single hot food stand is generally around 2kW.

Selection criteria

- Payback within 3 years.
- Non-intrusive.
- Retrofittable.
- Easy to install and maintain.

Innovative BMS solutions

The challenge

The Innovation Gateway Partners have a number of challenges and opportunities relating to the use of BMS systems across their estates. These can be summarised as follows:

- Buildings that have no BMS control in place.
- Buildings with old, unmaintained BMS systems.
- BMS systems in individual buildings, but no central visibility or control.
- High cost of proprietary BMS hardware and individual device controller solutions.
- Lack of in-house expertise necessary to maintain and operate complex systems.

The solutions we are seeking

The Innovation Gateway Partners are looking for innovative BMS solutions of the following types:

- Lower cost alternatives to traditional proprietary BMS hardware solutions, that are radically easier to configure, maintain and operate.
- Monitoring and control solutions that can interface to the existing BMS system portfolio to provide centralised visibility and control of building operations across the estate.
- Next Generation IoT based BMS solutions and programmable edge controllers for the full range of building automation requirements.

Selection criteria

- Easier to commission, maintain and operate than proprietary BMS hardware / controllers.
- Lower cost than proprietary BMS hardware and associated controllers.
- Strong security model and relevant certifications.
- <5 year payback.