The Department of Energy and Climate Change's

ADVANCED HEAT COMPETITION

Project Brief

30 May 2012

Advanced Heat Storage Competition for SBRI contracts

The Department for Energy and Climate Change has launched a SBRI (Small Business Research Initiative) competition, in partnership with the Technology Strategy Board (TSB), to assess the performance of advanced thermal storage[1] which can be integrated with heat technologies to help balance peak loads to the grid.

DECC are seeking applications to assess the viability of compact heat storage materials as an effective means to mitigate potential strain on the electricity grid in scenarios of increasing loads from low carbon heat technologies (such as heat pumps). Competition criteria will consider technical performance (relative to water), operating temperature range, cost (capital and operating) and scalability of the storage solutions, amongst other aspects. We also want to understand the potential of compact advanced heat storage mechanisms as an attractive solution for the domestic sector, for example in addressing spatial constraints for heat storage in UK homes and ensuring comfort and safety.

The competition will run in two phases, with the possibility of a third demonstration phase. Phase 1 will open on 30th May 2012 for feasibility studies of product performance and contracts are expected to be awarded at the end of September 2012. Applicants will be asked to provide a robust, evidence based case for the viability of their proposed technologies (for example a desk based feasibility study with some supporting small scale laboratory work/data) against a set of performance criteria. Successful studies will be invited to participate in a prototype demonstration (Phase 2) in Spring 2013 with monitoring to take place over a 12 month period.

Background and Challenge

As highlighted in DECC's Carbon Plan[2], there are important opportunities now to build a market for low carbon heat in buildings. In the residential sector, four million households are currently heated by alternatives to mains gas with many having to rely on expensive, higher carbon forms of heating. These households will gain from switching to low carbon heating because their heating bills and carbon emissions are higher than average and some of them currently suffer the inconvenience of having to have fuel delivered. However, increased penetration of heat technologies such as heat pumps are likely to place greater strain on the

[1] N.B Electricity storage is beyond the scope of this programme.
[2] http://www.decc.gov.uk/en/content/cms/tackling/carbon_plan/carbon_plan.aspx

electricity grid. Heat storage could therefore play an important role in balancing increased loads on the grid during periods of peak use.

Current economic models are unable to capture the utility of heat storage fully, as it often operates at short timescales and at a distributed level in a complex framework. Consequently, domestic consumers currently have little incentive (or means) to change the timing of their consumption of energy away from peak loads. Other barriers which may restrict the uptake of heat storage include coordination failures along the supply chain and uncertainty surrounding technological performance, safety and future market size.

Scope

The competition is open to any organisation, but is particularly targeted at manufacturers of advanced storage materials, universities and product providers. We are strongly encouraging collaboration across the supply chain (heat exchangers, controls) and will look for evidence in competition applications to demonstrate the integration of thermal stores with low carbon heating systems in later demonstration phases.

Applicants will be required to demonstrate:

Energy performance of storage unit compared to water
Expected life of the installed system
Degradation of performance over time
Cost (measured by payback period and to include product cost; maintenance; installation and ancillary equipment required)
How the system would operate across wider supply chain components
Scalability (indicate flexibility to enable load shifting over a range of hours)
Safety

SBRI and funding allocation

The competition will be run by DECC, following the model of the Technology Strategy Board's SBRI process which provides for 100% funded pre-commercial procurement. This is a way for Government departments to find novel solutions to specific problems by engaging innovative companies they could not otherwise reach.

This open and transparent competition will result in direct contracts between successful applicants and DECC. Applicants must therefore be a legal entity. Although we are encouraging projects that include strong collaboration across the supply chain, the contract will be with the lead party, and other collaborators will be subcontractors of the lead party. We particularly welcome applications that enable small companies to participate within the supply chain.

Successful applicants will be offered a contract of up to £30k to produce a feasibility study in Phase 1. Successful Phase 1 studies will be invited to apply for Phase 2, which is likely to start from Spring 2013. Phase 2 demonstration funding is likely to be in the range of £100-500K depending on the quality and uptake of applications.

Application process

To apply for funding through this competition and for further details please register your interest at https://www.surveymonkey.com/s/heatstorage and download the documentation via the innovation funding section of DECC's website at www.decc.gov.uk/heatstorage

Key dates

Phase 1(design/feasibility study)	
Competition opens	30 May 2012
Deadline for registration	3 August 2012
Deadline for applications	17 August 2012
Design phase commences	1 October 2012
Deadline for design report	21 December 2012

Phase 2 (prototype demonstration and monitoring)	
Successful Phase 1 reports invited to tender	Jan 2013
Deadline for Phase 2 applications	Feb/Mar 2013
Phase 2 delivery commences	March 2013
Phase 2 monitoring stage	1 April 2013 to 28 Mar 2014

Further information

For information about the competition scope and applications please email: heatstorage@decc.gsi.gov.uk

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