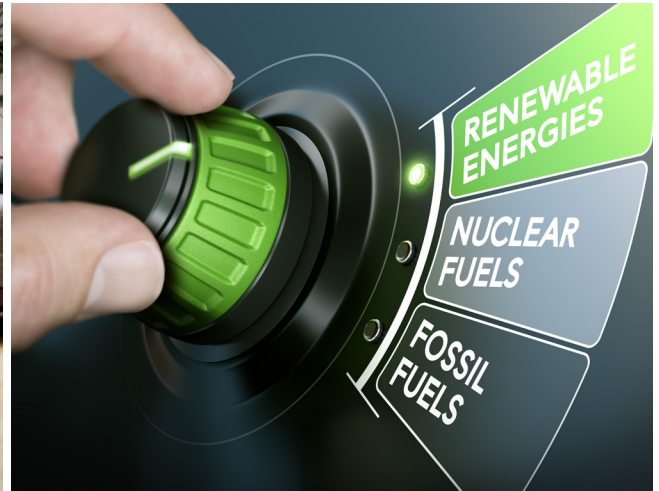




INVITATION

TO RESEARCH ORGANISATIONS AND INDUSTRY TO PARTICIPATE



JOINT PROJECT BETWEEN THE HPT AND ECES TCPS AND MISSION INNOVATION

Comfort and Climate Box

– Speeding up market development for smart integrated heating, cooling and energy storage.

Challenge

The pace and scale of the global clean energy transition is not in line with climate targets. Energy-related carbon dioxide (CO₂) emissions rose again in 2018 by 1.7%. The building sector represented 28% of those emissions. The growing global need for and availability of thermal comfort technology is a large contributor to emissions of greenhouse gases world-wide, and the transition to renewable energy is too slow.

Technology can reduce buildings emissions while improving comfort and energy services. There is potential for cost-effective technologies to deliver energy savings of 500 Mtoe per year in the building sector worldwide between 2020 and 2050. To meet the needs of the future, new innovative thermal comfort solutions must be developed. Heat pumps have the potential to massively reduce carbon emissions for heat, but have had limited take up. By integrating heat pump and storage systems to deliver heating, cooling, and energy storage we can accelerate their uptake and deliver low carbon heating and cooling. By combining heat pumps and storage, through the development of a Climate and Comfort Box solution several issues are addressed, such as:

- » *Balancing & controlling electricity grid loads;*
- » *Capturing a large (or larger) share of renewable (local/regional) power input (e.g., solar thermal, solar PV, wind);*
- » *Optimizing economics, CO₂ emissions, total fuel use over time;*
- » *Providing optimal security of supply to buildings.*

This project aims to accelerate the market development of Climate and Comfort Box (CCB) solutions. The technical challenge is the smart combination of different technologies in one system. Specialists from various fields of technology are required, and need to cooperate in order to accelerate product development and market introduction of combined heat pump / storage packages: The Comfort and Climate Box.



Scope & Goal

The scope in this project is limited to heating and the production of domestic hot water (DHW) only, possibly with cooling as a secondary function, for renovation or straight replacement of heating units in the building stock of existing single-family houses as well as in light commercial use, with a similar demand profile as domestic use (e.g., offices, dentists etc.). The CCB is considered as an integrated system or modular configuration, in order to be affordable. **The goal is to develop nearly market ready systems, including, as a minimum, a heat pump and a storage system.**

Organisation

This is a joint project between:

- » *The Heat Pumping Technologies (HPT) and the Energy Storage (ECES) Technology Collaboration Programmes (TCPs), under the auspices of the International Energy Agency (IEA), representing 19 countries.*
- » *Mission Innovation – Innovation Challenge 7 (IC7) - Affordable heating and cooling of buildings, representing 24 countries and the European Commission.*

Together, we have launched the “Comfort and Climate Box” (CCB) as a joint project, under an IEA led Annex, with task-shared collaboration among specialists from research institutes, universities, and industries from different countries. The Annex is led by a mandated operating agent. Preliminary definition work was carried out in November 2017 during a Mission Innovation IC7 Workshop that took place in Abu Dhabi.

Workplan and time schedule

The proposed running time of the “Comfort and Climate Box” project will be 2 ½ years (30 months). The project definition and start up workshop took place in Utrecht (The Netherlands) in January 2019. The following work packages are included:

- » *WP 1: Market status*
- » *WP 2: Prototyping*
- » *WP 3: Testing*
- » *WP 4: Roadmap*
- » *WP 5: Organization*

This time schedule is quite ambitious. In order to enable rapid and efficient progress of the project, the goal is to finalize WP 1 within 2019, to enable a ‘head start’ with WP 2 and WP 3 as soon as funding is obtained for the local projects in the participating countries. Within the project, simulations will be performed and prototypes will be developed and evaluated. A Roadmap should also be developed with recommendations to manufacturers, policy makers, and standardization organizations.

Deliverables

The Comfort and Climate Box will compile a portfolio of country-specific prototype testing and demonstration projects.

A description of the market status will be elaborated. Derived from this, a roadmap will establish the next steps of development and describe how to implement the CCB in the respective markets, with recommendations for market participants and policy makers on how to enhance market uptake.

How to participate

The expectations on participants are that they are involved in development of heating devices, directly or indirectly, and prepared to contribute three man-months per year to the Annex (mandatory). The collaboration is task shared; thus, participants are responsible for their own funding. We invite research organizations and industry to participate.

If you are interested to join this project, please contact:

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For more information on:

Mission Innovation - IC7:

www.mission-innovation.net/our-work/innovation-challenges/affordable-heating-and-cooling-of-buildings/

IEA Technology Collaboration Programme on Heat Pumping Technologies, HPT TCP:

<https://heatpumpingtechnologies.org/ongoing-annexes/>

IEA Energy conservation through energy storage, Energy storage TCP:

<https://iea-ecses.org/>