



Invitation to participate in a new competence center for heat pumping technologies at KTH

KTH/Applied thermodynamics and refrigeration intends to submit an application to create a competence center for heat pumping techniques, for both heating and cooling. The center will conduct research on components, systems and applications of systems.

The creation of the center requires clear support from industry and the focus of research will largely be guided by the interests of the participating companies. With this, we would like to inform you of the possibility of participating in the center application, of the center's direction and of how we need industry support. You can read more about this below.

The deadline for applications is the last of May, which means that we need your response relatively soon. In connection with the application, we need a Letter of Intent from you. At a later stage, and if the application goes through, we will sign a more formal contract regarding the rights and commitments of the participating parties.

Read more about the plans below and if this sounds interesting, please come back to me or one of my colleagues and we can have a closer discussion about what the competence center might mean for your company.

Background

At the Division of Applied Thermodynamics and Refrigeration, KTH, the research has been focused on cooling and heat pump processes for about a hundred years! In fact, it started with the invention of the refrigerator that von Platen and Munters developed as students at KTH, and which was then manufactured by Electrolux. Many of you who read this have participated in various projects we have conducted within the Swedish Energy Agency's program Termo, Effsys, Effsys Expand, Effsys 2, Klimat21 and Alternative Refrigerants. Perhaps you also know our research from the articles we regularly publish in Kyla&Värme, including those about new refrigerants.

The Swedish Energy Agency currently has a call for competence centers. More about this can be found here: <http://www.energimyndigheten.se/utlysningar/kompetenscentrum-for-ett-hallbart-energisystem/>. It states, among other things, about these centers: "*Needs-motivated excellent research is carried out on the solutions required for the transition to a sustainable energy system in collaboration between universities, research institutes, industry and the public sector.*" A total of SEK 650 million has been set aside over a five-year period. However, it is intended that these centers will live on for at least 10 years. Each center will be allocated at least SEK 5 million per year and for the center to be started, an equal amount is required from universities and industry.

Our idea of the focus of the competence center

Through the involvement of industry in these centers, the Swedish Energy Agency wants to ensure that the research is relevant for industry in general and especially for the participating companies. Companies will therefore have the opportunity to influence the focus of the research carried out. Our intention is that the research should primarily focus on the development of technical solutions for heat-pumping technologies for cooling and heating. This can apply to the entire range from components, e.g. heat exchangers, to the design of cooling/heat pump systems, such as residential heat pumps or

supermarket refrigeration systems, but also technical solutions for systems in the broader sense, i.e. the connection to the building or to the energy system as a whole. Projects can also focus on system modelling, e.g. combinations of cooling and heating with energy storage and/or solar energy. A list of examples of projects we are now running, or recently completed, can be found here: <https://www.energy.kth.se/applied-thermodynamics/current-projects> . These projects have been created in cooperation with industry and we therefore believe that they are also representative of the research that will be carried out within the center.

How is the center funded and how can industry contribute?

According to the call, 1/3 of the funding must come from universities, 1/3 from industry and 1/3 from the Swedish Energy Agency. The Swedish Energy Agency's contribution can only go to activities within universities or research institutes. KTH's management has promised support of SEK 0.5 –1 million for each center approved. In addition, the contribution from KTH will consist of faculty funding, i.e. the department's internal research funding. The involvement of industry can be in the form of cash contributions or *in kind*, i.e. through own work or by contributing components to the center's research, see more below. We envisage that our center will have a cash participation fee in three different levels. However, we expect that the dominant part of the industry's contribution will be in the form of in-kind efforts. Five million from industry may sound like a lot, but compared to the combined R&D budget of the industry in the area, it is very little. We hope, of course, that some of the research/development planned by the companies can be done as part of the counter-financing for the center's activities.

Here are some examples of what the in-kind efforts can consist of.

- Involvement in the Center's activities: Participation in activities such as project meetings, planning meetings, including preparation e.g. in the form of reading draft reports or compiling information for project meetings.
- Joint research projects: We recognize that there is a lot of research and development work of high quality in industry. By formulating joint research projects run within the framework of the competence center, the time spent by the company's employees on the project can be counted as a contribution in kind. We believe that any IPR issues can be resolved
- Industrial doctoral students: This means that a person with employment in the industry works with an industry-linked project and at the same time takes courses at a university and earns academic qualifications through the publication of articles. The wage cost can then be counted as co-financing.
- Components etc.: Within the projects we will need components for test rigs, perhaps access to databases/information that has a certain value. Access to real field sample facilities can also generate counter-financing.

It is important that the costs are revisable and linked to the center activities.

Companies wishing to join the center will also have to pay a cash participation fee. This will be used, among other things, to cover administrative and information costs. The logos of participating companies will be presented in connection with the center's activities, which is why the participation fee can be seen as a marketing cost. We envision membership in three levels:

- Gold member: 100 ksek / year
- Silver member: 50 ksek / year
- Bronze member: 20 ksek / year

In addition to visibility in connection with the center's activities and information material, member companies will receive regular information about the activities through a member newsletter. All member companies will also be given the opportunity to influence the direction of the research as members of an industrial reference group. The influence will be linked to the size of the company's contribution to the center. Gold and silver members will have the opportunity to join the center's board.

How do you become a member, and when do you have to make up your mind?

The deadline for us to submit the application to the Swedish Energy Agency is Monday May 31. In order for us to complete the application, we need your expression of interest by Friday May 28, but we would like to hear from you earlier that you are interested.

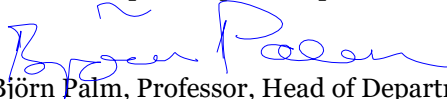
Together with the application, we must submit letters of intent, LoI, from all companies that wish to participate in the center. On the last page is the Swedish Energy Agency's template for how such a LoI should be designed. It can be very brief and includes the names and contact details of participating companies, reasons for the company's participation, description of the role the company envisages in the center and the type and size of the company's contribution to the center.

How do you find out more?

You are welcome to contact me directly by email or phone, see below.

You can also contact one of the colleagues at the department. Maybe there is someone you've been in closer contact with before.

With the hope of a quick response!



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Contact information to other colleagues at the department:

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Saman Nimali Gunasekara, Researcher	<saman.gunasekara@energy.kth.se>;

Declaration of intent for <stakeholders name> participating in the competence centre on *Heat pumping technologies for heating and cooling*

Reason for participation in the centre

Describe why the stakeholder wants to participate in the centre

[Beskriv vilka fördelar ni ser med att delta i centret, varför ni vill delta, t.ex. få tillgång till aktuell forskning, få möjlighet att påverka forskningen inom området, få möjlighet att driva forskningsprojekt tillsammans med KTH, vi vill få tillgång till välutbildat personal inom vårt område, vi vill anställa en industridoktorand inom området för att få god handledning av en person anställd hos oss, vi vill få bättre kontakt med internationella forskningsorganisationer och deras aktivieter, ser en fördel med närmare koppling mellan industrin och akademien....]

Description of the participation

What roles will the stakeholder take in the centre (eg centre board or project member)

[Vilken/vilka roller vill ert företag ta i centret (t.ex. delta i styrelsearbetet, delta i enskilda projekt, delta i arbetsgrupper som bildas inom centret, delta i möten för redovisning av forskningsresultat,)]

Type of commitment

What type of financing will the stakeholder contribute with separated in cash and in-kind

[Vilken typ av finansiering vill ert företag bidra med, fördelat på kontant bidrag och naturabidrag. Se inbjudan för exempel.]

Town, date

Signature of authorised signatory

Printed name

Title