

Helsinki Energy Challenge

Answers to the clarifying questions sent
to the organizer by 31 August

Helsinki

I beg you to answer the questions I have put here?

All questions that are sent by using the Q&A form, are answered and published on the Challenge website.

We would like an opportunity to present our idea, Please indicate: (1) Content specifications (if any); (2) Amount of Time

All applications have to be sent through the application portal, available at <https://applychallenge.hel.fi/en/login>. Further instructions, including the allowed length of the answer per question field, is available on the application portal. Further advice on the Challenge process and other details is available on the Competition program (available for download: <https://energychallenge.hel.fi/about>). Those teams that are selected as finalist teams (3–15 teams) will be invited to the co-creation phase and to join the 3-day boot camp in December, to learn more and to get support to be able to make the further elaborated versions of their proposals. The competition entries are plans and will be sent in a written format, also the final competition entries after the co-creation phase.

Does the heating plants energy supply figure include the warmwater for bath and shower of the flats and houses or do they produce it with own electric boilers in the houses separately?

District heated buildings use delivered heat for both space heating and preparation of domestic hot water (DHW). All figures in the background report showing district heat consumption and production include heat consumption of both space heating and DHW end-usage categories. It is very uncommon that buildings attached to district heating network in Helsinki have own parallel heating installations.

Please clarify whether family members of employees of City of Helsinki or its subsidiaries can join a competition team as a team member.

Helsinki Energy Challenge is a public design contest open for all. For each application, we will assess whether there are any factors that could affect the eligibility of that team. By default, being a family member of an employee of the City or its subsidiary does not harm the eligibility.

Is there possibility to have sometype of time domain data about system pressure, temperature and volumetric flow from the measuring points or in areal context?

This information is not available at this stage of the challenge competition.

Let's assume you enter the Challenge with a partner, which is required. You form an agreement between yourself and the partner as to how you would split the Prize if you are fortunate enough to win. This is one of the stipulations in the Application. However, if you are selected as finalists, are you not expected to further partner with other participants before you win the Prize? So now, your agreement with your original partner is no longer very useful since now you must divide the Prize if you win not just into two parts but into at least four. Is that not correct? What is the procedure for awarding the final prize and how is this matter supposed to be addressed?

The teams who are selected as finalists, are not expected to further partner with other participants. Team members that are named in the application phase, may only be changed for substantial and justified reasons. However, if selected as finalist, the team can register new members during the co-creation phase to add further expertise to their team, if they wish to do so/ see it relevant. The team can already in the application form specify on which grounds the prize and other awards are to be divided among the team members, but the finalists teams can of course specify that later during the process too.

I am logged in here. Why is that not enough for the Challenge?

Logging into the Q&A form is not enough if you want to join the Helsinki Energy Challenge. Even being logged into the application portal is not enough. You will need to submit your application form, following the guidelines that are given in the application portal as well as in the Competition program. Link to the application portal: <https://applychallenge.hel.fi/en/login>.

Where are the answers today? It´s Aug 21st!

All questions and answers are published on the Challenge website. Unfortunately, with the previous set of questions we had a delay; instead of publishing them by August 21, we published them August 26.

Is it possible to obtain information on the amount of transmission losses in Helsinki's current district heating network?

Heat losses in district heating networks can be found from the district heating statistics published by Finnish Energy. In 2018, the heat losses in Helen DH network were 439.9 GWh (about 8%). Full statistics can be found from here: https://energia.fi/en/newsroom/publications/district_heating_statistics.html.

I invited a friend from Sweden to discuss to be my team member in the competition but I didn´t hear anything from him so I sent him an email directly in Swedish and asked why he hadn´t answered? He had not seen anything and even after trying to find my invitation he couldn´t find it.

We are not entirely sure what the problem here has been and the question seems not relevant. However, as a general note: The organiser of the Challenge, the City of Helsinki, is not responsible for your communication with the potential team members. Emails or invitations to potential team members are not sent via the City of Helsinki.

Yesterday's webinar, the mayor mentioned that there are two power plants that run on coal and will be closed soon. Who owns these power plants? Who should we contact as we have a solution?

The two power plants are owned by Helen, the energy company owned by the City of Helsinki. If you are interested to join the Helsinki Energy Challenge, you should present your idea/solution in your application form that you will find from the application portal (<https://applychallenge.hel.fi/en/login>) – only applications that are sent through the application portal (applychallenge.hel.fi), following the instructions that are explained in the Competition program, will be accepted to the Helsinki Energy Challenge.

Where are the answers? I had put a lot and would have had the answers on the 21th!

All questions and answers are published on the Challenge website. Unfortunately, with the previous set of questions we had a delay; instead of publishing them by August 21, we published them August 26.

Does the character limits in the submission requirements include spaces? I.e. "the big cow." is 9 alphanumeric characters but 12 total characters.

In the application form, the space is considered a character so it is counted in the total number of characters.

Final competition entries are evaluated anonymously. If an important part of the proposed solution is a piece of unique or somewhat easily recognizable technology and the technology provider is part of the team, how should/can anonymity be ensured?

The jury will indeed evaluate the final competition entries of the finalist teams anonymously. Therefore, the finalists have to commit to not revealing the content of their entry in a way that could risk their anonymity. If the competition entry includes a unique solution that has only one provider globally – and one team member is from that solution provider organisation – the organizer of the Challenge will advise the team, if selected as a finalist, on how to deal with this in the final competition entry.

It is good to note that the anonymity can of course be safeguarded only with the means that are at disposal; the kind of generally known information as described in the question, cannot alone compromise the anonymity of the team. The risk can only be caused by factors that are not generally known before the competition is resolved.

How much coal and biomass for receiving heat and electric energy for Helsinki City do you consume for current day (summer) and tomorrow (winter) or on average per year? How much energy do you receive in general in quantitative terms per year for Helsinki City?

The fuel used for energy production in Helsinki varies yearly. In 2018, approximately 6 500GWh of coal was used for district heating and CHP electricity production, whereas 190GWh of wood pellets was used. The demand load of the DH network varies a lot during the year and thus also the used fuel mix varies somewhat during the year. Also, maintenance breaks of the larger plants may cause some variations in the fuel mix. Finnish DH statistics including information about annual fuel consumption can be found from the following link: https://energia.fi/en/newsroom/publications/district_heating_statistics.html.

In 2018, DH consumption in Helsinki was 6 500GWh and electricity consumption 4 200GWh. Energy consumption data in Helsinki and the metropolitan area can be found from the Excel file in the following link: https://hri.fi/data/en_GB/dataset/paakaupunkiseudun-energiakulutukset/resourcel/c56b3e9f-c742-4d9b-aa51-34c90565e53a?inner_span=True

In the coming weeks, we would like to promote our consortium's involvement in the challenge online (mainly on social media) with LinkedIn posts such as "we are taking part in Helsinki's energy Challenge with x y z Solutions to decarbonize the city's heating system" etc.

However, on your Competition Program, there are these guidelines (p.23): "The finalists commit to not revealing the content of their entry in a way that could risk their anonymity. (...) The City of Helsinki will be responsible for all communications during the challenge competition and will provide further advice to the finalist teams on communications. The City of Helsinki can publish information about the Challenge participants and finalists but when doing so, it ensures that the anonymity requirement is not compromised." Since we are not yet "finalists" of the competition, is it still ok to share posts such as the one aforementioned? Alternatively, do you have a set of specific guidelines to follow when doing so? Obviously, the last thing we'd want is to compromise our eligibility.

The jury will evaluate the final competition entries of the finalist teams anonymously. Therefore, the finalists have to commit to not revealing the content of their entry in a way that could risk their anonymity. During the application phase, the applicants cannot yet know if they will be selected as finalist or not, so it is recommended to be very careful at this stage too, in order to not to harm this anonymity requirement. In principle, it is ok to publicly announce that you are joining the Challenge. But we advise not to publish the content of the solution so that it can be linked with the team. It is important that the jury does not know who is behind which competition entry when judging the finalists' solutions. The anonymity requirement applies as long as the winner has been selected by the jury.

(1) Within one year, how the DH heat load was allocated between Hanasaari CHP, Salmisaari CHP, Vuosaari CHP and 11 peak boilers? (2) Please provide few typical temperature figures, supply and return temperature at the point of CHPs e.g. when outdoor temperature at -30 'C, 10 'C and 27 'C?

Information on this level of detail is not available at this stage of the Helsinki Energy Challenge; however, some of this information is available on the Background report (available for download: <https://energychallenge.hel.fi/heating-helsinki-today>). The determining factors for the

DH heat load allocation are the market price of electricity, fuel prices, taxes and the price of emission allowances. The allocation varies each year.

When will I be invited to Helsinki in September?

During the application period, we do not invite any teams to Helsinki. The background material and reports, concerning the current situation, that are published on the Challenge website should be sufficient information to prepare the application (<https://energychallenge.hel.fi/heating-helsinki-today>); the teams also have had the opportunity to send clarifying questions through the Q&A form. Those teams that will be selected as finalist (3–15 teams) will be informed about the selection in the beginning of November; they will be invited to Helsinki in December (9–11 December), if the covid-19 pandemic allows (if the situation does not allow, then the bootcamp will be organized virtually). The finalist teams will then get support and more information about the Helsinki situation, to be able to further develop and finalize their proposed solutions to fit into the context of Helsinki.

Does the district energy system network all operates at a high temperature or are there parts of it which operate at low temperature?

The temperature in the DH network may vary slightly according to the location of the network. For example, older heat exchangers of customers that are dimensioned for higher supply temperatures causes restrictions for lowering the supply temperature further. Lower supply temperatures are most likely found from the newer city areas where both the district heating network and customer heat exchangers have been dimensioned for lower supply temperatures. Detailed information about the temperature across Helen's DH network is not publicly available.

Does the City of Helsinki and/or HELEN have the jurisdictional ability to offer financial incentive programs for Demand Side Management, renewable energy incentives, etc?

Typically, these kinds of financial incentives in Finland are offered on the national level. However, in principle, the City can offer certain types of financial incentive programs of its own. If such incentive program is part of the Helsinki Energy Challenge's team's overall solution, it should be described in enough detail in the application form.

Does the City of Helsinki have the jurisdictional ability to mandate building codes requirements such as green building or net zero energy standards?

Currently, there are no effective measures to influence the existing building stock outside City's own ownership. For the City's own building stock (approximately 10% of the buildings in Helsinki) the City can decide on the building requirements and standards. For the new properties and buildings, the City can set various requirements, e.g. in the land transfer conditions (this applies to new properties being built on the city's leased plots, i.e. the majority of the city's construction). In addition, requirements can be set in the town plan and building order; however, the national law sets some limits to this. **As a general note, the teams participating in the Helsinki Energy Challenge can also propose non-technological innovations as part of their overall solution. In such proposals, the solution should be described in enough detail in the application form.*

Has Helsinki published any specific research on market barriers on building retrofits or renewable energy technologies?

The City of Helsinki has not published any specific research on the topic. However, there is one recent publication that covers this topic: The difficult process of adopting a comprehensive energy retrofit in housing companies: Barriers posed by nascent markets and complicated calculability (Murto, P., Jalas, M., Juntunen, J. & Hyysalo, S., 2019, <https://aaltodoc.aalto.fi/handle/123456789/39734>).

What is the governance structure and relationship between the electricity utility (Helen Electricity Networks Ltd.) and thermal energy utilities (Helen Ltd)?

The Finnish Energy Market Act requires the electricity distribution business (a natural monopoly) to be legally separated from the energy sales business. Helen Electricity Networks Ltd. is a legally separated subsidiary of Helen Ltd.

Is there an existing smart grid platform/policy/program in Helsinki?

There are some individual smart grid related projects in Helsinki, e.g. in the Kalasatama area. There is no overarching smart grid policy or program today.

How is food waste collected in Helsinki and how is food waste processed? i.e. through a green bin collection which goes into a biodigester or...? Would bio-gas be considered similar to biomass as something not desirable?

Food waste is collected as part of biowaste. In Helsinki, biowaste is collected in all housing cooperatives which has more than 10 apartments and in real estates that produce more than 50kg biowaste in a week. Otherwise it is voluntary. The biowaste is then processed into biogas and compost in Ämmässuo biogas plant.

Helen started to use biogas in DH production in 2016, and it was seen as a step towards carbon neutrality. However, biogas can also be used by the transport sector as it is delivered through the same network operated by Gasgrid Finland.

We would like clarification on the expectations for the Natural Resources Content section. In the Application will judges be looking natural resources used in the proposed solution as well as those not used, i.e. the solution will no longer require coal for CHP plants. Will judges be looking for teams to describe both natural resources embodied in proposed solution infrastructure as well as those required for operation?

The Challenge participants have to describe what kind of natural resources and energy sources their solution needs and is utilizing and assess the volume of the resources needed (that is, all resources that are connected to the proposed solution). The goal is to find solutions that help replace the coal used in the heat production with as little biomass as possible. The Challenge participants can also describe which resources will not be needed anymore, if needed in order to describe the proposed solution's impact.

Helsinki