

Helsinki Energy Challenge

Answers to the clarifying questions sent
to the organizer by 1 May

Helsinki

Miten kilpailussa turvataan kilpailuehdotuksen tehneen keksijän oikeudet? // How do you safeguard the rights of the inventor who submitted the competition proposal?

The City of Helsinki has the right to use the winning plan(s) and the idea(s) in them in its own operations to the extent specified in the section 3.7. of the Competition program. All other intellectual property rights of the winning plan(s) will remain with the winning team(s); all intellectual property rights of other than the winning plan(s) will remain with the Challenge teams. All business secrets will be respected and advice on how to provide such information is given in the application portal; further instructions will be given for the finalist teams during the co-creation phase. Also all relevant consents for using the competition entries for marketing purposes will be asked in advance.

Implementing the proposed solutions may require procuring materials, e.g. chemicals or machinery, in very high volumes. The final cost of the materials in such orders may be different from the publicly available costs e.g. for smaller amounts. Getting a reliable estimate of the final cost may require buying analysis reports of the relevant global markets which cost thousands of euros, or submitting calls for tenders which may be binding. Do the competition organizers offer access to such price data, e.g. in the cocreation phase? Is leaving the cost estimates pending for more accurate price information acceptable in the application phase?

Competitors themselves have the best understanding of what materials are needed in their proposed solution and are expected to have their own price estimates for such materials in the application phase. So it is possible to use estimated costs if accurate information is not available but competitors must describe any relevant risks and assumptions in their competition entry. In the co-creation phase, all finalist teams will get advice on how to sharpen/ further develop their proposal, based on which the competitors can assess if more accurate background information should be used (e.g. on cost of materials); the organizer also aims to help in providing that more accurate information when feasible (however, these decisions will be made at the co-creation phase when the finalist team's needs are clear).

According to the blog of Helen Ltd., "according to manufacturers, a reasonable minimum temperature of sea water for heat pumps is 3 °C" (<https://www.helen.fi/helen-oy/vastuullisuus/ajankohtaista/blogi/2019/merivesilampopumput>). However, the manufacturer FrioTherm states that the Unitop 50 heat pump, used in Katri Vala heat pump plant in Helsinki, provides brine chilling to -12 °C, and can be used in industrial process applications with temperatures down to -40 °C (<https://www.friotherm.com/products/unitop/unitop-50/>). Why this inconsistency in the figures? Why couldn't e.g. the Unitop 50 be used with below 3 C evaporator temperatures in Helsinki, and down to the negative values?

We do not comment on figures published by other parties. Competitors can choose what figures they utilise for their proposed solution but it is important to describe all assumptions that are made in the competition entry.

What is the available waste heat power from the datacenters in and around Helsinki? I assume the 100 MW Katri Vala HP is not the whole potential of waste heat usability from datacenters in Helsinki. It would be nice to have the energy or power consumption of electricity or installed power of datacenters in Helsinki. And is there any study projecting the growth of power consumption (waste heat production) in datacenters in the following years ?

The Katri Vala heat pump utilises sewage instead of excess heat from datacenters. There has not been a public study or power demand growth projections relating to datacenters in Helsinki. In general, the number and size of existing datacenters is relatively small and city's geography limits the potential number of large scale datacenters that could be build.

What is the installed capacity, produced heat and maximum waste to heat potential in and around Helsinki? Is there any study projecting the growth of waste procurement potential in Helsinki in the following years?

If the Challenge competitor is proposing a solution that is based on waste heat, the competitor itself should make a credible estimation of the future waste heat sources and present it as part of the competition entry. No comprehensive study on the future sources/growth has been made. A short report describing the waste heat sources in Helsinki and their potential in Helsinki area is available (only in Finnish) at <https://www.stadinilmasto.fi/2018/02/15/helsingissa-kartoitettiin-suuria-hukkalampokohteita/>

Is there any study projecting the growth of the consumption i.e. the increase of demand for heat in the following years?

Heat demand growth projection is provided in Section 2.1 of the background report (available on the Challenge website: <https://energychallenge.hel.fi/heating-helsinki-today>).

Can an assumption of reduction in the district heating grid feed in temperature be assumed for the futuristic scenarios? It is also meaningful that the heating grid is also renovated and the consumers also adapt their heating to reduced temperature for eg. residential buildings with floor heating and every industrial consumer with a mini heatpump so that the feed in temperature is 60°C and return ca. 40°C. Or the boundary conditions are from historic 2016 data and the data has to be used as such and a virtual solution should be provided for the 2016 historic Helsinki to be carbon neutral?

In this Challenge competition we are looking for solutions that can significantly affect the cessation of coal use by 2029 and speed up the City of Helsinki's journey to becoming carbon neutral by 2035. The competition entries are "master plans" and the proposed plan can include also less conventional solutions. Decreasing the heating network temperature and renovations in the consumer-end can be part of the solution. However, the proposed solutions have to be such that the City of Helsinki can either implement them centrally or have control over the implementation otherwise, which applies especially to the consumer-side solutions. The data from 2016 is provided only as an example for the competitors to get an understanding of typical heat demand over a year.

Will the City accept a green electricity production in order to fulfill the district heating system electrical needs from a wind power facility which could be located far from Helsinki and with the electricity transported through the national grid?

It is not necessary to produce the electricity needed for the proposed solution within the city of Helsinki.

What will happen if a team presents more than one proposal, and only one is acceptable or eligible to the jury? Will it be preferable to separate these proposals as different entries? And what if they're interlinked? Will the jury choose only those eligible?

This is a design contest and we are in a search for "master plan" on how to decarbonise the heating of Helsinki. This means that one competition entry, so "one master plan", can include one or more solutions: one impactful solution that will help us to get rid of coal and speed up our journey to becoming carbon-neutral, or several solutions that are complementary. So if the team has solutions/ ideas that are complementary or interlinked, it is recommended to propose them within one competition entry rather than as separate entries – as it is likely that the overall impact is then higher, meaning, the team would probably rank higher in the evaluation. However, that is of course a decision that the team itself has to make before submitting the proposal. Each competition entry, even if from the same team, and even if the separately sent competition entries are somehow interlinked, are evaluated individually and separately from each other. The team itself has to show-case any interlink by sending those interlinked solutions within the same competition entry.

We may need to know how much is currently being paid on heating by individuals, in order to be able to calculate if our proposal is economically suitable.

District heating prices are publicly available on Helen Ltd. website (<https://www.helen.fi/en/heating-and-cooling/district-heat/district-heat-prices>).

In addition, Finnish Energy Industries publishes district heating price statistics for different customer types – only available in Finnish (https://energia.fi/julkaisut/tilastot/kaukolampotilastot/kaukolammon_hinta).

In case of a nuclear energy solution, can the city council make its own decision on the approval and planning of a nuclear power plant project? What is your nuclear regulatory system? How does the nuclear licensing process work?

In case of a nuclear energy solution, does the city council have a plan for nuclear waste treatment and storage? What is your spent fuel disposal policy?

In case of a nuclear energy solution, what technical standard system do you follow?

In case of a nuclear energy solution, What is the public's attitude towards nuclear power?

Which country do you get fuel for your existing nuclear power plants?

Information about nuclear energy in Finland is provided by the Finnish Ministry of Energy and Employment (<https://tem.fi/en/nuclear-energy>) and the Finnish Radiation and Nuclear Safety Authority (<https://www.stuk.fi/web/en/frontpage>). As a general note, all competitors, regardless of their proposed solution, are expected to perform the necessary, light "due diligence" background research themselves. In necessary, applicants can also make assumptions and/or recommendations regarding the implementation of their proposal, taking into account the evaluation criteria.

Regarding to the Topic of Cost Impact, it is requested that the solutions should be cost feasible, is there cost range that is considered as feasible? What is the acceptable heat price?

We are looking for solutions that can be implemented and used at a feasible cost to the city and end-users. However, we have not set any cost range nor acceptable heat price. The challenge participants are required to present the total cost of their solutions and in the application phase it is enough to provide an estimation of the proposed solution's cost impact. During the co-creation phase the finalist teams will get further advice on how to present the cost impact in the final competition entry.

The current district heating prices are publicly available on Helen Ltd. website (<https://www.helen.fi/en/heating-and-cooling/district-heat/district-heat-prices>). In addition, Finnish Energy Industries publishes district heating price statistics for different customer types – only available in Finnish (https://energia.fi/julkaisut/tilastot/kaukolampotilastot/kaukolammon_hinta).

If the new project is not on the current power plant, do you have any plan or consideration on the site selection?

The site selection depends on the proposed solution. If the proposed solution requires new land area, the description of the possible land area need is adequate information in the application phase. If the challenge participants wish to do so, they may search information on the possible land areas from open source information provided in the Helsinki Map Service (<https://kartta.hel.fi/?setlanguage=en>; look to the Layer level of: "Real Estates and Unseparated Parcels and Buildings" – layer for "Available Plots"). However, the applicants should note that the maps may not necessarily be completely up to date.

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