

Helsinki Energy Challenge

Answers to the clarifying questions sent
to the organizer by 20 March

Helsinki

Käydäänkö kilpailu ainoastaan englannin kielellä, eikä suomeksi? / Is the competition held only in English, not in Finnish?

Helsinki Energy Challenge on kansainvälinen haastekilpailu ja se käydään englannin kielellä, ei suomeksi. Kaikki kilpailun taustamateriaalit on englanniksi ja myös kilpailuehdotukset tulee lähettää englanniksi. / Helsinki Energy Challenge is an international challenge competition and it is held in English, not in Finnish. All background material are in English and also competition entries have to be submitted in English.

Mihin ilmoitan joukkueeni/voin ehdotuksemme lähettää? / How can register my team and submit our proposal?

Kilpailuun ilmoittaudutaan digitaalisen hakuportaalin kautta. Se löytyy osoitteesta <https://applychallenge.hel.fi> / Competition entries must be submitted through the digital application portal available at <https://applychallenge.hel.fi>

Löytyvätkö suomenkielisest sivut mistä suunnasta? / Is the competition website also available in Finnish?

Kilpailu on kansainvälinen ja kilpailun nettisivut ainoastaan englanniksi. / The Challenge competition is international and the website is available only in English.

Why is the Challenge only open to teams?

We believe that great innovation often comes from multidisciplinary discussions and diverse teams. We therefore require teams to consist of at least two members and actively encourage large and more diverse teams. Team members can represent different organisations (start-ups, other companies, universities, research organizations, etc.) but may also be individual experts not representing any organization. The boot camp for finalists also requires team working. We encourage to team-up with others also due to the size of our challenge.

Is it possible to get more detailed datasets of the daily heat production of the CHP and heat boilers units and the amount of used fuel? The background info material is nice, but it's really hard to make a good proposal without detailed data.

This information is confidential and daily data on heat production will not be available. On annual level, the historical fuel use information can be found on the energy company Helen Ltd.'s website (e.g. <https://www.helen.fi/en/company/responsibility/responsibility-report/environmental-responsibility/carbon-neutral-energy>). The capacity figures provided in the background material together with the fuel use figures should give adequate background information in the application phase, for the participants to assess the potential and compatibility of their solution.

Is it possible to get hourly data of the district heating power 2019? You have it for 2016, but to be able to make more comparisons with the latest data from other sources, I would like to have 2019 data. Some valuable additional data is not available for 2016 or there has been major changes since 2016. Therefore detailed comparison is difficult if the data is not from the same year or is outdated.

Only 2016 data is available from Helen Ltd. but that should be adequate for the participants to prepare their proposals in the application phase. There is variation in heat demand from year to year because of many reasons, but there has not been any major changes in the heat demand drivers.

Should we present our proposal live on the internet or come there? Do we have to make a maquette of our proposal?

The applications have to be sent through the application portal, available at <https://applychallenge.hel.fi>. The teams do not have to present their proposal otherwise in the application phase. In the co-creation phase, the

finalist teams will be invited to join the boot camp in Helsinki, 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.

Do the jury believe in to the "Deep Hole" heating principle?

The jury will make the decision on the winner by using the evaluation criteria presented in the Competition program chapter 3.5. The program is available for download here: <https://energychallenge.hel.fi/about>

What confidentiality and non use obligations will the evaluation team of the City of Helsinki and their assistance have in regards to the preliminary plan of the application phase?

All evaluators will evaluate the proposals confidentially. All are bound by the obligation of professional secrecy and non use obligation, either by law or by contract.

Is it correct that the preliminary plan in the application phase will not be published by the City of Helsinki?

Due to the public nature of this competition, all submitted applications will be public after the competition prize has been paid, except the business secrets disclosed. By default, we advise you not to reveal any business secrets in your application in the application phase. If it is necessary to reveal business secrets to review the solution, the team needs to mark it clearly in the application form (instructions for how to mark the business secrets are available on the application portal). In the application form there is a field ("description of the preliminary plan/ solution") where the completed information will be used for marketing purpose if consent is given. When considering whether to give consent or not to marketing purposes, please bear in mind, that The City of Helsinki's commitment to share the solutions with other cities provides the Challenge participants with a unique opportunity to gain visibility and opportunities outside Helsinki and Finland.

What rights exactly will be granted to the City of Helsinki in regards to other plans (other than the winning plan)? (section 3.7. of your Challenge program). Only publishing the final plan as the final competition entries or also ideas and plans created during the boot camp?

The City of Helsinki has the right to use the winning plans and the ideas in them in its own operations to the extent specified in the section 3.7. in the Competition program.

All other intellectual property rights of the winning plans will remain with the winning teams. So, all intellectual property rights of other than winning plans will remain with the Challenge teams.

Due to the public nature of this competition, all submitted applications in the application phase as well as the final competition entries of the finalist teams, will be public after the competition prize has been paid, except the business secrets disclosed. All the finalists will receive further instructions for this (how to deal with business secrets in their final competition entries) during the boot camp/ co-creation phase. Also all relevant consents for using the competition entries for marketing purposes will be asked from the finalist teams in advance.

The organizer will document the essential information from the boot camp (concerning the process and the information the organiser has provided for each team) and those documents will be public after the competition prize has been paid. The public material will not contain any information that the team has specified as business secrets. Clear instructions will be provided for the teams during the boot camp.

What agreement will there be between the participants during the boot camp to safeguard their IP? Or will the boot camp be separate for each team?

During the boot camp, the teams will have information sessions together with all participants/ all teams but the teams will also have one-on-one meetings with selected industry experts and also time dedicated to the

team's own development work. The teams do not need to, at any stage, share information about their solution with other teams.

What confidentiality and non use obligations will the international jury have in regards to the final plan of the competition phase?

All the jury members will treat all the materials confidentially and will sign relevant non-disclosure agreements including non-use obligations.

I am working for the City of Helsinki as an employee of the city. How does this affect the participation? Can I still participate this competition as an individual expert with a team of other individual experts?

The competition 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. The teams must warrant that they have all relevant rights to their plans as well as the rights to use them in this challenge competition and that the use of the plan does not infringe on the rights of any third party.

It says that the final entries need to be anonymous so that jury can't know which proposal is from which team. How is this managed if the team has a well-known company as a member, with a well-known product as one of the key solutions in the proposal?

The final competition entries of the finalist teams will be evaluated anonymously by the external jury. The finalists must ensure that the submitted documents do not contain names or other information that could easily lead to the identification of certain finalist teams or team members. However, the information that is well-known within the industry, will naturally remain so during this competition. The City of Helsinki will provide further advice on this matter to the finalist teams during the co-creation phase.

How much the City of Helsinki is burning coal annually (in tonnages)? Could it be possible to get the real tonnages per year e.g. for the last 5 years (statistics purchased)? How much is this in money? How much was the annual maximum and in which year (in the last 10 years)?

Annual coal consumption in Helsinki district heating and CHP production can be found from the district heating statistics by Energy Industries:
https://energia.fi/en/news_and_publications/publications/district_heating_statistics.html#material-view. Fuel consumption in the networks is reported in energy basis. Conversion factors for achieving the consumption in tonnages can be found e.g. from https://www.stat.fi/tup/khkinv/khkaasut_polttoaineluokitus.html.

The cost of using coal depends on the purchase cost of coal for Helen Ltd., which is confidential information. However, it can be estimated based on the average fuel cost figures presented in the background report Figure 22 (Background report is available on the Challenge website: <https://energychallenge.hel.fi/heating-helsinki-today>). In addition, the revenues from electricity production with coal in CHP plants (electricity prices presented in Figure 23), CO2 emission allowance costs (Figure 24) and fuel taxes in heat production should be taken into account when assessing the cost of coal use.

How does the COVID-19 pandemia affect the timetable of this competition? Is it possible to postpone the deadline for application phase?

Due to the current situation with the corona virus/ covid-19, the organizer has decided to extend the application phase of Helsinki Energy Challenge until 30 September. This will affect the remaining timetable/ process too; the updated timetable can be found on the Challenge website: <https://energychallenge.hel.fi/process-and-timetable>. There will be webinars and other online events during the extended application phase, the timings and other details will be updated on the website when available: <https://energychallenge.hel.fi/events-and-webinars>.

Are marine debris a problem to Helsinki. If yes what are you doing with this waste? Incineration? Landfilling? Recycling?

Marine debris has not been considered a problem in Helsinki. There is a waste-to-energy plant located in Vantaa, next to Helsinki, which utilises the mixed waste from Helsinki region. Please see page 21 of the background report, which can be found from the Challenge website: <https://energychallenge.hel.fi/heating-helsinki-today>.

On application submission's section 3: supporting documents. Can a team upload more than one attachment file and more than one attachment image?

The team can upload relevant supporting attachments, if they are needed to verify the submitted answers. You can upload pdf-files or images (jpeg, jpg, png) of up to 5 MB each. It is possible to upload more than only one file or image. However, please note that the information filled in the question fields of the application form will be used as a basis for evaluation; the attachments will only be used if clarifying information is needed.

Is it possible for competitors to have access to data on district heating/cooling supply and return temperatures?

The district heating network operates at temperature levels in the range of 80–115°C on the supply side and 40–60°C on the return side. Please see background report page 20. District cooling supply temperatures are at coldest 4-8 °C and return temperatures depend on the customer's demand.

Is it possible for competitors to have access to building base temperature demands: For example how many percent of the building base needs high temperatures ($\geq 70^{\circ}\text{C}$) in sizing temperature (-26°C)?

Data on this granularity is not publicly available. However, to estimate the temperature demands of the building base you can check the buildings district heating specifications publication from different time periods by Finnish Energy (latest publication: https://energia.fi/files/1555/DH_of_buildings_PublicationK1_EN.pdf) as well as the buildings age profile in Helsinki from Statistics Finland. Of course this only represents the minimum requirements, and the actual temperature demands of the buildings is also subject to e.g. whether the building has floor heating, which does not require as high temperatures as buildings with radiators.

Is it possible to have data on CHP plant heat to power ratios?

This information is available on the background report page 22-24, where the CHP plants are described in more detail. The report can be downloaded from the Challenge website: <https://energychallenge.hel.fi/heating-helsinki-today>

Is it possible to have access to district cooling demand data?

According to Helen Ltd., district cooling demand in 2019 was 173 GWh (see: <https://www.helen.fi/en/annual-report/annual-report-2019/year-2019/business-year>).

What are the flue gas temperatures of power plants?

As there are already plans to include heat recovery from flue gas in the base load plants that are in use after the coal ban, the remaining flue gas temperatures will be fairly low.

In the documents provided we read that our submission is supposed to be a master plan on how to decarbonise Helsinki's heating. Does that mean our submission has to outline how Helsinki's heating can be made 100 % climate-neutral? Or can we also submit a plan that would only decarbonise parts of Helsinki's heating?

The main requirement is that the proposed solutions/ plans should significantly affect the cessation of coal use by 2029 and speed up the City of Helsinki's journey to becoming carbon-neutral by 2035. All proposed solutions will be evaluated according to the same criteria, which are presented in the Competition program section 3.5.

When the two CHP-plants are closed, there will also be a loss in power production. Does our submission have to include ideas on how to substitute that?

We are looking for solutions on how to decarbonise the heating of Helsinki, using as little biomass as possible. The submissions do not have to include ideas for power production.

Where can we look up the availability of land area in the Helsinki region? In the documents provided, you linked to HSY's maps (<https://kartta.hsy.fi/>), but these maps are only in Finnish. Will they be translated?

Materials will not be translated by the organizer of the competition. However, you may also use the 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"). Other information such as Lease Areas of the Land Property Development and Plots is also provided there. However, please note that the maps are not necessarily 100% up to date. On a general note, in the proposals in the Application phase of the Helsinki Energy Challenge, the description of the possible land area need is adequate information.

Where can we find any information on land area prices in the Helsinki area?

The National Land Survey of Finland maintains real estate trade statistics (<https://www.maanmittauslaitos.fi/en>). On a general note, in the proposals in the Application phase of the Helsinki Energy Challenge, the rough estimate figures are adequate.

Do you have any information on preferable feeding points within the district heating grid, especially regarding the integration of solar heat?

A background report describing the current heating system is available on the Challenge website (<https://energychallenge.hel.fi/heating-helsinki-today>). As described in the report p.19-21, the heat demand in Helsinki is largest in the city centre, and the need for the capacity is largest there. At the application phase of the Helsinki Energy Challenge, this level of information is assumed to be adequate for the competitors, and no detailed analysis of the feeding points is expected.

We can find data for 2016 for historical hourly production in Helsinki ("District heating power 2016").

- (a) Is there similar data available for 2017 and forward?
- (b) If not data from some years in the period of 2010-2015?
- (c) Do you have any data on the hourly consumption (estimates, comparisons to production or similar)?

Only 2016 data is available from Helen Ltd. but that should be adequate for the participants to prepare their proposals in the application phase. There is variation in heat demand from year to year because of many reasons, but there has not been any major changes in the heat demand drivers.

Is there any data in technical characteristics/limitations of the production plants in and around Helsinki (capacities, fuel, efficiencies, ramp rates, etc) to give a better understanding of the whole system.

As background report describing the current heating system is available on the Challenge website (<https://energychallenge.hel.fi/heating-helsinki-today>). Information on the heat production capacities, as well as description of the main existing production plants can be found on the background report, pages 21-29.

Helsinki