Helsinki

Helsinki Energy Challenge Evaluation Report

Helsinki

1. About the Helsinki Energy Challenge

In order to find the best solutions for the heating of Helsinki during the decades to come, the City of Helsinki organized the Helsinki Energy Challenge – an international challenge competition that seeks to answer the question: ***How can we decarbonise the heating of Helsinki, using as little biomass as possible?*** Helsinki Energy Challenge invited innovators, solution developers and technology providers from around the globe to propose impactful solutions that can transform Helsinki's heating.

The City of Helsinki welcomed different types of solutions to the Helsinki Energy Challenge. For example (*note – the following are examples and the list is not exhaustive*):

- New technologies for heat production and optimization, or solutions significantly disrupting, transforming or improving current heat production technologies or processes.
- Energy efficiency solutions that the City of Helsinki or its energy utility can either implement centrally or have control over the implementation otherwise.
- A competition entry could include several solutions that are complementary, or a single solution with a significant effect on future heat supply.
- Non-technological innovations, such as business or operating model innovations for city-governed organizations, and innovative policies, were welcomed as well.
- Furthermore, the proposed solutions could either be implemented as part of Helsinki's current district heating system or, solutions requiring system-level change.

The scope of Helsinki's energy challenge allowed for many different kinds of solutions to be put forward.

The key phases of the Helsinki Energy Challenge were: (1) Open application phase and selection of teams, (2) Co-creation phase and selection of the winners. The schedule for the competition was the following.

27 Feb.-30 Sept. 2020	Application phase
30 September 2020	Deadline for the applications
October 2020	Evaluation of the applications and selection of finalist teams
6 November 2020	Finalist teams invited to the co-creation phase of the Challenge
11 November 2020	Orientation webinar for the finalist teams
9-12 December 2020	Virtual boot camp for the finalist teams
22 January 2021	Deadline for the finalist teams to submit their final competition entries
February 2021	Winners selected by the international jury
16 March 2021	Finalists and winners announced

The original deadline for the application phase was 31 May 2020; however, due to the COVID-19 pandemic, the application phase was extended until end of September. This decision was taken to ensure that all interested parties had enough time to get familiar with the Challenge and to prepare their applications in the new situation caused by the pandemic, and, to give the organizer of the Challenge enough time to adapt the competition process to the new situation. Due to the extension of the application phase, the other dates had to be revised as well.

The competition is a design contest as specified in the Finnish Act on Public Procurement and Concession Contracts. A procurement notice on the competition was published in Tenders Electronic Daily (TED), the Supplement to the Official Journal of the European Union on 26 February 2020. The procurement documents (competition program) were available for unrestricted and full direct access, free of charge, on the competition website at https://energychallenge.hel.fi

A corrigendum notice for the above-mentioned schedule changes was published in Tenders Electronic Daily (TED), the Supplement to the Official Journal of the European Union, on 31 March 2020.

The language of the competition was English.

2. Application phase and selection of finalists for the co-creation phase

2.1 About the application phase

Helsinki Energy Challenge was a public competition (a design contest) which begun on 27 February 2020 with an open application phase. The application phase ended on 30 September 16:00 EET.

The competition was open to everyone globally – for example, startups, larger companies, research institutions, universities, research institutions, consortiums and individual experts. The only requirement was that to apply, the teams had to have at least two team members (persons). Team members could represent same or different organizations but also be individual experts not representing any organization.

A team could participate in a free form and different types of teams were welcome to participate: (1) One legal entity or a consortium/group of legal entities; (2) A team of individual experts not representing any legal entities; (3) A team could also be a mix of individual experts not representing any organizations, and experts representing certain organizations.

Throughout the application phase, the Competition program (describing the competition and its terms) and a background report (describing the current heating system in Helsinki) was available for download free of charge from the Challenge website, energychallenge.hel.fi. All applicants were also allowed to ask clarifying questions. The questions had to be submitted via the form available at the Challenge website and all questions and the organizer's answers to them were published on the website. The schedule and deadlines for questions were available on the challenge website as well as in the Competition program.

All materials were available on the Challenge website until the end of the competition

The applications including information about the team and team members and a preliminary version of team's proposed plan had to be submitted through the application portal available at energychallenge.hel.fi by 30 September 16:00 EET. Only applications written in English and submitted through the portal by the given deadline, and that met the requirements set for the team and that were compliant with the competition program, were accepted to the competition.

Moreover, webinars and webcasts were organized; the webinar recordings were added to the Helsinki Energy Challenge website.

Due the COVID-19 -pandemic, the planned "event road show" was cancelled. The physical events were planned to support the team formation and innovator networking. Due to the cancellation of the physical events, the City of Helsinki opened an online Collaboration Platform for the Helsinki Energy Challenge to support team formation and innovator networking. The platform provided an opportunity for the potential applicants to find a team or offer a position in a team.

252 applications were sent by the deadline by teams from 35 countries from all over the world. From all applications, **27** were disqualified, and **225** applications were evaluated and scored.

2.2 The evaluation and selection process

The aim of the first evaluation and selection process was to select a minimum 3 and a maximum 15 teams to proceed to the co-creation phase of the competition. All applications were evaluated from the following two perspectives:

1. The team (3/10 points): (1) The team's expertise relevant to the solution that the team proposed; (2) The diversity of relevant expertise represented within the team; (3) The team's experience in the energy sector or in developing or implementing energy technologies or systems.

2. The proposed preliminary plan* (7/10 points): when evaluating the proposed plan, the following evaluation criteria were used: climate impact – impact on natural resources – cost impact – implementation schedule – implementation feasibility – reliability and security of supply - capacity. Due to the nature of the competition, these criteria did not have any specific weight or order of importance. (**In this competition, the competition entries were plans on how to decarbonise the heating of Helsinki using as little biomass as possible; so the plan proposed by a Challenge team could include one or more technological or other types of solutions.)*

To be able to evaluate the proposed preliminary plans against those criteria, the applicants were asked to provide information about the team and their proposed plan in the application form.

The selection of the teams was done by the City of Helsinki, with the assistance of external industry experts. The evaluation process started on 1 October and ended on 5 November, 2020.

The applications were read, evaluated and scored and eventually shortlisted with the help of Afry Management Consulting (several industry experts from Afry were involved and consulted).

The shortlisted applications were then also discussed with a larger group of experts who were from the following organizations:

- VTT Technical Research Centre of Finland Ltd
- Lappeenranta University of Technology
- The Finnish Energy
- Finnish Environment Institute
- VATT Institute for Economic Research
- Ministry of Employment and Economy.

This larger expert panel did not get access to all applications but gave further insights that facilitated the selection process. For example general comments concerning the operating environment as well as maturity of certain technologies were discussed. The multidisciplinary insights of the expert panel helped finalize the selection of the finalist teams.

The expert panel was granted access to the short listed applications anonymously, commenting on the proposed plans and solutions without seeing the team behind the proposal. In the case that an expert panel member was from the same organization than the applicant, that specific application was not given to that expert panel member nor could that member comment on the application.

The applications and their scores are presented in Appendix *(Helsinki Energy Challenge applications and their scores)*. When scoring the applications, the purpose and overall nature of the competition, and all received applications, were kept in mind. This means that a weak score does not necessarily mean a weak team or a weak plan in general; rather, weak in terms of the purpose of this competition and when compared to all received applications.

The disqualified applications were non-compliant with the competition program, due to one or more of the following reasons: requested information was not provided in the application form, the application did not correspond to what was requested, the application was not prepared in English, the required minimum number of team members was not met. A list of disqualified application can be found in the Appendix.

2.3 The finalists for the co-creation phase

After the evaluation process, 10 applications were selected to proceed to the co-creation phase of the competition; all finalists had a total score of 10 points. The selected finalist teams were:

- Smart Salt City
- Going Deep
- Use It or Lose It
- Hive
- Sustainable Heat Coalition
- The Hot Heart
- Beyond fossils
- CHP Consumers to Heat Producers
- CarbonHelSinki
- Flexible Future

All finalist teams were informed about the selection on 6 November 2020 and invited to join the co-creation phase of the competition.

3. Co-creation phase for the finalists

The 10 finalist teams proceeded to the co-creation phase. The aim of the Helsinki Energy Challenge co-creation phase was to support the finalist teams to further develop and finalize their proposed solutions to fit into the context of Helsinki. So, in the application phase, the teams submitted the proposed plan as a preliminary version which they then updated and further developed during the co-creation phase, having become more familiar with the Helsinki-specific situation

In the beginning of the co-creation phase, there was an orientation webinar (11 November) about the next steps and the upcoming boot camp, including a Q&A session.

The core of the co-creation phase was an intensive 3-day virtual boot camp (organized 9-11 December). During the boot camp, the teams had information sessions together with all participants, one-on-one meetings with industry experts and time dedicated to the team's own development work. Further insights and mentoring was provided. The teams met with representatives of the City of Helsinki and the city-owned energy company Helen, as well as other industry experts.

The teams were allowed to define their needs before the boot camp through a questionnaire that was sent to all finalist teams. Each team received feedback on their preliminary plans presented in the application phase and all teams received further instructions on what was expected from their final competition entries. The preliminary information on what was expected in the Phase 2 compared to the Application phase, was available in the competition program to all applicants since the launch of the competition; more precise and detailed instructions were provided to all finalist teams during the co-creation phase.

After the boot camp the teams were still allowed to put their clarifying questions to the organizer; all questions and their answers were sent to all finalist teams.

All finalist teams submitted their final competition entries through the application portal by the given deadline, 22 January 16:00 EET.

4. The jury work – evaluation of the final proposals and jury's decisions

4.1. Jury members

The external jury made its decision based on its evaluation of the final proposals. The people involved in the evaluation and selection process in the Application phase, were not involved in the decision-making.

The jury was appointed by the City of Helsinki and the jury members were:

- **Hans Jørgen Koch**, Senior Adviser, Nordic Energy Research
- **Markku Ollikainen**, Chair of the Finnish Climate Change Panel; Professor of Environmental and Resource Economics, University of Helsinki
- **Robert Stoner,** Deputy Director, Science and Technology, MIT Energy Initiative; Founding Director, MIT Tata Center for Technology and Design
- **Sanna Syri**, Professor, Energy Technology and Energy Economics, Aalto University
- **Brian Vad Mathiesen**, Professor, University of Aalborg
- **Martin Young**, Senior Director, Scenarios and Business Insights, World Energy Council

4.2. The jury work - process

The jury members got access to the final competition entries on Friday 22 January in the evening. The jury members had three weeks to read the final competition entries and to evaluate them against the set evaluation criteria.

The jury discussed the competition entries and made their joint decision during two jury workshops on 16 and 17 February 2021. The workshops were held virtually.

The jury evaluated all final competition entries anonymously. The final competition entry documents that the jury reviewed and evaluated did not contain names or any other information that could have led to the identification of certain finalist teams or team members. Only the team name – that did not contain the names of the team members – was visible for the jury.

The finalist teams and the content of their competition entries were revealed by the organizer of the Challenge only after the jury had made their decision; they were revealed on 16 March whereas the jury had made its decision 17 February.

4.3 Evaluation criteria

The proposed plan formed 100% of the evaluation; the teams were not evaluated at this final phase of the competition. The jury only evaluated the final competition entries and did not have access to the application phase proposals.

The jury used the following evaluation criteria which were further defined in the Competition program:

- Climate impact
- Impact on natural resources
- Cost impact
- Implementation schedule
- Implementation feasibility
- Reliability and security of supply
- Capacity

These criteria did not have any specific weight or order of importance.

4.4 Results - decisions of the jury

Overall, the jury considered the finalist proposals to be interesting and noted that there are interesting approaches and solutions involved – existing, familiar technologies combined in different ways and new, emerging technologies. Alongside technical solutions, "non-technical" solutions, market-based approaches.

Instead of selecting one winner and awarding the main prize to one team, the jury recommended sharing the prize among the four strongest proposals. None of these proposals clearly outperformed the other proposals, nor, was such that could alone solve the heating challenge of the City of Helsinki, and, merit the main prize alone. Each proposal had some critical shortcomings against one or more of the evaluation criteria. However, four proposals were stronger than the rest of the proposals as judged against the evaluation criteria, and, each of them contained promising elements that could potentially be utilized in the transition to a future-proof heating system

The jury recommended sharing the prize among these four strongest proposals, which are:

- **HIVE:** jury recommended highest share of the prize to HIVE

- The jury recommended an equal share of the prize to the following three teams:
    - **Beyond fossils**
    - **Smart Salty City**
    - **The Hot Heart**

See the jury's evaluation and reasoning below.

4.5 Jury's evaluation - the award-winning proposals

HIVE

Hive is a strong proposal involving different technologically viable solutions and many different elements needed in the future zero emission district heating system. The presented plan is flexible enough to warrant updating, and climate-wise ambitious enough. The proposal includes a large number of technical solutions and is considering the local system and its needs. The proposal relies on existing technologies, which makes it rather feasible for implementation in the required timeframe.

These above-mentioned aspects make the overall proposal strong in terms of implementation feasibility and schedule as well as capacity.

The flexibility of the heating system and the possibility to introduce new, different technologies is an important aspect. The plan is flexible with regards to the technology choices. The supply technologies in the proposal include seawater heat pumps, solar thermal, electric boilers and substantial storage capacity, as well as demand side management measures. Although the presented storage capacity is substantial, its implementation seems feasible. Also the presented amount of solar thermal seems feasible for Helsinki's context. Seawater heat pumps and solar thermal are not currently used in Helsinki's heating system, but are, however, known and established technologies.

All these aspects positively affects the implementation feasibility and implementation schedule as well as the capacity of the presented plan.

However, the proposal included such critical shortages due to which the proposal did not qualify as the sole winner of the competition.

One of the core technologies to produce heat in this proposal was seawater heatpumps. Regarding this technology, the jury had some questions about the costs and implementation feasibility, mainly, as the proposal has not analysed the local conditions and technical requirements for implementing the technology in detail enough. However, it is important to note, that the plan is flexible as regards to the technology choice. The decrease of the district heat temperature is part of the overall plan, but, there are no concrete examples or demonstrations as to how this can be achieved in Helsinki. In addition, this would include high costs on building level investments, relying too much on the decisions of the building owners. These affect negatively the implementation feasibility of the overall plan. Moreover, winter-time district heat production in peak demand times would rely on natural gas and/or electricity used directly in heat-only boilers, which is not optimal in terms of climate impact and reliability.

The plan also included replacement of natural gas in addition to coal, and goes beyond 2029. The overall plan is still relying heavily on biomass, although no new investments in biomass boilers beyond the current plans, was proposed; the plan only utilizes the Vuosaari biomass plant where there already is an investment decision, and in that sense, the proposal follows the instructions of the competition. However, the use of that biomass-fired plant as more than just back-up capacity, somewhat negatively affects the proposal's overall, long-term climate impact and longer-term impact on natural resources.

All in all, a strong proposal with many strong elements.

Beyond fossils

The core of this proposal is a market-based solution – criteria-based, but technology neutral auctions, which is an interesting idea in terms of driving the journey of decarbonizing the heating system of Helsinki. The proposed auction method gives flexibility for production investments, which is important given the rapid evolvement of new technologies. With this solution, there is no need to bet on the winning future solutions now. The clear benefit of this proposal is that it would not lock the city to any specific technology or to large-scale, uncertain investments; repeated auctions could be a way for Helsinki to avoid the risk of technology choice. The auctions are also flexible in relation to the needed capacity, as the auction volumes may be increased if the demand is higher and vice versa. Well-organized auctions can decrease the cost of heat for the consumers as a result. Especially the presented Category B type of auctioning would be an interesting approach, supporting investments to emission-free production and opening district heating markets. The city would be able to determine the terms of the category B auctions, such as "no biomass and no fossil fuels". Category A was deemed unnecessary, as these investments are already taking place without city-level financial support.

All these above aspects make the proposed plan rather strong especially in terms of its climate impact, cost impact and impact on natural resources.

However, there is a high risk that setting up the auctions and getting them to function effectively would take longer time, and that it would not be possible to implement this proposal in the planned capacity by 2029. In addition, the auctions as presented in the plan would not solve the problem of heat production during cold winter times, when most capacity is needed, unless the requirement to produce during peak demand times is specified as compulsory criterion. Thus, there are risks in terms of the implementation schedule as well as the security of supply and capacity. In addition, the proposal relies on experiences from electricity market, which is different from the heating market. Even though the presented marked-based approach could potentially work in the heat market as well, the overall implementation feasibility and schedule of it, as well as its true cost impact, remains to be seen. Therefore, it might be advisable to test it in smaller scale first.

The Hot Heart

The Hot Heart is a unique and ambitious proposal. The proposal would make it possible to shift from fuel use to electricity-based heat production with large storage capacity. This proposal would also make it possible to replace biomass use in Helsinki, besides the fossil fuels. The proposal is also flexible, heat can be produced with different kind of heat pump solutions, waste heat and other electricity-based heat sources. The proposal is scalable, it can be implemented in many other cities globally, and it is a sustainable solution for the future district heating systems.

The above mentioned aspects make the proposal rather strong in terms of its impact on natural resources, capacity and climate impact. The plan is also rather strong in terms of security of supply.

However, there is a risk that it would not be possible to implement the solution by 2029. This is especially due to the potential risks of building to the vulnerable sea area in front of Helsinki, with potentially very challenging wintertime ice conditions. Environmental impacts have to be assessed in detail and acquiring the necessary permits might take more time than expected. The costs of building the huge storages, “the islands”, seem to be somewhat too optimistically estimated and could be significantly higher than estimated. Thus, there are clear risks and uncertainties in terms of the cost impact as well as implementation schedule and implementation feasibility of this solution.

Smart Salt City

This proposal is a high promise solution - for Helsinki, but also for other cities. The proposal includes an ambitious plan to use new technology for energy storage (TCES, thermo chemical energy storage). The combination of proposed technologies appears reasonable and conventional, apart from the chemical storage. The proposal supports the overall targets of the transition of the heating system very well and has a high long-term potential. The impacts on the greenhouse gas emissions are substantial, and the plan supports the circular economy development and decarbonised energy systems. The proposal also includes a bonus track for carbon capture utilisation and storage (CCUS), which could be an interesting option to be introduced to the district heating system in Helsinki. There is also an interesting scheme for forecasting and heat use optimization. The reduction of peaks with forecasting and DMS are considered as important parts of the future district heating systems

The above-mentioned aspects make the proposal especially strong in terms of its climate impact and capacity. The proposal is also rather strong in terms of its impact on natural resources.

However, the jury had concerns about the technological maturity of the proposal; the proposed timeline does not seem realistic. In addition, the cost estimations were not presented in enough detail to be convincing. Thus, the plan was seen risky in terms of its implementation schedule and feasibility, as well as cost impact, and somewhat also in terms of its security of supply; however, it is a highly promising proposal for the future.

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4.6 Jury's evaluation – other finalist proposals

CHP Consumers to Heat Producers

CHP proposes a market-based approach to the challenge, aimed at improving the functioning of the heating market in Helsinki. The plan proposes changes to the market model and pricing structures, which would enable maintaining district heating as a platform for decentralized producers too. This way, the proposal aims to bring the concept of CHP, utilization of waste heat for district heating, to the new century. The proposal shows a good understanding of the core of the challenge in district heating markets in Finland from many relevant viewpoints and stakeholders. The presented plan includes some new types of pricing structures, such as a feed-in tariff for heat producers as well as a hybrid-tariff for "hybrid heat users and producers", which looks to the challenge from new perspective and encourages also hybrid heaters to stay connected to district heating system. Demand management was also presented as part of the proposal.

However, overall, the jury found the plan to be risky considering the magnitude of the challenge and the timeframe the City of Helsinki has to phase out coal. According to the jury, the plan also includes some too optimistic assumptions in terms of capacity savings in relation to the demand side management. The new market set-up and dependency on consumers and variety of different heat producers can be seen as somewhat risky - in terms of actual overall costs, implementation feasibility and schedule as well as security of supply. Overall, in terms of the other evaluation criteria (climate impact, impact on natural resources, capacity) the proposal did not stand out either. However, it includes interesting thinking and a very bold new approach to a new kind of heat market for Helsinki.

Going Deep

This proposal includes many solutions and sources for Helsinki's heat supply. The increased intelligence of the system and orientation towards power-to-x production system are seen as positive elements. The suggested power-to-X solution would provide reduction of GHG emissions. Also an interesting idea for property taxes based on energy use is included.

However, the jury had doubts about the technological feasibility of the proposal. In addition, the plan makes extensive use of electric boilers, and the proposal was not fully in line with the optimal function of the electric market. Also, a considerable amount of deep heat production in a relatively small city area may turn out more difficult than estimated.

A somewhat unfortunate feature is the lock to burning biomass for a longer period of time

Due to the above-mentioned issues, the proposal is evaluated as weaker when compared to the strongest proposals, especially in terms of implementation feasibility and impact on natural resources. The proposal was also seen as less strong in terms of cost impact, implementation schedule, security of supply, and capacity, making it less strong than the highest-ranking proposals overall.

CarbonHelSinki

This proposal is based on different solutions and heat sources. The proposal is strong in not relying on biomass and it targets the maximal use of waste heat and renewable energy sources. The included technologies are well established. The plan for the Eastern Helsinki energy hub and renovations are seen as an interesting idea, bringing additional social benefits. All these elements are positive and such that make the plan rather good in terms of its climate impact, impact on natural resources as well as capacity. The proposal seems rather good in terms of implementation schedule as well.

However, a key component in this proposal is using waste heat from the Kilpilahti refinery area (Neste) by building a pipeline to bring the heat to Helsinki. This may be a very costly and very complicated task, as well as risky. The long-term availability of heat from the Kilpilahti area is uncertain, since Neste cannot promise that it will continue operating in the area. Also the idea of decarbonizing the heating of a city with high dependence on an oil refinery, seems questionable, as there is no guarantee that the refinery will shift to biofuel production in near the future. The cost of the heat sourcing from the refinery area was also considered somewhat uncertain. Due to all these aspects, the proposed plan was seen less strong in terms of its overall cost impact, implementation feasibility and the reliability and security of supply as well.

Sustainable Heat Coalition

This proposal relies on solar thermal plants, centralized seasonal heat storage, decentralized short-term heat storage, intelligent platform and demand side response program. The strong sides of this proposal are that the consumption of resource would be small, it is a scalable, modular solution, providing much flexibility and uses proven technologies (although, peak storage relies upon novel materials).

However, the plan was less strong in terms of it's implementation schedule and feasibility, due to the following factors: (1) time schedule may be too tight given the changes in land use and slow environmental permitting process in Finland; (2) Solar thermal requires large land areas, which are not so easily available in Helsinki; they would have to be put in the private lands in nearby cities, thus, making the implementation very risky, and possibly even not feasible. While solar thermal may play a role in the overall heating system, the role proposed in this proposal seems very large. Strong reliance on one heat source may be problematic. This makes the proposal less strong in terms of reliability and security of supply, as well as capacity throughout the year. The proposal did not standout in terms of climate impact, impact on natural resources and cost impact either.

Even though the proposal includes interesting elements, such as promotion of the use of solar heat, it is less strong compared to the strongest proposals in this competition, when evaluated against the evaluation criteria

Use it Or Lose It

This is an interesting and unique proposal. In case the proposed solution would be feasible to implement, it would provide access to a potentially substantial amount of waste heat, without the need to invest in heavy and costly infrastructure. Also its potential capacity to replace the coal-fired heat production would be good, making it also rather good in terms of climate impact and impact on natural resources and potentially also in terms of the implementation schedule.

However, there are doubts about the estimated total costs of the solution. The jury assessed that not all relevant cost items were included in the presented plan, such as some costs related to the ships and especially the cost related to the supply of the heat from the Fortum nuclear power plant. Also, the plan is not very strong in terms

of implementation feasibility - in light of the interaction with the nuclear plant, harbor infrastructure as well as the current district heating network (would modifications be needed to accommodate the new source?). The proposal is also rather weak in terms of its reliability and security of supply - ships might break down and there can be difficult winter conditions. Most importantly, the nuclear plant in Loviisa is old, and there is no certainty of how long it will operate in the future. The same goes for the nearby Kilpilahti area, which is presented as an alternative source of heat. To be stronger against the evaluation criteria, the proposed solution should be combined with other solutions and heat sources. Even though this could provide a solution, and can be considered a unique idea, it does not standout in this competition when evaluated against all evaluation criteria. Also, it cannot be considered as a long-term sustainable and viable solution as it would not contribute to the creation of future-proof heating system.

Flexible Future

Flexible Future proposes a practical plan with use of existing technologies. The proposal aims at improved efficiency of the existing energy infrastructure using current centralized energy production and installing new decentralized technology, both integrated in the Virtual Battery Platform. The proposal identifies a large potential of heat recovery from houses, shopping malls and other buildings, which are presented in detail. These are the strong aspects of the proposal.

However, the challenge with this proposal is the integration of houses and others to active production - how to do it without high transactions costs? In addition, the approach relies heavily upon energy efficiency savings across different building categories, but, it is unsure whether these savings are achievable in the presented scale or timeframe. The assumed amount of energy savings/ demand shifting by ICT solutions do not seem realistic. In addition, the plan calls for a significant amount of investments in heat recovery from hospitals, skating rinks, grocery stores, etc. that use extensive refrigeration. Thus, the plan is not seen as very strong in terms of its implementation feasibility and schedule, as well as overall costs. The plan is not standing out strongly in terms of security of supply, impact on natural resources, capacity and climate impact either.

Interesting proposals in terms of the energy saving measures and potential decentralized sources of waste heat, which are very important. However, considering the size of Helsinki's heating challenge and all the evaluation criteria, the proposal overall does not stand out strongly compared to the strongest proposals.

4.7 Signing off the evaluation report – jury work and jury's decisions

The jury confirmed and signed the information concerning the jury evaluations and decisions given in Chapter 4 of the evaluation report.

Hans Jørgen Koch

Markku Ollikainen

Robert Stoner

Sanna Syri

Brian Vad Mathiesen

Martin Young

5. Recognition award

The City of Helsinki decided to award a recognition award to team CHP Consumers to Heat Producers. The proposal shows good understanding of the core of the challenge from many relevant viewpoints and stakeholders. The proposal comprehensively describes the diversity of the heating challenge and relevant stakeholders and as such, works as a good tool for the City of Helsinki. The proposal contains elements that the City should consider regardless of which solutions will be implemented in the future.

6. Awarded teams and other finalists

The jury evaluated the finalist proposals anonymously and the team members behind the proposals were not revealed until the jury had made its decisions.

The team members in the awarded teams:

HIVE:
STORENGY: Philippe Aubry
NEWHEAT: Julien Metge
ENGIE: Romain Donat, Sandrine Bosso, Valentin Gavan, Jean-Baptiste Débonnaire, Albin Popot
PlanEnergi: Daniel Trier
AEE INTEC: Ingo Leusbrock
SAVOSOLAR: Laurène Mejean

Beynd fossils:
VTT Technical Research Centre of Finland: Åsa Hedman, Tomi J. Lindroos
Finnish Environment Institute (SYKE): Karoliina Auvinen, Hannu Savolainen
Hansel: Pasi Tainio
Aleksi Lumijärvi

Smart Salt City:
SaltX Technology: Corey Blackman, Eric Jacobson, Magnus Ekblad, Lars Croon, Michele Pressiani, Pankaj Gujarathi, Carl-Johan Linér, Nadia Amirpour, Boo Ljungdahl
Rebase Energy: Ilias Dimoulkas, Sebastian Haglund, Mihai Chiru

The Hot Heart:

Carlo Ratti Associati: Carlo Ratti, James Schrader, Alberto Benetti, Chenyu Xu, Stephanie Lee, Rui Guan
Ramboll: Jouni Laukkanen, Mika Kovanen, Kreetta Manninen
Transsolar: Thomas Auer, Monika Schulz, Alice Chevrier, Helmut Meyer
Danfoss / Leanheat: Jukka Aho, Juho Nermes, Lauri Leppä, Oddgeir Gudmundsson
Schneider Electric: Jan Mattsson, Jani Vahvanen
OP: Kaisa Ahtiainen
Squint/Opera: Alice Britton, Manu Sainz, Tom Law, Kelly Woodward, Svenja Schlossarek

The recognition award, CHP Consumers to Heat Producers:
Helsinki Energy Designers: Perttu Lahtinen, Minna Näsman, Ossi Porri

APPENDIXES

Helsinki Energy Challenge applications and their scores

Disqualified applications