

Clean Vallisaari
Innovation Competition

Jury Evaluation Report

1 September 2016

Introduction

Helsinki's closed fortress islands Vallisaari and Kuninkaansaari have opened to the public in spring 2016. This innovation competition sought ideas and solutions that support the on-going development of the islands and contribute new insights to the story of the islands. Vallisaari and Kuninkaansaari are seen as a possible platform for showcasing Finnish know-how in development and deployment of clean technologies and solutions. The organizers, City of Helsinki and Metsähallitus, were looking for innovative ideas and solutions for solving water, waste and energy management in an island environment and in a way that respects the unique nature and cultural values of the islands, creates new jobs and business opportunities and enables a minimum environmental footprint of the proposed development. The ideas and solutions were also meant to address the needs and perspectives of the visitors and add to the appeal of the islands.

The competition supports the work of the City of Helsinki as one of the city's reference cases in the Smart & Clean development scheme, which aims to launch significant new projects and enables piloting Finnish know-how in the field of clean technologies.

The aim of the competition was to find feasible smart and clean solutions and possible partners to cooperate with for the future development of Vallisaari and Kuninkaansaari. The competition prize was EUR 30.000, which was to be distributed at the jury's discretion among the best entries. In addition to the monetary reward, it has been envisioned that the overall concept and technical solutions of the islands will be further developed in collaboration with the winning participants.

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The competition

The competition assignment

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Competition procedures

The competition was open for companies, educational and research institutions, associations and other organizations and individual experts. The competition time was from 1 March to 23 May 2016. All the competition material, links and instructions for registration, questions and submitting proposals were published at competition web page www.hel.fi/clean-vallisaari. The organizers arranged a voluntary site visit to Vallisaari for registered participants on 20 April.

The submission deadline occurred on May 23, 2016. To maintain anonymity in the competition, all files must be clearly marked with the pen name to identify the entries.

After the jury's decision of the competition result, a public display of the submitted entries (A1 poster presentations) is arranged in conjunction with the publication event.

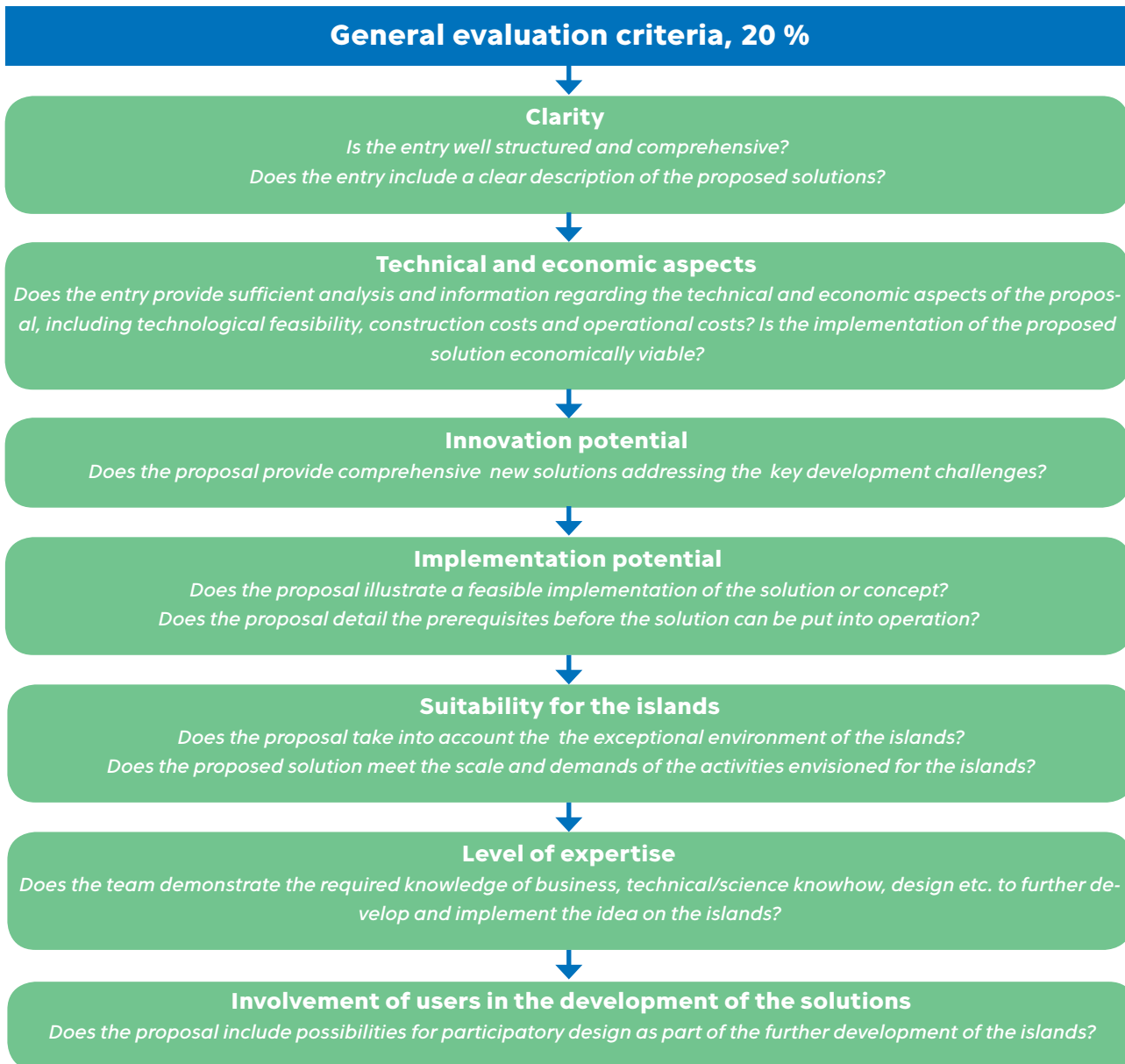
Jury evaluation procedure

The jury visited the site in Vallisaari at the beginning of May 2016. Jury gathered on 21 June to a workshop meeting and on 10 August 2016 to decide on the results of the jury's evaluation of the proposals and distribution of the prize sum among the successful proposals. Jury had available an expert group's evaluation of the proposals, prepared with a focus on providing a thorough basis for the work of the jury with regard to the aspects covered in the proposals and their accordance with the competition program.

Submissions were evaluated and judged anonymously in the meetings of the jury as well as preliminary evaluation of the group of experts.

The evaluation criteria

The general evaluation criteria reflected the issues identified as the common quality criteria for the proposals. Proposals were required to demonstrate adequate performance regarding the general evaluation criteria. The evaluation criteria "Unique island experience" and "Sustainable technologies and solutions" reflect the sustainability criteria developed for the islands as part of the general plan (Metsähallitus, WSP, Verstas Architects, Tmi Lauri Putkonen, 2015) and the specific challenges and opportunities identified for the future development and cooperation. The teams were not requested to fulfill all criteria regarding the unique island experience and sustainable technologies and solutions, but proposals addressing more than one theme had a possibility to benefit from being able to cover several criteria, indicating overall sustainable development possibilities. The jury had also a possibility to reward proposals that demonstrate excellent performance with regard to one of the competition themes.



Jury's evaluation

The proposals included several innovative and creative solutions addressing the criteria. Most of the proposals presented a large amount of solutions, and several proposals included ideas that could be further developed. Technical solutions included several innovative and ambitious ideas. Many proposals also provided solutions for the user interface, with the view to adding to the experience of the islands and raising awareness on sustainable use of resources. However, the unique Vallisaari experience

would have deserved more thinking and emphasis. The unique nature and cultural heritage values of the islands were often in the background and members of the jury would have expected more consideration of the feasibility, maintenance and life-cycle aspects, potential synergies with closeby islands or analysis of experiences elsewhere. There is also a need for further consideration in terms of providing a clear differentiation or selling point for the proposed concepts that would attract investments.

Unique island experience, 30 %

Image of the islands
Does the solution have potential to enhance the reputation, image and visibility of the islands?

Visitor experience
*Does the solution add to the experience of the islands?
How?
Can the solutions be showcased to the public?*

Wellbeing and quality of life
Does the solution enhance wellbeing and make use of the unique environment of the islands? How?

Cooperation
Does the proposal provide possibilities for cooperation with other functions on the islands?

Unique nature and cultural values
Is the proposed solution adequately fitted for the valuable nature and the scenic and historically valuable surroundings of the islands?

Sustainable technologies and operations, 50 %

Sustainable implementation
*How long is the estimated lifecycle of the solution?
Can the solution be updated to improve performance?*

Competitiveness and business possibilities
Does the proposal provide new business possibilities and jobs?

Impact on the environment
*Does the solution enable reducing the impacts on the environment compared to conventional solutions?
Are the benefits showcased ?*

Resource efficiency and closed loops
Does the solution enable improved resource efficiency and closed loops?

Sustainable energy solutions
*Are internal energy resources and waste heat utilized efficiently?
Will the energy system provide a possibility to reach a sustainable solution?*

Sustainable water supply and sewage treatment
*Can the sewage treatment be organized locally?
Is the use of local fresh water resources sustainable?*



Results

Altogether 12 acceptable proposals were received to the competition. Besides the uniqueness and tourism perspective each proposal highlighted technical solutions for the islands. Practically every proposal presented ideas and solutions to exploit in the future.

However, no clear winner proposal emerged. The jury assessed two proposals preferable to others in meeting the evaluation criteria accurately and balanced.

Therefore the jury decided to distribute the competition prize to following entries. Two best entries are in alphabetical order.

12.500 €

Precious Vallisaari

12.500 €

Virgin Island

2000 €

Theme prize, category Innovative solutions for user interface and systems management

My Vallisaari Experience

1500 €

Honorable mention for achieving a good balance of technology and nature

Haven Islands

1500 €

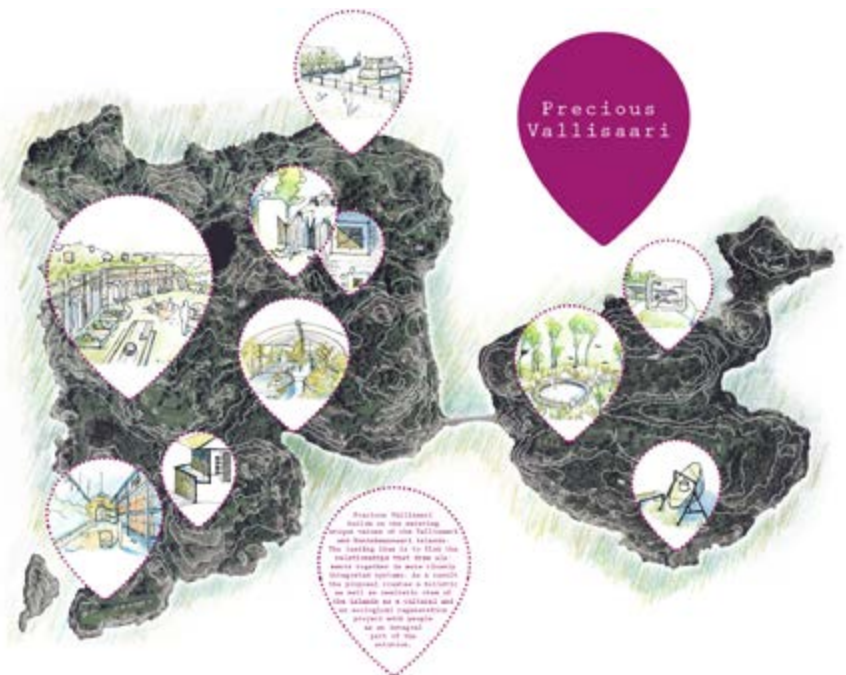
Honorable mention for an innovative solution of energy management concept

Islanders

Description and justification of awarded entries

Precious Vallisaari

Human centric experience differentiates the proposal well. Greenhouses and local food production are interesting ideas. Circular economy is a good starting point for further development. The entry contains innovative elements. Comprehensive, well thought proposal that also incorporates the learning experience.



Abstract written by the competition team

Precious Vallisaari builds on the existing unique values of the Vallisaari and Kuninkaansaari islands. The proposal utilizes the potential of the islands for the future development at the same time preserving and enhancing the existing values. The islands have the opportunity to serve as an example of innovation and a pioneer in sustainable development; to show up as “the future islands”.

The proposal addresses the three themes of the competition: (1) Sustainable water supply and sewage treatment, (2) sustainable energy solutions and efficient use of materials and (3) innovative solutions for user interface and systems management. The leading idea is to find the relationships that draw elements together in more closely integrated systems. Activities on the islands will be based on circular economy in a way that new solutions combined with known best practices create a positive ecological footprint. Solutions can be

further developed through learning and research that also support City of Helsinki to have one more reference case in the Smart & Clean development scheme.

All the functions of the island will be organized along so called zoning principle. The five zones indicate the level of intensity of the uses and the forms of technologies used for energy and water supply as well as waste management and food production. The zoning is based on the potential of functions and productivity in different parts of the islands. This helps in locating different functions to suitable places and finding the most appropriate systems solutions for each place.

The primary starting point for the islands functions is to minimize energy and water needs and to reduce the demand for outside resources. All the functions aim at capturing local flows of energy and water recycling. Energy, water and food production is based on circular economy inside the islands internal processes.

The proposed technologies already exist, but are constantly evolving. Different operators can showcase their latest technologies on the islands. Small function units, developers output as well as lower consumption make the solutions also economical. The capacity of small operating units can be easily enhanced, or the techniques can be combined to create a larger grid, if the number of visitors and the production is set to a steadier level in the future.

Water, energy and food production make use of the local resources and gives people new ideas of self-sufficiency. All the solutions take into account four seasons

and are flexible in terms of the need for growing capacity in the future.

All the presented ideas and solutions add value to the visitors and entrepreneurs operating on the islands. First of all, human scale, long-lasting and energy-efficient products and solutions help users to reduce consumption. Secondly, the effectiveness of innovative and energy efficient products and activities encourage for further application also outside the islands. As a results this proposal creates a holistic as well as realistic view of the islands as a cultural and an ecological regeneration project with people as an integral part of the solution.

Virgin Island

The proposal emphasizes self-sustained systems and proposes a compelling basis for creating a showcase for clean technologies. Self-sufficient water systems, innovative dry toilets and hovering structures are examples of the good ideas. User experience is nicely incorporated and the proposal allows for phased development. Some of the proposed solutions might not be entirely feasible and the business concept would need further elaboration.



Abstract written by the competition team

Virgin Island will make Vallisaari a global forerunner in sustainable and inclusive eco-tourism. We will create an ecologically sound, culturally unique inspirational destination that fosters continuous and dynamic innovation, challenges minds and enables cleantech businesses to harness the creative powers of the public for a better, cleaner tomorrow.

Virgin Island builds on conserving and protecting a unique nature and culture. We have concentrated new constructions and functions into the existing caves and structures. Seasonal fluctuation in visitor numbers is

accommodated by using Modular Floating Structures for intrusive activities such as restaurants and attractions.

Necessary infrastructure, including cables and drains, is hidden under hovering pathways that both contain future wear and tear from walking and eliminates the need for disturbing construction work. The four guiding principles are:

1. Avoiding or minimizing water, energy and resource consumption

2. Creating an inclusive and interactive visitor experience
3. Constructing a world class platform, the Cleantech ShowCave, for developing and testing cleantech innovations
4. Innovative funding

1: Resource use: Clean technologies, closed water circuits, and fractioning water streams minimize water consumption and sewage treatment needs. Local renewable energy production is based on organic waste, solar, eolic, tidal and geothermal energy. Targets for maximum energy consumption level are set by local renewable energy production capacity. The most energy efficient solutions are selected for testing and performance is continuously monitored against the target. Businesses operating on the island are urged to plan their operations so that the need for energy and resources is minimized and waste avoided.

2: Visitor experience: Visitors are treated to a virginal nature experience through careful preservation and restoration of the natural state of the island. Restored caves and buildings add a dimension of original cultural history experience.

3: The Cleantech ShowCave -concept: Through the Cleantech ShowCave -concept, businesses are invited

to develop, test and showcase innovative solutions for the island's varying needs. It will boost sustainability awareness, and enable innovations to reach global markets. Visitors are encouraged to share ideas, and to experience and test new innovative concepts in practice. Examples include smart renewable energy production, water purification systems as well as novel cooking, food storing and dry toilet solutions. User feedback on the tested solutions is constantly collected and used in further development. As development proceeds, the best solutions are selected for replication. Visitors and people globally can participate through gamification, and contribute to developing solutions and selecting attraction themes – onsite and through online platforms.

4: Innovative funding: The concept includes a cost efficient financing model, where the owner pays for the basic solution, cleantech solution providers invest in their showcase and utilization of crowdfunding enables visitors and others to influence the development of the island, within the limits of strictly set sustainability criteria. The concept will enable Vallisaari's owners to preserve the nature and invest in cleantech for the island whilst participating in technology development and green job creation – a green growth platform at its best.

My Vallisaari Experience

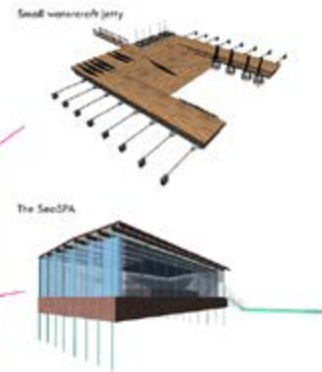
This proposal focuses on competition theme 3: innovative user-solutions and system management.

The proposal introduces a portal that would be a good way to engage both users (visitors) and service providers to communicate and develop new services to Vallisaari. Good description of potential user groups: foreign tourists, people with small boats, locals interested in nature and history.

The proposal includes a possibility to involve third sector operators, e.g. sports and cultural clubs. Shared online market place makes it easy for small businesses to promote and sell their products (online booking and payment system with low fixed costs).

The built infrastructure

To facilitate the use of Vallisaari for a multitude of outdoors experiences and facilitate access with small watercraft, the proposal includes two major constructions proposals.



A service example - Vallisaari Escape Island/Smugglers

The service consist of:
Boat trip to and from Vallisaari on a classic boat from 1927
"Escape room" type of mystery to be solved on the island
Add-on services such as dinner and seaSPA.

Potential service providers:

- Boat owner/charter operator
- Escape room company

Infrastructure:

- Access to exciting buildings on the island including some of the caves and old houses.



The Escape Island is a concept based on the popular Escape room concept. The Escape Island however is not confined to a single room, instead the players move around the island looking for clues and finally solving the actual mystery in one of the island's many caves.

The Escape Island is a great example of how the overall experience is created by combining components that can be offered by different companies or service providers.

The Escape Island experience starts with a boat trip on a classic boat from the smuggler prohibition period, this in itself is an experience.

After they arrive at a secret location, the participants get to explore Vallisaari when following the clues towards solving the mystery. The adventure thus also becomes a guided tour of the island, where the visitors get information about the history of the island, the various buildings and interesting places in a different way than just following a guided tour.

Abstract written by the competition team

Tourism is one of the few growth industries in the Finnish economy. Small businesses form the majority of the companies in the tourism industry in Finland. To help develop new businesses in Vallisaari it is therefore important to focus on new and small businesses. The main objective of the myVallisaariExperience proposal is to help tourism companies get started and grow using Vallisaari as the market entry point.

In our estimation, the ferries and marina will have a capacity of about 120'000 visitors/year. Reaching the goal of 300'000 visitors per year means that Vallisaari must attract visitors also in other ways. The myVallisaariExperience proposal focuses on attracting visitors that use small boats. The proposal also encourages boat-based services.

To attract these visitors, Vallisaari must offer engaging activities that go beyond just strolling around

the island. myVallisaariExperience attracts visitors by offering personalized services and activities on Vallisaari. The services are developed and offered by service providers. The service providers can be private persons (freelancers) or small and medium size companies. The key objective of the myVallisaariExperience is to facilitate the creation of new services of interest to locals and visiting tourist alike.

To support starting and running new businesses, the proposal includes the following components:

1. An online web-store where companies can market and sell their Vallisaari-related services. A shared marketplace with many active sellers lowers fixed costs for the sellers, lowers skills requirement to get started and provides better visibility to participating companies.

The services of the web-store service browsing,

booking, payment. Also included is online and social media marketing so that even very small service providers can benefit from “best-in-class” digital marketing.

2. A “tourism accelerator” service that helps companies get started in the tourism business. SMEs in the tourist industry rarely have the growth potential to be of interest to high-growth accelerators. The myVallisaariExperience “accelerator” is an umbrella term for services that help small companies and individuals with the multitude of task involved in creating new tourism services, including service innovation, legal and other obligations, partners and sales and marketing channels.

3. Simple booking and permission procedures for businesses needing access to Vallisaari. This helps service providers quickly and easily find and book

those Vallisaari services and facilities that they need for service provision. This service should be maintained by Metsähallitus and is used by the service providers, not directly by the Vallisaari visitors.

4. Infrastructure that supports innovative service provision on the island. The main points in this proposal are an extension to the Vallisaari marina mainly targeting small boats and a SeaSPA that provides refreshment facilities for visitors.

Implementation of the proposal could start immediately. The web-store for services and the support activities expected from Metsähallitus require only small investments and could be started even in the summer of 2016. The proposed infrastructure project could be started so that at least part of the new facilities would be available for the summer of 2017.

Haven Islands

The entry addresses the different user groups and their needs very well. User-centric principles behind the concept give solid ground for developing solutions. Well thought business model for running the islands and their various functions. Energy and water management solutions would require extensive construction of networks and the actual structures.



Abstract written by the competition team

The process of technological evolution is very unpredictable; we tackle this with a so-called bimodal strategy for implementing solutions, where tried-and-tested solutions are employed to secure a stable infrastructure while a variety of small scale experimental solutions would be incrementally added to the islands as playful case studies.

Intensive wastewater treatment on the islands costs three times more energy than processing it on the mainland, so we propose connecting a sewer pipe to the mainland and for separating grey and black water outlets from the buildings to allow for experimentation with reuse of wastewater, and with novel treatment methods such as phytoremediation and composting

dry-toilets. Similar considerations lead us to argue that fresh water should be brought from the mainland and only produced in small scales on the islands. To reduce consumption we advocate implementing water saving measures such as waterless urinals.

Our calculations show that in order to power the facilities on the islands, and wind turbine of 0.5MW would be needed, which we propose to place on Pukkisaari as a monument to sustainability. Since storing energy in significant quantities on the islands unfeasible, connecting to the mainland grid for load balancing would be necessary. Inspired by existing structures on the islands, we designed a concept for the new buildings on the island to be partially covered in soil to increase thermal efficiency.

We propose a generalization of the smart grid concept that would apply to all aspects of infrastructure:

every device would be submetered to measure power and water consumption and coordinated with production to increase efficiency. We wish to provide the option to use a RFID bracelet to collect and view personal data on one's own consumption trends, so that visitors could learn how to reduce their consumption. The smart infrastructure would also have a sensor network and drone fleet to track the impact visitors have on the wildlife of the islands: we believe that biodiversity loss has been neglected due to focus on climate change. To encourage different perspectives we propose that three major routes on the islands would permanent and temporary exhibitions themed around the biological sciences of ecology, evolution and development. We

believe these perspectives will help illuminate not only environmental issues, but also help the visitor better understand the way culture and technology change.

Our concept is named the Haven Islands to emphasize the islands' role as a sanctuary for all life. In particular, we envision the islands catering to the locals as well as tourists. We propose creating a foundation for the islands to promote a variety of cultural activities, as well as a limited liability company for leasing commercial areas on the islands to entrepreneurs and promoting innovative business on the islands. We believe that this kind of evolutionary ecosystemic thinking on a vibrant island community near the heart of Helsinki could change the world.

Islanders

Holistic entry where solution are profoundly explained. Clear concept for the development of the islands. Deep approach and informatively back-grounded, justification of solutions are well described.

Abstract written by the competition team

Nature, history and the future

There aren't many cases like Vallisaari – after being in military use for nearly a century it finally opens to the public. Its invaluable and diverse nature is its main attraction, offering visitors nature trails, bat and bird sighting tours and water sports, just as an example. All this will be executed using environmentally sustainable means that will preserve the precious nature from erosion.

To bring Vallisaari and its history to the present day, a mobile app will support the experience in Vallisaari's unique nature. It works as your personal guide through the trails and enables you to share your experience with others. While you come to enjoy the clean and exquisite nature, you can also learn about the energy and

water solutions on the island. Children can take part in a summer camp about environmental education. You can even contribute by using a static bike to pedal your own drinking water through a cleaning device.

Experiencing and learning about the unique nature and environment will make Vallisaari an ecological brand that offers something that the other islands don't have. Vallisaari will be the forerunner of a new eco-technological wave.

Energy from sea and sun

The sun of the northern latitudes, shining throughout the summer nights, casts light on the island of Vallisaari, which is surrounded by a vast and unused energy



source called the Baltic Sea. By utilizing the advanced Finnish technological expertise we can make Vallisaari a showcase for new energy innovations. We have chosen solar power as the main energy source in our plan. It is very sustainable and environmentally friendly, as it does not pollute and never runs out. Most of the solar energy is produced by solar panels placed on the roofs of buildings. They are efficient and installed on the roofs they minimize the environmental footprint. Solar power is mostly aimed at the summer season, when both the production and the use of energy peak.

In addition to producing primary energy, solar power is used in quirky small-scale projects such as solar grills and solar street lights. Not all will be solar powered. Finnish Water Heat Exchangers will be used to warm and cool the buildings and their consumption water all year round. The buildings themselves will be as energy efficient as possible. This will be made possible by passive and zero-energy solutions. With automatic devices you can optimize ventilation, heating and the usage of electronic devices to match the time of optimal power supply. All this will be for the visitors to experience.

To secure adequate energy supply at all times, we will build a permanent connection to the mainland grid via Suomenlinna or Santahamina. This is necessary especially during the winter season. However, Vallisaari of the future will be completely self-sufficient in its energy production and use, so later on we don't have to import any electricity.

In our plan, the main key in waste disposal is sorting and recycling. Solar energy powered compressing

garbage bins will decrease the amount of garbage and frequency to empty the bins. Organic waste will be composted and used as fertilizer on the island's small-scale farming. All the remaining waste will first be moved to the main sorting center, and then by solar powered ATVs to the waste-disposal ferry.

An island surrounded by water

Key things about the water supply in Vallisaari and Kuninkaansaari are ecological sustainability, recycling and as high self-sufficiency as possible. Kuninkaansaari is where we focus our efforts in the most innovative water supply solutions. We calculated that it is possible to make it wholly self-sufficient. Clean water intake is either from drilled wells or from seawater that is cleaned by reversed osmosis. All lavatories are dry toilets so only grey water is produced, which is cleaned and recycled locally.

In Vallisaari a complete self-sufficiency in water supply is not realistic due to high number of visitors. Hence the clean water and sewage solutions are based on the basic water infrastructure of the City of Helsinki. Even so, we will focus on sustainability everywhere, for example by recycling the grey water even in the most popular sites. Runoff water is directed and used on both islands for irrigation and for storage in case of fires.

One special feature will be encouraging visitor participation in the sustainable water supply. There will be an adventure park on the beach filled with mechanical devices to pump up water by your own power, in a fun and educational manner.

Evaluation of the rest of the proposals

Ajattelemista poikineen

Clearly structured, comprehensive and holistic proposal including all the main themes of the competition. However, the approach is somewhat general and there are no clear differentiation elements; some particularly inspiring ideas would be needed. Energy and water supply are handled separately, they are not interlinked. Technology for local waste water treatment is left open.



Abstract written by the competition team

In our Clean Vallisaari -competition report we have described particularly different water and energy solutions which would make Vallisaari a competitive and ecological destination to visit. The solutions are planned with respect to the island's nature and historical environment in order to develop Vallisaari to become the most interesting new attraction in Helsinki.

In our solutions we have emphasized the island's self-sufficiency while also ensuring the operability of services even when the visitor amounts are at their highest. The solutions are built and coordinated so that the water and energy distribution both function in the high season of summer as well as the cold winter months. The water and energy solutions are complemented by building Val-

lisaari's image and creating the Vallisaari experience. The island experience is developed together with eco-friendly cleantech solutions. The "Vallisaari of opportunities" is born from sustainable collaboration of man and nature.

Solar energy has a key part in the island's energy self-sufficiency and will be used both actively and passively. On the southern roofs of buildings solar cells are installed. This way the sun's light energy can be transformed into electricity. The northern side roofs are made to be green roofs by planting vegetation. This makes the roofs visually pleasing and also helps with energy efficiency by leveling differences in temperature. Solar thermal collectors on the other hand can be used especially in the summer to warm water. Solar air collectors

secure the ventilation and dehumidification even in the older buildings. New buildings are built to be passive houses so that the heat preservation materials will make the buildings more energy efficient. In addition to solar energy, geothermal heat is used in the buildings of Vallisaari village. Holes drilled in the bedrock function as energy wells so that heat can be transferred to the buildings from bedrock. Also sea water heat pump technology can be used in the buildings close to the sea. This is done by installing water heat exchangers to approximately 3 meters depth in the sea. Because the lowest levels of sea water always remain at 4 degrees, heat can be drawn from the sea in the winter. During the summer the technology serves as a cold water source.

To ensure sufficient energy all year round, Vallisaari should be connected to the public electrical grid. This would be done via Santahamina Island. Through the grid the possible excess energy produced by Vallisaari's energy solutions could be sold to the public electricity network. The grid would be executed as a ground cable to make it long-lasting and more resistant to storms and challenging weather conditions. Moreover, this way cables would not be in sight and would not visually distract the visitors' island experience.

In water solutions it is crucial to minimize the amount of sewage so that the stress to the island is as low as possible. Besides of dry toilets this can be done by purification of greywater through filters. The filtered water can be released into nature without harmful effects. In the most visited areas, such as Vallisaari village, a sewer system should be built.

Rainwater harvesting systems are easy to execute in Vallisaari. The collected rainwater could be used e.g.

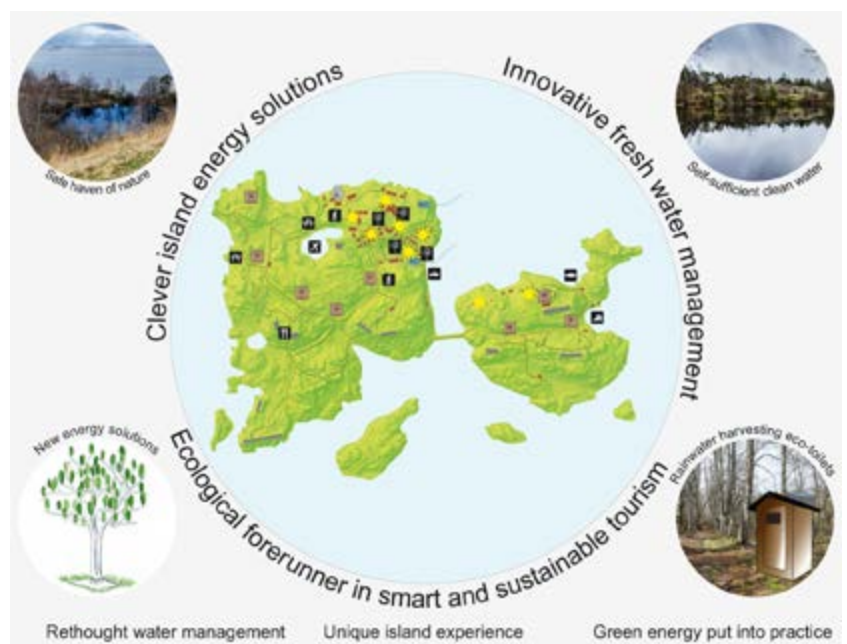
as drinking water for animals, to water plants and to flush toilets. Pure, drinkable water could be produced through reverse osmosis technology, especially in areas with less use, such as Kuninkaansaari. The reverse osmosis -water would also suit for washing purposes. The areas with the most use, such as Vallisaari village, should be linked to the general water supply through Suomenlinna to ensure the water supply even in the busiest hours of high season.

In the island's image and services we highlight the interaction between human and nature in a sustainable way. Restaurants and cafes would advertise the food's origin and would favour local and organic ingredients. This would be both eco-friendly and an attraction to visitors. Where possible, small-scale cultivation of ingredients could also be carried out. The island's nature is special and it would be preserved and protected for instance by establishing a traditional meadow with lambs in the northeast corner of the island. Various cleantech and environment solutions could be showcased in an exhibition where visitors could learn about the technologies used on the island. Visitors could also explore Vallisaari with dark tourism tours, where they could visit Kuolemanlaakso (Death valley), discover the bats of the island and the mysterious side of Vallisaari.

Our main goal is to develop Vallisaari step by step to become a more unique and sustainable island experience. The solutions presented in our competition report provide a great opportunity to accomplish things in a right way from the beginning and to take nature carefully into account while developing Vallisaari. The building on the island has already begun. Now it is the time to make the future of this island great!

Mcislefance

Clearly structured and balanced proposal, addresses all the themes of the competition. Holistic but there are also some very particular edges. Some of the cleantech solutions are presented well (e.g.reverse osmosis, wind-trees). The entry combines creative thinking and user-friendliness and sensible approach regarding which solutions will work best ecologically and economically.



Abstract written by the competition team

Vallisaari, the island in front of Helsinki that is being reopened for the general public, comes with numerous opportunities for nature traveling. The working team has come up with new ecological image for the island, and it is reinforced with modern technical user solutions. This report is created so that holistic approach to environmental friendliness and self-sufficiency have been taken into consideration.

The grand idea behind the new image of Vallisaari is that the island is plastic-free. The concept of plastic-free island concerns all the service providers on the island, and also motivates visitors to keep the island clean from plastics and other garbage. In practice the concept of plastic-free island means that all the services and products that are purchased from the island would not contain any plastic. Self-sufficiency of the services and products emphasize the ideal of plastic-free island.

Because of the new sustainable solutions, Vallisaari is also an island of science. Modern and sustainable technological solutions are ideal for congress services. Especially for scientists and clean tech experts, the clean, innovative and unique island environment is a great place to meet each other. Modern technology is present in the form of mobile applications that use GPS-technology and QR-codes, which provide information about interesting sights on the island. Here modernity and traditional travelling services efficiently supplement each other.

The energy management solutions highlight self-sufficiency and energy saving. In other words energy consumption is minimized. When saving energy, elements from the more traditional way of life are put into practice. Many Finns are already familiar with this thinking from the summer cottage environment.

In the self-sufficient energy production, main emphasis will be on solar energy. Thermal wells are the first

example of this. These wells are drill holes that conduct heat from the ground, and this heat can be used to warm houses on location. In the long run, the wells are an economical energy solution especially for the village area in the North-East part of the island.

Part of the energy has to be imported from the continent. This purchased energy is always green energy, which applies to the city of Helsinki's policy about distributed energy.

Solar panels will be mounted on all the suitable rooftop and wall surfaces on the island. This fact is taken into consideration when designing new buildings on the island. Because of this as much solar energy as possible can be harvested. The estimate is that 140 megawatt-hours per year can be produced this way.

As a modern and fresh wind power solution, the plan is to place wind trees (Aeroleaf® technology, Arbre à Vent®-tree) on the island. The wind trees present wind power in a new light for the great public, and this fits well the image of Vallisaari as well.

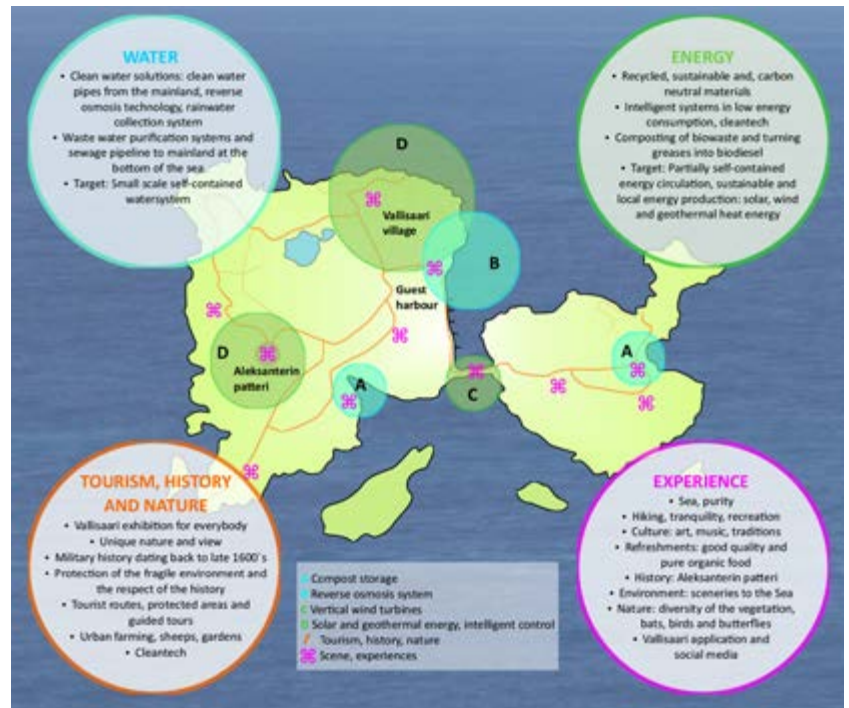
Water management is designed with new technology called reverse osmosis. This technology makes sea water drinkable. The process requires electricity that can be produced on the island.. As a contingency plan, fixed pipelines from the continent are required as well.

Like with the energy solutions, also the water solutions emphasize saving. Modern and luxurious outdoor toilets, that do not need water, and compost the waste into fertilizers, are placed carefully on the island to ease the stress on water management. Hygiene is handled by taking advantage of harvested rain water that can be used for hand washing.

Because of these innovative energy and water solutions, Vallisaari becomes an appealing clean tech island. The concept turns into practice for the visitors in the form of plastic free services, smart clean technology and traditional travelling services with a twist.

Sea Pearl

A clearly structured, balanced and comprehensive presentation with many ideas, in which ecology, technology and economy as a holistic system is well managed. The importance of the visitor flows and seasonality are noticed clearly in the solutions. Includes a clear vision which is ambitious but realistic.



Abstract written by the competition team

The old military island Vallisaari, situated in the archipelago of Helsinki, opens up for visitors in summer 2016. The low human impact on the island for the past decades has given a possibility for nature to grow freely. Vallisaari island is characterised by a very special history and an overwhelming nature. In the planning of the future usage of the island, the concepts are targeting sustainability in water supply and sewage treatment, renewable energy solutions using modern innovative technology and enhancing the image of Vallisaari. The island will be preserved as a peaceful, genuine marine environment. The old buildings will be conserved and the history will be considered. One of the main targets is a high degree of self-sufficient ecologically sustainable energy solutions together with utilizing renewable building materials with a low carbon dioxide footprint.

The planning of the water service on the island is based on self-sufficiency and ecological solutions in three areas and on the fact that the number of visitors will vary during the year. Firstly, the costs are optimized using the existing solutions. Costs are though not jeopardizing quality at any state. Secondly, a secure sewage system is built to the mainland. All black waters and part of the grey waters are transported to the mainland. A part of the grey waters is filtered locally. Thirdly, there will be enough clean water at all times by having a pipe brought from the mainland, by producing drinking water from sea water using inverse osmosis technology and by filtering rain water. The sewage system will be planned for a possibility to use grey waters for irrigation of local growth of vegetables and other crops. Outside the village in north east part

of the island all toilets will be dry ones with tanks that can be transported for composting in the mainland. The water toilets, in the village area where the restaurants and hotel are situated, are of low water consumption type.

When it comes to energy solutions the emphasis lies on renewable energy resources like solar, wind, water and geothermal energy utilizing modern, innovative solutions. This is in harmony with the image of the island. The new buildings will be low energy, passive houses planned to maximize solar energy input and will be equipped with smart energy control to get the most out of the renewable sources. The renewable energy will have a backup from a new power cable coming from the mainland.

Vallisaari island with its unique historical and cultural values can be marketed as a clean and ecological nature resort, interesting also in international scale. The island will have a well-planned experience path which gives the visitors an opportunity to get acquainted with innovative energy production and water service solutions. The path also includes historical and nature sites with several sightseeing places offering breath taking scenery over Helsinki and the archipelago. To help the visitors to get acquainted with the island, a multi-lingual mobile smartphone application will be introduced. This will include maps with information of the sites, various games for educational purpose as species identification and personal energy calculator etc. Although a major part of the island will be preserved as a protectorate in natural state there will be possibilities for the visitors to participate in excursions with various themes and to visit different annual exhibitions.

Facilitating Clean

This proposal focuses on competition theme 3: innovative user-solutions and system management. The proposal describes well the way that different service providers of the island can promote, sell and operate their businesses through the Vallisaari APP. For visitors, the APP makes it easy to book and pay for the various services offered on the islands. The APP could be a way to market innovative and sustainable services on Vallisaari also to interested people abroad.

Facilitating Clean

Developing Vallisaari into the gem of clean innovation and sustainable island management.



Abstract written by the competition team

VallisaariAPP

VallisaariAPP is an application for both visitors and service providers of Vallisaari, which is based on user-oriented solutions. Networking among service providers and other professionals on the island is supported by an internal part of the application. Creating user-organized events, services and culture is made possible by the application. The functions and tourist attractions on the island change naturally during different times of the year and supporting the different phases in the development of Vallisaari.

Culture & Events

Diverse and actual culture and events attract visitors and long-term residents to Vallisaari. VallisaariAPP has an integrated map of the island showing live feed from different sites and venues. The visitors get real-time info of the culture and events on the island. The updated online map provides all necessary information of the island at one glimpse. In the VallisaariAPP people can also apply for workrooms and showrooms and get a temporary grant for their work on the island. Provided by the city of Helsinki and organized by the Facilitator of the island, the grant brings short-term to long-term activities and functions to the island. For artists this is a great opportunity to be provided with working facilities in a beautiful and inspiring setting.

To the visitors of Vallisaari this offers a sneak peak to the work of artist life and workshops. Events on Vallisaari are organized and supervised by the Facilitator of the island. The facilitator is responsible that the events and actions are healthy and in line with sustainable development of the island. Together the visitors, residents and culture providers create clean and healthy events on Vallisaari by networking in the VallisaariAPP. School classes and hobby clubs are welcomed to Vallisaari with CleanLab. CleanLab provides education of the technologies used and developed on Vallisaari. CleanLab gives a hands-on experience of the ecological energy systems, clean methods for water circulation and innovative organization of waste management.

Services & Research

Sustainable and clean development of Vallisaari is supported by smart solutions for doing research and providing services. Intangible service network preserves the physical environment of Vallisaari using methods of sustainable research. Collecting data from Vallisaari without damaging the untouched nature and historical sites is arranged by technological solutions. The visitors can take pictures and collect data with the different functions on their smartphones to support research and cultural and natural preservation on

Vallisaari. The visitors entering the island don't need to take any waste with them to Vallisaari. To enrich their experiential day on the island the visitors can order a picnic basket with proper utensils that are returned against a deposit in the end of the visit. The food can be ordered straight to any site on Vallisaari from the application. The facilitator organizes an all-island bicycle courier service delivering food cooked by the restaurants on the island. The premises taken to use on the island can be reserved and paid via the application, VallisaariAPP. Visitors can easily access and use accommodation, venues and saunas as well as the kayak and equipment rental. Visitors can book activities by the reservation system in advance or check the

availability on the spot. The VallisaariAPP also supports the marketing and branding of the service providers on Vallisaari. There is an integrated part on the VallisaariAPP that is usable only by service and culture providers and offers centralized transportation, waste management and supply of resources.

The facilitator

The facilitator supports the activities on the island both digitally through the VallisaariAPP and physically on Vallisaari. The facilitator controls the access and usage of different sites on Vallisaari and also moderates the usage of the application controlling that the events and services on Vallisaari support its values and goals.

BioWaste-Solar

Proposal is a product presentation of biomeiler technology and smart heat management unit. Addresses themes 1 and 3 (mainly energy and sustainable use of materials). BioWasteSolar has a narrow perspective and provides a partial solution that does not answer to the needs of the island.



Abstract written by the competition team

When people are coming to Vallisaari, they will need food, waste waters handling and renewable energy and heat. There are many possibilities to use local resources in Vallisaari with biomeiler concept added with collecting solar-air heat system. It's possible to put all organic material (waste food, human waste, organic biomass etc.) to biomeiler and produce Vallinsaares heat in this way. Heat and electricity of Vallisaari may be produced using biomeiler, solar panels and air-solar collecting system. This way it is possible to create environmental friendly and developing Vallisaari.

Biomeiler compost also helps visitors ways to consider how energy and waste may be produced and used. Learning by doing is now popular and noticed to good way to give information. Showing to people what happens to their waste material in Vallisaari may promote ecological thinking. Solar-air heating system is also good new way to produce energy and can also join to many other systems. These two ways added with solar panels can produce local energy to Vallisaari and its not need energy from other places. Also most trash material can be recycled this way.

Valli-landers

The proposal specializes in Augmented Reality (AR) but remains superficial in terms of the overall competition assignment. The proposal introduces an objective to bring modern technology, history and nature and sustainable solutions closer together for the visitor through AR.



Abstract written by the competition team

Our project is about a meeting of old and new experience – to combine modern technology with the historical heritage of the island and create an experience where the old and new elements support and emphasize each other. The island’s historical and planned technical features are rich and exciting, but we feel it’s a challenge to bring these closer to the average visitor. Therefore we combined our solutions with augmented reality (AR) to make it an exciting adventure to get to know more about historical, natural and technical facts. In our concept, AR doesn’t oppress the island’s values but emphasizes them and draws the visitors into the island’s vibe. As the island is planned to be an international showcase, we believe that such uncommon concept would make Finland and Helsinki stand out and would add to its reputation as an innovator and supporter of fresh, out-of-the-box ideas.

We plan to use three bunkers to build a desalination plant, wastewater treatment facility and a bioluminescent cafe.

Wastewater treatment plant recycles water and desalination plant produces freshwater from seawater. All proposed concepts are linked to the sea, since bioluminescent bacteria is a marine microorganism.

Water recycling is based on the chain of food reactors where water is treated in nine stages, starting with pre-treatment process, going through eight stages of bioreactors and ending with sludge disposal and disinfection process. The plant can be fit into any design requirements, it may look just like a botanical garden. Another treatment facility should be built in order to have safe drinking water. The desalination plant has three main stages starting with filtration part, reverse osmosis (the main concept where sea-

water is being pushed with high pressure through membranes) and ending with remineralization unit. Bioluminescence uses microorganisms which are placed into capsules with all the nutrients needed for them to live and glow light. They provide a mild glowing green light as extraordinary decoration and can be placed on any surface.

Our concept will be supported by three main interfaces.

1. Web interface provides information for visitors and companies.
2. IoT interface provides real-time data and control for system management
3. VR/AR interface provide endless recreational possibilities

IoT interface integrates with the sustainable facilities to monitor, analyze and control the system. AR also displays general information of the facilities as well as real-time data.

AR enables “virtual tour guide”: the history of the island is shown through AR glasses, so that the visitor can see ancient architecture / people / activities blended with the actual island scenery. Technology solutions on the island can also be shown through the glasses: when the visitor points to something she is interested in, the glass will display related information. This way the guided tour becomes highly interactive. VR/AR games can also be developed, e.g. treasure hunting or action games themed with the military history of the island. The planned AR features can be seen through AR glasses (preferably) or smartphones with a downloadable application.

Opening the name files

After the jury had reached a decision the submitted name files were opened. The documents showed that these teams were behind the respective proposals:

Precious Vallisaari

12.500 €

Team

Kurmakka – Organic Food Ltd:

Marja Nuora

Nomaji Landscape Architects Ltd:

Mari Ariluoma

Anni Järvitä

Studio Puisto Architects Ltd:

Emma Johansson

Sweco Environment Ltd:

Susanna Harvio

Valtteri Lankiniemi

Taina Riekkinen

Niina Laasonen

Virgin island

12.500 €

Team

Gaia Consulting Oy:

Laura Descombes

Minna Päällysaho

Pekka Pokela

Johan Lunabba

Elomatic Oy:

Henrik Bachér

Sebastian Kankkonen

Antti Yrjänäinen

Rami Raute

Pekka Koivukunnas

Anita Vuorenmaa

Mika Patrakka

Jukka Mikkonen

My Vallisaari Experience

2000 €

Theme prize, category Innovative solutions for user interface and systems management

Team

Dokk:

Lilli Mäkelä

Håkan Mitts

Haven Island

1500 €

Honorable mention for achieving a good balance of technology and nature

Team

Arkadia bookshop:

Ian Bourgeot, Group leader

Fluxcraft:

Matan Shenhav

Farnaz Roudsari

Cristian Coniglio

Aquazone:

Jyri Koivisto

Islanders

1500 €

Honorable mention for an innovative solution of energy management concept

Team

Alexandra Belinda Charlotte Arppe

Karoliina Mia Maria Bergström

Anna Karoliina Hakala

Atte Sakari Hatakka

Reetu Ville Oskari Jormakka

Veera Iida Aliisa Karvonen

Simo Tommi Kristian Kivikko

Arttu Oskari Kivimäki

Maria Eliisa Kröger

Aku Johannes Meriläinen

Marisofia Kaarina Nurmi

Riikka Oittinen

Victoria Marja Sofia Ollus

Niko Pekka Pelkonen

Tuomas Tapani Pätäri

Rami Ratvio

Olli Ruth

Noora Maria Saksa

Markus Albert Sirviö

Lari Johannes Teittinen

Isa Emilia Tuuri

Sonja Maria Jessica Vanhanen

Anna-Maria Virkkala

Competition jury's recommendation

An objective of the idea competition has been to find potential partners to cooperate with in the future development of Vallisaari. The organisers of the competition will invite the competitors to negotiate and further develop the overall concept and technical solutions for the islands.

Further information

www.hel.fi/www/Helsinki/en/administration/enterprises/competitive/development-activities-+projects/clean-vallisaari/

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