Smart Cities Accelerator's Open Innovation Call:

Parking for power: Charge and avoid shortage in the grid

Competition manual

Aim of the Open Innovation Call

The challenges in this *Open Innovation Call* target how cities can introduce a drastically larger number of charging stations for electric cars in new parking garages without causing power shortage in the distribution grid. The solution should allow for as many charging stations as possible, with as low power outtake from the grid as possible. The solution should also allow the parking garage to be a flexibility provider for the distribution grid. It should be a user-friendly and environmentally excellent solution as well as an economic win-win situation for both the owner of the parking garage and the grid operator.

The process is conducted as a procurement with a direct reward.

Background for the Call

Smart Cities Accelerator (SCA) is a project-based partnership consisting of leading universities, companies and cities in southern Sweden and Denmark, co-funded by EU's Interreg scheme. The aims of the project are to develop smart cities and sustainable solutions for intelligent use of energy.

In SCA, and beyond, the City of Malmö and its project partners City of Lund and Høje-Taastrup Municipality, aim to introduce ***physical and virtual energy storage*** in cities, to make use of locally produced excess energy, and to avoid power peaks in the electricity grid.

E.ON is a private energy company operating in several European countries. The Swedish headquarter is in Malmö, where E.ON is both the distribution grid operator as well as a provider of a wide range of energy solutions.

Climate-KIC is supported by the EIT, a body of the European Union

Parkering Malmö is a municipality owned parking company in Malmö, Sweden, with 6,000 own parking spots in 10 parking garages, and another 30,000 parking spots on private properties. In 2017, Parkering Malmö initiated a cooperation together with E.ON, resulting in over 100 new charging stations for electric cars. The reaction from the customers was a success, and now they want more…

Description of the call

There are two major trends that have significant impact on the background of the call. The first is the situation of the distribution grid, and the second is the rapid electrification of the transport sector.

The distribution grid in southern Sweden is already facing major challenges. While cities like Malmö and Lund are growing rapidly, the regional power consumption far outgrows the production. The capacity available from the national transmission grid is limited and will not be expanded until 2027. When power peaks occur, in mornings and early evenings and in cold winter days with less wind, the electricity consumption is exceeding the regional power grid subscription level towards the national transmission grid.

There are several challenges, that themselves also are solutions to this multidimensional problem. More local energy production is one solution, but it has turned out to be difficult to find possible locations for example wind power in densely populated areas like southern Skåne, while the financial conditions for large scale combined heat and power production in Sweden are challenging at the moment. Retrofitting and demanding flexibility are two other major challenges which have potential of major impact on the power outtake. One thing is certain; these capacity limitations are already jeopardising potential establishments of new industries – or large-scale charging infrastructure for electric vehicles.

With the constantly increasing electrification of the transport sector an increasing number of the parking lots in a parking garage will have to have charging stations. This will in turn affect both the fuse level needed in the parking garage, as well as the capacity needed in the electricity grid. It will cause a higher energy consumption and higher power peaks. These are challenges that both the owner of the parking garage and the grid operator need to find solutions to and business models for. Ultimately, this is also a challenge for cities with ambitious targets of, and policy towards, more electric cars in the city to reduce greenhouse gas emissions, air- and noise pollution.

The call therefore wants to find synergetic solutions that enable owners of parking garages to drastically increase the number of charging stations for electric cars in an economical sustainable way for both the owner of the parking garage and for the grid operator, and that the solution at the same time is in line with the city's environmental goals.

The process is conducted as a procurement with a direct award. The intention of the organizers is to, without prior publication, offer the winner a paid contract with Parkering Malmö.

The aim is to implement the winning solution in the new parking garage in the Sege Park area, one of Malmö's prioritized development areas until the year 2025. In total there will be up to 800 dwellings in Sege Park. Today, when Sege Park is to be developed, the ambitions within sustainability are high. The

area is to be a "display window" and frontrunner in sustainable urban development. The sustainability strategy for Sege Park includes goals such as 100 % renewable energy for the area, local energy sources, smart electric grids, businesses in the area should have a sustainability focus, car traffic should be minimized, the culture heritage values should be kept, the biodiversity should be developed, all residents should have the possibility to do urban gardening, etc.

The Challenge in Sege Park – technical specifications

Parking Malmö, together with the City of Malmö, wants to take the lead when it comes to construction of sustainable and climate-smart buildings and has designated the parking garage in Sege Park as a pilot project for the next-generation parking garage. It will be built in a wooden construction, with concrete only in the foundation, and the facades will be covered in green plants. Rainwater from neighboring areas will be collected for watering of the green facades and stored in waterbeds when in excess. The garage will store around 600 cars whereof at least 15 will be carpooling cars. There will also be space for bikes, cargo bikes, electric bikes and scooters. Rental bikes from the *Malmö by bike*-concept will be in connection to the parking garage, as well as a bus stop for the Malmö Express Line No. 4, enabling combined mobility for both residents and commuters.

Conditions decided for the parking garage in Sege Park:

- 60 car parking spots with installed charging possibilities.
- Another 60 car parking spots prepared for charging possibilities.
- Approximately 300 m^2 is available on ground floor for technical equipment.
- Other electricity needs in the parking garage:
    - Indoor lighting for 18 000 m^2 (approximately 35 kW)
    - Facade lighting and lighting to enhance the safety experience (approximately 7 kW)
    - Two elevators (approximately 12 kW)
    - Other (pumps, alarm systems, etc.) (approximately 1 kW)

The following components are required in the concept:

- Approximately 2000 m^2 PVs on the roof of the garage.
- Short-term physical storage possibilities for electricity (e.g. batteries).
- Long-term physical storage possibilities for electricity (e.g. hydrogen/fuel cell).
- DC instead of AC where applicable and convenient.
- Software solution to optimize the system.
- Financial model that benefits both Parkering Malmö and E.ON.

Who can participate?

All relevant ideas will be taken into consideration. There are no requirements as to how far the idea/proposal/product has been developed, i.e. also ideas taking some areas of the general challenges into consideration are welcome, as the call is looking for multiple ways to deal with the overall aim

mentioned in the call text. Therefore, as part of the competition, the idea could be matured towards the finals and beyond.

Groups/consortia with a constellation of competencies are expected to be most successful in this call. This, however, is in no way a requirement for participation. The competition is open to everyone regardless of background, experience, location or other factors. Applicants can participate alone or in groups, be private individuals or part of a company, organization, institution or through any kind of joint effort.

What's in it for the contestants/finalists?

The finalists will have the opportunity to present their idea at *Open Innovation Day* held in Malmö, Sweden, on 12 April 2019. At this Open Innovation Day an expert jury will guide and assist the finalist for a final co-creation of the ideas and choose a winner for the Open Innovation Call.

As a contestant, you will receive customized consultancy support, if you are chosen as a finalist for the Open Innovation Day following the Open Innovation Call. A network of specialist will be at your assistance to prepare the idea/proposal for the finals. Furthermore, validation and/or implementation of the proposal will be the utmost aim for both the organizing partners as well as the contestants, alas this cannot be promised beforehand.

Additionally, participation may provide opportunities to engage with relevant stakeholders and potential customers and expand networks and knowledge about the theme at hand. There are plenty of parking companies and grid operators in cities around Europe in need of this kind of innovation. Hence, a potentially large market for the innovations and several possible co-partners or actors who wants to continue and perhaps further develop the design and the work done so far. Thus, the exposure for the finalists is also of great value.

What's in it for the winner?

As the call is conducted as a procurement with a direct reward, the winners of this Open Innovation Call will have the opportunity to negotiate a paid contract with Parkering Malmö and E.ON, worth up to 100 000 SEK, to further cooperate with the project management team with the projection of the energy solutions of the Sege Park parking garage.

Competition programme

The competition is an Open Innovation Process open for everyone who wants to share their ideas on how to drastically increase the number of charging stations in parking facilities without causing power shortage in the distribution grid, in accordance with the conditions of this call. The process runs in the following steps according to the timeline described further down.

All proposals submitted are judged in accordance with the judging criteria (see below). Up to five (5) proposals are selected for a final pitch event on the Open Innovation Day.

Process timeline:

Release of call	*11 February 2019*
Webinar	*4 March 2019*
Deadline for submissions	*20 March 2019, 12:00 noon CET*
Presentation of finalists	*25 March 2019*
Open Innovation Day	*12 April 2019*

Webinar

A webinar will take place on 4 March 2019 at 13:00. Sign up here before the seminar:

https://attendee.gotowebinar.com/register/1884705163665640204

After registering, you will receive a confirmation email containing information about joining the webinar.

Application procedure

All proposals must be presented via the submission form on the website by 20 March, 12 noon CET, 2019.

Every proposal should account for how the project team/the innovator uses the compulsory EU-criteria of sustainability:

1. Environmental sustainability
2. Equal rights and non-discrimination
3. Equality between men and women and non-binaries

The report should be brief, maximum one A4-page, stating that each of the three criteria have been taken into consideration, explaining how this has contributed to the innovation/product and the innovation process and the expected impact of the innovation/product on sustainability.

Submissions that are not sent via the submission form and/or without the sustainability report **will not** be considered.

Judging criteria

Submitted proposals will be judged according to the following criteria:

Functionality
The proposal is rated on its ability to solve the challenge described under "Aim of the open innovation call" and its ability to be validated or even implemented by the organizers, i.e. primarily Parkering Malmö and E.ON.

Innovation
The proposal is rated on its level of innovative thinking and how this is reflected in the proposed idea or solution.

Replicability
The proposal is rated on its replicability in different parking garages, i.e. a concept that enable more companies and cities to take advantage of the solution(s) and not only Parkering Malmö, E.ON and City of Malmö.

Sustainability
The proposal is rated on its sustainability report as well as its potential to accelerate the green transition of cities.

Jury process

The process to decide the winning idea/innovation is divided into two steps.

In a first step, when all proposals are submitted, a project group consisting of representatives from the City of Malmö, Parkering Malmö, E.ON and Climate-KIC will select a maximum of five (5) finalists/teams that will be invited to further participation. The proposals will be judged with a score sheet based on the judging criteria described above. The result of this selection will be a presentation of the finalist/teams that receives the highest score and is qualified for the Open Innovation Day, no further motivation will be presented.

Step two in the process is the Open Innovation Day. Here, the selected finalist/teams will pitch and present their ideas and proposed solutions in front of a professional jury. The jury will decide a winner based on how the ideas and solutions answer to the challenge and the judging criteria.

Jury

The jury is composed of professionals and problem owners from Sweden and Denmark with enough qualifications to guarantee that the submitted proposals are judged fair in relation to the challenge of the call and the described judging criteria.

Ownership and responsibility

The Intellectual Property Rights (IPR) of the idea and related materials are owned by the contestant(s). **However, we urge the contestants to bear in mind that this is an open innovation call that is looking for co-creation and joint development**. The contestants can decide what kind of sensitive business information they would like, or need, to share in the competition. Individual confidentiality agreements to protect sensitive business information will be accepted to protect the business idea. It is the contestants' responsibility to point out the sensitive information and deliver the confidentiality agreement. All submissions could be published on the competition's website as written documentation associated with the competition, on websites of the organizing partners and network or under other circumstances in which the organizing partners and network may want to inform others about the competition and its results. When contestants submit for the competition, they accept that their proposal can be published.

Climate-KIC is facilitating professional business assistants and advice throughout the competition within its network. Our goal is to help the contestants in any way possible to mature their idea towards the Open Innovation Day and expose the idea to a high-profile jury and professional audience. It is the contestants' own responsibility to make use of the resources made available in the competition, seek the necessary information and meet the deadlines.

Open Innovation Day

A maximum of five (5) selected finalists will be invited to a final pitch event (Open Innovation Day) in Malmö, Sweden, on 12 April 2019. Travel costs and accommodation for up to two members per selected finalist/team will be reimbursed by Climate-KIC in accordance with the terms and conditions provided. The winning proposal will receive professional advice and assistance by Climate-KIC on how best to progress with turning their idea into reality.

Contact Information

For further information and questions concerning the competition, please get in touch with:

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