GREEN CHARGE

Electric Mobility
Newsletter

Issue 6 | February 2022

Goodbye from GreenCharge, hello to green charging

For our 6th, and final, newsletter, we talked to Jacqueline Floch, Project Coordinator of the GreenCharge project, based at SINTEF in Norway. What have we learnt over the last 3.5 years, and how can the rest of the world benefit?

GreenCharge 2018-2022

This is a farewell from the GreenCharge project. I jumped into the project as Coordinator mid-way through. I had the opportunity to influence the work since, but much work was decided when I joined. Therefore, I look at the project from two angles, one internal and one external. The project is both mine and not mine, and this is what this final summary might reflect.

A complex projects with multiple lines of focus

GreenCharge is one of the most complex projects I ever contributed to. The project has tried to address so many concerns. We wished to increase confidence in the availability for charging such that **more drivers go for e-mobility**. This is important for private ownership, and even more for fleet managers where charging management is paramount. We wished to **maximise sharing of the greenest** available energy, and to reduce the demand for grid infrastructure that would only preserve reliance on the status quo of existing (carbon intensive) energy sources. And we wished to define **good ways to do business** to make all this work and motivate mobility users to adopt flexible behaviours in when they travel and how they charge.

Beyond these concerns, GreenCharge targeted different mobility cultures in 3 pilot cities, in Oslo with a high density of electric cars, in Bremen with focus on combining different mobility modes and reducing car usage, and in Barcelona where light vehicles (ebikes and escooters) are widely used. Demonstrators addressed concerns in different ways, and they were a means to evaluate different factors. At times it can be difficult to make sense of this level of complexity, and project participants strove with this too. We therefore developed one page "demo cards" that helped us - and will hopefully help you - to quickly understand what the demonstrators are about. We repeated such one page guides with Uptake Cities on their own road maps, and we hope these newsletters – of which this is the sixth – have distilled some complex ideas into easily digestible forms.

Transport and energy going through transitions in parallel

GreenCharge is a project that was very ambitious. The most ambitious goal was to support smart energy management across neighbourhoods – rather than only in private households or offices. E-mobility adds demand on the energy infrastructure. Smart energy management is about controlling energy use to make the best use of energy when it is available. Of course, keeping in mind the goal of climate-neutrality, it aims at best exploiting renewable energy and prioritising new investment in developing those new sources, →

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provided through the grid or produced more locally. Predicting consumption and production is needed. Previous consumption patterns, weather forecast, and other parameters can be used for prediction. Solutions were demonstrated by GreenCharge partners at a workplace in Barcelona and in a residential area Oslo.

Going forward and using our results

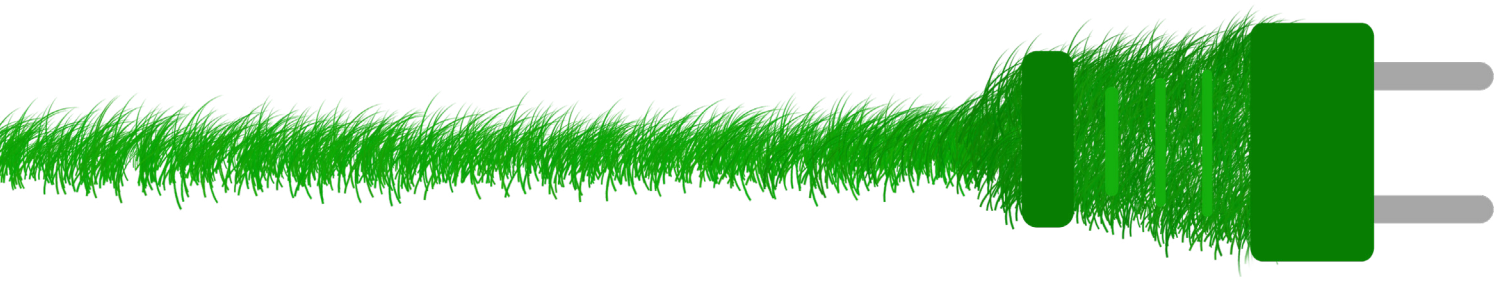
This has not been an easy journey. Much of what we are doing is at the crossroads between different domains, i.e., transport, energy and buildings. The development of solutions thus required the integration of technologies from these different domains. Understanding these domains is of course challenging. Even more challenging is the lack of standardised interfaces. The GreenCharge *Reference Architecture* – a form of masterplan bringing software, policy and stakeholders together, from the knowledge of all our pilots - can help build understanding about the main concerns for e-Mobility, as well as developing the more detailed technology aspects. It also identifies opportunities for formal standardisation, that would allow better integration of systems, data sharing and ultimately a better, more sustainable customer experience.

The COVID-19 pandemic has prevented GreenCharge to collect as many data from demonstrators as planned. The confinement measures have led to less mobility and less users for the implemented solutions. People simply stopped travelling for much of the project. Fortunately, GreenCharge planned to develop a hybrid evaluation approach where the evaluation of real cases could be extended with the simulation of new scenarios.

The GreenCharge evaluation approach extends the CIVITAS evaluation framework with a set of measures related to e-mobility (i.e., actions that can be introduced), associated Key Performance Indicators (KPIs) to measure the effects, and algorithms to calculate KPIs from collected data. Using simulation, it is possible to evaluate new "scenarios". For example, it is possible to scale up a test or experiment to a real case, to combine elements from different demonstrators and to introduce new elements, e.g., Vehicle to Grid (V2G). Still simulation does not start from scratch. It builds upon real data, so COVID-19 has hampered us to come as far as envisaged. We have developed a solid framework that is available openly after the project.

GreenCharge has made a tiny step towards achieving the ambitious Green Deal target goal of climate-neutrality. Far more steps are needed. Hopefully, new projects will learn from the knowledge generated in GreenCharge and build upon our results. Let us keep in touch, find new opportunities for collaboration and exchange knowledge.

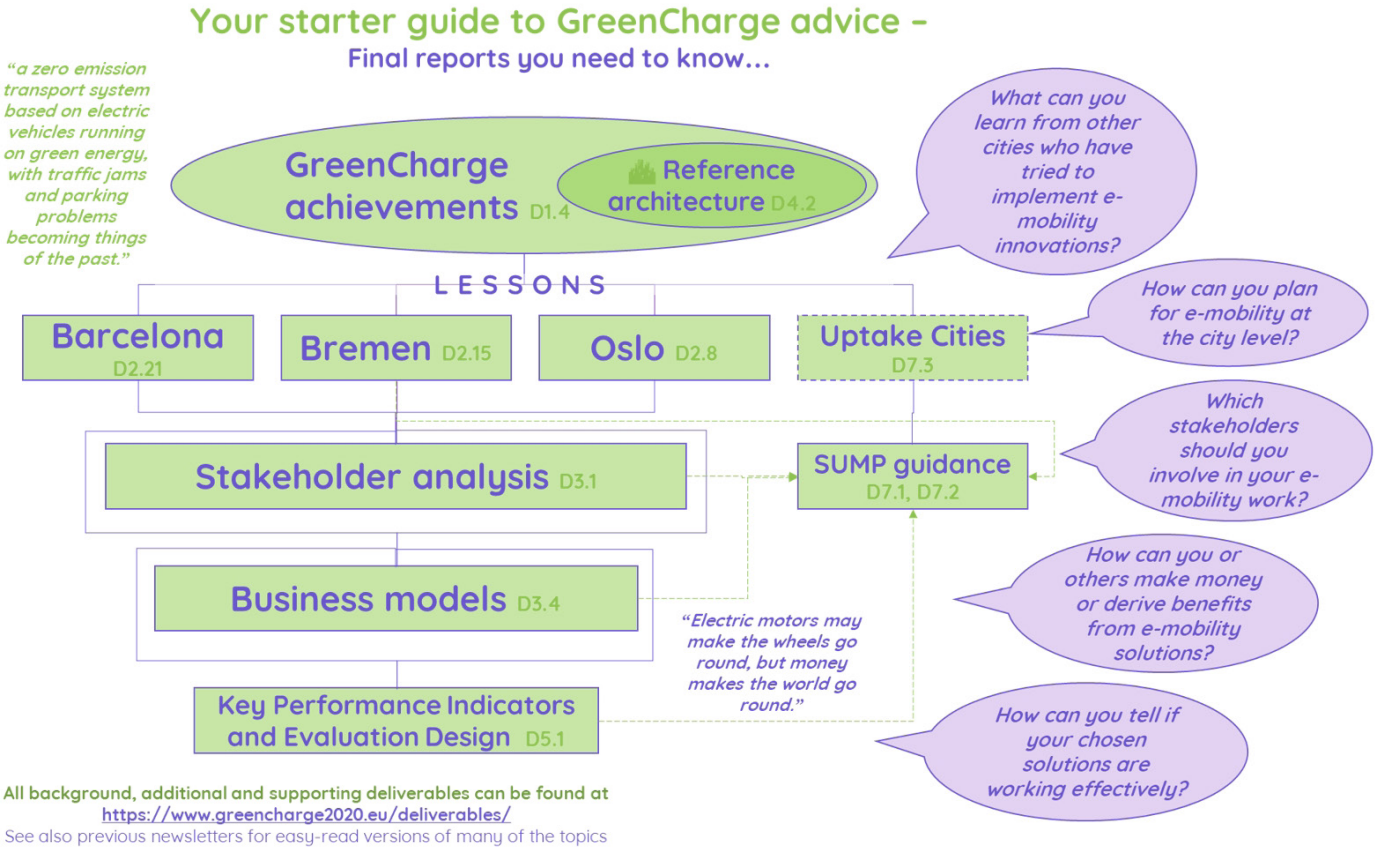
Jacqueline Floch,
Project Coordinator of the GreenCharge project



GreenCharge's deliverables

How to learn more about the project and apply it in your own city or country

Among 54 deliverables produced in GreenCharge, we have selected a few ones targeting readers with different backgrounds. Most of our deliverables will be available openly on GreenCharge community on Zenodo after acceptance by the European Commission. Take a look at the diagram below which highlights some of the best written outputs from the project to start with.



- A light approach to understanding GreenCharge is to go through the project "demo cards". The cards summarize the challenges to be solved, the goals and the measures implemented to achieve the goals. (D1.4)

- For those who want to understand more about the GreenCharge concept, we recommend the GreenCharge Reference Architecture that describes an ecosystem for smart and green charging. Architecture may sound very technical. The Architecture covers several viewpoints though that are relevant for readers with different backgrounds. For instance, it describes stakeholders and their concerns. For those developing technical solutions, it provides formal and technical specifications. (D4.2)

- For city planners and policy makers, we provide recommendations and guidelines for integrating e-Mobility into SUMPs. Cities and rural areas face several mobility problems. It is not simply about electrifying vehicles. Congestion, parking, road safety and connectivity are other challenges facing the transport sector. With SUMPs, priority is put on reducing transport needs, shifting to active modes, strengthening public transport and electrifying fleets. (D7.1/2)

- The GreenCharge evaluation approach is also a central deliverable in the project. It describes in detail the measures being evaluated as well as the indicators used to evaluate the impact of these measures. Measures are defined for EV fleets, charging, smart energy management and business aspects. Some measures are innovative. Some are state of the start and used in combination with innovative ones. (D5.1)

GreenCharge's results

What key technologies or products can you make use of yourself?

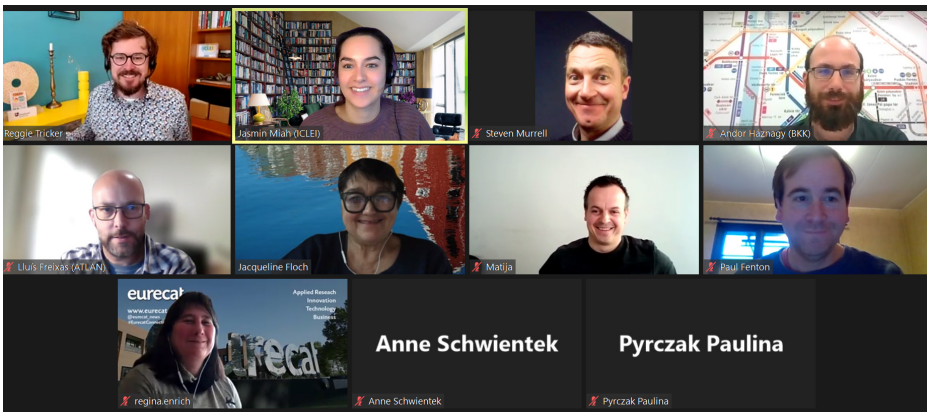
Included within our deliverables are GreenCharge's key results – this is the equivalent of our product catalogue. The diagram below summarises our technological solutions and policy advice that we offer you to explore and use in your own city. See p6 for further links.

"Working as Innovation Manager in GreenCharge, it has been fascinating to see this family of products grow, as the world around us has also grown to take e-mobility and green energy more and more seriously."

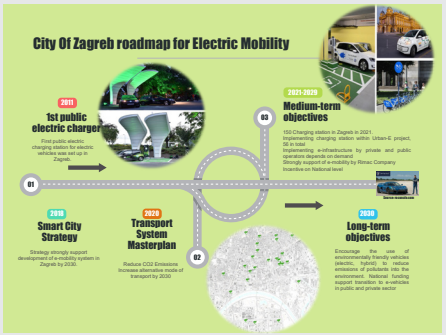
Reggie Tricker, Innovation Manager, ICLEI Europe

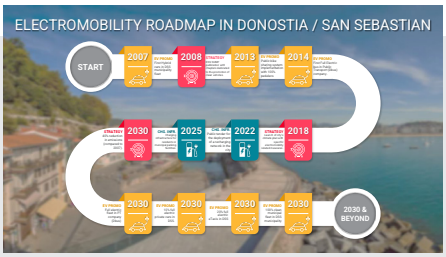
The results of the Uptake Cities

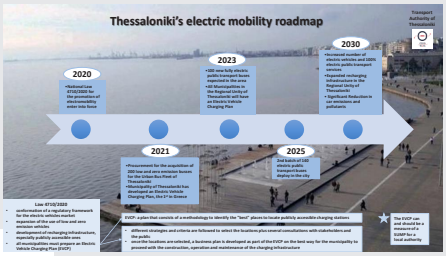
Uptake Cities learnt from the three pilot GreenCharge cities, and from each other, through site visits and an advanced webinar programme. This included cities are still at early stages of their electric mobility journey, who seek to learn from our GreenCharge pilots and demonstrations. Through GreenCharge, our Uptake Cities produced roadmaps to show how they intend to move forward with e-mobility after GreenCharge.

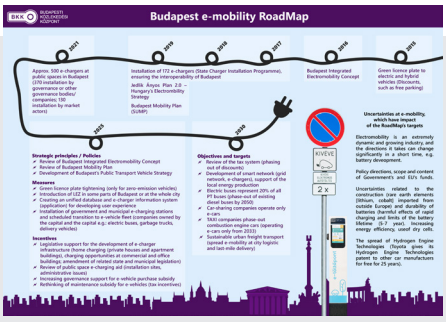


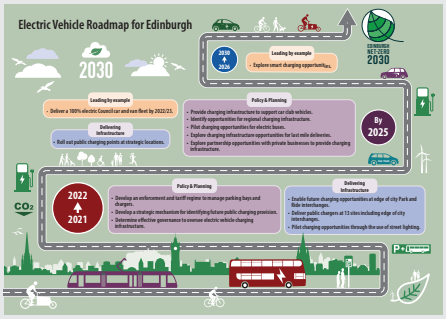
Example roadmaps











"I enjoyed the project not only being about technology. The project organised several workshops with mobility planners in Uptake Cities with the aim to discuss needs in the cities, actions undertaken and experiences, as well the project results. We found that smart energy management is not a main concern yet. Today a priority for many European cities is to build a charging infrastructure. Where the energy comes from and how it is managed is still a blurry issue. Based on these workshops as well as the project experiences, GreenCharge provides e-Mobility guidelines for Sustainable Urban Mobility Planning (SUMP Deliverable 7.3). These differences in approach and backgrounds have also been evident within the consortium, but it has been great to see people understand each other's ideas and professions over three years – but the challenge will also be present in the outside world as transport and energy needs to operate in unison with one another."

Jacqueline Floch, SINTEF

See more in Deliverable 7.3

In Brief

EV News - EU updates

New "Urban Mobility Framework for the EU

"Measures … include obligations to put in place recharging and refuelling infrastructure for electric and hydrogen vehicles in cities, improved coordination, dedicated funding for cities under the EU Mission on Climate-neutral and Smart Cities, and integrate sustainable urban logistics plans (SULPs) within the SUMP framework."
www.eltis.org/in-brief/news/european-commission-releases-new-urban-mobility-framework

eMobility Expertise Centre (EeMEC) Webinar

"*Driving the future of eMobility. Best Practices from 3 EU Cities.*"
23 February 2022 at 10:00 AM CET
https://meisterproject.eu/eemec-webinar-driving-the-future-of-emobility-best-practices-from-3-eu-cities

Fifth European conference on results from road transport R&I in H2020 projects

29-30 March 2022
www.2zeroemission.eu/event/h2020rtr21-5th-edition

Where are they at with USER-CHI?

"*It's with the users in mind that USER-CHI wants them to charge "anywhere, anytime". So, where are we at now?*"
www.userchi.eu/news/where-are-we-at-with-user-chi

New projects on mobility behaviour:

PS Lifestyle
https://pslifestyle.eu

Shared Green Deal
www.sharedgreendeal.eu

Gone but not forgotten: staying up to date with GreenCharge results

Visit the following websites to find GreenCharge's final results as they are available:

Zenodo - **https://zenodo.org/communities/h2020-greencharge**
GreenCharge's open source results will be stored to the GreenCharge community on Zenodo after approval of the deliverables by the EC.

CIVITAS - **https://civitas.eu/projects/greencharge**
The Reference Architecture, the Evaluation Framework and the Recommendations and Guidelines for integrating e-Mobility into SUMPs will be uploaded to the CIVITAS platform after approval of the deliverables by the EC.

Cordis - **https://cordis.europa.eu/project/id/769016/results**
All open deliverables are also published by the EC on CORDIS. The description of results is however more concise than that we provide on Zenodo.

App Stores –
ZET.Share **https://play.google.com/store/apps/details?id=com.zetshare** and **https://apps.apple.com/us/app/zet-share/id1497321575**
ZET.Charge **https://apps.apple.com/us/app/zet-charge/id1533967472** and **https://play.google.com/store/apps/details?id=com.zetcharge**

GitHub - search for GreenCharge

#H2020RTR21 European Conference
29 & 30 March 2022, Brussels

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Co-organised by
2ZERO CCAM ERTRAC European Commission

"Zenodo is a catch-all research data repository that enables researchers, scientists, EU projects and institutions to share research results, make research results citable, and search and reuse open research results from other projects."

GreenCharge on stage

Re-purpose. Re-charge. Re-think. Heritage and e-mobility at the crossroads:

Informed Cities Forum 26-28 October 2021

NOW AVAILABLE ONLINE

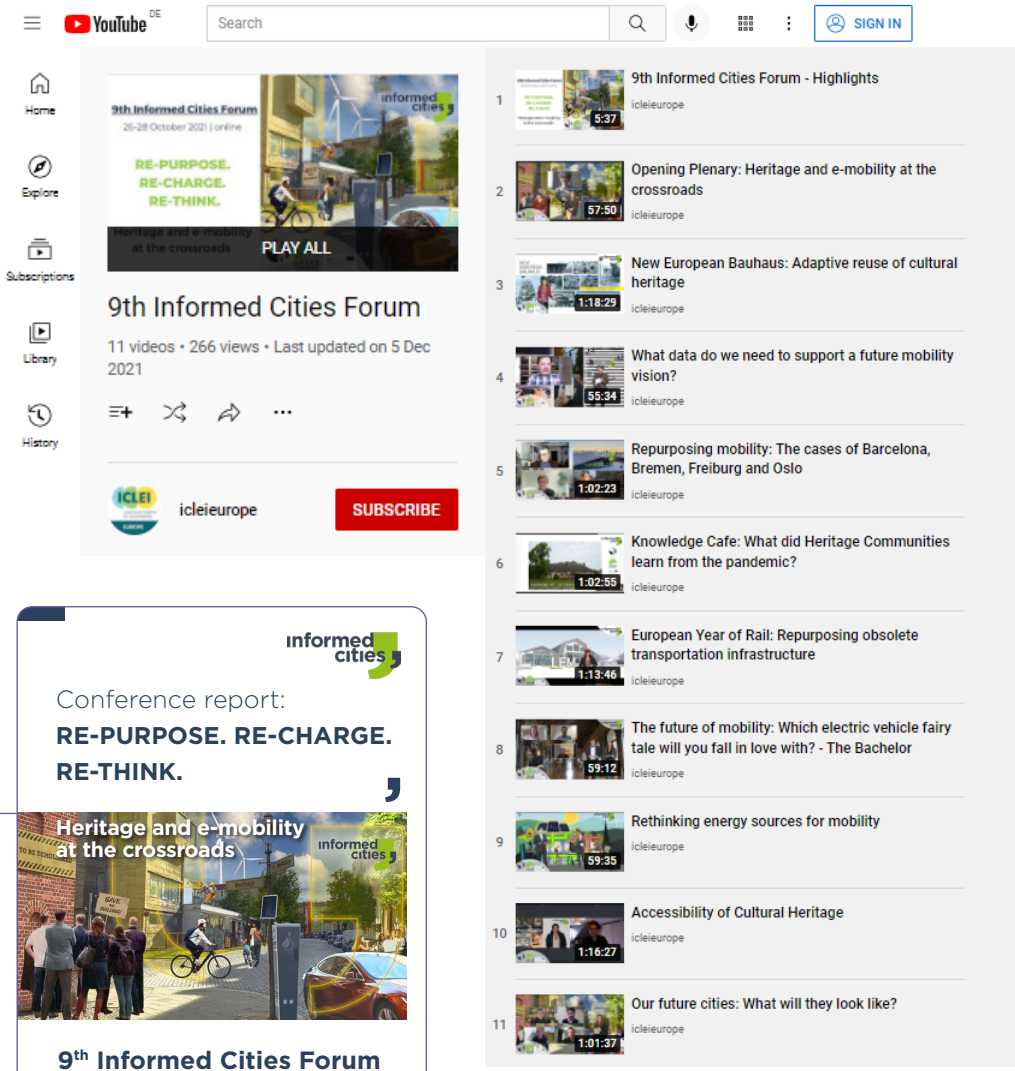
Run by ICLEI with an online audience from studios in Freiburg, members of the GreenCharge consortium gathered to discuss the results and concepts behind GreenCharge with external stakeholders and audience members – as well as with members from the Open Heritage project partnering us with the event.

Recordings from the session are available online, and a report of the event summarises what was discussed in less detail.

Event home page:
https://informedcities.eu/events/9th-informed-cities-forum

Conference summary report:
https://informedcities.eu/fileadmin/user_upload/9th-Informed-Cities-report.pdf

Video playlist:
www.youtube.com/playlist?list=PLv-mhCFisOsXBFXpU1UpELWBgx3KfnuIU



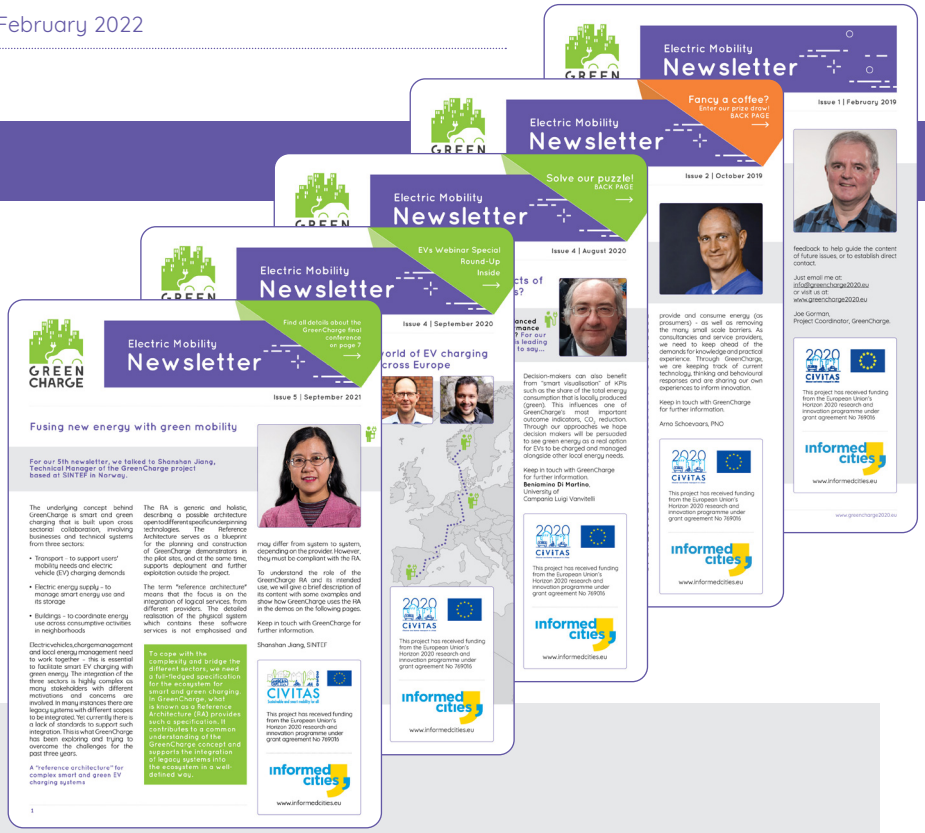
"The most memorable event to me will not be COVID-19. It will be a glad one. GreenCharge and OpenHeritage co-organized the 9th Informed Cities Forum online. What happens when people from two worlds, electric mobility and cultural heritage, meet? Indeed, we found a common ground discussing the importance of sharing, of involving communities towards making changes. Then I realized that e-mobility is much more that recharging cars, it is about recharging people with knowledge so they can change behaviours. Sessions were recorded and are available to all. Enjoy!"

Jacqueline Floch, SINTEF

Who are We?

Missed a copy?
See our previous newsletters at:
www.greencharge2020.eu/newsletters

Issue 1: Introduction to Pilots
Issue 2: Business Models
Issue 3: Simulation of Impacts
Issue 4: Roaming
Issue 5: Reference Architecture



Project Partners

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eSmart Systems
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pmc personal mobility center
Fortum charge & drive
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UiO : University of Oslo
Freie Hansestadt Bremen
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Interested in finding news from our technical partners?
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Stay up to date with further related initiatives through Informed Cities, including the next Informed Cities Forum on Sustainable Urban Mobility Planning in Grenoble.
Due Autumn 2022!

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