Newsletter #9 – September 2022

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Reflections on Replicability

Dimitrios Vranis, HEDNO
Chairman of the Replicability Board

Welcome to the 9th IElectrix Newsletter!

As the IElectrix project draws to a close, it is important to reflect upon the conclusions that have been reached, through the five different demos, the methodologies and tools applied, the challenges and the eventual contribution to sustainability and a greener future. It is also imperative to ensure that the proposed solutions can be applied elsewhere as well. And so we come to the question of Scalability and Replicability and the work of the Replicability Board.

The role of the Board has been to advise and support the activities of the WPs concerning all issues that may impact the proposed flexibility solutions (i.e. regulatory obstacles, business limitations).

Throughout the project duration, three Replicability Board meetings have been held. The goal of those meetings has been to update the members of the Replicability Board on the progress of the demos and more particularly on the work of WP4.*

Specifically, in the first meeting, in 2020 the role and responsibilities of the board were presented. In the second meeting, the progress of the demos along with the progress of the Scalability and Replicability analysis were presented.

It gave the opportunity to the Board members to comment and give insight to the presenters. In the final meeting, held in 2022, the finalized demos were presented, along with detailed results on the functional and qualitative SRA concerning the demo and replication countries.

The main takeaway from the work of the Replicability Board has been the importance of collaboration within the consortium and outside for data collection, exchange of information and technical know-how, feedback and problem solving. The synergies that exist in the fields of IT, business and financial analysis, engineering and policy making cannot be ignored and should always be in the focus of research and development.

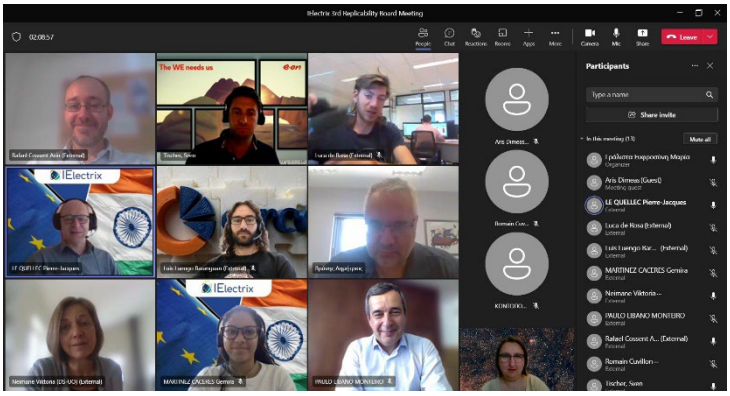
The impact of climate change cannot be ignored and the proposed solutions constitute a big step forward to tackling this massive challenge. The Replicability Board has been instrumental in aggregating the results of the analyses.

**The work of the Replicability Board has been made possible by the participation of the following members: Chairman Dimitrios Vranis (HEDNO), Victoria Neimane (Vattenfall), Paulo Libano Monteiro (EDP), Aris Dimeas (NTUA), Jan Kůla (CEZ DIstribuce)*

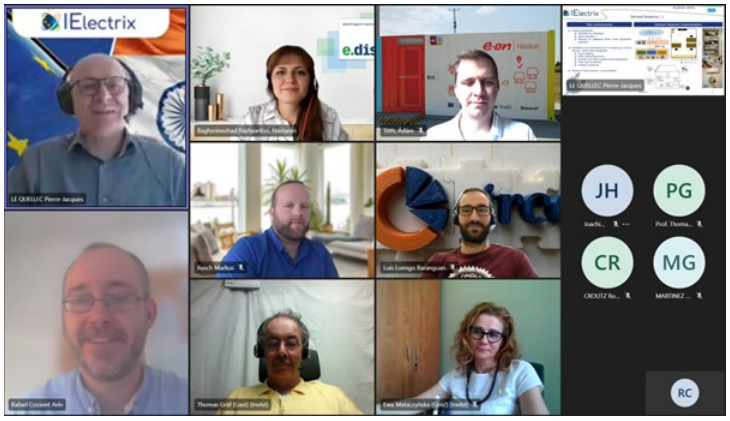
Advisory and Replicability Board

7-8 July 2022
Online event

On the 7th and the 8th of July 2022, the IElectrix work package leaders took part in the third Replicability Board and the Second Advisory Board of the project.



Lead by the Greek DSO, HEDNO, the third Replicability Board purpose was the presentation of the scalability and replicability analysis (SRA° to the partners and the external members. The Replicability Board started with a short update of the demonstrations main achievements, followed by the main topics of the discussion which were the quantitative and qualitative SRA results. Luis Luengo Baragan from Circe and Luca De Rosa from Comillas presented the results of the functionnal SRA. This analysis evaluated how changes in certain boundary conditions can affect the KPIs. Then Rafael Cossent from Comillas presented the qualitative SRA results focusing on regulatory, stakeholders and ICT.



The external members of the board shared their insights, which led to fruitfull discussions. We thank the external members Viktoria Neimane from Vattenfall, Paulo Libano Monteiro from EDP and Aris Dimeas from NTUA for joining this meeting.

During the second Advisory Board organised by the project coordinator Enedis all the demonstration leaders went more into details on the results. They especially presented the first results on Congestion and Voltage Management, Demand response and Network stability. They presented also all the lessons learned during the last few months. The external members raised some very interesting points and questions. Thanks to Thomas Graef from HTW Berlin and Ewa Mataczynska from ETIP SNET for their participation in this meeting.

Moew.e Site Visit
TC19

26-27 July 2022
In Postdam & Online

On the 26th and 27th of July, E.DIS hosted the 19th technical committee of the IElectrix project in Potsdam.

Every two months the work package leaders meet together to discuss about the progress of the project and its outlooks.

A lot of interesting topics were discussed during these two days. Especially, E.DIS, leader of the German demonstrator, presented the results of their project. The extensive measurements and simulations show that battery storage has a positive influence on grid operation. In particular, it could be proven that grid fluctuations and interventions in the grid can be reduced.

On the 27th of July, the partners who attended the technical committee on site went in the Friedland region of north-eastern Germany to visit the Moew.e demonstrator site. Due to its location, the site is ideally suited to a scenario that E.DIS network often encounters in the area of MecklenburgVorpommern and Brandenburg. Here, many plants that generate renewable energies meet relatively little customer load directly on site. This poses a challenge for the secure operation of the electricity grid and the associated grid expansion.

IElectrix demonstrators

HELGA

Demo in Hungary led by E.on EED

IElectrix Hungarian team submitted its last deliverable in July. The development of energy management system, which is responsible for the control of the battery energy storages and the development of advanced direct load control module were completed. In addition, HELGA public monitoring system is live and available for our customers:
https://www.eon.hu/hu/lakossagi/aram/ielectrix.html
In Helga demonstration, the development, implementation and evaluation phases have been completed, and we have started to disseminate the results of the project. In mid-September the Hungarian team gave a presentation at the annual conference of the Hungarian Electrotechnical Association and the presentation was well received.

Strom Güssing

Demo in Austria led by FIB (Wirtschaftsagentur Burgenland Forschungs und Innovations GmbH)

In this very last phase of the Austrian Demonstration, the individual testing of the different systems (EMS components, BESS, DR participants) took place in order to verify that the communication between the components is working bidirectional. As a follow up, the real life testing of the whole system in a combined way has been successfully carried out in the recent weeks. Based on forecasts, evaluation of available flexibility and grid calculation, schedules for the different assets have been applied resulting in the expected impact on the distribution grid.
The results of these demonstration activities are now drafted in the final Austrian Deliverable D6.4

Moew.e

Demo in Germany led by E.DIS

E.DIS team delivered sucessfully their last report to European Union, at the end of June. This report contains several KPI mesurements and calculations to evaluate both technical use case “congestion management” and “network stability”. With the submission of the report D7.4, tasks of the work package 7 are officially completed.
At the end of July, E.DIS team hosted the technical committee meeting in Potsdam and presented its results. During this event project partners visited the battery and the HV-substation in Friedland.
This newsletter contains some interesting KPI results of the Moew.e demo.

SHAKTI

Demo in India led by Enedis

During the summer, the Shakti faced some issues. Due to very hot temperatures in Delhi, the HVAC units have broken down. To preserve the health of the batteries, the BESS has been put in safety mode. During this time, thanks to the SCADA system, Shakti’s partners observed earth leakage currents in the grid. This leakage has been investigated cautiously during the previous weeks at site in India. All these issues are currently resolved and the tests will be launched soon.

Concerning the Demand-Response program, 50% of the clients agreed to participate in this experiment.

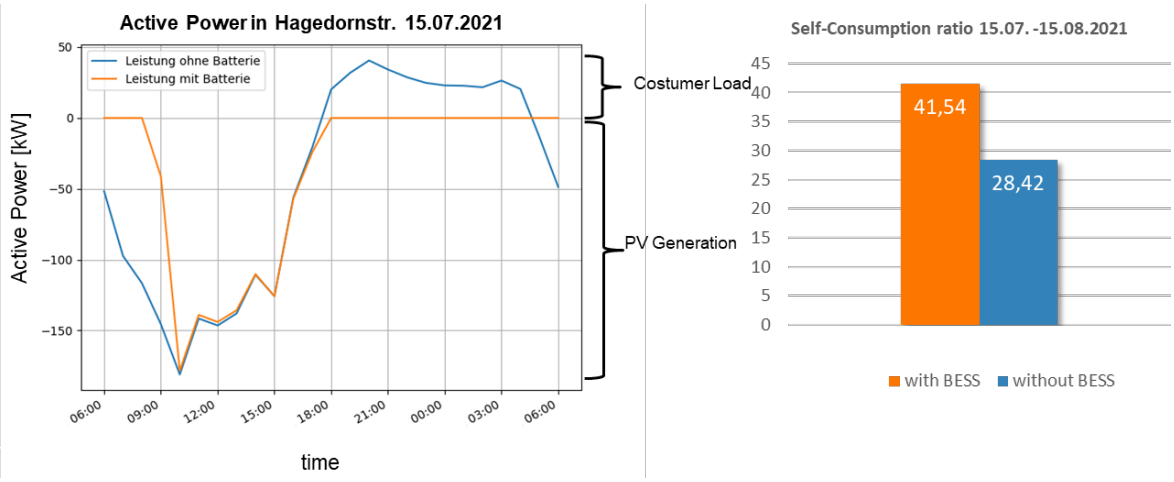
Focus on Moew.e demonstration

Moew.e BESS improves local energy management

Using the Moew.e BESS improves the local consumption of the locally generated energy. One of the KPI, which shows this improvement is self-consumption. Self-consumption in the IElectrix project describes the relationship between the proportion of locally generated energy and consumed electricity from PV systems. The basis is the local network with a solar power generation of approx. 400 kW, and a consumption of approx. 65 kW. Through battery storage the excess energy generated during the day is temporarily stored in the battery and supplies grid customers in the evening and at night.

The following figures illustrate two different curves for the case of PV generation and customer load. The blue curve in the diagram shows the generation from PV plants during the day and the consumption from the MV grid at night -without battery storage. The orange curve shows the generation and load behavior with battery storage. Here it becomes clear that no supply from the MV network is required during the night hours.

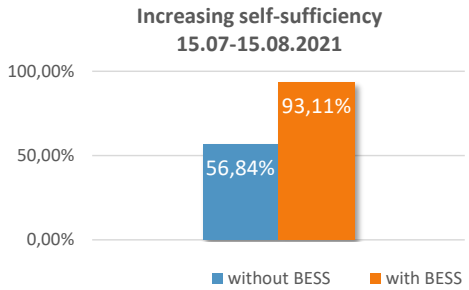
By using the battery, the self-consumption of locally generated electricity increased by around 13 percent in the test phase between 15.07-15.08.2021.



Increase in self-consumption with battery in summer

By reducing the energy export to the next grid level the self sufficiency ratio increases. Self-sufficiency in the IElectrix research project describes the relationship between the proportion of local consumption and local production from PV systems.

By using the battery, the self-sufficiency of the local community increased by around 26 percent in the test phase. Following figure shows the measurement results between 15.07-15.08.2021.



Increase in self-sufficiency with battery in summer

Using the local generated energy locally has a positive effect on the CO2 emissions. For evaluating the impact of the BESS on the CO2 emissions we assumed that the CO2 emissions associated with the **electricity mix** is constant throughout the considered period as given in (Umweltbundesamt, 2022). The specific CO2 emissions in 2021 are according to (Bundesregierung, 2021) **428 g/kWh.**

With this assumption the avoided CO2 emissions are computed based on the saved energy that is otherwise imported to the local network from the grid. The following table shows the reduction of the imported energy as well as the reduction in the CO2 emissions.

	Imported Energy [MWh]	CO2 Emissions [t]
Without BESS	10	4,3
With BESS	3,93	1,68

Reduction of CO2 emissions by means of the BESS

Website Update

First results of the IElectrix project are now available on its website in the Results section at the following web address :

https://ielectrix-h2020.eu/ielectrix-no-results

In this section you will also find a link redirecting to the Eureopean Commission funded projects page Cordis. On the IElectrix Cordis page you have access to all the public IElectrix deliverables.

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