



11/10/2018

Newsletter #6

What happened in the InterFlex project since this summer?

Newsletter's opening:	Introductory words from Dr. Marco Cupelli, Head of Power System Control and Automation, EON Energy Research Center - RWTH Aachen University
Launch of German demo:	In September, Avacon has successfully launched the remote control of first PV systems in private households by the Smart Grid Hub
Meeting with TEPCO:	A delegation of the Japanese utility TEPCO visited the InterFlex project to learn from Avacon's architecture to control flexibilities
Installation of equipment:	CEZ Distribuce installed Voltage regulated distribution transformers to monitor the behaviour of autonomous smart PV inverters functions
Battery for Flexibility market:	A 250 kW battery was installed in Eindhoven and will be directly used for the implementation of a local flexibility market
Virtual island mode:	In Simris, E.ON operates a Virtual Island Mode to minimize power exchange with the utility grid during non-landing test periods
Activation of flexibilities:	The French demo has successfully tested the first activation of flexibilities provided by 2 aggregators upon DSO's demand
2 nd Community Meeting:	InterFlex 2 nd Community Meeting, hosted by Avacon, took place in



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DR. MARCO CUPELLI

Interoperability is the Key

The InterFlex Consortium is right now halfway through the project. This is a good time to look back at the work carried out and how it meets our expectations.

The impact and deployment analysis of all innovative solutions that are being put in place in the frame of the project constitute an essential part of InterFlex. We're honoured to lead a dedicated work package on this topic focusing on the interoperability, interchangeability, and laboratory based testing of the developed solutions in all demo sites.

A very fruitful collaboration among the project partners and namely the Austrian Institute of Technology and Trialog lead to the development of a complete methodology to assess the interoperability and align the respective solutions elaborated in the different demonstrators.

We believe that this interoperability assessment methodology will not only help the DSOs in the future to have a clear picture on how they can incorporate the solutions developed in InterFlex into their control centres, but it will also enable advanced laboratory testing, where not only devices but complete architectures can be tested and evaluated, thus enabling a faster digitalization: we're bridging the gap between simulations and field trials.

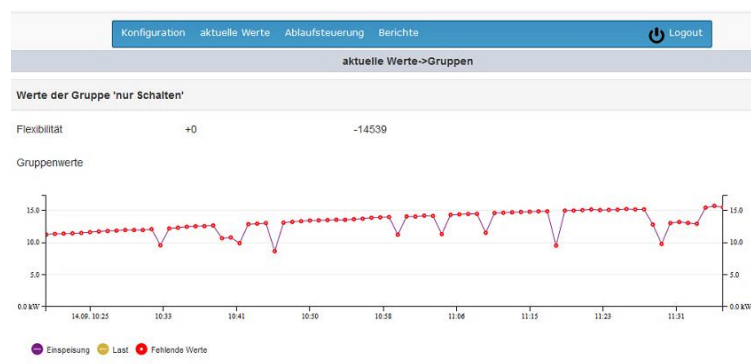


**Dr. Marco Cupelli,
Head of Power System Control and Automation, EON Energy Research Center
RWTH Aachen University**

FIELD TEST DEMONSTRATION IN GERMANY OFFICIALLY LAUNCHED!

The German demonstration has achieved a major milestone when at the beginning of September the field tests were kicked off in Lüneburg. After extensive tests in a laboratory setting first photovoltaic systems in private households were remotely controlled by the Smart Grid Hub. To enable this control mechanism the participating households were equipped beforehand with a digital meter, a Smart Meter Gateway and a control box. Over the course of the upcoming weeks the first use case on feed in management will be tested and evaluated. At the same time more households will be equipped with the measuring and control system and integrated into the smart meter infrastructure to prepare for the second round of field tests on different use cases.

Visualization of feed-in capacity of selected photovoltaic systems in the SGH graphical user interface



TEPCO MEETS INTERFLEX AT AVACON

A delegation of the Japanese utility TEPCO visited the InterFlex project at Avacon. TEPCO is responsible for the power supply in the metropolitan area in and around Tokyo. Representatives were on a visit across Europe to learn more about how Europe approaches its ambitious targets on climate change and decarbonization. Of particular interest was the German demonstrator of InterFlex and in particular the Smart Grid Hub, its infrastructure and the strategies to leverage this technology to control flexible producers and consumers.



Japan is pursuing its own energy transition. Currently a large expansion of photovoltaic systems is taking place, which leads the grid operator to face major challenges in the integration of renewables into the energy supply system.

VOLTAGE REGULATED DISTRIBUTION TRANSFORMERS ARE INSTALLED IN THE FIELD

CEZ Distribuce, the biggest Distribution System Operator (DSO) in the Czech Republic aims at implementing smart PV inverters which are equipped with advanced autonomous Volt/VAr and Volt/Watt control functions.



CEZ Distribuce installed Voltage regulated distribution transformers from SGB Company equipped with Maschinenfabrik Reinhausen On Load Tap Changer (OLTC) in 3 demonstration areas, in order to enhance testing. OLTC enables to test the behaviour of the autonomous functions at any time without waiting for voltage change in the grid.

Voltage regulated distribution transformers will be used for voltage change in the all demonstration areas during the testing period. Targeted change of the voltage by those transformers will help to evaluate in detail benefits and behaviour of advanced autonomous smart PV inverter functions.

Voltage regulated distribution transformer installed in the Divisov area, Czech Republic.

LOCAL BATTERY INSTALLED FOR THE IMPLEMENTATION OF A FLEXIBILITY MARKET

In August 2018, a 250 kW Li-ion local battery was installed in Eindhoven's Strijp-S district. In the Dutch pilot this battery is used for creating a flex market on the MV/LV network. The battery can also handle power quality issues and is managed by the Local Infra Structure management system that is built by one of the technical aggregators, CroonWolter&Dros in the project.

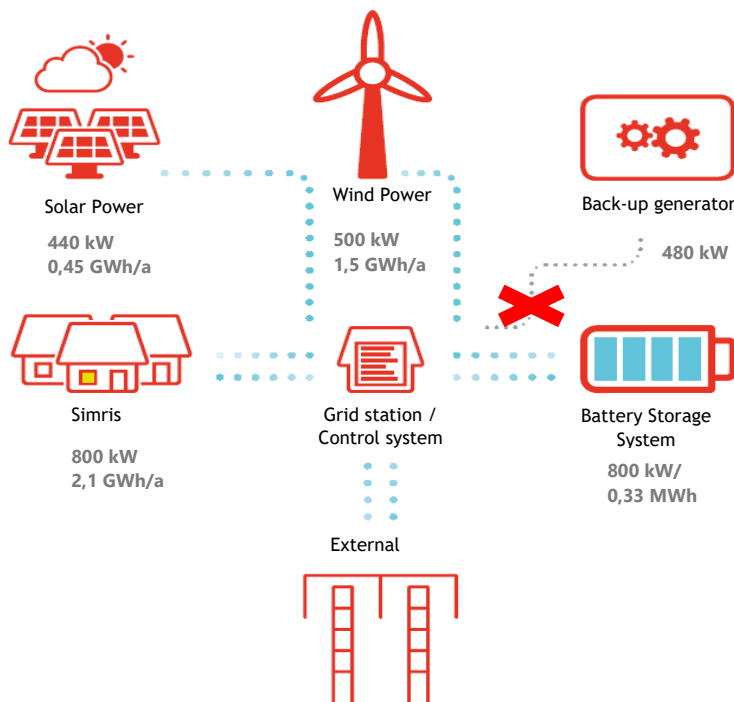
The battery was first tested in the high voltage test laboratories of DNV/GL (formerly KEMA) in Arnhem. A first test series was run in April 2018. The battery passed all subsequent tests and is now used as an asset on the LV network to create flexibility when asked from the DSO, Enexis.



VIRTUAL ISLAND MODE OPERATION - LOCAL ENERGY SYSTEM IN SIMRIS

Since a few weeks back, E.ON entered a new stage with the introduction of a Virtual Island Mode (VIM) to the Local Energy System in Simris. In VIM, the only objective is to minimize power exchanges with the utility grid. This objective translates into a cost function, which penalizes the absolute value of the power flow from and to the utility grid respectively. Particularly, power is only provided to the utility grid if renewables would have to be curtailed otherwise and power is consumed from the utility grid if internal generation and storage cannot satisfy the demand.

VIM is currently being used during the four out of five weeks when not in test mode. During these periods the battery is running as during a regular test week. However, when the battery storage system reaches its maximum state of charge level, curtailment of the centralized production units, i.e. Solar- and Wind Power Plant, is not initialized as during island mode operation. Instead, the excess energy is distributed to the external power grid. If the lower state of charge level of the battery is reached, power will be provided by the external power grid instead of utilizing the back-up biodiesel generator, as would be the case during test weeks.



Virtual Island Mode operation:

External grid is utilized when needed and back-up generator and curtailment of Solar- and Wind power plant is avoided.

Through implementing VIM more data regarding the Demand Side Response system can be collected as data is gathered every week instead of every fifth week. This additional data will enable fine-tuning of the Demand Side Response system, thus hopefully increasing the systems overall efficiency and stability. In addition, as VIM allows for DSR operation it will increase the autarky level of the customers.

FIRST ACTIVATION OF FLEXIBILITIES IN INTERFLEX'S FRENCH DEMO, NICE SMART VALLEY

The French Demonstrator of InterFlex - Nice Smart Valley - started its experimental phase during the summer of 2018, with the first activation of flexibilities upon DSO's demand.

The objective of the demonstration is to design mechanisms and tools fostering the use of local flexibilities to relieve distribution grid constraints which may arise in areas with significant renewable energy generation.

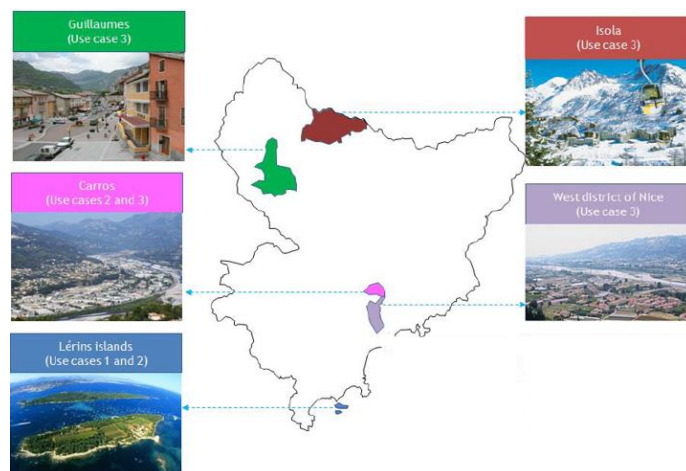
For that purpose, several types of flexibilities are provided by the two aggregators of the French demo, EDF and ENGIE:

- Behaviour based flexibilities, where B2C customers lower their consumption upon aggregator's demand. Today, 60 B2C customers volunteered to be part of the demonstration.
- Managed flexibilities, where B2C or B2B customers support the grid through modulated production or the use of adaptable loads (such as dual energy heaters): 10 B2C and 1 B2B customers provide gas/electricity flexibilities, and gas cogeneration production are about to be installed on 1 B2B customer facility.

The IT developments made to connect the gas appliance to the aggregator portals and manage these Gas/electricity flexibilities were achieved by GRDF in order to promote the use of the gas network for electrical flexibilities.

Enedis developed and installed a flexibility platform (E-Flex) at its Regional Control Agency which allows to request and activate flexibilities of the aggregators and the customers. Besides, ongoing works with the aggregators aim at designing the flexibility activation processes. In case of grid constraints, the DSO requests flexibilities in a specific area via the E-Flex platform. In response to the DSO's demand, aggregators propose a portfolio of flexibilities that the DSO chooses to activate or not. If activated, the effect of this activation is measured thanks to the Linky smart meters.

The aggregators are pursuing the customer recruitment and strengthen the IT system, in order to enhance the effect of the respective activation campaigns on the grid. Thanks to first lessons learnt the involved partners in the Nice Smart Valley project will go deeper into the market design: How many activation scenarios are relevant or needed? How can the economic value of a local flexibility be evaluated? How can we design the merit order which leads the DSO to select the best offer among the locally available flexibilities?



2ND COMMUNITY MEETING IN HANOVER

The 2nd InterFlex Community Meeting took place at the Museum of Energy History in Hanover (Germany) on the 11th of October 2018. Around 30 companies attended the event gathering energy industry associations, equipment manufacturers, DSOs, aggregators, researchers, consultants and other smart grids experts.

Frank Aigner, member of Avacon's board of management, opened the event and highlighted the importance of the challenges addressed by InterFlex in the context of the global energy transition. He summed up the first achievements of InterFlex in its different demonstrators since the beginning of the project, 22 months ago. Those achievements were then shared and discussed with the audience all along the day.



Very fruitful discussions about the future use of flexibilities at a local scale helped to pinpoint the major social, regulatory and economic challenges to face. All speakers insisted on one point: customer involvement is essential in order to implement a local flexibility market. Stakeholder's roles for distributed energy storage and perspectives for emerging business models were addressed in a second panel discussion in which experiences from different European projects were shared.

Manifold outcomes of the demonstrations are expected this year and will feed next discussions on the use of local flexibility in the upcoming events. The slides which were presented during the day are available upon request.

Thank you very much for your interest in our project!

NEXT EVENT

**European Utility Week
Vienna, 6-8th November**

See you at InterFlex stand

This is the end of our 6th Newsletter!

Next one in two months!

Do not forget to visit our website:

<http://interflex-h2020.com/>

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