

## First Scientific Day on Demand Side Response / Management

HES-SO Valais//Wallis, Sion, Route du Rawyl 47 (<http://www.hevs.ch/GoRawyl>), Room BR01

October 24<sup>th</sup> 2014, 9:30 – 13:00

### Program

Time	Title	Presenter	Abstract
9:30	<b>Welcome</b>	Dominique Gabioud, HES-SO; Mario Paolone, EPFL, Head of SCCER FURIES	
9:40	<b>GECN: A Demand-Response Mechanism for Providing Grid Ancillary Services</b>	Dan Cristian Tomozei ( <a href="mailto:dan-cristian.tomozei@epfl.ch">dan-cristian.tomozei@epfl.ch</a> ) EPFL-LAC2/DESL	We propose the Grid Explicit Congestion Notification (GECN), a protocol for real-time demand response in active distribution networks (ADN). GECN performs primary voltage control using real-time demand response via a broadcast low-rate communication signal. We show that it is possible to use the same broadcast signal for control of loads and for distributed storage management. The performance of the scheme is numerically evaluated on the IEEE 34-node test feeder.
10:15	<b>Managing Flexibility in Energy Systems: towards the Elaboration of Control Strategies and of a Real-time Control Architecture</b>	Dominique Gabioud ( <a href="mailto:dominique.gabioud@hevs.ch">dominique.gabioud@hevs.ch</a> ) HES-SO Valais-Wallis	We propose an approach to demand side response combining simulation and real-time control. Once constraints at the process, building and feeder levels are fulfilled, the remaining flexibility is made available to market actors. A multi-energy simulator including an electrical load flow calculator and a thermal process module allows assessing control strategies. An architecture based on message-oriented middleware and internet of things (IoT) technology has been elaborated to support real-time control.
10:50	<b>Pause</b>		
11:15	<b>Optimization of District Energy Systems: the Potential for Thermal Storage</b>	Araz Ashouri ( <a href="mailto:araz.ashouri@epfl.ch">araz.ashouri@epfl.ch</a> ), François Maréchal ( <a href="mailto:francois.marechal@epfl.ch">francois.marechal@epfl.ch</a> ), EPFL-IPESE	The use of storage tanks integrated with district energy systems would permit to increase the annual utilization of base load equipment and balancing the energy demand fluctuation during day and night. We use a model for optimal sizing and operating of storage devices, resulting in improved efficiency, environmental impacts and total costs. In addition, model predictive control techniques are used to investigate the influence of electrical pricing and electrical grid constraints on the operation of storage tanks.
11:50	<b>A Decentralized Approach to the Management of Distributed Energy Generation, Storage and Consumption</b>	Vasco Medici ( <a href="mailto:vasco.medici@supsi.ch">vasco.medici@supsi.ch</a> ), SUPSI	We investigate the applicability of demand-side management of dispatchable loads in a residential microgrid by means of decentralized controllers applied to the single electrical appliances and deployed in each household. Only local electricity measurements at the appliances' sockets are used as predictors of the status of the grid. Our preliminary results indicate that the introduction of the smart controllers has a beneficial effect on the grid stability, especially when combined with local storage.
12:25	<b>Flexibilisation of household electricity demand for larger PV penetration in the grid</b>	Nicolas Wyrsh ( <a href="mailto:nicolas.wyrsh@epfl.ch">nicolas.wyrsh@epfl.ch</a> ) EPFL STI IMT PV-LAB	Demand-side management is an important measure to maximize auto-consumption of locally produced electricity. Such a demand-side management requires either technical or consumers motivation measures to shift electricity demand to periods of time when PV production is plentiful. We investigate here the share of electricity that indeed is flexible and in which extent consumers may shift their consumption.
13:00	<b>Lunch</b>		