INCREASE

INCREASING THE PENETRATION OF RENEWABLE ENERGY SOURCES IN THE DISTRIBUTION GRID BY DEVELOPING CONTROL STRATEGIES AND USING ANCILLARY SERVICES

D6.6 INCREASE workshops to be organized, one of the workshops concerning multi-agent based techniques will be organized in cooperation with the DREAM consortium

INCREASE – *Increasing the penetration of renewable energy sources in the distribution grid by developing control strategies and using ancillary services*
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1. Summary

In Annex I of INCREASE one of the indicators of success for WP6 (Dissemination and deployment of results) task 6.3 (Setting up 1 large scale conference, summer schools and exchange workshops) is the organisation of at least 4 dedicated workshops with 25 to 50 participants. As we are now in the middle of the project, 2 workshops have already been organized and 2 more are still planned. This report gives an overview of the different workshops, their themes, audience and outcome.

2. Overview of organized workshops

Two INCREASE workshops already took place:

- May 19th 2014, Graz, Austria: The EU INCREASE Project - Providing solutions for distributed RES generation from technical issues to test case demonstrations
- July 17th 2015, Kortrijk, Belgium: Grid-interactive solutions

2.1 The EU INCREASE Project - Providing solutions for distributed RES generation from technical issues to test case demonstrations

To highlight the unique features of the INCREASE project dealing with demonstration of intelligent smart grid solutions in the distribution network, an INCREASE workshop was organized as a dedicated session on the first day of the premier Smart Grid event of Styria, Austria: the Smart Grids Week. Partner Energienetze Steiermark and Joanneum Research organized this dedicated workshop. The Smart Grids Week took place from May 19th until 23rd 2014 in Graz, organized by the Austrian Federal Ministry for Transport, Innovation and Technology, the Austrian Climate and Energy Fund and Energie Steiermark. The theme of this workshop was 'Providing solutions for distributed RES generation from technical issues to test case demonstrations'.

27 national and international participants from academia, administration and business attended this workshop, all engaging in the discussion and also giving feedback on the project's contents. The speakers presented the INCREASE project, its goals and methodology, as well as the field demonstration cases in which the developed technological solutions will be showcased and gave an outline on planned work related to ancillary services. Other speakers included the industrial experts who presented the national smart grid projects of interest to the audience, extending the applicability scope of the proposed INCREASE solutions.

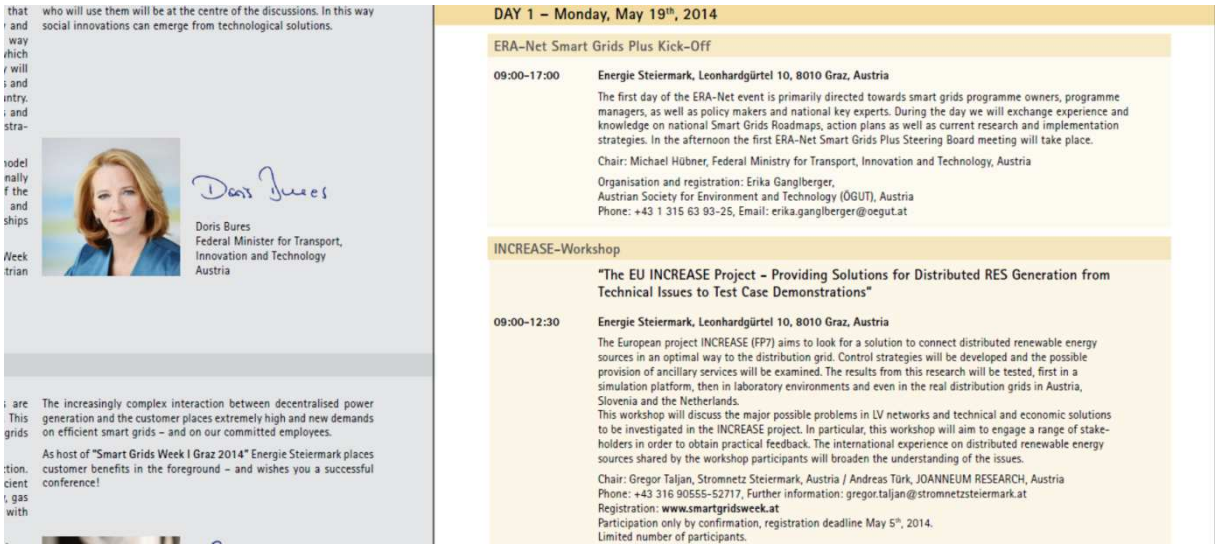
The discussion focused in particular on the practical problems the DSO faces as the supply of electricity is increasingly becoming decentralized. A more decentralized electricity production leads to issues associated with local power injection, current direction changes, fluctuating and less controllable flow of energy in distribution networks. Also the network becomes bidirectional and an

energy injection from DSO to TSO emerges. Within the field trials, the DSOs in the INCREASE project test possible solutions for these new challenges.

In the current top-down architecture of the electricity system, increasing decentralized electricity production leads also to regulatory issues in addition to the technical issues. The Belgian DSOs for example face the overlapping jurisdiction of two regulators, the national and regional, with sometimes conflicting requirements. EANDIS presented an example of a DSO dealing with these issues. Also, the issue of renewable quality of the energy injected into the grid by distributed renewable energy sources is only now being discussed. Up to now, the national legislation often decreed that when green energy is being put into the grid, it is treated in the same way as energy from conventional sources. One possible solution would be to introduce a green certificate-based solution, similar to RECS certificates, or use the Guarantees of Origin to certify the green quality of this energy. On the other hand, a system needs to be in place to cater to the needs of the consumers of such green energy.

The Workshop concluded that field tests as the above are of high importance to prepare the DSO for the coming challenges and minimize their risks.

The workshop was internationally announced through the INCREASE channels, the channels of Energienetze Steiermark and of the Smart Grids Week. Below is a picture of the workshop in the Smart Grids Program.



who will use them will be at the centre of the discussions. In this way social innovations can emerge from technological solutions.

Doris Bures
Federal Minister for Transport, Innovation and Technology
Austria

The increasingly complex interaction between decentralised power generation and the customer places extremely high and new demands on efficient smart grids – and on our committed employees.

As host of "Smart Grids Week I Graz 2014" Energie Steiermark places customer benefits in the foreground – and wishes you a successful conference!

DAY 1 – Monday, May 19th, 2014

ERA-Net Smart Grids Plus Kick-Off

09:00–17:00 **Energie Steiermark, Leonhardgürtel 10, 8010 Graz, Austria**

The first day of the ERA-Net event is primarily directed towards smart grids programme owners, programme managers, as well as policy makers and national key experts. During the day we will exchange experience and knowledge on national Smart Grids Roadmaps, action plans as well as current research and implementation strategies. In the afternoon the first ERA-Net Smart Grids Plus Steering Board meeting will take place.

Chair: Michael Hübner, Federal Ministry for Transport, Innovation and Technology, Austria

Organisation and registration: Erika Ganglberger,
Austrian Society for Environment and Technology (ÖGUT), Austria
Phone: +43 1 315 63 93-25, Email: erika.ganglberger@oegut.at

INCREASE-Workshop

"The EU INCREASE Project – Providing Solutions for Distributed RES Generation from Technical Issues to Test Case Demonstrations"

09:00–12:30 **Energie Steiermark, Leonhardgürtel 10, 8010 Graz, Austria**

The European project INCREASE (FP7) aims to look for a solution to connect distributed renewable energy sources in an optimal way to the distribution grid. Control strategies will be developed and the possible provision of ancillary services will be examined. The results from this research will be tested, first in a simulation platform, then in laboratory environments and even in the real distribution grids in Austria, Slovenia and the Netherlands.
This workshop will discuss the major possible problems in LV networks and technical and economic solutions to be investigated in the INCREASE project. In particular, this workshop will aim to engage a range of stake-holders in order to obtain practical feedback. The international experience on distributed renewable energy sources shared by the workshop participants will broaden the understanding of the issues.

Chair: Gregor Taljan, Stromnetz Steiermark, Austria / Andreas Türk, JOANNEUM RESEARCH, Austria
Phone: +43 316 90555-52717, Further information: gregor.taljan@stromnetzsteiermark.at
Registration: **www.smartgridsweek.at**
Participation only by confirmation, registration deadline May 5th, 2014.
Limited number of participants.

2.2 Grid-interactive solutions

INCREASE also has 3 summer schools planned. The first one was organized by partner Ghent University in Ghent, Belgium, from July 14th until July 17th 2015. This summer school also included a dedicated workshop entitled 'Grid-interactive solutions'. For this workshop the whole group of

summer school participants travelled to Kortrijk to visit the Lemcko laboratory where the INCREASE lab tests are taking place.

Below is the programme of the summer school and also of the workshop:

DAY 1: The structure and operation of the distribution grid		14/7/2015
Module 1: The distribution grid		***Presenter***
8u30-9u45	1.1 Structure of the distribution grid	Ruth Van Caenegem (Eandis)
9u45-10u00	*Break*	
10u00-11u15	1.2 Operation of the distribution grid	Ruth Van Caenegem (Eandis)
11u15-12u30	1.3 Overview of new components and technologies (RES, heat pumps, EV, etc.)	Sergio Jurado (iURBAN)
12u30u-13u30	**Lunch**	
Module 2: The transition from the traditional grid to the smart grid		
13u30-14u45	2.1 Need for new topology/structure of the smart grid?	Ruth Van Caenegem (Eandis)
14u45-16u00	2.2 Overview of smart grid components (OLTC, FACTS, Active power filters)	Antony Zegers (AIT)
16u00-16u15	*Break*	
16u15-17u30	2.3 What does this mean: a flexible grid, a smart grid, what do we need to change?	Sergio Jurado (iURBAN)

DAY 2: Controlling the distribution grid of tomorrow and its components		15/7/2015
Module 3: Introduction to control techniques		***Presenter***
8u30-9u45	3.1 PQ-improving control strategies & Droop-based control strategies	Bart Meersman (UGent)
9u45-10u00	*Break*	
10u00-11u15	3.2 Communication based optimisation techniques	Gaspard Lebel (INPG - DREAM)
Module 4: The INCREASE control strategy		
11u15-12u30	4.1 The local control strategy	Dimitar Bozalakov (UGent)
12u30u-13u30	**Lunch**	

13u30-14u45	4.2 The overlaying control strategy	Phuong Nguyen (TU/e)
14u45-16u00	4.3 The scheduling control strategy	Andrej Gubina (UL)
16u30-18u30	*Guided visit to Ghent (Meeting point: Capitole, Zuid)*	

Day 3: Simulating the distribution grid of tomorrow		16/7/2015
Module 5: Introduction to modelling and simulation techniques		***Presenter***
8u30-9u45	5.1 Introduction to simulation platforms, modelling processes and techniques	Grigoris Papagiannis (AUTH)
9u45-10u00	*Break*	
10u00-11u15	5.2 Smart distribution grids, distributed simulations and the identification based models	Mihail Mihaylov (SCANERGY - Sensing Control)
11u15-12u30	5.3 Modelling of complex smart grids: co-simulation concepts and methods	Matthias Strobbe (UGent - iMinds)
12u30u-13u30	**Lunch**	
Module 6: The INCREASE Simulation platform		
13u30-14u45	6.1 The OpenDSS environment and its application in smart grid simulations	Andreas Chrysochos (AUTH)
14u45-16u00	6.2 Intelligent control system modelling, multi-agent control implementation in co-simulation environment	Andreas Chrysochos (AUTH)

Day 4: Market models & Visit of Lemcko @ Kortrijk		17/7/2015
Module 7: Market models necessary to address the challenges		***Presenter***
8u30-9u45	7.1 Ancillary services in the distribution network: Where are the opportunities?	Andrej Gubina (UL)
9u45-10u00	*Break*	
10u00-11u15	7.2 Market models	Sergio Jurado (iURBAN & GreenCom - Sensing Control)
Module 8: Visit of Lemcko @ Kortrijk for the technical workshop 'Grid-interactive solutions'		
11u15-12u30	*Transport to Kortrijk*	
12u30u-13u30	**Lunch**	

13u30-14u05	Theoretical considerations	Jan Desmet, (Lemcko - UGent),
14u10-14u45	Group 1: Voltage unbalance Group 2: Batteries	Jurgen Van Ryckegem (Lemcko - UGent), Dimitar Bozalakov (UGent)
14u45-15u20	Group 1: Batteries Group 2: Voltage unbalance	Jurgen Van Ryckegem (Lemcko - UGent), Dimitar Bozalakov (UGent)

28 participants attended the summer school and workshop. Many positive feedback was received for the organization and the content. More detailed information about the INCREASE summer school will be reported in D7.4 Intermediate Progress Report n°3.

Below are pictures from the workshop in Kortrijk and a group picture of the participants.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3. Planned INCREASE workshops

3.1 Workshop in Thessaloniki

The next INCREASE dedicated workshop will be organized by partner AUTH in Thessaloniki, Greece, on September 16th 2015. This workshop will discuss how to develop new tools and methods for DSOs and TSOs for the future smart grids'. Preparations for this workshop are at full speed right now and presenters are being contacted. The draft agenda is the following:

09.00 - 09.30 Registration

09.30 - 09.45 Welcome, Opening Speech

First session: Looking in the future grids: Challenges and opportunities

09.45 - 10.10 1st presentation by a representative of ETPSG or EDSO

10.10 - 10.35 2nd presentation on PV installations and trends by a representative of EPIA or ETP PV

10.35 - 11.00 3rd presentation about the collaboration between DSOs and TSOs by a representative of ENTSO-e or EURELECTRIC or a TSO

11.00 - 11.30 Panel discussion

11.30 - 12.00 Coffee break

Second session: Tools and methods for DSOs and TSOs

12.00 - 12.25 Project presentation of the proposed solutions of DREAM or evolvDSO

12.25 - 12.50 Project presentation of the proposed solutions of one of the following projects: SINGULAR, MetaPV

12.50 - 13.15 The INCREASE control solutions

13.15 - 13.45 Panel discussion – Conclusions

14.00 - 15.30 Lunch

Optional

16.30 - 18.30 A guided tour of the city of Thessaloniki (by bus)

This is still the preliminary program, more details about this workshop will also be described in D7.4 Intermediate Progress Report n°3.

3.2 Workshop in Grenoble

The INCREASE sister project DREAM is organizing a winter school this December 2015. During this winter school also the workshop concerning multi-agent based techniques will take place in cooperation with the DREAM consortium. This event will take place in Grenoble, France, during the week of December 14th 2015. More details are not yet available at this moment, organizing this workshop will start in September 2015. This workshop will be reported in detail in D7.5 Intermediate Progress Report n°4.