



1. Welcome

History meets future - The 8th International Conference on the Integration of Renewable and Distributed Energy Resources in Vienna, Austria

Today's power sector worldwide has been observing dramatic changes. The main reasons behind these changes are the growing shares of renewable and distributed energy resources (DER) and their advanced functionalities, the introduction of advanced communication technologies, rising volumes of data and the evolution of electricity markets. Within the 8th International Conference on the Integration of Renewable and Distributed Energy Resources – IRED 2018, the future of distributed energy resources and their participation in the power system management and operation will be discussed in the historic ambience of the city of Vienna.

IRED is a global conference gathering experts from industry, government and academia to share information on state-of-the-art technologies, research and know-how and engage in lively discussions related to the integration of renewable and distributed energy resources into the power systems. The conference will focus on the technical, market, and regulatory issues that challenge the integration of these resources into the grid. The goals of this conference are to:

- Share status and latest results of research projects
- Better understand and communicate the visions from various stakeholders and players
- Learn from individual national programs and policies
- Discuss main issues and barriers and identify other needed research and potential solutions
- Stimulate international, national, and regional project and program coordination

The conference will include several opportunities for in depth discussion within pre-conference sessions, post-conference breakouts, a poster session, and evening events.

Conference Chairs



Helfried Brunner
AIT Austrian Institute of Technology



Michael Hübner
BMVIT Federal Ministry for Transport,
Innovation and Technology

2. Conference Venue

Parkhotel Schönbrunn
 Hietzinger Hauptstraße 10-14
 1130 Vienna, Austria



3. Program at a glance

time	Tu 16.10.	We 17.10.	Th 18.10.	Fr 19.10.
Morning		DERlab side-event	IRED 2018 Session 2 Session 3	IRED 2018 Session 5 Session 6
lunch				
Afternoon	NEDO side-event	ERI Grid Side Event @ AIT	IRED 2018 Opening Session 1 Session 2	IRED 2018 Session 4
				IRED 2018 Session 7
				Site visit Seestadt ASPERN, Vienna
Evening		Hosted Dinner	Poster Session & Reception	

4. Conference Programme (draft)

Wednesday October 17th, 2018

Opening Session – Welcome and Introductions

Chair: Helfried Brunner, AIT Austrian Institute of Technology

Michael Hübner, BMVIT Austrian Federal Ministry for Transport, Innovation and Technology

Title of talk	Speaker name	Speaker Affiliation
Welcome Speech	Helfried Brunner	AIT Austrian Institute of Technology
Welcome Speech	Michael Hübner	BMVIT Austrian Federal Ministry for Transport, Innovation and Technology
Keynote: DOE Grid Modernization Initiative	Kevin Lynn	US Department of Energy

Session 1: Policies & Programs

Chair: Satoshi Morozumi, New Energy and Industrial Technology Development Organization (NEDO), Japan

Title of talk	Speaker name	Speaker Affiliation
Opening	Satoshi Morozumi	New Energy and Industrial Technology Development Organization (NEDO), Japan
Status and challenges on the power system in Japan	Kazuhiko Mutoh	Smart Community Department, NEDO, Japan
EU leadership in the integration of renewables	Piotr Tulej	European Commission, DG Research and Innovation
Further talks	tbc.	

Session 2 part 1: Reporting on Results of Large Project Portfolios

Chairs: Benjamin Kroposki, National Renewable Energy Laboratory, US

Patrick Van Hove, European Commission, DG Research and Innovation

Title of talk	Speaker name	Speaker Affiliation
Opening	Benjamin Kroposki	National Renewable Energy Laboratory, US
	Patrick Van Hove	European Commission, DG Research and Innovation
German SINTEG program – Smartgrid Showcase	Tom Ryssele	Federal Ministry for Economic Affairs and Energy, Germany



US DOE Grid Modernization Initiative and Laboratory Consortium	Kevin Lynn	US Department of Energy
European CROSSBOW Project	Manuel Serrano Matoses	ETRA, Spain
Nii-jima demonstration in Japan	Jun Johkaji	Tokyo Electric Power Company, Japan
New Developments in Smart Grid Investments in Canada	Josef Ayoub	Natural Resources Canada, Canada
Smart Grid Demonstration Project on Shanghai Chongming Island	Peichao Zhang	Shanghai Jiao Tong University, China

Hosted Dinner Rathauskeller Wien

Thursday October 18th, 2018

Session 2 part 2: Reporting on Results of Large Project Portfolios Chairs: Benjamin Kroposki, National Renewable Energy laboratory, US Patrick Van Hove, European Commission, DG Research and Innovation		
Title of talk	Speaker name	Speaker Affiliation
Recap / Welcome	Benjamin Kroposki	National Renewable Energy Laboratory, US
	Patrick Van Hove	European Commission, DG Research and Innovation
Monitoring 9000 MW photovoltaics worldwide	Javier Sanjuan	DNL-GL, Norway
Prospering from the Energy Revolution, a UK R7D and demonstration programme	Rob Saunders	Innovate UK, UK
Developing renewables to the 2030 targets in India	S.K. Mishra	Solar Energy Corporation of India, India
Seestadt Aspern: Vienna's test bed for the future of energy provision in urban areas	Alfred Einfalt	Siemens Corporate Technology, Austria

Coffee Break

Session 3: Markets and Regulatory Frameworks

Chairs: Luciano Martini, Ricerca sul Sistema Energetico – RSE SpA, Italy
 Mark Rawson, California Energy Commission, US

Title of talk	Speaker name	Speaker Affiliation
Opening	Mark Rawson	California Energy Commission, US
	Luciano Martini	RSE SpA, Italy
Regulation and markets summary in Asia	tbc.	Waseda University, Japan
Further talks tbc.	tbc.	

12:30-14:00 Lunch

Session 4: Transmission and Distribution Interaction, Systems Integration, Modelling & Simulation

Chairs: Jim Reilly, Reilly Associates, US
 Nikos Hatziargyriou, National Technical University of Athens and HEDNO, Greece

Title of talk	Speaker name	Speaker Affiliation
Opening	Jim Reilly	Reilly Associates, US
	Nikos Hatziargyriou	National Technical University of Athens and HEDNO, Greece
ENTSOE (European TSOs) and EDSO (European DSOs) Views on TSO/DSO Collaboration	Laurent Schmitt Robert Zagrandi	General Secretary of ENTSO-e General Secretary of EDSO
EPRI TSO DSO project	Alison O'Connell	Electric Power Research Institute (EPRI), US
Reliability Issues related to transmission and distribution interaction	John N. Moura	North American Electric Reliability Corporation, US
Transmission Distribution co-simulation modelling	Ning Kang	Argonne National Laboratory, US

Coffee Break

Session 4 – part 2: Transmission and Distribution Interaction, Systems Integration, Modelling & Simulation

Chairs: Jim Reilly, Reilly Associates, US

Nikos Hatzigiorgiou, National Technical University of Athens and HEDNO, Greece

Title of talk	Speaker name	Speaker Affiliation
Data exchange and ICT-requirements for TSO-DSO interaction: an international best practice analysis	Mark Stefan	AIT Austrian Institute of Technology, Austria
OpSim: test- and simulation-environment for grid control and aggregation strategies	Martin Braun	Fraunhofer IEE, Germany
Planning method on the high renewable penetration grid; Japanese renewable generation forecasting method development and simulation applying those forecasting	Takeshi Maeno	NEDO, Japan
SmartNetProject - TSO and DSO coordination for the provision of ancillary services	Gianluigi Migliavacca	Coordinator of EU SmartNet project, RSE, Italy

Poster reception

Chair: Wolfgang Gawlik, University of Technology Vienna

Friday October 19th, 2018

Session 5: Standards and evolution of grid codes for the Integration of Higher Penetrations of renewable and Distributed Resources

Chairs: Roland Bründlinger, AIT Austrian Institute of Technology, Austria

Tom Key, Electric Power Research Institute (EPRI), US

Title of talk	Speaker name	Speaker Affiliation
Opening	Tom Key Roland Bründlinger	Electric Power Research Institute (EPRI), US AIT Austrian Institute of Technology, Austria
The Grid Interconnection Standard IEEE 1547 2018	David Narang	NREL
Standard for specification of microgrid controllers (IEEE 2030.7) and P2030.11 DERMS	Geza Joos	MCGill University Montreal, Canada



European Network Code Requirements for Generators – update on national implementation in Europe	Thomas Schaupp	European Committee for Electrotechnical Standardization (CENELEC)
Update on Developments in Australia	John Ward	CSIRO, Australia
Japanese test bed of renewable integration	Kenji Otani	Fukushima Renewable Energy Institute, Japan

Coffee Break

Session 6: Panel Discussion: Running the Grid Mostly on Renewable Energy

Chair: Abraham Ellis, Sandia National Laboratories (SNL), US

Title of talk	Speaker name	Speaker Affiliation
Moderation	Abraham Ellis	Sandia National Laboratories (SNL), US
Managing RE with flexible thermal energy	Alexandre Prieur	Natural Resources Canada, Canada
Working with high RE penetration in So. Japan	Hirohisa Aki	Tsukuba University, Japan
Managing RE at the bulk system level	Thibault Prevost	RTE, France
Glimpses of 100% RE in Hawaii	Debbie Lew	GE Power, US
Transmission and Large-scale RE	Jingran Wang	State Grid Corporation, China
Tbc.	Tbc.	Singapore tbc.

12:30-1:30 Lunch

Session 7: Closing Session

Chair: Helfried Brunner, AIT Austrian Institute of Technology

Title of talk	Speaker name	Speaker Affiliation
Opening	Helfried Brunner	AIT Austrian Institute of Technology
Summary Session 1	Satoshi Morozumi	New Energy and Industrial Technology Development Organization (NEDO), Japan
Summary Session 2	Benjamin Kroposki Patrick Van Hove	National Renewable Energy Laboratory, US European Commission, DG Research and Innovation



Summary Session 3	Mark Rawson Luciano Martini	California Energy Commission, US RSE SpA, Italy
Summary Session 4	Jim Reilly Nikos Hatziaargyriou	Reilly Associates, US National Technical University of Athens and HEDNO, Greece
Summary Session 5	Tom Key Roland Bründlinger	Electric Power Research Institute (EPRI), US AIT Austrian Institute of Technology GmbH, Austria
Summary Session 6	Abraham Ellis	Sandia National Laboratories (SNL), US
Announcement of IRED 2020 Australia	John Ward	CSIRO, Australia
Closing remarks	Michael Hübner	BMVIT Federal Ministry for Transport, Innovation and Technology

5. Side Events

Tuesday Oct 16th, 2018

AIT	Laboratory-based Services for Smart Grids: Best Practices from the ERIGrid Project
Venue:	AIT Austrian Institute of Technology Giefinggasse 2 A 1210 Wien
Time	Registration starts at 8:30 am Workshop 9:00 am-5:00 pm
Event summary	<p>Power system testing issues have not been much considered in laboratory context up to now. Up till now supporting future development of smart grid solutions and technologies was done on component level, but system level issues need to be considered too. Pure simulation and current laboratory-based approaches need to be combined and enhanced, since they are not always sufficient to tackle complex problems. Therefore, there is a need for harmonizing the existing flexible simulation and co-simulation tools, advanced validations methods using hardware-in-the-loop testing environments and for improving laboratory testing of component and small-scale power system.</p> <p>The proposed workshop intends to bring together the relevant stakeholders, initiatives and projects to discuss the state-of-the-art and future aims. The discussions should also support the knowledge exchange of running projects.</p> <p>The following research topics will be considered in the workshop:</p> <ul style="list-style-type: none"> • Improvement of existing laboratories with ICT systems • Developed advanced testing scenarios and corresponding methods from a systems integration point of view • Improvement of hardware-in-the-loop approach fostering system integration tests, combining co-simulation and real setups for advanced system integration tests
Contact	Thomas.Strasser@ait.ac.at. https://erigrd.eu

NEDO	NEDO Smart Community Showcase 2018 - Let's talk about technology demonstration
Venue:	Venue: Parkhotel Schönbrunn, Hietzinger Hauptstraße 10-14, 1130 Vienna, Souterrain: Room Franz Joseph I+II
Time	1:30-7:00 pm
Event summary	<p>NEDO has carried out 17 international smart community Demonstration Projects. More than half of these are done in Europe with European Partners.</p> <p>NEDO Smart Community Showcase 2018: Let's talk about technology demonstration Date and Time : October 16th 13:30-19:00 (including</p>




	<p>Networking Reception)</p> <p>NEDO wants to enhance our demonstration project with your knowledge and suggestions. Stakeholders of Japan and partner country related to NEDO demonstration projects mainly in Europe introduce the project plan and results for discussion.</p> <p>The following topics will be discussed in the Symposium (tentative)</p> <p>1) Transmission / Distribution reliability improvement: Poland Project: Slovenia Project</p> <p>2) Battery application: Niedersachsen Project, Speyer Project, California Project</p> <p>3) Demand response: Lisbon Project</p>
Contact	nedo_smart_showcase2018@nedo.go.jp

Wednesday October 17th, 2018

DERlab	Grid control for inverter dominated power Systems
Venue:	Parkhotel Schönbrunn, Hietzinger Hauptstraße 10-14, 1130 Vienna: Room Österreich-Ungarn.
Time	8:00-12:30
Event summary	<p>The power quality and reliability of today's power systems is mostly based on synchronous generators. In order to operate the future power systems securely and stably with very high shares of inverters, appropriate control algorithms and operation procedures have to be developed. Inverter systems can partially reproduce physical properties similar to those of synchronous generators. Selected new characteristics have to be implemented in grid codes and suitable testing procedures have to be developed.</p> <p>Following research questions are relevant in this area:</p> <p>Under which conditions and control methods can inverters be operated stably?</p> <p>How many voltage-controlled inverters are required at the different voltage levels? What are the requirements concerning spatial distribution and control capabilities?</p> <p>What shares of rotating generators, current controlled and voltage-controlled inverters can guarantee power system stability?</p> <p>To which extent can "must-run-units" be reduced and replaced by inverter-based generation with enhanced functionalities?</p> <p>What is the target scenario for frequency and voltage regulation in the future interconnected power systems with very high shares of inverter coupled generation?</p> <p>The proposed workshop intends to bring together the relevant stakeholders, initiatives and projects dealing with the topic for discussing the state-of-the-art and future aims. The discussions should also support the knowledge exchange of running projects. This event will be the kick-off for the international research cluster "Grid control for inverter dominated power systems".</p>

Friday October 19th, 2018

Siemens	Site visit: Testbed Aspern Smart City Research
Venue:	<p>Registration: anna.kaltenbaeck@siemens.com</p> <p>Only a limited number of participants can join this Side Event - first come first served basis</p> <p>Meeting: Before the building of the Seestadt Technology Center, Seestadtstrasse 27, 1220 Vienna.</p> <p>Directions: Starting from the conference venue at Parkhotel Schönbrunn, take the Underground line U4 in the direction Heiligenstadt and change at the Station Schottenring for the line U2 in the direction Seestadt and go till the final stop. It will take one hour to go there.</p> 
Time	4:00 pm – 6:00 pm
Event summary	<p>During the visit you will be able to see the Demo Center, have a walk through the Seestadt Aspern and visit an intelligent secondary substation within the testbed.</p> <p>The testbed Aspern Smart City Research focuses on energy management, smart buildings, smart grids, smart ICT and smart users. To optimize the utilization of energy, technologies and consumption, an integrative system approach is used.</p> <p>ASCR was identified as the world's best Smart Project 2016. It prevailed against more than 250 projects from 45 countries at the Smart City Expo World Congress in Barcelona, the world's largest event on the subject of smart cities.</p> <p>ASCR Democenter: In an interactive showroom, visitors are given the opportunity to get to know the complex research programme and all its facets. A tour through the Demo Center demonstrates all about how the production, storage, distribution and consumption of energy can be efficiently designed in an urban context. Presentations are tailored to the interests and prior knowledge of the visitors.</p> <p>Walk through the Smart City Vienna Living Lab District - Seestadt</p>



	<p>Aspern:</p> <p>You will be able to see the Seestadt Aspern in real life operation – including the visit of one intelligent secondary substation.</p> <p>In total 12 secondary substations, 24 transformers of different types (including one variable), numerous sensors in the substations and supply lines with different measurement accuracy (including power quality measurements) as well as smart meters make up the basic infrastructure of the ASCR Smart Grid testbed. Furthermore, there are five grid storage systems in the substations with important functions both for the grid and the energy market. ASCR is investigating how to turn passive distribution network operations into actively managed smart grid operations.</p> <p>In addition, three buildings – a residential building, a student home and a school campus (currently a nursery school and primary school) – constitute the smart building research objects of ASCR. Equipped with photovoltaic panels, solar thermal panels, hybrid panels, heat pumps and various thermal as well as electrical storage facilities, smart materials, building technology and IT, the buildings of tomorrow act as flexible prosumers. Complex ICT systems facilitate the optimum, automated management of energy distribution, consumption, storage and transmission. Furthermore, smart buildings can also participate in the electricity market.</p>
Contact	anna.kaltenbaeck@siemens.com

6. Scientific Committee

Hirohisa	Aki	National Institute of Advanced Industrial Science and Technology (AIST), Japan
Josef	Ayoub	National Resources Canada, Canada
Atul	Bali	Power Grid India, India
Minnesh	Bipath	SANEDI South African National Energy Development Institute, South Africa
Roland	Bründlinger	AIT Austrian Institute of Technology, Austria
Graeme	Burt	University of Strathclyde, UK
Mihai	Calin	DERlab e.V.
Remy	Denos	European Commission
Abraham	Ellis	Sandia National Laboratories (SNL), US
Wolfgang	Gawlik	University of Technology Vienna, Austria
Nikos	Hatziargyriou	National Technical University of Athens and HEDNO, Greece
Reza	Iravani	University of Toronto, Canada
Thomas	Key	Electric Power Research Institute (EPRI), US
Benjamin	Kroposki	National Renewable Energy Laboratory (NREL), US
Reji	Kumar Pillai	India Smart Grid Forum, India
Nobuhiko	Kusunose	New Energy and Industrial Technology Development Organization (NEDO), Japan
Andreas	Lugmaier	Nationale Technologieplattform Smart Grids Austria / Siemens AG, Austria
Luciano	Martini	Ricerca sul Sistema Energetico Spa., Italy
Mark	McGranaghan	Electric Power Research Institute (EPRI), US
Satoshi	Morozumi	New Energy and Industrial Technology Development Organization (NEDO), Japan
Alexandre	Prieur	Natural Resources Canada, Canada
Mark	Rawson	California Energy Commission, US
Jim	Reilly	Reilly Associates, US
Yap Choon	Soh	Energy Market Authority, Singapore
Philippe	Strauss	Fraunhofer IEE, Germany
Kazuyuki	Takada	New Energy and Industrial Technology Development Organization (NEDO), Japan
Dan	Ton	Department of Energy, US
Peter	Vaessen	DERlab e.V.
Patrick	Van Hove	European Commission
Weisheng	Wang	CEPRI (SGCC), China
John	Ward	CSIRO, Australia
Karin	Widegren	ISGAN Chair
Chae	Woo-Kyu	Korea Electric Power Research Institute, Korea
Wang	Yibo	China Academy of Science, China



7. Contact Information

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