European Utility Week

5 October 2017, Amsterdam

ERIGrid

Connecting European Smart Grid Infrastructures

Free of charge access to the ERIGrid research infrastructures/laboratories

Examples of Trans-national Access Projects

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TECNALIA

EU H2020 Programme GA No. 654113

CONTENTS

1. TRANS-NATIONAL ACCESS (TA)

- **CORE ACTIVITY in ERIGrid:**
  - Provision of **access to research infrastructures** to individual researchers and research groups involved in the **development of smart grid concepts and configurations**
  - Availability of a range of **testing and simulation facilities** within the ERIGrid Consortium
  - Provision of **technical support and expertise**
  - **Promotion** of the experimental **research results** through ERIGrid

- Costs of **lab operation** and support of the hosting staff are **free of charge**
- Users' **travel expenses, subsistence and accommodation costs** will be **reimbursed**, subject to ERIGrid rules and regulations

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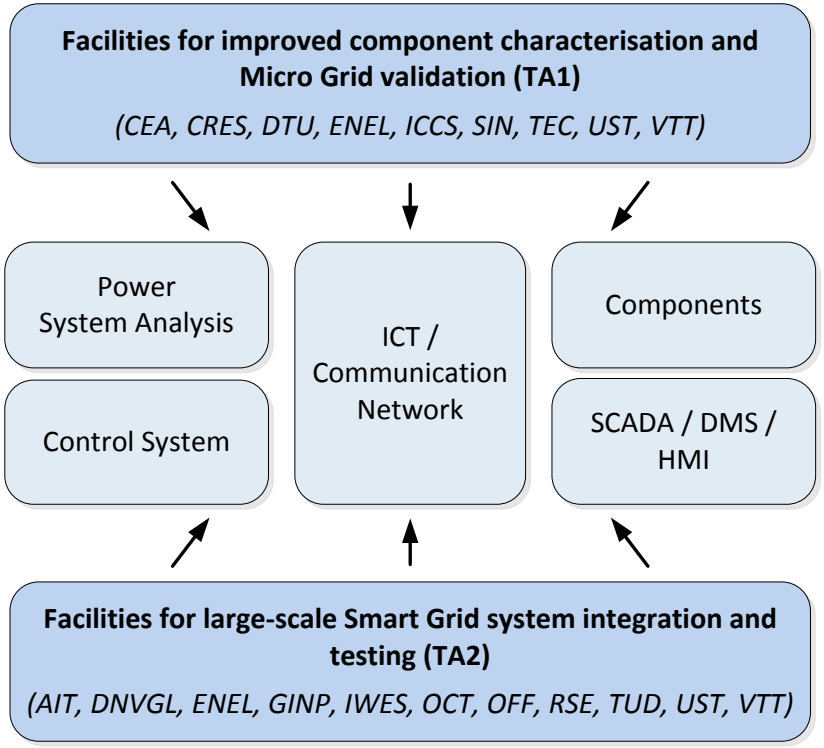
1. TA RESEARCH TOPICS

- *"Research on Smart Grid concepts and configurations supported by validation methods and tools **following a holistic approach**"*



R&D topic	Provided services to external users
DER components	• PV-inverter tests (component, integration) • Storage, charging devices test (component, integration) • …
Development of new network components	• Test of new component concepts • Validation of advanced control methods for components • …
Smart Grid ICT / Automation	• Valdiation of controller implementation and integration • Validation of communication protocols • Test of SCADA system developments and integration • Cyber-security assessment • …
Co-simulation	• Co-simulation tests power grid ↔ communication network • Co-simulation tests power grid ↔ components ↔ communication network • …
Real-time simulation and HIL	• Integration tests for inverter-based devices • Validation of new power electronic component topologies • …
…	…

1. TA RESEARCH INFRASTRUCTURES

- ERIGrid operates as a "**Joint Infrastructure**" (integrated approach, methodologies and procedures) with physically **distributed installations** (19 installations in 11 countries)

- **Examples:**

National Smart Grid Laboratory
SINTEF, Norway

SmartEST Laboratory
AIT, Austria

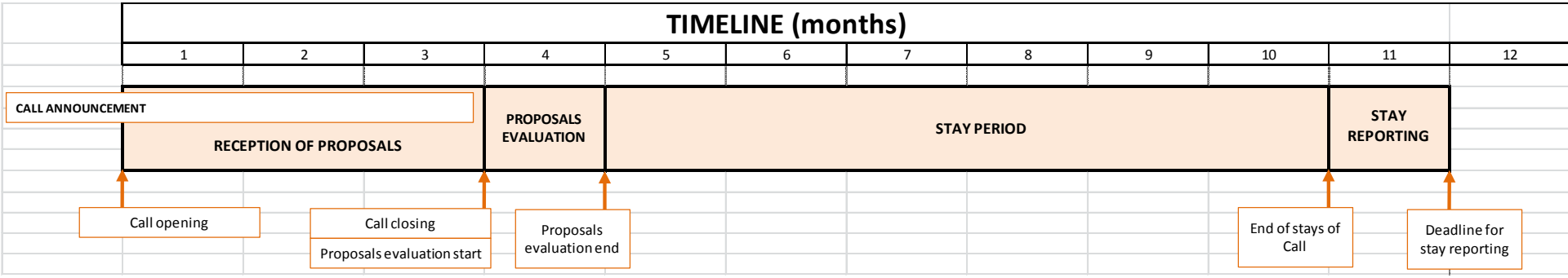
1. TA RESEARCH INFRASTRUCTURES

Flex Power Grid Laboratory, **DNV GL, The Netherlands**

1. TA USER GROUPS

- **Elegibility of the User Groups**:
  - One or more researchers
  - Country of the RI must be **different** than the country of the user institution ("trans-national")
  - **Universities, Research Centres, SMEs, large industries,…**
  - Able to **publicly disseminate** the TA project results
  - User organizations from the **EU Member States** and **Associated Countries;** however:
    - **Limited access** (20% of total ERIGrid access) for applicants from non-EU countries **("third countries"**)

2. TA PROCESS AND TIMELINE



- Call for TA proposals remains open for **3 months**
- Starting time and length of the user projects (accepted proposals) are **flexible**:
  - Maximum stay duration: **3 months** (typical stay: **1 month**)
  - Approved projects must be implemented during the **next 6 months** after notification to users
  - Stays can be splitted into 2 parts, if needed

2.1 HOW TO APPLY

- Potential user follows indications provided in the "TA Guide"
- Potential user analyses the **different ERIGrid RI descriptions** and selects 3 of them as the most suitable for the project
- User prepares a proposal using the provided **Template**
- **Electronic submission** before the call deadline:
  - **Specific email address for receiving proposals:**
    erigrid-ta@list.ait.ac.at
  - **Doubts and further support in TA activity:**
    erigrid-mgt@list.ait.ac.at
- **Recommendation:** User should contact the prefered RIs before submitting the proposal (feasibility of the experiments, clarification of access conditions, etc.

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2.2 PROPOSAL EVALUATION

- Phase 1: **PRESCREENING**:
  - **First assessment of technical-economical feasibility** of user project by the three selected RIs
  - Starts **as soon as proposal is received** (even before call deadline)
  - RIs may suggest/request **modifications to the proposal** (which must be incorporated before the call deadline)
  - If the project is not feasible in the three selected RIs, the proposal will be circulated to the **rest of RIs for prescreening**
  - **Communication of User Group with selected RIs** is crucial during the proposal preparation phase (Prescreening will be straightfoward)

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2.2 PROPOSAL EVALUATION

- Phase 2: **USER SELECTION PANEL (USP)**:
  - **Full evaluation** (independent peer-review) of positive prescreened user proposals: 3 experts/proposal
  - Evaluation results available **within 1 month** after call closing
  - USP will issue a brief **evaluation report** (including scores, comments, potential improvements, etc.)
  - USP Structure:
    - Group of **international independent voluntary experts** on SG **domains**: Power systems, ICT, electronics, cybersecurity, etc.
    - **54 members**: mixture of **41 external** and **13 internal** (ERIGrid) experts
    - Members from **Academia, Research Institutes, Industry**

2.2 PROPOSAL EVALUATION

– Phase 2: **USER SELECTION PANEL (USP)**:

EVALUATION CRITERIA:

- ***Scientific/Technical merit*** (score: 0-5): scientific and technical relevance, originality and innovation, methodology, robust and realistic test/evaluation approach.
- ***Improve know-how and capacity of the Research Infrastructure*** (score: 0-5): improvement of know-how within the Research Infrastructures, enhancement of RI technologies and methods, alignment with ERIGrid scenarios/use cases/test cases, synergies with other projects and cooperation with other infrastructures.
- ***Compliance with EU policies and priorities*** (score: 0-5): compliance with European RTD policies and priorities. Social impact. Impact on EU industry (e.g. standardization and competitiveness). Sustainable growth interest. New users, young researchers, female researchers.
- ***General quality of the proposal*** (score: 0-5): completeness and organization of the proposal, clear definition of the objectives and expected results, relevance of the proposed dissemination actions, justified requested amount of access.

2.3 ACCESS TO INFRASTRUCTURE

- After proposal acceptance, User Group and host RI must **agree** the **access details**:
  - **Access period** (*from … to …*): normally within the next 6 months to the User notification
  - Signature of **Contract** (including a **Technical Annex** coherent with the approved proposal)
  - **Responsible Person** appointed by each host RI for each User project: supervision and support for administrative, technical and logistic issues
  - **Declaration of Use of infrastructure** by User Group: *days of access* and *days of stay* by each member of the User Group

2.4 DISSEMINATION OF PROJECT RESULTS

- General premise: **project results must be publicly available**
- **Mandatory** according to EC conditions and access Contract:
  - **2 Questionnaires:**
    - Filled by the User: user feedback
    - Filled by the Host RI: host experience
  - ***Project Fact Sheet***: extended abstract to be prepared by User
  - **Technical Report** to be prepared by the User (technical details of the project: objectives, set-ups, results, conclusions)
    - Special provisions to be taken when confidential information is included (industrial partners)
- Reference of **future publications** (papers, conferences, etc.)
- **Workshop** on user projects organised by ERIGrid

2.5 SUPPORTING TOOLS

European Research Infrastructure supporting Smart Grid Systems Technology Development, Validation and Roll Out

Work Package 3

NA3 - Organisation and Management of Trans-national Access User Projects

Deliverable D-NA3.3

Reporting the trans-national access activities by the user groups

Grant Agreement No:	654113
Funding Instrument:	Research and Innovation Actions (RIA) – Integrating Activity (IA)
Funded under:	INFRAIA-1-2014/2015: Integrating and opening existing national and regional research infrastructures of European interest
Starting date of project:	01.11.2015
Project Duration:	54 month
Contractual delivery date:	31.01.2017
Actual delivery date:	07.03.2017
Name of lead beneficiary for this deliverable:	15 TECNALIA Research & Innovation
Deliverable Type:	Report (R)
Security Class:	Confidential, only for members of the consortium (including the Commission Services) (CO)
Revision/ Status:	released

Project co-funded by the European Commission within the H2020 Programme (2014-2020)

"TA Reporting Guide"

3. TA CALLS

- ***ERIGrid Calls for Trans-national Access (2 per year):***

  - 1st Call: 15 September – 15 December 2016
  - 2nd Call: 15 March – 15 June 2017
  - **3rd Call: 15 August – 15 November 2017**
  - **4th Call: 15 February – 15 May 2018**
  - **5th Call: 15 August – 15 November 2018**
  - **6th Call: 15 February – 15 May 2019**

3. TA CALLS: 1st CALL SUMMARY

- **14** proposals received and accepted
- Type of organisation:
  - 1 from **Industry** + 13 from Universities / Research Institutions
- Expected access duration: 2-12 weeks; **4 weeks (average)**
- User Groups from:
  - **EU**: 8-9 proposals (Germany, Spain, Italy, France, UK, Denmark)
  - **Associated Countries**: 3-4 proposals (Turkey, Switzerland)
  - **Non-EU**: 2 proposals (USA, India)
- **Proposed research topics**:
  - Grid optimization and reliability, DER integration and control, flexibility and demand response, smart EV charging applications, component testing in complex scenarios, event detection with high DER penetration

3. TA CALLS: 2nd CALL SUMMARY

- **13** proposals received, **12** accepted
- Type of organisation:
  - 2 from **Industry** + 11 from Universities / Research Institutions
- Expected access duration: 2-10 weeks; **3.6 weeks (average)**
- User Groups from:
  - **EU**: 9 proposals (Greece, Spain, UK, Finland, Latvia, Belgium, Denmark)
  - **Associated Countries**: 1 proposal (Switzerland)
  - **Non-EU**: 3 proposals (USA, Nepal, Singapore)
- **Proposed research topics**:
  - Energy management for commercial buildings, rural electrification, load modelling validation, economic assessment for microgrids, transient control in microgrids, advanced anti-islanding, smart converters

4. TA USER PROJECT IMPLEMENTATION: EXAMPLES

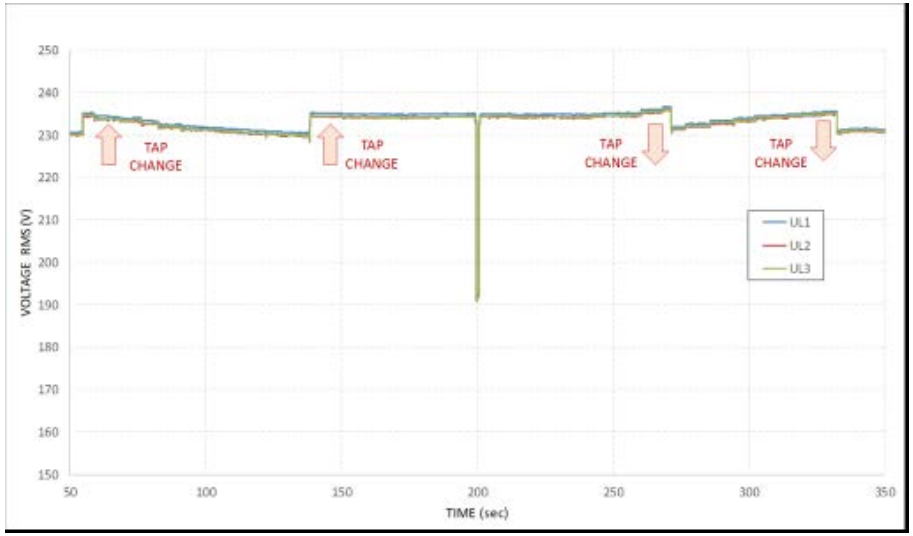
- **"INTREPID":** ***INtelligent Transformer for Renewable Energy Prosumers Integration and Deployment***
- User Group: **ORMAZABAL COTRADIS, Spain**
- Host infrastructure: **Fraunhofer IWES, Germany**
- Access: **15 days**

4. TA USER PROJECT IMPLEMENTATION: EXAMPLES

- **"INTREPID":** ***INtelligent Transformer for Renewable Energy Prosumers Integration and Deployment***

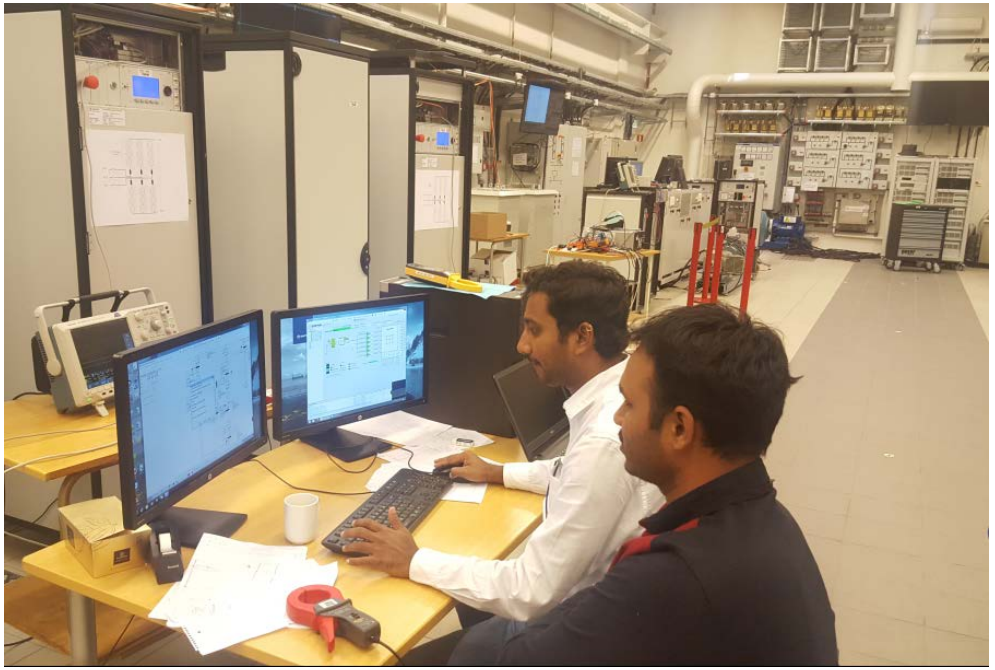
4. TA USER PROJECT IMPLEMENTATION: EXAMPLES

- **"INTREPID":** ***INtelligent Transformer for Renewable Energy Prosumers Integration and Deployment***
  - Characterization of the behaviour of a new compact smart distribution transformer with OLTC
  - Assessment under different voltage dip and reverse power flow conditions in MV
  - Testing of different control algorithms for integration of DER and EV
  - According to grid codes, current standards and further operating conditions



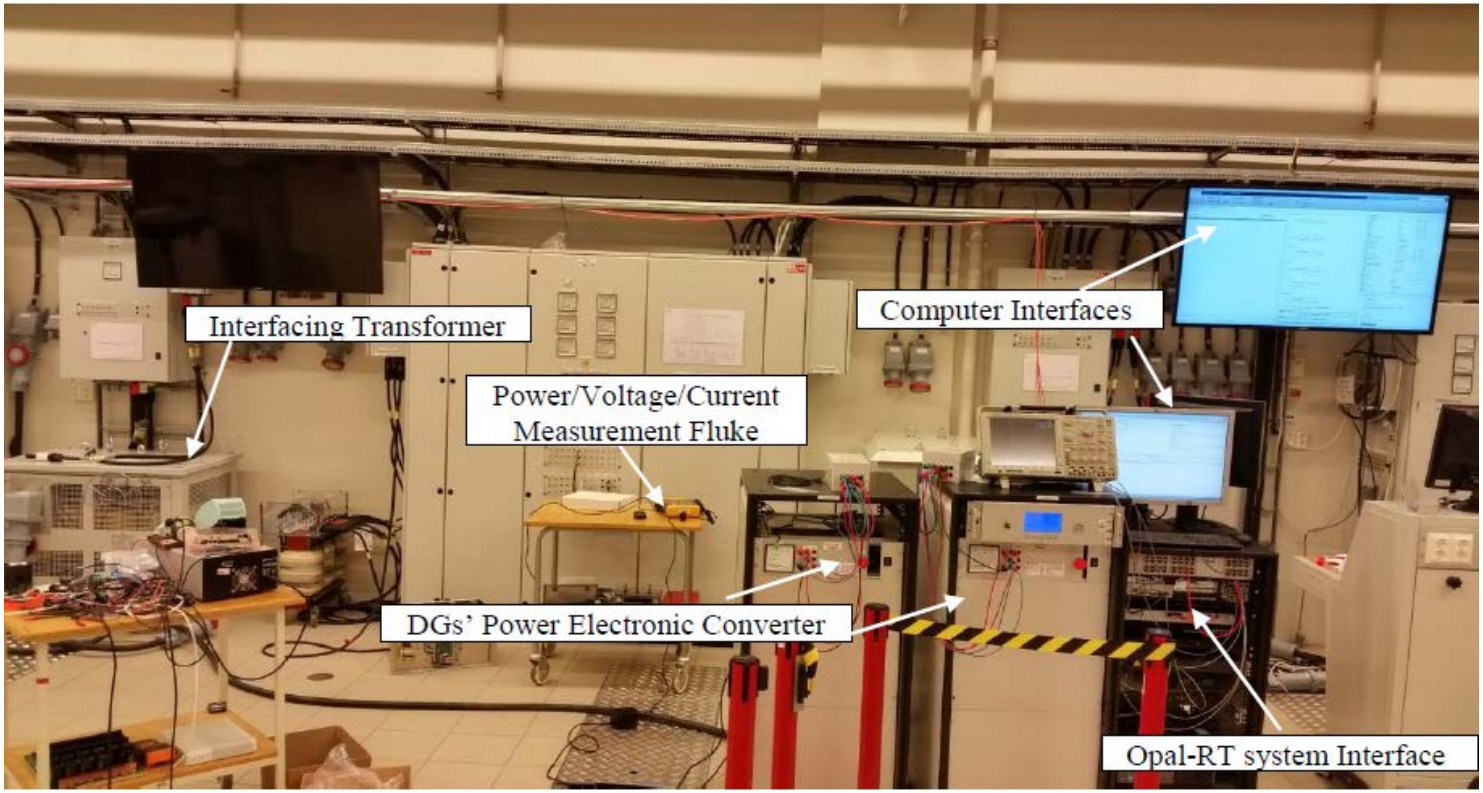
4. TA USER PROJECT IMPLEMENTATION: EXAMPLES

- **"REPRMs":** ***Reliability Enhancement in PV Rich Microgrids with Plug-in-Hybrid Electric Vehicles and Data Centres***
- User Group: **National Institute of Technology Warangal, India**
- Host infrastructure: **SINTEF, Norway**
- Access: **6 days**



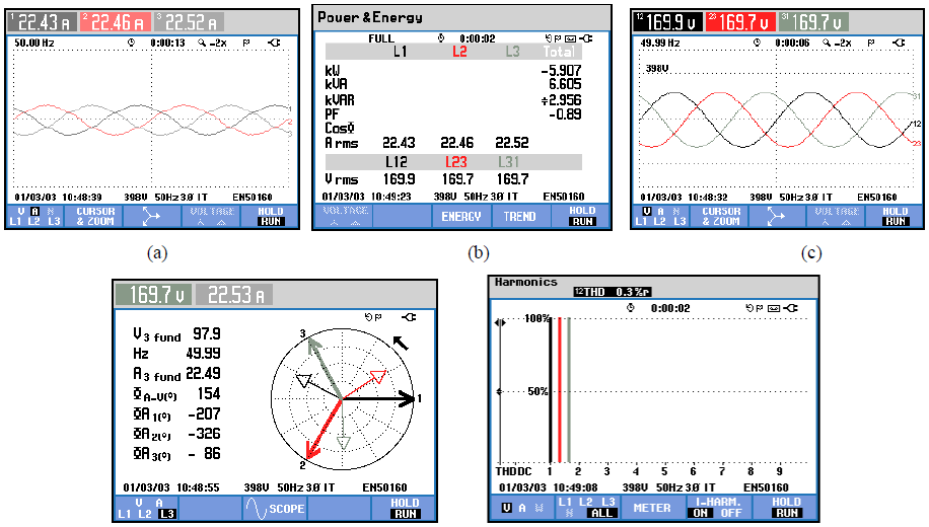
4. TA USER PROJECT IMPLEMENTATION: EXAMPLES

- **"REPRMs": *Reliability Enhancement in PV Rich Microgrids with Plug-in-Hybrid Electric Vehicles and Data Centres***



4. TA USER PROJECT IMPLEMENTATION: EXAMPLES

- **"REPRMs":** ***Reliability Enhancement in PV Rich Microgrids with Plug-in-Hybrid Electric Vehicles and Data Centres***
  - Analysis of reliability of microgrids with PV generators, plug-in hybrid electric vehicles (PHEV) and data centres (DC)
  - Improvement of reliability through optimal integration of distributed generators (DG)
  - Optimal dispatch of DGs, PHEVs and DCs to minimize losses, operation costs and enhance reliability
  - PHIL based on OPAL-RT and real power electronic converters



THANK YOU!

DO NOT MISS THE ERIGrid TRANS-NATIONAL ACCESS OPPORTUNITY!

3rd CALL:
15 August – 15 November 2017

erigrid.eu/transnational-access/

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ADDITIONAL INFORMATION SLIDES

erigrid.eu/transnational-access/

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USP: MEMBERSHIP

EXTERNAL EXPERTS					
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Haris Patsios	University of Newcastle	UK	**Mathias Noe**	KIT (Technical University of Karlsruhe)	Germany
Stamatis Karnouskos	SAP	Germany	**Jörn Geisbüsch**	KIT (Technical University of Karlsruhe)	Germany
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Andrea Bengini	University of South Carolina	USA	**Rad Stanev**	TU Sofia	Bulgaria
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Pierluigi Mancarella	University of Manchester / University of Melbourne	UK / Australia	**Irena Wasiak**	TU Lodz	Poland
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Spyros Skarvelis-Kazakos	University of Sussex	UK	**George E. Georghiou**	FOSS Cyprus	Cyprus
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Carlos Veganzones	Technical University of Madrid (UPM)	Spain	**José M. Maza-Ortega**	University of Sevilla	Spain
Sergio Martínez	Technical University of Madrid (UPM)	Spain	**Alvaro Luna Alloza**	Research Center on Renewable Energy Systems (SEER-UPC)	Spain
Giri Venkataramanan	University of Wisconsin-Madison	USA	**Anna M. Kosek**	TNO	The Netherlands
			Sami Repo	Tampere University of Technology	Finland
INTERNAL EXPERTS					
Roland Bründlinger	AIT Austrian Institute of Technology	Austria	**Diana Strauß-Mincu**	DERlab	Germany
Filip Pröstl Andrén	AIT Austrian Institute of Technology	Austria	**Henrik Bindner**	DTU	Denmark
Eduardo Zabala	TECNALIA	Spain	**Panos Kotsampopoulos**	ICCS-NTUA	Greece
Salvador Ceballos	TECNALIA	Spain	**Van Hoa NGUYEN**	Grenoble INP	France
Mihai Calin	DERlab	Germany	**Davood Babazadeh**	OFFIS	Germany
Ove S. Grande	SINTEF Energy Research	Norway	**Ian Gilbert**	Ormazabal Corporate Technology	Spain
			Kari Mäki	VTT	Finland

TA CALLS: 1st CALL ACCEPTED PROPOSALS

	1ST CALL			
1	**TEAM-VAR**	***Networked feedback control of distributed energy resources for realtime voltage regulation***	Switzerland	4 weeks
		ETH Zurich		
2	**INTREPID**	***INtelligent Transformer for Renewable Energy Prosumers Integration and Deployment***	Spain	3 weeks
		ORMAZABAL COTRADIS		
3	**GaMDER**	***Gamified Management of Distributed Energy Resources***	Turkey	3 weeks
		Istanbul Technical University		
4	**DiNODR**	***Distribution Network Oriented Demand Response***	Turkey	3 weeks
		Istanbul Technical University		
5	**FT Operation**	***Fault-Tolerant Operation of a Wind Turbine with Control Hardware in the Loop Tests***	UK	4 weeks
		University of Liverpool		
6	**REPRMs**	***Reliability Enhancement in PV Rich Microgrids with Plug-in-Hybrid Electric Vehicles and Data Centres***	India	4 weeks
		National Institute of Technology Warangal		
7	**DUSCP**	***Dicle Üniversity Smart Campus Project***	Denmark, Turkey	4 weeks
		Aalborg University & Dicle Üniversity		
8	**Smart beats Copper**	***Smart Grids Testbed for Hardware and Software in the Loop Testing of PV Integration into a Future DSO Network based on a Secure Energy Information Network***	Germany	2 weeks
		Ulm University of Applied Sciences		
9	**B2GDEMO**	***Demonstration of the applicability of bidirectional electric vehicle chargers in buildings***	Spain	2 weeks
		Universitat Politècnica de Catalunya		
10	**SimOptBuild**	***Testing of Simulation Models and Optimization Methods to Setup an Optimal Infrastructure the Flexibility in Demand Response of Buildings***	Germany	3 weeks
		University of Applied Sciences Stuttgart		
11	**NOMADIC**	***Smart eNergy grid Optimization with Multi-Agent Distributed predIctive Control***	Italy	4 weeks
		Politecnico di Milano		
12	**3D-Power**	***Data-Driven Detection of Events in Power Systems (3D-Power): Machine Learning Based Event Detection in Power Distribution Network with high DER Penetration Using PMU Measurement and HIL Test beds***	USA	6 weeks
		Florida State University		
13	**AQUA**	***Analysis of power QUAlity through smart EV charging processes***	Germany	12 weeks
		Universität Passau		
14	**Eval-loggers**	***Evaluation of different data logger technology and data processing techniques for field testing of small locally manufactured wind turbines***	France	2 weeks
		University Paul Sabatier, Laboratory LAAS of CNSR		

TA CALLS: 2nd CALL
RECEIVED PROPOSALS

	2ND CALL			
1	**Multi-Island**	***Experimental investigation on the performance characteristics of anti-islanding techniques in the prospect of high PV penetration level***	Democritus University of Thrace	Greece	4 weeks
2	**DERT4PM**	***Distributed Energy Resources as Tools for Power Management***	University of Greenwich	UK	10 weeks
3	**CHROME**	***Converter Harmonic Model Measurement***	Tampere University of Technology	Finland	4 weeks
4	**Filters**	***Comparative Study of the Control of Passive, Active and Hybrids Filters for mitigation of Harmonics and reactive power compensation***	National Distance Education University (UNED)	Spain	2 weeks
5	**ECOSMIC**	***Developing and Evaluating an Economic Assessment Framework for Microgrids, Based on the Concept of Economies of Scope***	University of Antwerp	Belgium	4 x 1 week
6	**ROCOF**	***Real-time Price-based Energy Management Strategies of Commercial building***	Institute of Physical Energetics (IPE)	Latvia	3 weeks
7	**HARSH**	***Harmonic stability under sympathetic transformer inrush***	Aalborg University	Denmark	4 weeks
8	**TCMG**	***Transient Control in Microgrids***	Ecole Polytechnique Fédérale de Lausanne (EPFL)	Switzerland	4 weeks
9	**EPB**	***Power Hardware in the Loop Testing of Phase Rebalancing Impact (Ensto Phase Balancer)***	Ensto Utility Networks, Power Electronic Solutions	Finland	3 weeks
10	**VoSISDN**	***Validation of using Smart Inverters for Supporting the Distribution Network***	National Renewable Energy Laboratory (NREL)	USA	2 weeks
11	**DD-CVC**	***Decentralized and Distributed Coordinated Voltage Control: coordinated control of DERs to enhance LV distribution network voltage profile***	Nanyang Technological University	Singapore	2 weeks
12	**LMSWT-Nepal**	***Locally Manufactured Small Wind Turbines for Rural Electrification in Nepal***	Kathmandu Alternative Power and Energy Group (KAPEG)	Nepal	2 weeks
13	**HARMONIC**	***Enhanced Generic Load Modelling using Harmonic Profiles***	Democritus University of Thrace	Greece	3 weeks