



ANNEX 8- ISGAN Academy

January 31st, 2017

IEA TCPS JOINT WORKSHOP



CLEAN ENERGY
MINISTERIAL

Accelerating the Transition to Clean Energy Technologies



IIT team profile



Pablo Frías

- PhD on Power Systems (2008)
- Senior Researcher at Institute for Research in Technology, Comillas
- Associate Professor at Engineering School Power System Dep.
- **Major research projects on RES and SmartGrids European and national (48):**
 - SUSPLAN, TWENTIES, ADRESS, ...
 - GRID4EU, SUSTAINABLE, ADVANCED, PVGRID, ...
- **Academic course management:**
 - Graduate/postgraduate Smart-grids subjects
 - Collaboration with MIT, FSR and EES-UETP
- **Contacts detail: +34 915406232 Pablo.Frias@iit.comillas.edu**

José Pablo Chaves

- PhD on Sustainable Energies Technologies and Strategies (2014)
- Researcher at Institute for Research in Technology, Comillas University
- **Major research projects on RES and Smart Grids:**
 - Utility of the Future Project – Project with Massachusetts Institute of Technology
- **Contact details: +34 91 542-2800 Jose.Chaves@comillas.edu**



Members of the Academic Committee



Members already confirmed

Name	Country	Institution	Area of expertise
Dr. Hubert Fechner	Austria	Austria's Technical University of Applied Sciences	Renewable integration & urban planning
Dr. Yannick Pérez	France	CentraleSupélec & ESSEC Business School	Energy Economics & Electric vehicles integration
Dr. Delfanti Maurizio	Italy	Politecnico di Milano	Power system modeling, regulation
Dr. César Ángeles Camacho	México	Universidad Nacional Autónoma de México	Power systems modeling
Dr. Laurens de Vries	Netherlands	Delft University of Technology	Energy Markets regulation & modeling
Msc. Cyril Draffin	United States of America	Massachusetts Institute of Technology Energy Initiative	Cyber security

Potential members

Name	Country	Institution	Area of expertise
Dr. Minnesh Bipath	South Africa	Centre for Energy Systems Analysis and Research	Smart grids data management
Dr. Turhan Hilmi Demiray	Switzerland	ETH Zurich	Power system modeling & DSM



Background & administrative issues

Context: background



- Current situation on Smart grids knowledge:
 - Basic knowledge for many engineers
 - Minimum knowledge for policy makers
- Need for improving current understanding of Smart grids potential:
 - Basic operation of power systems and current challenges
 - New advanced technologies to improve system efficiency
 - International experiences
- Position
 - ISGAN Annex 4 and other annexes
 - Universities, Technical Schools, other disseminations activities

Context: objectives



- The objectives of the ISGAN academy are to offer the ISGAN community of high level engineers and decision makers a means of rational and efficient continuous technical skills **complement** and **update** in the field of smart grids.
- **Channel: e-learning platform**
 - **Topics:** power system fundamentals to more specialised courses on breakthrough smart grids solutions
 - **Structure information** (public material) about recent developments, best practices, interesting methodologies, etc. on smart grids theory, application, deployment, events, etc.

Context: contents

- Technology and ICT
- Integration in system operation
- Smart regulation and policy
- Standards and interoperability
- Business models

- Fundamentals of power systems
- Introduction to Smart grids
- Technology fundamentals

- Awards
- National experience
- Workshops

Core module

Fundamentals

Local material and perspectives

Additional material

E-learning platform

- Mandatory references
- Events
- Workshops

Course program

Course Program



- **Admission:**
 - **target audience/profile:** technicians, researcher community, policy makers
 - **target number/country:** 50 per webinar, all
 - **Requirements:** background, language, ...: English / national
 - **Marketing channels:** ECI mailing list of 25,000 + ISGAN. Mobilize ECEEE and IEADSM, mailing...
- **Curriculum:**
 - Draft module **structure:** core, fundamentals, additional and local material
 - **Pathways** to get the Certificate
 - **Communication** alternatives: slides, video (WS), papers, case studies (fun.), etc.
 - **Length:** 1-2 hours
- **Evaluation:**
 - ISGAN Course Certificate options: generalist vs. specialization
 - Methods and grading criteria
 - Credits
 - Student achievement visualization
- **Course academic/technical support:** Academic Committee/ECI
- **Course satisfaction & impact of skills developments:** surveys to students at the end of the course & some months after asking for the use of the knowledge developed

Preliminary list of contents



Theme 1. Fundamentals

- The structure of power systems: transmission and distribution
- The structure of power systems: generation and supply
- Regulatory economics, monopolistic activities: network businesses
- Regulatory economics, competitive activities: generation and retailing
- Introduction to smart grids
- Smart devices for smart grids

Theme 2. Technical aspects: technologies, devices and system operation

- Integration of RES in power systems: transmission networks issues
- Integration of DER in distribution networks
- Electric mobility and the impact in power systems
- The role of storage in power systems and networks
- The active participation of demand: DSM
- Smart devices & technologies for transmission networks

- Smart devices & technologies for distribution networks
- Communication systems in distribution networks: operation and control
- Communication systems in distribution networks: metering
- Cybersecurity and resiliency

Theme 3: Economics and regulation

- Tariff designs in the Smart grid context
- Cost and benefit analysis of smart grids functionalities
- Scalability and replicability of smart grids
- The use of reference network models
- Economics and business models
- Regulation of network activities
- Standards & interoperability
- Sustainability policies
- Social aspects and consumer involvement
- TSO-DSO coordination

Theme 4: International case studies and perspectives

- Jeju Island Smart Grid Project
- GRID4EU project, innovation for energy networks
- PRICE project, integrating Smart grids from two major distribution utilities in Spain



Platform



- Overview of the platform
- Participants & roles
- Course short example

ISGAN Academy web platform



Screenshot of the ISGAN Academy web platform interface.

Browser address bar: <http://www.leonardo-academy.org/course/index.php?categoryid=80>

Page header: Leonardo ENERGY

Navigation: HOME, MY LEARNING, FIND COURSES

Search: Search courses: [input] Go

Course categories: [dropdown menu showing ISGAN Academy]


The ISGAN Academy is focused in offering the ISGAN community of high level engineers and decision makers a means of rational and efficient continuous technical skills complement and update in the field of smart grids.

Technology: smart grids, control and automation, energy storage, finance, renewables

Sector: electricity networks, industry, dwellings, non-residential buildings

Purpose: Smart grids, energy efficiency, energy management, environmental impact, public acceptance, resilience and reliability, economic efficiency

Channel: e-learning



The I(A) Implementing Agreement for a Co-operative Programme on Smart Grids

ISGAN

The ISGAN Academy is based on the experience of the International Energy Agency (IEA) Implementing Agreement for a Co-operative Program on Smart Grids (ISGAN). The Academy provides a structured way to access the knowledge developed at ISGAN.

The ISGAN University is active through webinars, covering from basics on Power Systems and Smart Grids to specialized technical experiences. The access to the resources of the ISGAN Academy requires a one-time registration which is free of charge.

Youtube access

Disclaimer

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Each training unit represents about 1 hour of learning. The training is delivered through bi-monthly webinars (on Fridays) which are archived after the event and remain available for 24/7 viewing. Upcoming webinars are shown in red, archived webinars in green, and webinars that still need to be planned in grey. Click ► to register for training units, past, present & upcoming.

Theme 1: Fundamentals (0)

Theme 2: Technical aspects: technologies, devices and system operation (1)

Theme 3: Economics and regulation (0)

Theme 4: International case studies and perspectives (1)

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Participants & roles



- **Operating Agent (IIT-Comillas)**
 - Annex planning, scheduling and communications.
 - **Program Committee** leader
 - Preparing and summarizing Annex-related calls, meetings and workshops.
 - Reporting to the ISGAN Executive Committee.
 - Facilitate publication of reports, tools, and other materials, in coordination with Annex 4.
 - Marketing channels
- **E-learning infrastructure (Leonardo Energy)**
 - Set up the general e-learning platform and configure the tool according to the requirements defined by the Program Committee
 - Assist after/during/before the e-learning unit the participant.
 - Report to the OA main KPIs of the unit.
- **The “National Experts”:**
 - Propose and produce e-learning units (Local modules).
 - Take the lead responsibility on an individual national basis for the sourcing and integration of any information inputs to the Annex.
 - Attend and participate in relevant calls, workshops, and meetings, as organized by the Operating Agent in coordination with the Task leaders.



Example



- **Title & Description:** *Reference Network Models: an essential tool for smart grid evaluation*
- **Goal and motivation:** *large-scale optimization models for distribution networks planning & compute DERs' impacts on network costs.*
- **Rehearsal**
 - Course materials: recording & slides
 - Q&A forum
 - Further reading materials
 - Test
 - Feedback survey
- **Badge**
 - Viewing the lecture
 - Downloading the slides
 - Viewing the further readings
 - Participate to the Q&A forum
 - Completion of the test
 - Completion of the feedback survey

Preliminary work plan: 1st year 2017



- **March- July 2017 (subject to changes):**

- March 2017: 1 core webinar: *Reference Network Models: an essential tool for smart grid evaluation*
- April 2017: 1 fundamental webinar: *Distribution network operation and control*
- May 2017: 1 add webinar: *GRID4EU project*
- July 2017: 1 core webinar: *Cybersecurity, Resiliency and Reliability*



Thank you!



Contacts:

Dr. José Pablo Chaves Avila
Institute for Research in Technology
Comillas Pontifical University
Santa Cruz de Marcenado 26
28015 Madrid, Spain
Email: Jose.Chaves@comillas.edu

Dr. Pablo Frias Marín
Department of Electrical and Electronic Engineering
Institute for Research in Technology
Comillas Pontifical University
Santa Cruz de Marcenado 26
28015 Madrid, Spain
Email: Pablo.Frias@comillas.edu