



# *ISGAN TECHNOLOGY COLLABORATION PROGRAMME AN INTRODUCTION*

*Michele de Nigris – Chair ISGAN TCP*

*31 January 2017  
Milano - Italy*



**CLEAN ENERGY**  
MINISTERIAL

Accelerating the Transition to Clean Energy Technologies



# ISGAN in a nutshell



## International Smart Grid Action Network TCP (ISGAN)

‘Strategic platform to support high-level government attention and action for the accelerated development and deployment of smarter, cleaner electricity grids around the world’



- An initiative of the Clean Energy Ministerial (CEM)



- Organized as the Implementing Agreement for a Co-Operative Programme on Smart Grids (ISGAN)



***The CEM is the only multilateral forum dedicated exclusively to the advancement of clean energy technologies and related policies. ISGAN is the only global government-to-government forum on smart grids***

# Geography of ISGAN



**Contracting Parties: 25**

**Invited:** Malaysia

**Expression of Interest:**  
Indonesia, UAE

European Commission



Government of Belgium



Sustainable Energy  
Authority of Ireland



Union Fenosa Distribucion



Government of France



Ricerca sul Sistema Energetico (RSE S.p.A.)



Government of Austria



Danish Energy Agency



Norwegian Ministry of Petroleum and Energy



Forschungszentrum Jülich GmbH



Swedish Energy Agency



Tekes (Finnish Funding Agency for Technology and Innovation)

Russian Energy Agency



Government of the Netherlands,  
Ministry of Economic Affairs,  
Agriculture and Innovation



Ministry of Science and Technology  
Department of High and New  
Technology Development and  
Industrialization



New Energy and Industrial  
Technology Development  
Organization (NEDO)



Government of Korea



Energy Market  
Authority, Singapore



Government of India

MOP, NSGM,  
POWER GRID, CPRI



South African National  
Energy Development Institute



Commonwealth Scientific  
and Industrial Research  
Organization



Government of Canada



U.S. Department of Energy



Government of Mexico

# Activities of ISGAN



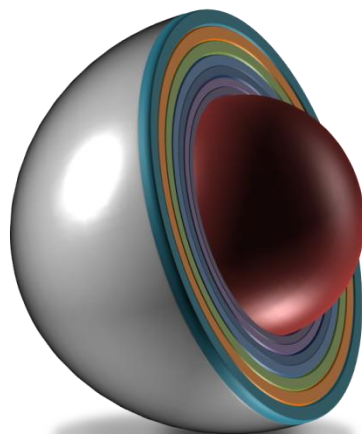
## ANNEX 1

Main drivers that motivate the governments to develop and apply smart grid solutions and the related technologies.

Identify gaps, opportunities, synergies among smart grid activities and programmes

Catalogue the wide range of smart grid activities underway, mapping the actual activities against the drivers and interests.

Several outstanding smart grids projects have been discussed during webinars and workshops



## ANNEX 2

Case Books dedicated to outstanding smart grid applications.

To date, two case books have been delivered, and specifically on Advance Metering Infrastructure (AMI) and Demand Side Management (DSM). A third case book about Consumer Engagement & Empowerment is under preparation.

The Case Books have been transformed into web-based dynamic documents and are meant to be updated on a regular basis..

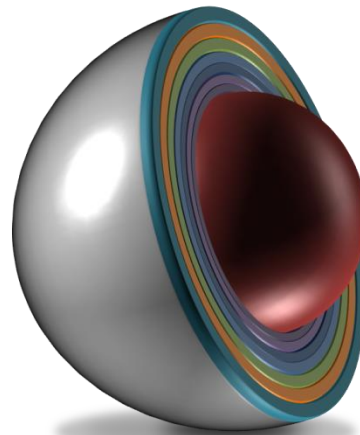


## ANNEX 3

Tools for the assessment of the present smartness of electricity networks

Tools for the evaluation of benefits and costs of smart grids projects characterised by a limited system impact (i.e. local projects).

Six toolkits have been developed covering storage, network automation, ICT and AMI.



## ANNEX 7

Governance and socio-technical issues associated with smart grids deployment.

Preparation of a prototype of a smart grids foresight process to help policy makers to orchestrate a sustainable transition.

Evaluation of processes of market forming, actor involvement and integration

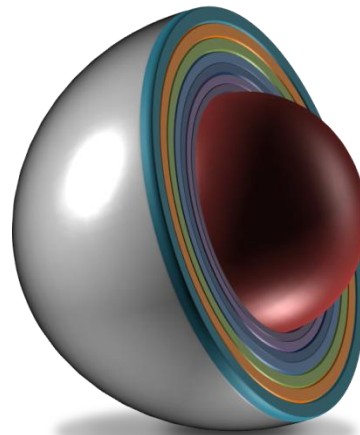
LinkedIn Discussion group entitled “smart grid transition”

## ANNEX 5

Smart grid research and testing facilities, test beds, testing projects: identification of collaboration opportunities among test facilities, state of the art testing practices, identification of testing protocols needing attention,

RES integration: Test Protocols for Advanced Inverter Functions for PV and storage integration

Smart Grid Modelling: Server and interfaces to use these systems/topologies. SunSpec Alliance System Validation Platform, to reduce barriers to testing in emerging / developing economies



## ANNEX 6

Improve understanding of Smart Grid technologies

accelerate their development and deployment and promote adoption of related enabling regulatory and government policies.

Sectors considered: Policy and regulation, expansion planning, Market Analysis, Technology demonstration, System Operation, Security, T&D interaction and optimization.

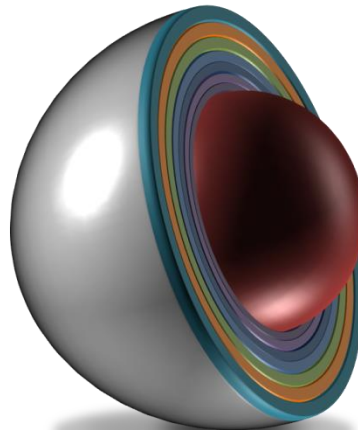
Discussion papers, state-of-the art reports, case books<sub>8</sub>

## ANNEX 8

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.

The Academy is proposed as a set of e-learning core modules dealing with the entire value chain of smart grid.

Fundamentals and further reading modules are also provided as appendices

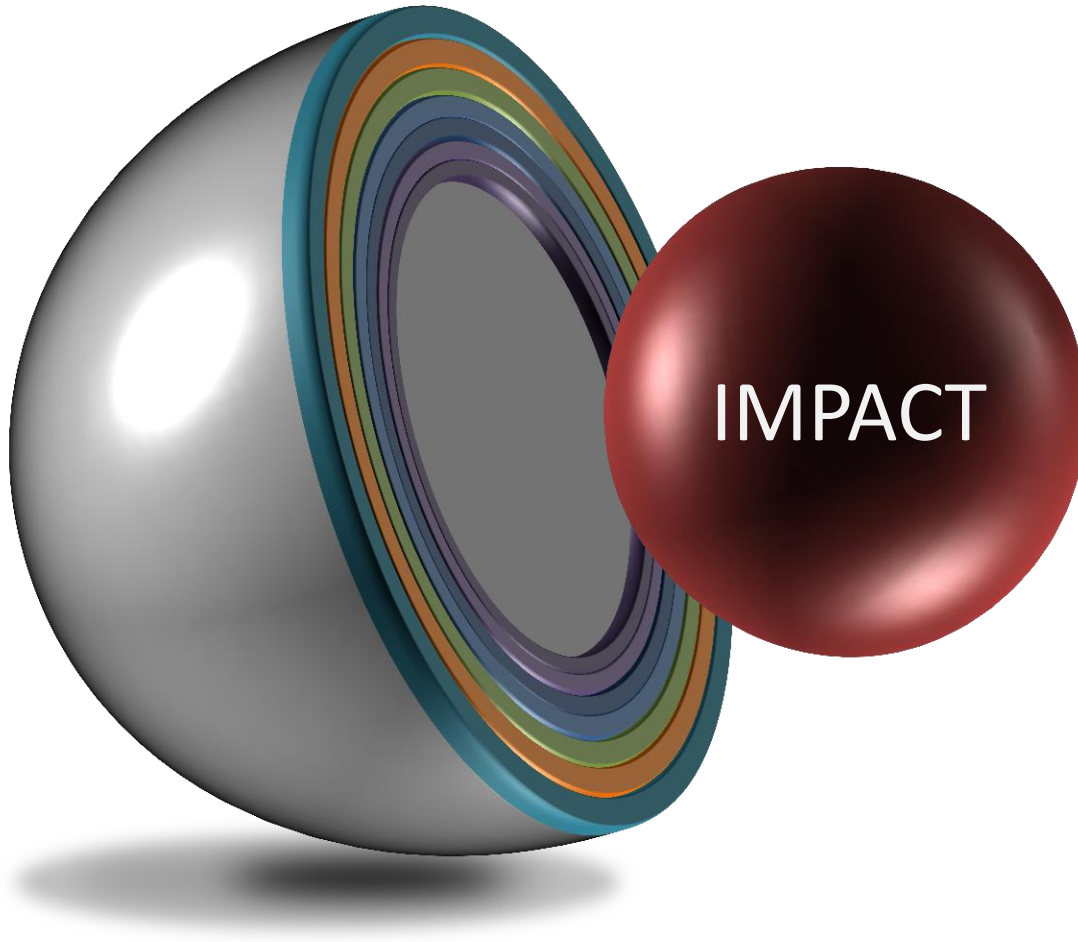


## AWARD OF EXCELLENCE

Showcases leadership and innovation in SG projects to accelerate global exchange of best practices and promote replication or adaptation of proven concepts in other markets, countries, and regions. In partnership with the Global Smart Grid Federation (GSGF)

- 2014: Consumer Engagement & Empowerment
- 2015: Excellence in Smart Grids for Renewable Energy Integration
- 2016: Smart Grids for Reliable Electricity Service





## ANNEX 4

Organization of knowledge, key issues, important themes, insightful analysis for the benefit of decision makers.

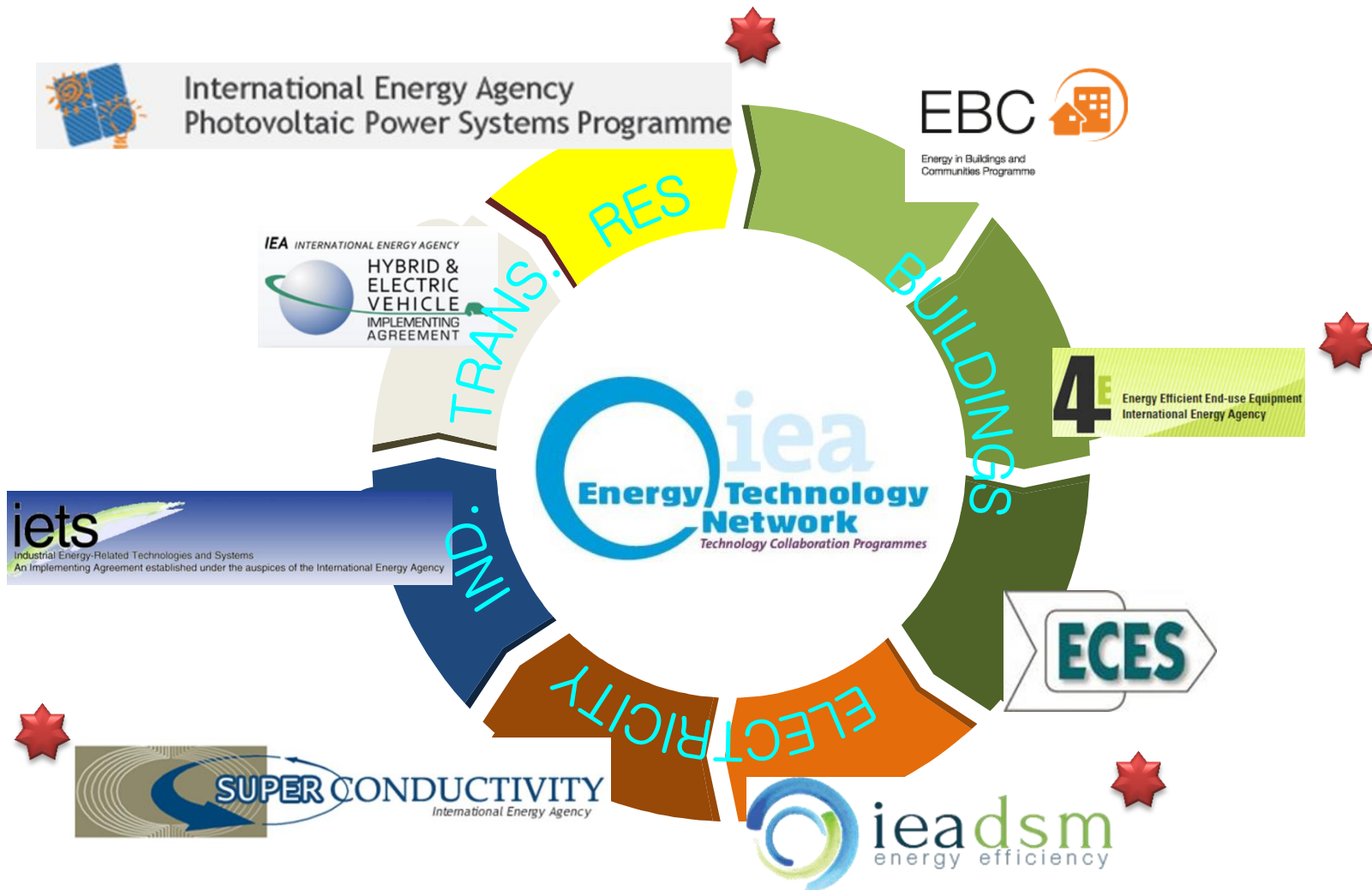
Lessons learned and best practices on smart grid.

Dissemination of efforts of other ISGAN Annexes

ISGAN interface towards the “Ask an Expert” initiative

Interaction with the CEM Clean Energy Solution Centre (webinars, knowledge sharing, ISGAN On-line Smart grid glossary.

# Collaborations and synergies



# Collaborations and synergies



**EVI**  
ELECTRIC VEHICLES  
**Joint workshops.**



**02**

**EMWG**  
ENERGY MANAGEMENT  
**CEM**



**03**

**21 CPPP**  
POWER PARTNERSHIP  
**Continuous collaboration.**



**01**

**CESC**  
SOLUTIONS CENTRE  
**Webinars, Outreach, Policy, etc..**



**07**

**SEAD**  
APPLIANCES  
**CEM.**



**04**



**06**

**G-LEAP**  
LIGHTING AND ACCESS  
**CEM**



**05**

**MMWWG**  
WIND & SOLAR  
**CEM.**

# Collaborations and synergies



**ISGF**

India Smart Grid Forum



Smart Grids Italia

SmartGrid  
CANADA

SMARTGRIDS  
AUSTRIA



**NASPI** North American  
SynchroPhasor Initiative



COLLABORATION AND SYNERGIES WITH  
EXTERNAL STAKEHOLDERS



**PRIVATE  
SECTOR**

**NATIONAL  
PLATF.**

**SECTOR  
PLATF.**

- Interaction with the **private sector**: to discuss applications on real cases at the light of the development of innovative technologies, methods and tools in real situations.
- Interaction with **national platforms**: to increase involvement of all possible stakeholders and to achieve maximum impact of reports, briefs and tools developed.
- Interaction with **sectorial platforms**: to ensure most effective insight from experts and operators and to identify the most important and impactful items to be addressed in the Annexes.

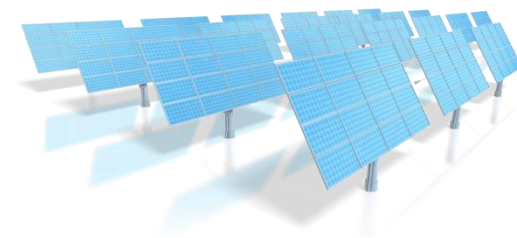
# Contribution to Technology evolution



- **NO DIRECT TECHNOLOGY DEVELOPMENT** OR DEMONSTRATION ACTIVITIES
- **EXCHANGE AND DISSEMINATION** OF INFORMATION AND PERSPECTIVE
- DEVELOP PROTOCOLS AND **BEST PRACTICES**, IDENTIFY ENVIRONMENTAL ISSUES AND MITIGATION OPTIONS
- A GLOBAL **BENCHMARK** AND COLLABORATIVE ATTITUDE AMONG PARTICIPATING COUNTRIES
- INDICATE TO **EMERGING COUNTRIES THE TECHNOLOGICAL ALTERNATIVES** AVAILABLE FOR THEIR OWN DEVELOPMENT

## SIRFN – ANNEX 5: TESTING PROTOCOL FOR SMART INVERTERS

- DEFINITION OF TEST PROTOCOLS FOR ADVANCED INVERTER INTEROPERABILITY FUNCTIONS
- SEVERAL LABORATORIES HAVE APPLIED THE PROTOCOLS AND COMPARED RESULTS IN DIFFERENT CONDITIONS
- PROTOCOL ASSESSMENT HAS BEEN SHARED WITH KEY STAKEHOLDERS AND ARE NOW ACTING AS THE KEY INPUT FOR CERTIFICATION PROCEDURES





# Contribution to Market development



- **RAPID UPTAKE OF RENEWABLES** REQUIRES SMART GRIDS DEPLOYMENT
- BOLSTER THE **DEMAND FOR SOPHISTICATED CONTROL SYSTEMS**
- ISGAN **GLOBAL PARTICIPATION REPRESENTS MORE THAN 90%** WORLDWIDE INVESTMENTS
- EXPERIENCES EXPRESSED ARE **UNIQUE FORUM OF DISCUSSION AND EXPERIENCE SHARING**

## ISGAN ANNEX 2 – CASE BOOK ON ADVANCED METERING INFRASTRUCTURE



- GATHERS THE EXPERIENCE OF DEPLOYING **SMART METERS IN 19 COUNTRIES**, CHARACTERISED BY DIFFERENT NETWORK CONDITIONS, REGULATIONS, ENERGY MIX, LEGISLATION, CONSUMER REACTIONS
- **LESSONS LEARNED** FROM THIS BENCHMARK AND INSIGHT IS OF HIGH VALUE FOR THE POLICY MAKERS
- MORE THAN **3300 COPIES** OF THE PDF VERSION THIS REPORT HAVE BEEN DOWNLOADED
- IMPORTANCE OF FINAL USER ACCEPTANCE, REGULATION, PRICING POLICIES, PRIVACY, CYBERSECURITY, DATA ANALYSIS (BIG DATA) AND AMI BUSINESS CASES

- **TOP PRIORITY** FOR ISGAN.
- **UNBIASED TECHNICAL EXPERTISE** AND THE DIRECT INTERACTION WITH POLICY MAKERS ARE TWO MAJOR ASSETS.
- SUCCESS FACTORS: **TECHNICAL SOUNDNESS** OF THE INFORMATION AND KNOWLEDGE  
**EFFICIENT TRANSLATION** OF THE TECHNICAL CONCEPTS INTO IMPACTFUL POLICY MESSAGES.
- **DEDICATED ANNEX** SET UP SINCE THE BEGINNING OF THE INITIATIVE.

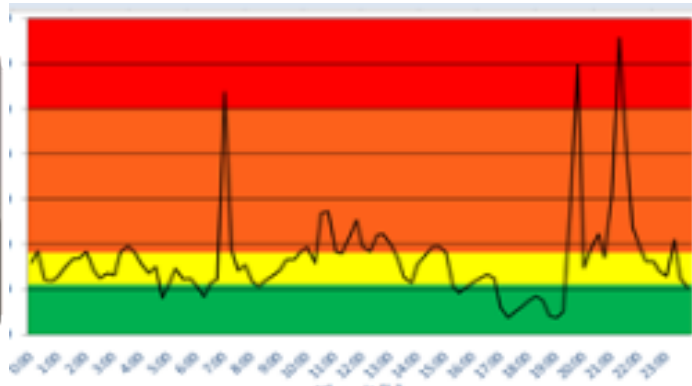
## ISGAN ANNEX 2 – ASSISTING THE GOVERNMENTS OF MEXICO AND SOUTH AFRICA



- **MEXICO'S TRANSFORMATIVE POWER SYSTEM REFORMS:** OPPORTUNITIES TO INTEGRATE ADVANCED DEVICES AND APPROACHES INTO MEXICO'S ELECTRICITY GRID AND ACTIVELY SEEKING INTERNATIONAL EXPERIENCE ON THIS TOPIC
- **SOUTH AFRICA DEVELOPING THE MARKET FOR ROOFTOP PHOTOVOLTAIC:** EFFECTIVELY SHOWCASED EMERGING FRAMEWORKS, METHODOLOGIES, AND EXPERIENCES FOR INTEGRATING ROOFTOP PV IN ELECTRIC POWER SYSTEMS AND MARKETS, AND HOW THEY COULD POTENTIALLY BE APPLIED IN SOUTH AFRICA

# Environmental protection

REAL POSSIBILITY OF A **REDUCTION IN ENERGY CONSUMPTION** RANGING BETWEEN 10-15% THROUGH THE ACTIVATION OF THE FINAL CONSUMER AND THE ADOPTION OF SMART GRIDS FUNCTIONALITIES





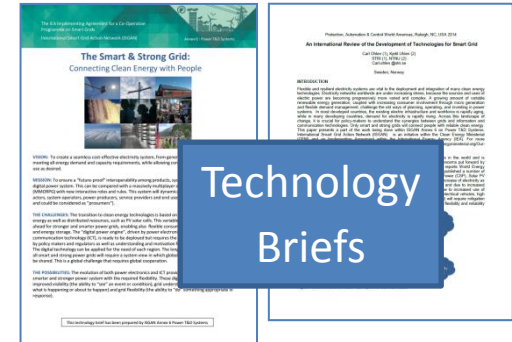
# Typical Outputs



## Discussion Papers



## Messages for Policymakers



## Technology Briefs



## Workshops



## Technical Papers



## Case Books



## Conference Presentations



## Webinars

# Added value for participants

**SUPPORTING POLICYMAKERS** BY FOCUSING ON THE DIRECTION, EFFICACY AND EFFICIENCY OF THE ENERGY SYSTEM TRANSITION BY **ADDRESSING INSTITUTIONAL ASPECTS** INCLUDING, **GOVERNANCE OF THE ELECTRICITY SYSTEM, POLICIES AND STAKEHOLDER PROCESSES, REGULATORY ASPECTS AND HUMAN BEHAVIOUR;** IMPROVING **EXPERT EXCHANGE ACROSS REGIONS** ON POWER NETWORKS (AND NOT JUST FOCUSED ON "END-POINT" GENERATION OR END-USE TECHNOLOGIES)

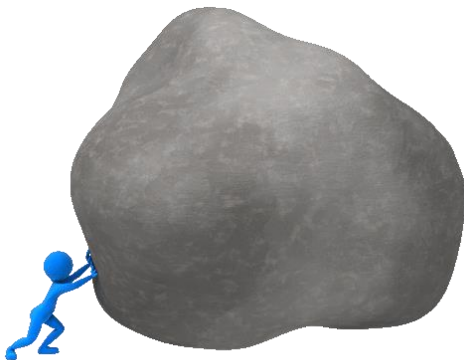




**Vision:** *The vision of ISGAN is **the attainment of national, regional and global clean energy and climate goals** supported by the integration of advanced technological, operational and analytical capabilities for electric power grids, including the smart management and coordination of the participants in the electricity system.*



**Mission:** *The mission of the International Smart Grid Action Network is to **provide a platform for the development and exchange of expertise and competence on smarter, cleaner electric power systems** and to serve as an important channel for communication of related knowledge, trends, and lessons learned, and future plans in support of national, regional and global climate and clean energy objectives.*





- **Continue to target**, first and foremost, Government agencies and officials, especially those developing or implementing policies and programs on smart grids.
- Identify areas for **increased attention and investment**; examine **smart grid development** in relation to regulatory and institutional considerations and technical needs; improve **international collaboration** and competency on smart grid **testing and evaluation**; and further enable a **global community of smart grid practitioners**.
- Assess its potential role in **deeper grid modelling, analysis, metrics and scenarios** development in support of broader climate and clean energy efforts, such as the IEA Energy Technology Perspectives suite of activities

# Thank you!

## For more information, please visit:

- ISGAN: [www.iea-isgan.org](http://www.iea-isgan.org)
- 21<sup>st</sup> Century Power Partnership: [www.21stcenturypower.org](http://www.21stcenturypower.org)
- Power System Challenge: [www.powersystemchallenge.org](http://www.powersystemchallenge.org)
- Clean Energy Ministerial: [www.cleanenergyministerial.org](http://www.cleanenergyministerial.org)
- IEA Energy Technology Network: <https://www.iea.org/tcp/>
- Clean Energy Solutions Center  
*including "Ask-an-Expert" service:*  
[www.cleanenergysolutions.org](http://www.cleanenergysolutions.org)
- Global Smart Grid Federation:  
[www.globalsmartgridfederation.org](http://www.globalsmartgridfederation.org)
- Contact: [michele.denigris@rse-web.it](mailto:michele.denigris@rse-web.it)  
+39 02 3992 5890

