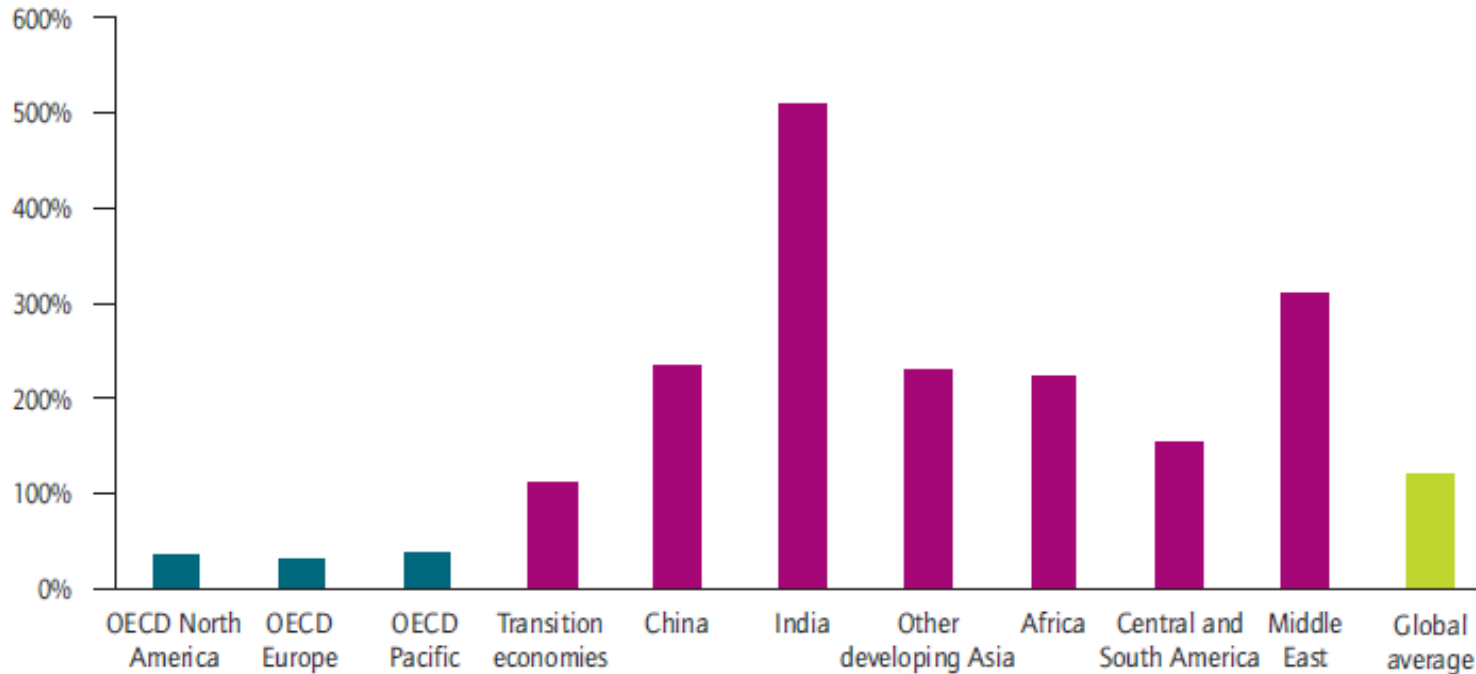




Michele de Nigris – ISGAN Chair
Michael Hübner – Executive Committee Member

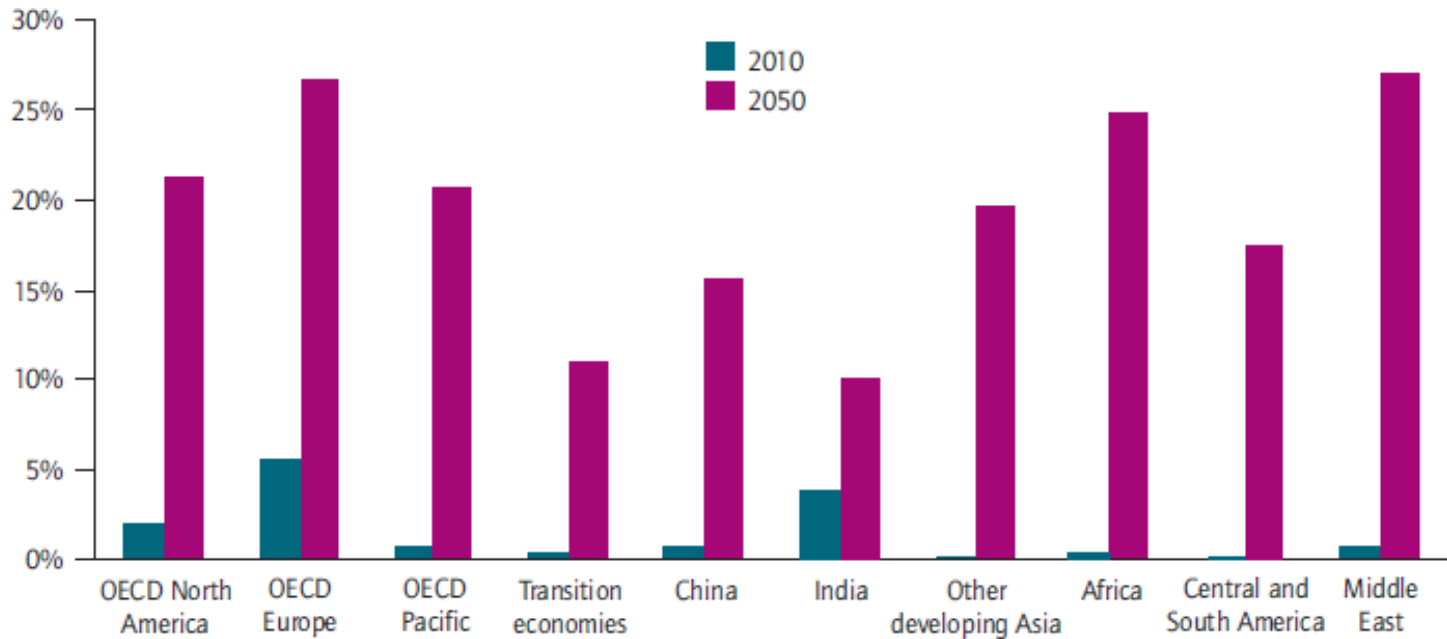
Figure 3. Electricity consumption growth 2007-50 (BLUE Map Scenario)



Source: IEA, 2010.

KEY POINT: Emerging economies will need to use smart grids to efficiently meet rapidly growing electricity demand.

Figure 4. Portion of variable generation of electricity by region (BLUE Map Scenario)

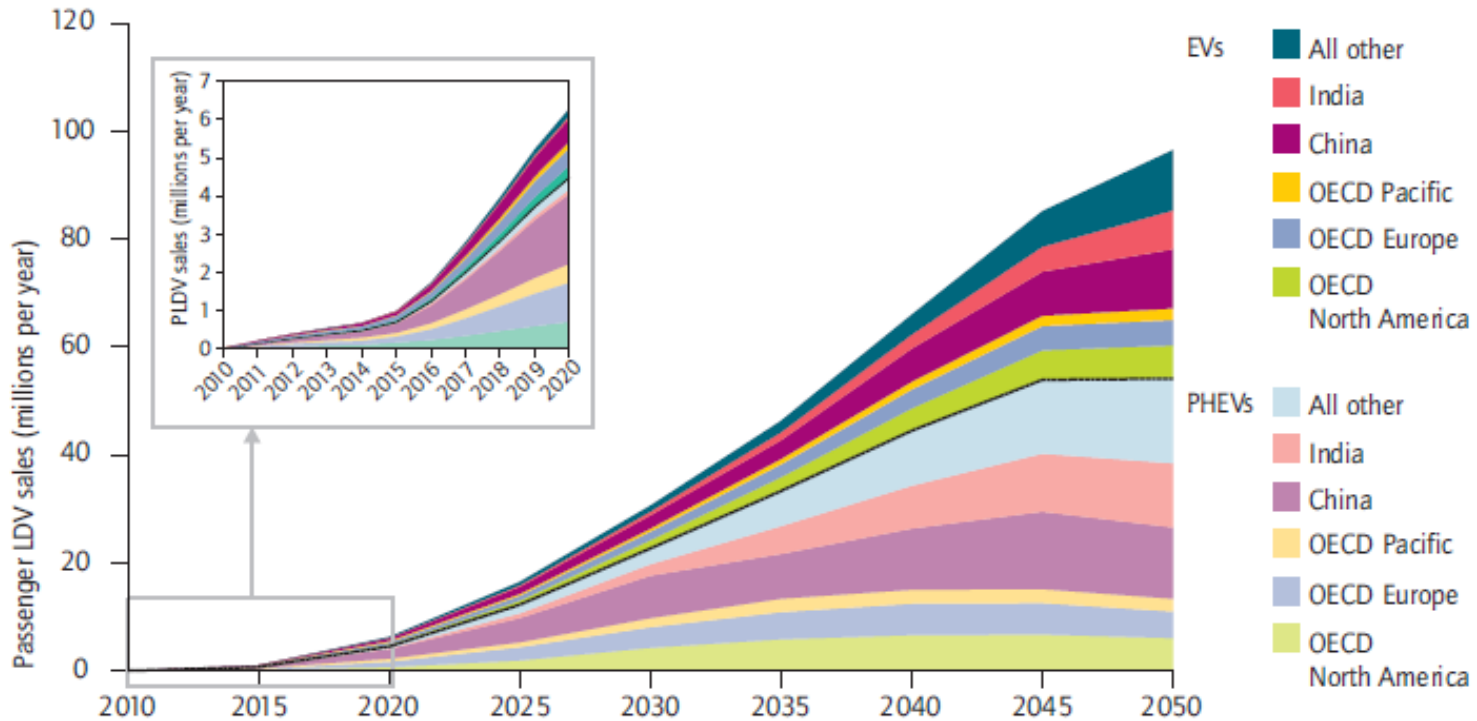


Source: IEA, 2010.

KEY POINT: All regions will need smart grids to enable the effective integration of significantly higher amounts of variable resources to their electricity grids.

Source: IEA Technology Roadmap Smart Grids

Figure 5. Deployment of electric vehicles and plug-in hybrid electric vehicles

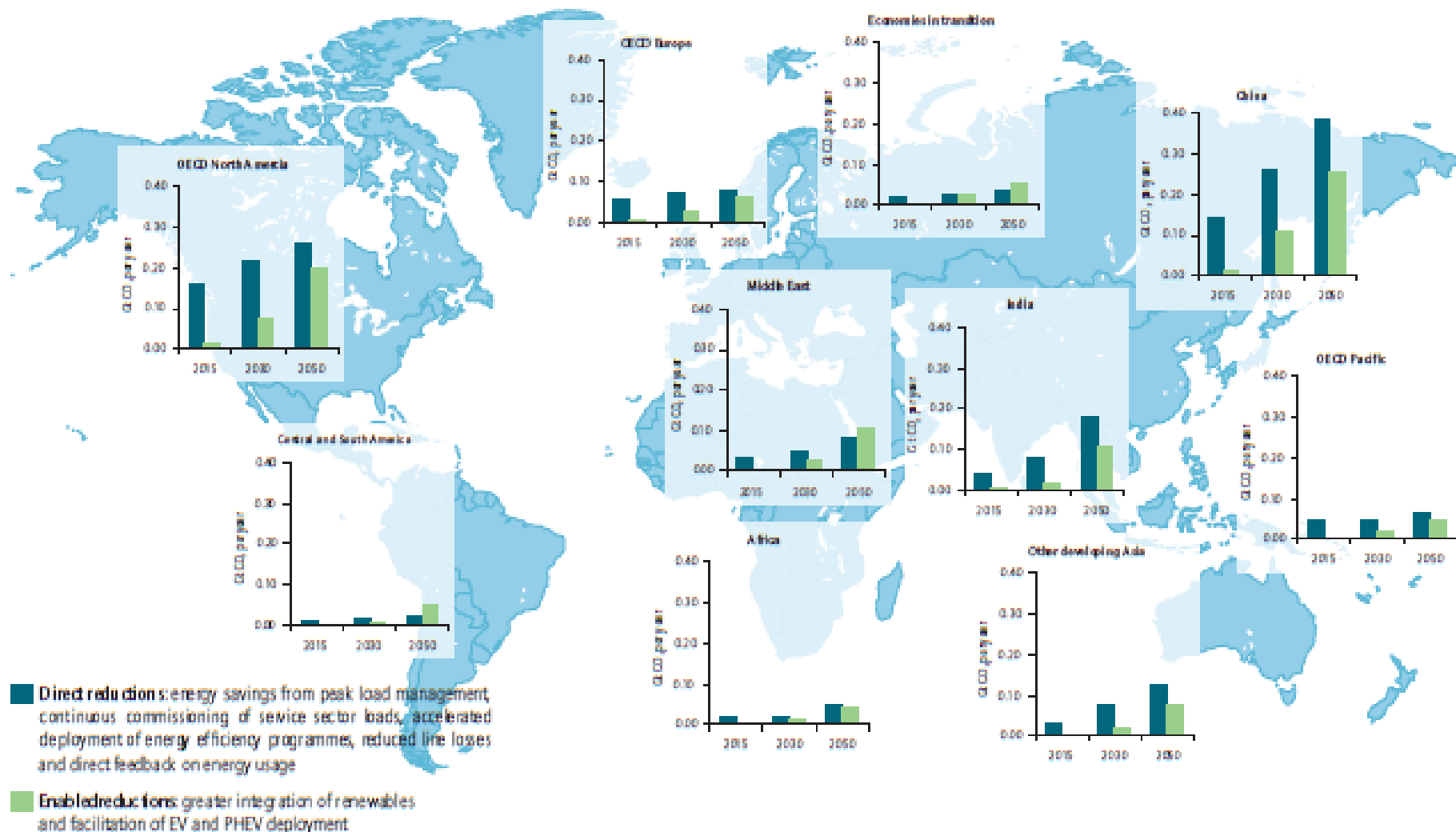


Source: IEA, 2009.

KEY POINT: Major economies with large personal vehicle sales will need smart grids to enable the effective integration of electric vehicles to their electricity grids.

Source: IEA Tchnology Roadmap Smart Grids

Figure 13. Regional CO₂ emissions reduction from smart grid deployment



KEY POINT: Smart grid deployment enables significant CO₂ emissions reductions.

Table 5. Select national smart grid demonstration and deployment efforts

Country	National smart grid initiatives
China	The Chinese government has developed a large, long-term stimulus plan to invest in water systems, rural infrastructures and power grids, including a substantial investment in smart grids. Smart grids are seen as a way to reduce energy consumption, increase the efficiency of the electricity network and manage electricity generation from renewable technologies. China's State Grid Corporation outlined plans in 2010 for a pilot smart grid programme that maps out deployment to 2030. Smart grids investments will reach at least USD 96 billion by 2020.
United States	USD 4.5 billion was allocated to grid modernisation under the American Recovery Reinvestment Act of 2009, including: USD 3.48 billion for the quick integration of proven technologies into existing electric grids, USD 435 million for regional smart grid demonstrations, and USD 185 million for energy storage and demonstrations.
Italy	Building on the success of the Telegestore project, in 2011 the Italian regulator (Autorità per l'Energia Elettrica ed il Gas) has awarded eight tariff-based funded projects on active medium voltage distribution systems, to demonstrate at-scale advanced network management and automation solutions necessary to integrate distributed generation. The Ministry of Economic Development has also granted over EUR 200 million for demonstration of smart grids features and network modernisation in Southern Italian regions.
Japan	The Federation of Electric Power Companies of Japan is developing a smart grid that incorporates solar power generation by 2020 with government investment of over USD 100 million. The Japanese government has announced a national smart metering initiative and large utilities have announced smart grid programmes.
South Korea	The Korean government has launched a USD 65 million pilot programme on Jeju Island in partnership with industry. The pilot consists of a fully integrated smart grid system for 6 000 households, wind farms and four distribution lines. Korea has announced plans to implement smart grids nationwide by 2030.

Spain	<p>In 2008, the government mandated distribution companies to replace existing meters with new smart meters; this must be done at no additional cost to the customer.</p> <p>The utility Endesa aims to deploy automated meter management to more than 13 million customers on the low voltage network from 2010 to 2015, building on past efforts by the Italian utility ENEL. The communication protocol used will be open. The utility Iberdrola will replace 10 million meters.</p>
Germany	<p>The E-Energy funding programme has several projects focusing on ICTs for the energy system.</p>
Australia	<p>The Australian government announced the AUD 100 million “Smart Grid, Smart City” initiative in 2009 to deliver a commercial-scale smart grid demonstration project. Additional efforts in the area of renewable energy deployments are resulting in further study on smart grids.</p>
United Kingdom	<p>The energy regulator OFGEM has an initiative called the Registered Power Zone that will encourage distributors to develop and implement innovative solutions to connect distributed generators to the network. OFGEM has set up a Low Carbon Networks fund that will allow up to GBP 500m support to DSO projects that test new technology, operating and commercial arrangements.</p>
France	<p>The electricity distribution operator ERDF is deploying 300 000 smart meters in a pilot project based on an advanced communication protocol named Linky. If the pilot is deemed a success, ERDF will replace all of its 35 million meters with Linky smart meters from 2012 to 2016.</p>
Brazil	<p>APTEL, a utility association, has been working with the Brazilian government on narrowband power line carrier trials with a social and educational focus.</p> <p>Several utilities are also managing smart grid pilots, including Ampla, a power distributor in Rio de Janeiro State owned by the Spanish utility Endesa, which has been deploying smart meters and secure networks to reduce losses from illegal connections. AES Eletropaulo, a distributor in São Paulo State, has developed a smart grid business plan using the existing fibre-optic backbone. The utility CEMIG has started a smart grid project based on system architecture developed by the IntelliGrid Consortium, an initiative of the California-based Electric Power Research Institute.</p>

Source: Updated from MEF 2009 using feedback from country experts. Projects are listed in order of largest to smallest amount of investment.

Country/Region	Forecasted investments in the electrical system (€/€/\$)	Stimulus funding for Smart Grids development (€/€/\$)	Number of Smart meters deployed and/or planned
European Union	€56 billion by 2020 [Pike Research, 2011] <i>(estimated Smart Grids investments)</i>	€184 million (FP6 and FP7 European funding for projects in the JRC catalogue) €125 million (recovery fund for Kriegers Flak project) National funding: n/a	About 45 million deployed or planned for installation (JRC catalogue, 2010) 240 million by 2020 [Pike Research, 2011]
USA	\$338 (€238) to 476 (€527) billion by 2030 [EPRI, 2011] <i>(estimated investments for implementation of fully functional smart grid)</i>	\$7 (€4.9) billion in 2009 (US Recovery act)	8 million in 2011 [Smartmeters.com, 2011] 60 million by 2020 [Smartmeters.com, 2011]
China	\$101 (€71) billion [Zpryme 2011] (Smart Grid technology development)	\$7.3 billion in 2009 (€5.1) [Zpryme, 2010]	360 million by 2030 [Innovation observatory, 2011]
South Korea	\$24 (€16.8) billion by 2030 [Reuters] (estimated Smart Grids investments)	\$824 (€580) million in 2009 [Zpryme, 2010]	500 000 in 2010, 750 000 in 2011 and 24 million by 2020
Australia	n/a	\$360 (€253) million in 2009 [Zpryme, 2010]	2.4 million by 2013 in state of Victoria
India	n/a	n/a	130 million by 2020 [Innovation Observatory, 2011]
Brazil	n/a	\$204 (€143.6) million in 2009 [Zpryme, 2010]	63 million by 2020 [Innovation Observatory, 2011]
Japan	n/a	\$849 (€143.6) millions in 2009 [Zpryme, 2010].	n/a

Source:
Smart Grids Catalogue,
EU-JRC 2011




ISGAN – Structure and workprogramme





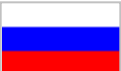















Michele de Nigris – ISGAN Chair

Michael Hübner – Executive Committee Member

A mechanism for bringing high-level government attention and action to accelerate the development and deployment of smarter electricity grids around the world.

ISGAN...

- Fulfills a key recommendation in the Smart Grids Technology Action Plan (released by Major Economies Forum Global Partnership, 2009)
- Was launched as one of 11 initiatives under the Clean Energy Ministerial (in 2010)
- Is organized as an IEA Implementing Agreement (in 2011, under the EUWP and CERT)
- Sponsors activities that build a global understanding of smart grids, address gaps in knowledge and tools, and accelerate smart grid deployment
- Builds on the momentum of and the knowledge created by the substantial smart grid investments being made globally
- Will leverage cooperation with the Global Smart Grid Federation  and others

Australia		India		The Netherlands	
Austria		Ireland		Russia*	
Belgium		Italy		Sweden	
Canada		Japan*		Switzerland	
China*		Korea		United Kingdom	
Finland		Mexico		United States	
France		Norway		European Commission*	
Germany					

**Plus five other countries invited to join:
Brazil, Denmark, South Africa, Spain, and Turkey**

**Participate through the CEM, but have not yet signed the Implementing Agreement*

One of 11 Clean Energy Ministerial Initiatives

International
Smart Grid
Action Network

Super-Efficient
Equipment and
Appliance
Deployment
Initiative

Electric Vehicles
Initiative

Bioenergy
Working Group

Carbon Capture
Use and Storage
Action Group

Clean Energy
Education and
Empowerment
Women's
Initiative

Clean Energy
Solutions
Centers

Global Superior
Energy
Performance
Partnership

Multilateral
Solar and Wind
Working Group

Solar and LED
Energy Access
Program

Sustainable
Development of
Hydropower
Initiative

Foundational Annexes

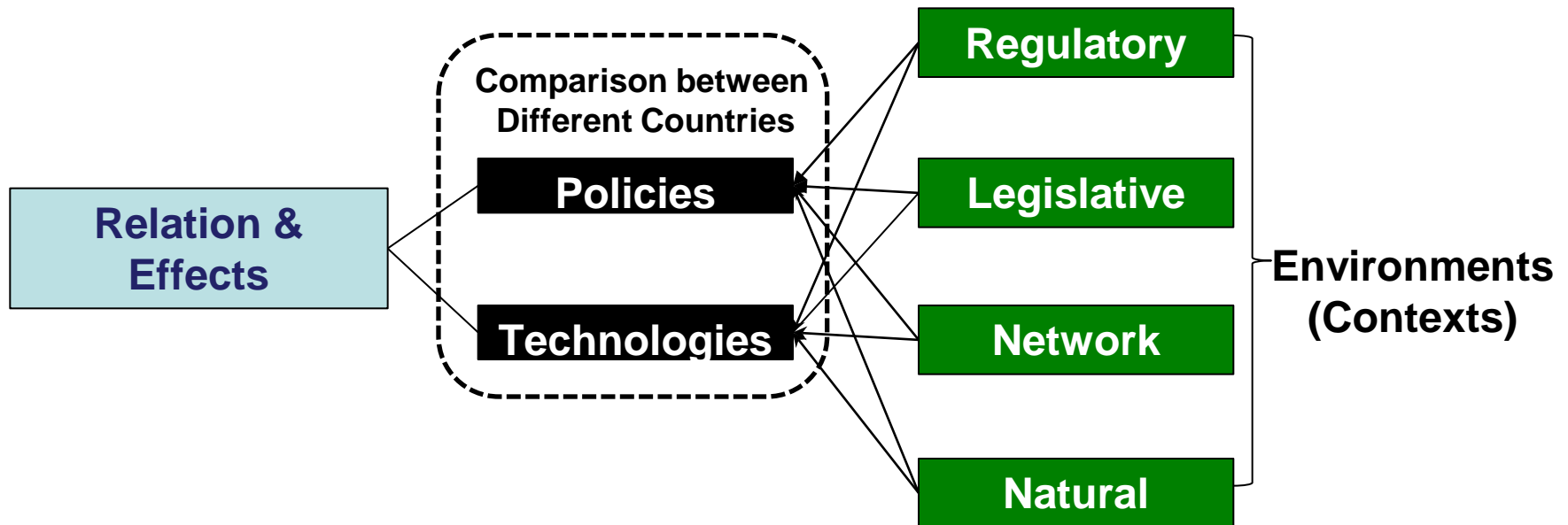


Emphases



- **Develop a unified ISGAN framework for assessing smart grid features and technologies**
 - **Prioritize this framework for each participating country**
(i.e., what are the motivating drivers and specific technology interests)
 - **Map this framework against existing inventories, surveys, and assessments**
 - **Identify gaps, opportunities, synergies, and inconsistencies and make recommendations, if appropriate**
 - **Expand framework to take into account key metrics and indicators**
 - **Develop appropriate tools for disseminating results**
(complement, not duplicate existing platforms)
-

- Assess best practice examples of case studies
- Develop and apply a common case study template & methodological framework



- **Assessment, modification, and application of methods to measure the present level of maturity of networks (i.e., the “smartness”)**
- **Assessment, modification, and application of existing benefit-cost methodologies and tools, as well as development of new ones**
- **From these analyses, develop appropriate toolkits (including KPI definition)**
 - Range of levels targeted: From high-level, broad-based methodologies to more detailed system-level approaches to project- or technology-level approaches
 - Builds on metrics and data identified by Annexes 1 & 2, and other sources

In short: Knowledge management and info sharing by design

- **Develop a platform that compiles smart grid concepts from high-quality sources and makes them accessible to policymakers (e.g., online glossary)**
 - **Produce brief, timely analytical reports that clarify important issues or raise key questions in smart grid policy and deployment**
 - **Establish platforms (or augment existing ones) for knowledge management and collaboration among ISGAN participants**
 - **Develop other tools for collaboration and information sharing**
-

Integration of ENARD* Work Programme into ISGAN

(*Implementing Agreement for Electricity Networks Analysis, Research & Development)

Cooperation with Other Implementing Agreements, such as DSM and 4E

(directly through Electricity Coordination Group, End Use Working Party, etc.)

Smart Grid International Research Facility Network (SIRFN) – *proposed Annex*

(to be coordinated with APEC Smart Grid Test Beds Network)

Governance During the Smart Grid Transition – *proposed Annex*

(social sciences focus)

Continuing Dialogue with Other Int'l Efforts, Private Sector, etc.

(e.g., US-EU Energy Council, APEC Smart Grid Initiative, Global Smart Grid Federation, Smart Grid Interoperability Panel)

Smart Grid Interoperability Frameworks

– *proposed Annex*

(integration and synthesis exercise)

- **Beyond ISGAN, there is...**

- Global Smart Grid Federation – private sector
- APEC Smart Grid Initiative
- US-EU Energy Council smart grid work
- Smart Grid Interoperability Panel
- European Electric Grid Initiative
- European Energy Research Alliance Joint Programme
- EC Joint Research Centre mapping efforts (with Eurelectric)
- EPRI Smart Grid Demonstration Initiative
- ...and many more



-
- **The smart grid transformation is a multi-decadal enterprise.**
 - **It will require much experimentation and learning by doing (and in many cases, learning by failing).**
 - **Countries and regions must determine for themselves which technologies, applications, and services are their priority.**
One size does not fit all!
 - **However, their decisions can be better informed by common (and rigorously tested) frameworks, methodologies, and tools**
 - **The development and coordination of these tools internationally is just beginning!**
-

-
- **Worldwide movement- a great opportunity for industry and for the development of the energy systems**
 - **But also means to take responsibility (system design)**
 - **The goals are important, not the means, not the technology per se → for the development process: to ask the right questions is important**
 - **The problems are complex, the solutions have to be simple (customer) and robust (system)**
 - **We need a broad and long-term scope (sustainability- e.g. question of materials and resources)**
-

- ***10 January 2012***
**ENARD Power Systems Annex Scoping for ISGAN Integration,
Stockholm, Sweden**
 - ***24-26 January 2012***
**Smart Grid Test Bed Networks Workshop (ISGAN / APEC),
Washington, DC and Albuquerque, NM, USA**
 - ***2-3 February 2012***
**Prep Meeting for 3rd Clean Energy Ministerial,
Delhi, India**
 - ***Week of 26 March 2012***
**ISGAN Executive Committee Meeting and Workshop(s),
Mexico City, Mexico**
 - ***24-25 April 2012***
**Third Clean Energy Ministerial
London, UK**
-

**proposed:
ISGAN WS
DG- Integration- Focus PV**

**in the Framework of the Austrian
Smart Grids Week | Bregenz 2012**

May 21st 2012



SMART GRIDS WEEK | BREGENZ 2012

May, 21st to 25th, 2012

Bregenz Festival House and illwerke vkw
Bregenz / Austria

illwerke vkw

Questions? Comments? Concerns?



Contact Info

CEM1 took place on 19-20 July 2010 in Washington, DC, USA.

CEM2 took place on 6-7 April 2011 in Abu Dhabi, UAE.

CEM3, CEM 4, and CEM5 will take place in 2012, 2013, and 2014 in the UK, India, and Korea

>90% of Global Clean Energy Investment

> 80% of Global GHG Emissions



Australia



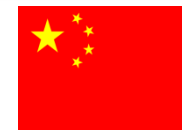
European Commission



Brazil



Canada



China



Denmark



Finland



France



Germany



Hungary



India



Indonesia



Italy



Japan



Korea



Mexico



Norway



Russia



South Africa



Sweden



Spain



United Arab Emirates



United Kingdom



United States

Michael Hübner

Energy and Environmental Technologies

Austrian Federal Ministry for Transport, Innovation and Technology

Smart Grids Themenmanagement BMVIT

EEGI- EII-Team Memberstates Representative for Austria

ERA-Net Smart Grids Management Team Member

ISGAN EXCO Member

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