APEC Workshop on Small Hydro and Renewable Grid Integration

Overview of EGNRET Projects

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(EGNRET)

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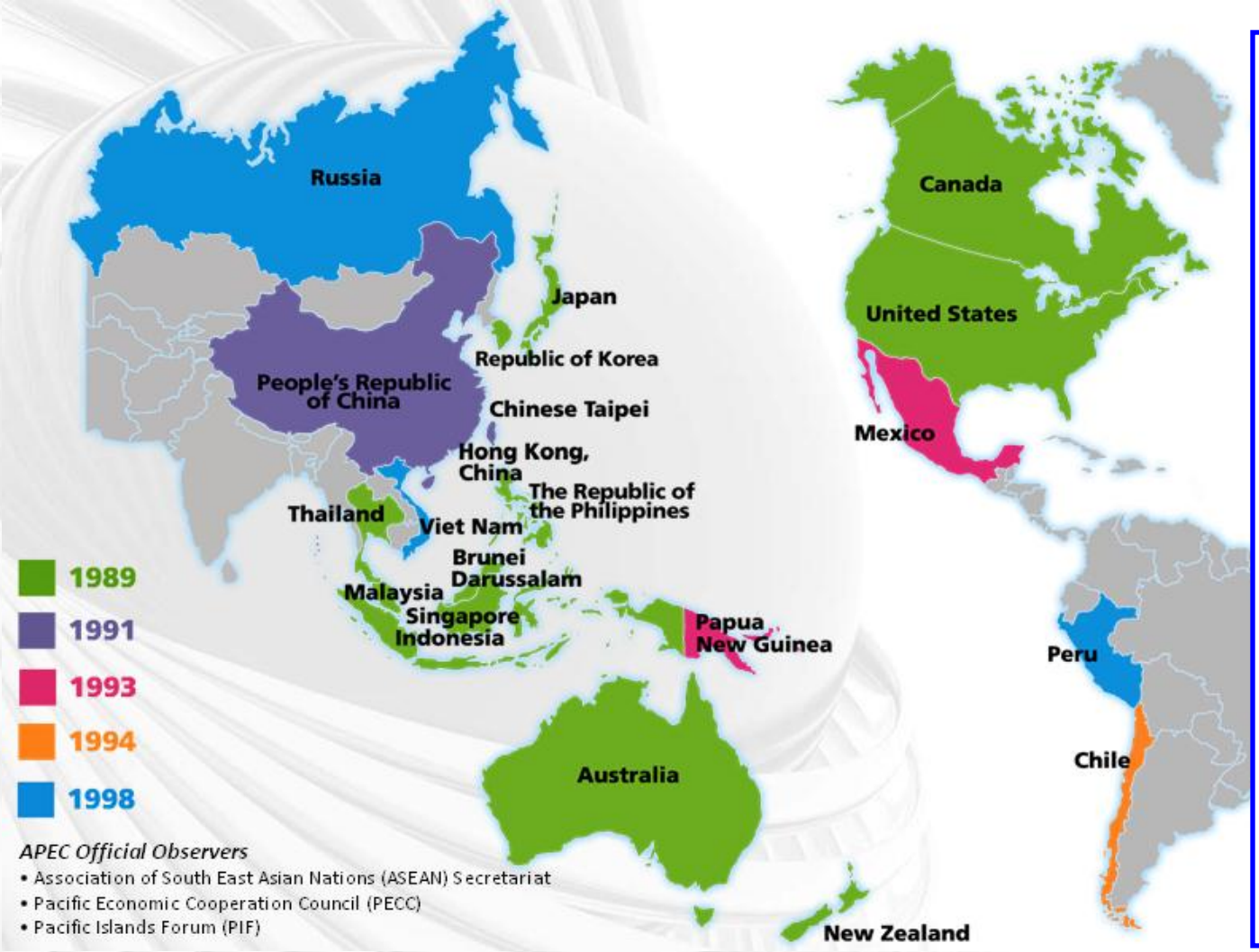
Asia-Pacific Economic Cooperation

EGNRET

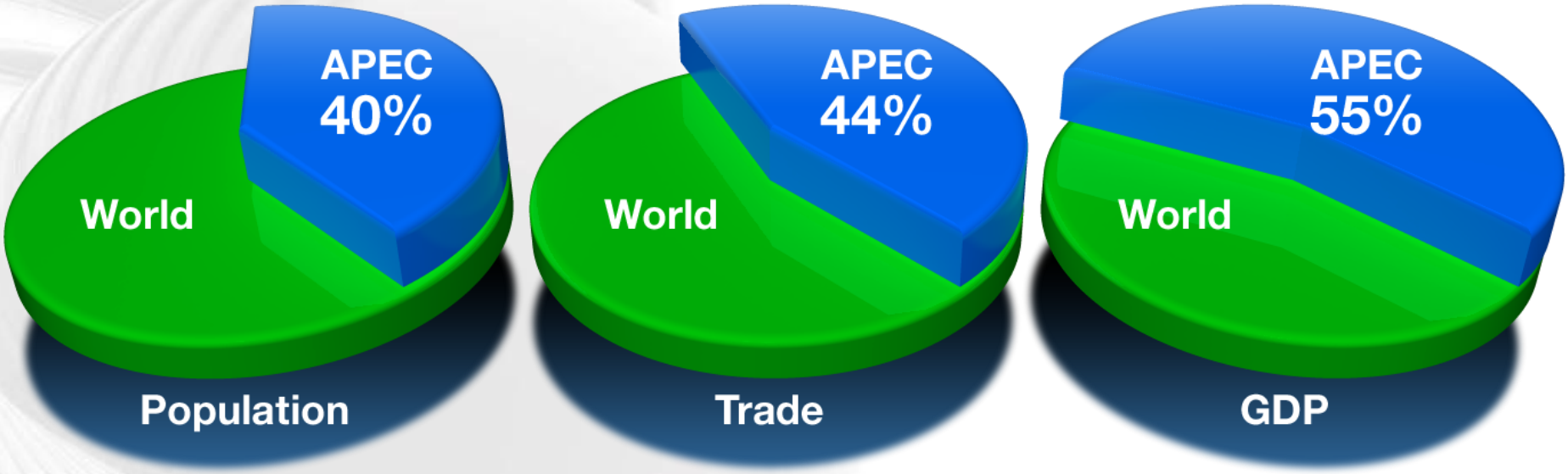
Who We Are: APEC (Asia-Pacific Economic Cooperation)



21 Members

Australia
Brunei Darussalam
Canada
Chile
People's Republic of China
Hong Kong, China
Indonesia
Japan
Republic of Korea
Malaysia
Mexico
New Zealand
Papua New Guinea
Peru
Republic of the Philippines
Russia
Singapore
Chinese Taipei
Thailand
United States
Vietnam

APEC's Economic Significance



World 6.8 billion

APEC 2.7 billion

World US$38 trillion

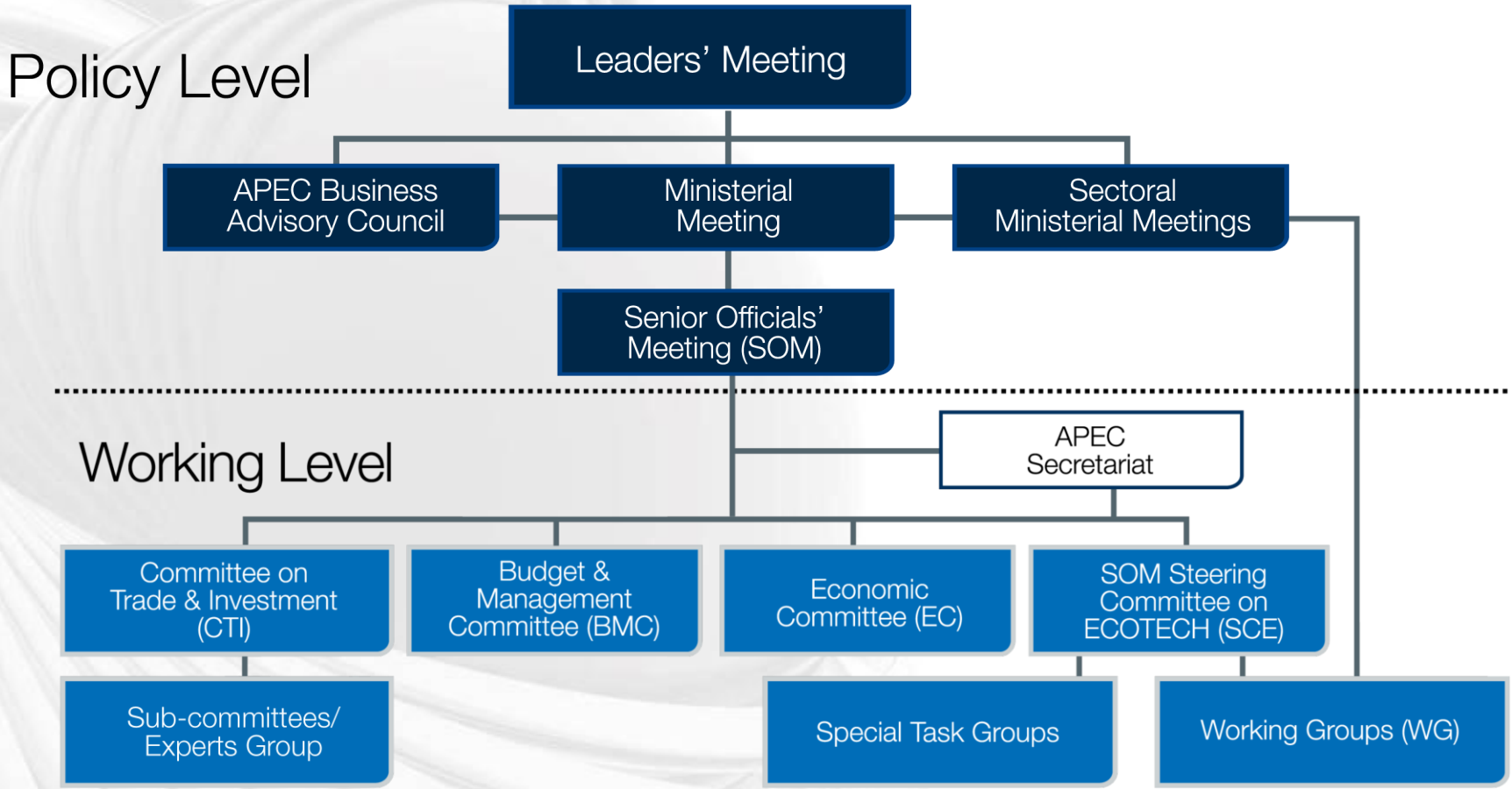
APEC US$17 trillion

World US$58 trillion

APEC US$32 trillion

Source: StatsAPEC, Key Indicators Database

How APEC Operates



Working Groups (14)

- Agricultural Technical Cooperation
- Anti-Corruption and Transparency
- Emergency Preparedness
- **Energy (Energy Working Group, EWG)**
- Health
- Human Resources Development
- Experts Group on Illegal Logging and Associated Trade
- Ocean and Fisheries
- Policy Partnership on Science, Technology and Innovation
- Policy Partnership on Women and the Economy
- Small and Medium Enterprises
- Telecommunications and Information
- Tourism
- Transportation

Energy Working Group (EWG)

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EWG: 4 Expert Groups + 3 Task Forces

- Expert Group on Clean Fossil Energy (EGCFE)
- Expert Group on Energy Efficiency & Conservation (EGEE&C)
- Expert Group on Energy Data & Analysis (EGEDA)
- Expert Group on New & Renewable Energy Technologies (EGNRET)

- Biofuels Task Force (BTF) (2005-2011)
- Energy Trade and Investment Task Force (ETITF) (2009-)
- Low-Carbon Model Town Task Force (LCMT TF) (2010-)

EGNRET Mission

- The APEC Expert Group on New and Renewable Energy Technologies (EGNRET) has been established by - and reports to - the APEC Energy Working Group (EWG).
- The mission of the EGNRET is to facilitate an increase in the use of new and renewable energy technologies in the APEC region.
- The activities of the EGNRET will be directed towards meeting the energy challenges identified by APEC Leaders and Energy Ministers.

EGNRET Activities

- Meeting twice annually
- Conducting research projects
- Organizing workshops
- Supporting major Initiatives
  - ✓ APEC 21st Century Renewable Energy Development Initiative
  - ✓ Energy Smart Communities Initiative (ESCI)
  - ✓ APEC Smart Grid Initiative (ASGI)

APEC Smart Grid Initiative (ASGI)

- Launched in June 2010 (EMM 9)
- EMM 9 instructed the Energy Working Group (EWG) "to start an APEC Smart Grid Initiative (ASGI) to evaluate the potential of smart grids to support the integration of intermittent renewable energies and energy management approaches in buildings and industry."

Fukui Declaration (EMM 9)

Smart grid technologies (including advanced battery technologies for highly-efficient and cost-effective energy storage)

- To integrate intermittent renewable power sources and building control systems that let businesses and consumers use energy more efficiently
- To enhance the reliability of electricity supply, extend the useful life of power system components, and reduce system operating costs

Recent Renewable Grid Integration Projects

Asia-Pacific Economic Cooperation

1. Addressing Challenges of AMI Deployment in APEC (Chinese Taipei)
2. Stock-take of Electric Vehicle Interface with Electricity and Smart Grids Across APEC Economies and the Potential for Harmonization (New Zealand)
3. Piloting smart/micro grid projects for insular and remote localities in APEC economies (Russia)
4. Combined heat and power (CHP) technologies for distributed energy systems (Russia)
5. Small Hydro and Renewables Grid Integration Workshop (Vietnam)
6. Study of Demand Response's Effect in Accommodating Renewable Energy Penetration in the Smart Grid (China)
7. Christchurch Smart Energy Grids: Earthquake Recovery Project (New Zealand)

Completed Projects

C1. Addressing Challenges of Advanced Metering Infrastructure (AMI) Deployment in APEC (EWG 07/2011A) (Chinese Taipei)

- This project is to investigate the development strategies and current status of AMI in all APEC economies, and provide recommendations for AMI deployment. The methodology of this project involves survey and analysis of AMI development status, and an two-day AMI workshop.
- The literature survey of global AMI deployment has been carried out to identify the objective and strategy to discover the purposes of AMI deployment as well as the supporting scheme.
- A two-day workshop for the project was held on August 24th -25th, 2011 in Chinese Taipei. The purpose of the workshop was to share the experience of AMI deployment among APEC economies. The workshop presentations are available on the workshop's website at: http://www.egnret.ewg.apec.org/workshops/AMIWorkshop/index.html

Completed Projects

C1. Addressing Challenges of Advanced Metering Infrastructure Deployment in APEC (EWG 07/2011A) (Chinese Taipei)

- **Major findings of this project**

(1) Principles of AMI deployment: Major criteria such as economic efficiency, societal equity, sustainable development and security have been defined, and variables including standardization, interoperability, timing and cost-benefit analysis were also identified.

(2) Guidelines for APEC economies: The process of improving public awareness, proposing comprehensive plan, and developing applicable demand control program are suggested. Afterwards, support schemes such as policy, privacy, security and cost-benefit analysis are needed to be carried out.

Completed Projects

C1. Addressing Challenges of AMI Deployment in APEC (EWG 07/2011A) (Chinese Taipei)

- **Major findings of this project (*cont'd*)**

(3) Transition from AMI to smart grids: AMI forms the fundamental networking for power grid systems, and enables the increment of renewable energy adoption and efficiency improvement.

(4) More considerations pop out while the power systems are turned into smart grids, such as scalability, interoperability, and customer services. All the issues are dependent, and require more efforts to maintain the integrity and functionality of smart grids.

Completed Projects

C2. Stock-take of Electric Vehicle Interface with Electricity and Smart Grids Across APEC Economies and the Potential for Harmonization (EWG 11/2011) (New Zealand)

- The objective of the project is to enhance understanding in APEC economies of EV connectivity to electricity grids and identify opportunities to increase the harmonization of standards and requirements to promote the deployment and integration of EVs, both vehicles and supporting technologies.
- The methodology of this project involves 3 main steps, including a survey of APEC economies on existing EV connectivity infrastructure, regulations, and standards; a desktop review of the results; and a workshop to discuss the findings and collect APEC feedback.
- The APEC Electric Vehicle Connectivity Workshop 2012 will be held on 19 June 2012 in Wellington, New Zealand, alongside the EGNRET 38.

Completed Projects

Asia-Pacific Economic Cooperation

C2. Stock-take of Electric Vehicle Interface with Electricity and Smart Grids Across APEC Economies and the Potential for Harmonization (EWG 11/2011) (New Zealand)

- **Major findings of this project**

1) All APEC Economies are still at a relatively early stage in their PEV market development.

2) Detailed knowledge of PEV connectivity conditions across the stakeholder group was limited and gaps remained in the knowledge base after the completion of the survey despite supplemental desktop research. These gaps were attributed to the combined effects of early market development (meaning that stakeholders are still on a learning curve) plus inefficiencies in the survey process itself.

Completed Projects

C2. Stock-take of Electric Vehicle Interface with Electricity and Smart Grids Across APEC Economies and the Potential for Harmonization (EWG 11/2011) (New Zealand)

- **Major findings of this project (*cont'd*)**

3) Barriers to trade from PEV connectivity conditions were identified in a number of areas such as charging interfaces, grid network interfaces, electrical safety regulations and energy market arrangements. However other barriers to trade such as vehicle homologation requirements and government incentives and other policies were also identified.

4) Some barriers to trade of PEVs throughout APEC were unlikely to be resolved through a process of harmonization, due to the established and entrenched nature of some standards and regulations. Examples in this regard include standard grid configurations and certain electrical safety regulations and vehicle homologation requirements.

Completed Projects

C3. Piloting Smart/micro Grid Projects for Insular and Remote Localities in APEC Economies (S EWG 15 11A) (Russia)

- The objectives of the project are
  - to compile and share member economies' experiences in introducing new technologies for local energy systems including smart & micro grid technologies to support sustainable development of remote and isolated areas,
  - to review microgrid as a critical component of smart grid concept for local energy systems with a view to maximize the economic and environmental effect of tested and ready-to-use technologies,
  - to provide a menu of options to APEC economies for piloting of smart/micro grid projects in the form of assessment methodologies, business scenario models and specific recommendations.
- A project newsletter was released in February 2012 to allow for wider dissemination of the information about the project. The project team also established a dedicated project website at www.localenergy-apec.ru, and the final report canbe found at http://publications.apec.org/publication-detail.php?pub_id=1359

Completed Projects

C3. Piloting Smart/micro Grid Projects for Insular and Remote Localities in APEC Economies (S EWG 15 11A) (Russia)

- **Major findings of this project**

1) Remote microgrids indeed appear as a standalone, ultimate case of decentralised electricity and a way towards energy independence. Many of these microgrids are designed to reduce diesel fuel consumption by integration of solar photovoltaics, a technology that is the primary driver for remote microgrids over the next 6 years.

2) Pike Research forecasts that the global remote microgrid market will expand from 349 MW of generation capacity in 2011 to over 1.1 GW by 2017, an amount that equals or perhaps even surpasses all other microgrid segments combined that are in the current planning stages or have already been deployed.

Completed Projects

C3. Piloting Smart/micro Grid Projects for Insular and Remote Localities in APEC Economies (S EWG 15 11A) (Russia)

- **Major findings of this project (*cont'd*)**

3) The challenge is to find business models that would be commercially viable and could be configured to meet specific requirements of individual economies and communities. APEC which brings together developed and developing economies and ensures the presence of both government and businesses at the discussion table, is well positioned to effectively address this task.

4) APEC EWG should indeed re-introduce microgrid within the ESCI as a core paradigm to build smart communities in a decentralized energy environment. APEC makes distinction for its flexible, cost-efficient capacity building projects, and the members should utilize APEC approach to foster training and raising awareness of microgrid project and technology development.

Thank you for your attention!

Asia-Pacific Economic Cooperation

EGNRET website: http://www.egnret.ewg.apec.org/

EGNRET On-going Projects: 11

Currently the EGNRET is implementing 11 projects:

P1. Prospects for Marine Current Energy Generation in APEC Region (S EWG 23 11A) (Russia)

P2. Best Practices in Energy Efficiency and Renewable Energy Technologies in the Industrial Sector in APEC Region (S EWG 19 11A) (Cooperated with EGEE&C) (Thailand)

P3. Urban Development Smart Grid Roadmap: Christchurch Recovery Project (EWG 08 2012) (Cooperated with EGEE&C) (New Zealand)

P4. Research on the Application of Physical Energy Storage Technology to Enhance the Deployment of Renewable Energy in an APEC Low Carbon Town (EWG 16 2012A) (China)

P.5 The Comprehensive Analysis and Research of Key Technologies and Commercial Model of Low Carbon Model Town Applied in Yujiapu CBD EWG (EWG 11/2012A) (China)

EGNRET On-going Projects: 11

(Cont'd)

P6. APEC Peer Review on Low-carbon Energy Policies (PRLCE) Phase 2 (EWG 18 2012A) (Japan)

P7. APEC Workshop on Best Practices on Financing Renewable Energy (EWG 21 2012A) (Viet Nam) (Approval in Session 3, 2012)

P8. Promoting Stable and Consistent Renewable Energy Supply by Utilizing Suitable Energy Storage Systems (EWG 22 2012A) (China)

P9. Operation Technology of Solar Photovoltaic Power Station Roof and Policy Framework (EWG 24 2012A) (China)

P.10 Study on Measures to Reduce Energy Intensity in APEC Low Carbon Town (EWG 23/2012A) (China)

P.11 2013 APEC Workshop on Geothermal Technology (SF EWG 01/2013) (Chinese Taipei)

APEC 21st Century Renewable Energy Development Initiative

- Launched in May 2000
- Launched by the United States at the 4th APEC Energy Ministers meeting (EMM 4)
- Developed within the EGNRET
- A Multi-Year Work Program
- To advance the use of renewable energy for sustainable economic development and growth of the APEC region

APEC 21st Century Renewable Energy Development Initiative

Objectives of the Initiative

- Fostering a common understanding of regional renewable energy technology issues
- Facilitating trade and investment in new and renewable energy technologies and services
- Reducing the environmental impact of the energy sector through applications of new and renewable energy technologies

APEC 21st Century Renewable Energy Development Initiative

Asia-Pacific Economic Cooperation

Multi-Year Work Programs were developed for 9 Collaboratives

I	Stakeholders Dialogues, Outreach Forums and Symposiums
II	Micro-Business Development
III	Renewable Energy Training and Certification Network
IV	Renewable Energy Standards
V	Distributed Energy Resources
VI	Renewable-Energy Technology Applications
VII	Web-Based Renewable Energy Information Dissemination
VIII	Financing
IX	Alternative Transport Fuels Lead

2013 APEC Workshop on Geothermal Technology

Asia-Pacific Economic Cooperation

Date: June 25 - 27, 2013

Venue:
NTUH International Convention Center
Taipei, Chinese Taipei

June 25 (Tue)	AM	Session I: Geothermal Status and Perspectives
	PM	Session II: Geothermal Exploration and Assessment
June 26 (Wed)	AM	Session III: Enhanced Geothermal System Tech
	PM	Tatun Site Field Trip
June 27 (Thu)		Visit to related research institute (by invited only)

APEC Smart Grid Initiative (ASGI)

Suggested Elements of the Smart Grid Initiative

- Element 1 – Survey of Smart Grid Status and Potential
- Element 2 – Smart Grid Roadmap
- Element 3 – Smart Grid Test Beds
- Element 4 – Development of Smart Grid Interoperability Standards

The Smart Grid Initiative is being led by the U.S, Korea, and Chinese Taipei

Future Prospects in 2013

- The EGNRET will focus more on smart grid, low carbon town, etc. which are directly related to the ESCI and APEC ASGI.
- EGNRET members are encouraged to conduct researches related to reduction of energy intensity in APEC region.
- The EGNRET will strengthen collaboration with APEC other fora, e.g., LCMT Task Force, EGEE&C, Policy Partnership on Science, Technology, and Innovation (PPSTI), and some projects, e.g., PRLCE and PREE supported by APERC.
- Collaboration with International Renewable Energy Agency (IRENA), and International Copper Association Ltd. (ICA) on promotion of renewable energy in the APEC region will be carried out as well.