

# APEC Concept Note

<b>Project Title:</b>	Study of Demand Response's Effect in Accommodating Renewable Energy Penetration in the Smart Grid
<b>Source of funds:</b> ( <i>Select one</i> ):	<input type="checkbox"/> Operational Account <input type="checkbox"/> TILF Special Account <input checked="" type="checkbox"/> APEC Support Fund
<b>Committee / WG / Sub-fora / Task-force:</b>	Energy Working Group
<b>Proposing APEC economy:</b>	China
<b>Co-sponsoring economies:</b>	USA , Korea , Chile, Thailand, Chinese Taipei, Hong Kong China
<b>Expected start date:</b>	January 1, 2012
<b>Expected completion date:</b>	December 31, 2013
<b>Project summary:</b>  <b>Describe the project in under 150 words. Your summary should include the project topic, planned activities, timing and location:</b>	<p>Increasing economies put more attention to renewable energy development for the shortage of conventional energy source and climatic change. However, the volatility and intermittent of renewable generation not only makes inefficient use of renewable resources, but also adds uncertainty to the power system planning and operation, which goes against the stable and economic operation of power grid. Demand response can promote the interaction of "Source-Load" through incentives and price signals on the basis of real-time output status of renewable generation, encouraging demand side participate in power grid operation actively to address the issue of accommodating renewable energy penetration effectively.</p> <p>This project aims to study the demand response's potential of settling the fluctuations of renewable energy, and how to implement demand response programs to better dissolve the renewable energy, and promote comprehensive energy efficiency, and reduce system operating costs and carbon emissions. It is composed of three parts:</p> <ol style="list-style-type: none"> <li>1) Feasibility analysis of demand response's effect in accommodating renewable energy penetration</li> <li>2) Host a seminar about feasibility analysis of demand response's effect in accommodating renewable energy penetration</li> <li>3) Study the commercial operation and policy mechanism of demand response</li> <li>4) Study the implementation program of demand response pilot</li> </ol>
<b>Total cost of proposal:</b>  <b>USD</b> U.S.\$200,000	<b>Total amount being sought from APEC (USD):</b> U.S.\$100,000  <b>By category:</b> <i>Travel:</i> \$30,000 <i>Labour costs:</i> \$110,000 <i>Hosting:</i> \$30,000 <i>Publication &amp; distribution:</i> \$10,000 <i>Other:</i> \$20,000

**Project Proponent Information and Declaration:**

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I declare that this submission has been prepared in line with the **Guidebook on APEC Projects**. If approved, I agree to develop the project in line with APEC project requirements.

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*Name of Project Proponent*

**Date:**

# Project Synopsis

1. **Relevance:** Why should APEC undertake this project? What problem or opportunity will the project address and why is it important?

On the June 19 2010, Energy Ministers of the APEC economies, gathered in Fukui, Japan to discuss Low Carbon Paths to Energy Security: Cooperative Energy Solutions for a Sustainable APEC. They emphasize that improving energy efficiency is one of the quickest, greenest and most cost-effective ways to address energy security, economic growth and climate change challenges at the same time, and renewable energy technologies, including solar, wind and geothermal for electricity generation and bio-fuels for transport, are declining in cost and diversifying the energy supply mix, and smart grid technologies can help to integrate intermittent renewable power sources and building control systems that let businesses and consumers use energy more efficiently, and they can also help to enhance the reliability of electricity supply, extend the useful life of power system components, and reduce system operating costs.

APEC representatives considered ways to build toward a seamless regional economy by advancing three priorities in 2011, one of which is encouraging green growth. APEC senior officials also welcomed efforts to explore the use of low-carbon development strategies as an essential component of sustainable growth in the Asia-Pacific region.

“Study of Demand Response’s Effect in Accommodating Renewable Energy Penetration in the Smart Grid” project focuses on how to help integrate the intermittent of renewable energy sources through demand response under the background of the growing scale of the global renewable energy, so that enterprises and users can use the energy more effectively, then the electric company can improve energy efficiency and reduce system operating costs and carbon emissions.

2. **Objectives:** Describe the 2-3 key objectives of the project. (e.g. to... create a framework...; ensure participants will be able to...; share experiences...; enhance understanding...; develop recommendations...; build interest...; revise strategies... etc.)

Firstly this project analyses the feasibility of demand response’s effect in accommodating renewable energy penetration, to study the mechanism and effect of demand response in accommodating renewable energy penetration.

Then, study the main body and the relevant income of demand response. Study the win-win benefit distribution model of multi-user like government, power companies, energy agencies and third-party. Study the best supporting policies and regulations of demand response. Study the commercial operation mode of demand response which is easy to implementation in China.

Finally, this project will study the available programs like incentive-based demand response programs and the implementation proposal of demand response pilot, taking full account of the basic situation of the economy, which will provide a favorable reference for economies’ implementation of demand response, but also provide a new way of energy use for enterprises and users in the economies, to further improve energy efficiency and reduce system operating costs and carbon emissions.

3. **Alignment:** Describe how the project will help achieve APEC’s key priorities and meet your forum’s work-plan or medium-term plan.

Demand response refers to electricity power user change their consumption ways according to the price signals and/or incentives. It can shift peak load to off-peak period, slow down installed power capacity and improve the efficiency of electricity production, while reducing greenhouse gas emissions. Renewable energy is called as "green energy", and its own features cause the low utilization of renewable energy, which can not bring the advantages of renewable energy to full play. Demand response strategy itself is one of low-carbon development strategies, and can effectively integrate renewable energy avoiding unnecessary waste of renewable energy. This project will help achieve APEC’s green energy and low carbon strategies, as well as the Forum’s work plan and medium-term plan.

4. **Methodology:** How do you plan to implement the project? In this section, address:

In this section, address briefly:

- **Timeline:** Project timelines and dates for key activities and deliverables

This APEC Project will be carried out in four phases:

- Phase I will focus on studying the feasibility of demand response's effect in accommodating renewable energy penetration. It is anticipated that Phase I will begin in early January 2012. Phase I will require APEC Support Fund U.S.\$80,000.
- Phase II will focus on the commercial operation and policy mechanism of demand response. It is anticipated that Phase II will begin in early September 2012. Phase II will be self-funded U.S.\$40,000.
- Phase III will focus on a seminar about feasibility analysis of demand response's effect in accommodating renewable energy penetration. It is anticipated that Phase III will begin in early April 2013. Phase III will require APEC Support Fund U.S.\$20,000.
- Phase IV will focus on studying the implementation program of demand response pilot. It is anticipated that Phase IV will begin in early May 2013 and end in late December 2013. Implementation of Phase IV will be self-funded U.S.\$60,000.

- **Stakeholders: Beneficiaries and stakeholders (APEC & non-APEC) and how they will be engaged**

Some APEC member economies can participate in the whole project, including:

- Understand the feasibility of demand response in accommodating renewable energy penetration;
- Study the effectiveness and impact of demand response from generators, transmission operators and distribution providers;
- Study the implementation program of demand response pilot which will greatly improve efficiency of renewable energy use, achieving the purpose of energy saving.

All APEC member economies and other economies will benefit from the project through information sharing and interactive discussions on demand response.

- **Previous projects/activities: If and how this proposal builds on the findings or lessons learned from previous projects/activities, while avoiding duplication**

Although we have not applied for APEC fund before, State Grid Electric Power Research Institute(SGEPRI) and the U.S. Trade Development Agency (USTDA) signed a Sino-US energy cooperation project (ECP) "The feasibility studies and demonstration of automated demand response system of smart grid" grant agreement on the February 28, 2011, to give full play to the role of demand response in energy efficiency of the smart grid, significantly increase the power consumption efficiency in China with coal-based power generation, thereby reduce the total carbon emissions volume. Implementation of the project will promote the smart grid-related technology research and the potential of smart grid, and solve the major energy and environmental sustainable development issues.

This program is built on the grant agreement with USTDA undertaken, and we want to promote the experience in bilateral cooperation between China and U.S.A to Asia-Pacific region and other regions, achieving the multi-party cooperation, and also we'd like to go on cooperating with Honeywell through this project, exchanging each opinion and experience, to facilitate the development and implementation of demand response in China or other economies.

- **Communication: How you plan to communicate the results or benefits of this project to others**

We will host a seminar about feasibility analysis of demand response's effect in accommodating renewable energy penetration, inviting domestic and foreign experts and other personnel or organizations to discuss and demonstrate the study of demand response.

Information about the project will be available on the APEC website. All phases' reports will be disseminated to APEC member economies through the Secretariat. The project planning committee will develop a publicity plan that may include uploading demand response promotion materials on other interested stakeholders' websites.