



SECTION 1: IEA DSM PROGRAMME TASK XIII BACKGROUND INFORMATION

Project History

Price setting in efficient markets is based upon a set of complex interactions between buyers and sellers – the demand-side and the supply-side of the market, respectively. However, in today's liberalized electricity markets, most consumers do not participate actively in the price setting process. As a result, retail prices do not play their normal role in balancing electricity demand and supply. This makes the market susceptible to system congestion and system shortfalls, which lead to excessive price volatility. Demand Response Resources (DRR) act to stabilize electricity markets by engaging demand elasticity. Customers confront and by virtue of the response, mitigate price volatility. DRR may also generate important environmental benefits¹. In addition, flexibility on the market's demand side will improve the reliability of the electricity grid and thereby increase system security.

The International Energy Agency Demand Side Management Programme (IEA DSM) recognizes the challenge that is inherent with a mismatch of supply and demand. In order to address some of these challenges the IEA DSM approved the creation of a new annex called Task XIII: Demand Response Resources at its April 2004 Executive Committee (ExCo) meeting. At the same time, the ExCo appointed Ross Malme, President & CEO RETX Energy Services, Inc. and Chairman of the Peak Load Management Alliance (PLMA) in the United States, as the Operating Agent for Task XIII. Task XIII is charged with reviewing DRR practices in various markets around the world and developing recommendations and economic tools for integrating DRR into regular market activities. Additional information on Task XIII can be found at:

www.demandresponseresources.com

Task XIII was conceived in the spring of 2003 shortly after Ross Malme, representing the PLMA, gave a presentation to the IEA DSM's Demand Response workshop and the IEA Secretariat reciprocated by attending the PLMA's Spring 2003 conference. Based on the interest expressed in identifying ways to bring DRR into the market at these events, a multinational work group was formed to develop a proposed task plan for Task XIII. After a meeting in Albany, NY and multiple iterations of a draft project plan, it was presented to the IEA DSM ExCo in October 2004. The project was well received at this meeting and subsequently approved at the April 2004 ExCo meeting.

As of year end 2004, a total of 10 IEA member countries have joined the project. These countries are Australia, Denmark, Finland, Italy, Japan, Korea, Netherlands, Norway, Spain, Sweden, and the United States of America (hereinafter, USA). Canada joined the project in 2005. In addition, several other IEA member countries and nonmember countries are considering participation. It is customary in IEA DSM projects for one of the ExCo members

to be a sponsoring entity. The USA, through the USA Department of Energy, has accepted this role for Task XIII.

Overview: International Energy Agency

The International Energy Agency (IEA), headquartered in Paris and consisting of 26 Member countries, seeks to create the conditions in which the energy sectors of their economies can make the fullest possible contribution to sustainable economic development and the well being of their people and of the environment. In formulating energy policies, the establishment of free and open markets is a fundamental point of departure, though energy security and environmental protection need to be given particular emphasis by governments. IEA countries recognize the significance of increasing global interdependence in energy. They therefore seek to promote the effective operation of international energy markets and encourage dialogue with all participants. The IEA secretariat has recently published a review of the issues related to Demand Response; “The Power to choose” and has hosted several conferences on the matter (see www.iea.org).

Operating as an Implementing Agreement to the Office of the Secretariat to the central IEA Organization, The IEA Demand-Side Management Programme (IEA DSM) is an international collaboration with seventeen IEA Member countries and the European Commission, working to clarify and promote opportunities for demand-side management (DSM). For the purposes of this Programme, DSM is defined to include a variety of purposes such as load management, energy efficiency, strategic conservation and related activities. DSM is thus forming a “tool-box” for [commodity suppliers](#) and governments in their work to make energy systems more suited to their purpose. Furthermore, the Programme is developed to cover such needs under different regulatory regimes and market structures since the basic need to ensure an optimal function of the energy system is common throughout the world. Additional information about the IEA DSM Programme can be found on its website at <http://dsm.iea.org/>.

Task XIII Project Objectives

In October 2003, the IEA Secretariat issued a report titled “Power to Choose.” This report drew three main conclusions that were used to support the objectives and approach proposed for Task XIII.

The “Power to Choose” concluded² :

1. Current market designs do not enable demand response due to:
 - Outdated metering and related technologies,
 - A lack of real-time price information reaching consumers,
 - Regulated retail prices while wholesale markets have largely been deregulated,
 - System operators focused on supply-side resources,
 - And an historical legacy where demand response was not considered important.

2. Significant investment is needed in demand-side infrastructure to enable markets to communicate the value and cost of electricity supply. This shortfall is not due to the availability of technology or its cost, but to current market designs that fail to recognize and correct for the barriers that exist for the investment in such technology.
3. Governments and regulators have a key role to play in enabling demand response. Since the benefits of demand response are widely dispersed among different market players, it is clear that current markets will not develop a meaningful demand response capability without facilitation by governments. In addition, there are not only private economic gains available directly to market participants, but there also are many public good and societal benefits which will not register in a normal business investment model. As a result, government policy needs to be aligned to the realities of the investment environment and capable of recognizing how benefits are accrued (in which quantities and to whom) if appropriate levels of investment in DRR are to be attained.

These conclusions lead one to believe that DR is being held back from full-scale implementation due more to structural and institutional reasons than technical ones. Task XIII was designed with this in mind. Task XIII was created to assess these challenges and offer suggestions for dealing with them. The primary objectives for Task XIII are:

1. Identify and develop the country-specific information needed to establish the existing stock of and potential for demand response.
2. Perform the market and institutional assessment needed to set realistic goals for the contribution of DRR to sector objectives.
3. Mobilize technical and analytic resources needed to complete the project.

Objective 1: Identify and develop the country-specific information needed to establish the existing stock of and potential for demand response.

The Operating Agent (OA) will coordinate with the designated Country Expert(s) (CE) to assess the potential and existing DRR in the nation. The OA & CE will gather applicable market data and complete an analysis designed to estimate the available DRR in that market. The analysis will be based on national demographics, best practices identified from around the world, and local market constraints.

The OA and the CE will work closely together to complete this objective. The CE will have primary responsibilities for gathering the applicable data points and the OA will provide various tools (e.g. data templates, Internet based project portal, Expert Workshops, best practice recommendations, others) to assist with the process. Once the appropriate information is gathered, the OA and CE will collaboratively analyze the data and apply statistical analysis to estimate the DRR potential for the market.

The OA will release proposed data templates in advance of the Experts Workshop. These templates will outline initial thoughts on data gathering requirements. This data will be used as “inputs” into the analytic process. At the conclusion of the process, the project team will

present a report estimating the potential for demand response in the given market, recommendations for implementation (e.g. infrastructure & operating guidelines), and econometric analysis on the value of DRR to the market.

Objective 2: Perform the market and institutional assessment needed to set realistic goals for the contribution of DRR to sector objectives.

An institutional market assessment must be completed in order to assess the true market potential for DRR and suggest ways in which the potential may be realized. There are many similarities among the electric market structures around the world, but there are also some circumstances unique to each marketplace. This reality means that not all best practices will be optimal for all markets. It also means that realizing the DRR potential in any given market may be impacted directly or indirectly by specific market challenges. These issues must be understood and considered or any potential recommendations will likely be flawed.

In completing this objective, the OA and CE will review the local market operation and attempt to identify potential barriers that may limit the realization of a robust DRR participation. The project team will review how price signals are currently presented to consumers; evaluate business case potential through the industry value chain (i.e. market, commodity supplier, consumer); and, assess the infrastructure requirements to establish DRR as an available capacity resource.

The project team will also endeavor to analyze the value of DRR to the market being reviewed. Various econometric models and benefit tests will be utilized. This analysis will help establish the impact DRR has directly on the marketplace. The econometric analysis should provide empirical evidence that regulators and other constituencies can review as they establish market priorities. The project team will offer recommendations for implementing DRR in the market with a focus on maximizing the economic benefits.

Additional considerations may be reviewed on a case-by-case basis.

Objective 3: Mobilize technical and analytic resources needed to complete the project.

The OA will work with each nation's CE to establish work plans, technical support requirements, and the tools needed to complete the work. As the project manager, the OA will facilitate the process and help ensure that appropriate resources are available at the proper times. The OA will track the projects performance with the CE and strive to ensure all milestones and deliverables are met. In the event that the participating nation implements a pilot project during the project period, the project team will track the pilot projects performance and compare it to the results from other marketplaces.. This assessment may provide insight into modifications or adjustments to the pilot project to obtain optimal results. On the other hand, the prospective project may also establish new best practices that will be shared with other Task XIII participants

Task XIII Project Tasks

Task 1 – Finalize Global and County-Specific Objectives

This task will define the basic principles on which the project would proceed and involve three steps:

1. Develop global objectives based upon IEA principles.
2. Develop country-specific objectives, with each participating country customizing their own objectives within the global objectives.
3. Finalize the deliverables that would be produced by this Annex

Task 1 Deliverable – The deliverables from this Task would include a report detailing the consensus objectives, project deliverables on a task-by-task basis, and a section for each country summarizing country-specific objectives.

Task 2 – Define the DR Resource Base and Market Characterization

This will involve a market characterization of demand response products, services and enabling technologies. It would identify the market actors involved and the decisions that need to be made by market actors to effectively deploy DRR. Steps to be taken in this Task include:

- Gather reports and studies on DR methods and applications from participating countries and any other relevant source.
- Develop a classification scheme for DR products, services and technologies that recognizes important product and delivery features.
- Characterize the methods, policies and processes that can be used to integrate DRR into liberalized electricity markets.
- Identify existing DR efforts and catalogue their operation and performance to create a best practices database

Task 2 Deliverable – The expected deliverable from this Task will include a review of existing studies and reports on DRR, a classification of DRR by product and delivery features, a characterization of the methods by which DRR can be integrated into markets, and, most importantly, a best practices database of DR activity.

Task 3 – Market Potential of DRR

This Task will examine those factors that make DRR economic with specific application to participating countries. This effort will build on the results of Task 2 and the best practices database to determine how much DRR would be economic within different markets and under different market conditions. The steps in this Task would include:

- Define markets within countries based on DRR product and delivery features.

- Characterize existing electricity markets (wholesale and retail) and DRR within each country.
- Develop common methodology for estimating economic DRR potential.
 - On a regional level and on a country level.
 - Develop DRR potential relationships, i.e., how the amount of economic DRR will vary given changes in key variables (e.g., operating reserves, peak and off-peak prices, customer characteristics, and technology costs).
- Estimate economic DRR market potential on a regional and country-specific basis.

Task 3 Deliverable – The expected deliverable from this task is an estimate of the magnitude of DRR that can be integrated into region and country-specific markets given attributes of those markets.

Task 4 – Demand Response Valuation

This task will develop the methods and procedures required to establish the value of DR and to administer them in each country to create a valuation framework to guide development initiatives. This value of DRR can be compared to the market potential developed in Task 3 to set initial targets for DRR within regions and countries. The steps to be taken in this Task include:

- Assess the public value of DR by establishing how DR contributes to system reliability and price stabilization objectives of liberalized markets.
- Assess the private value of DR by characterizing customers' acceptance of DR program features and how that influences program participation and quantify price responsiveness.
- Create an integrated value model that fully characterizes the level and distribution of benefits associated with DR programs, recognizing different market structures, products designs and customer participation and response.
- Conduct workshops to train country experts on the use and interpretation of the integrated value model.
- Administer value model in each region and country and establish DR goals.

Task 4 Deliverable – While Task 3 assessed the market potential of DRR, Task 4 will address the public and private value associated with different levels of DRR that can be combined with the market potential estimates to produce initial target levels of DRR by region and country.

Task 5 – Role and Value of Enabling Technologies

The focus of this task will be to develop a catalogue that describes the technologies and systems that are available for use in DR programs both from the perspective of the system operator and the participating customer. The value of technologies and systems of different applications will also be addressed. The steps to be taken include:

- Develop catalogue scheme that organizes devices and systems according to how they provide value to customers and/or system operators.
- Identify current country applications by applying the scheme to each country, identifying current practices and applications and characterizing their performance, benefits and costs.
- Catalogue new and potential technologies and systems.

Task 5 Deliverable – The expected deliverable from this Task will be a catalogue of existing, new and potential technologies and systems that will be updated and maintained.

Task 6 – Characterize Priorities and Barriers, and develop Solutions and Recommendations

The focus of this task will be to establish channels for communicating with each country's key decision makers, thought leaders and DR program administrators and implementers and utilize them to promote the development of DR resources. This will include:

- Create stakeholder groups in each country.
- Develop methods for soliciting and analyzing information on barriers and priorities.
- Implement surveys; conduct focus groups and other information outreach initiatives.
- Assess potential governmental policies that might help overcome identified barriers
- Develop market design recommendations that address barriers to economic DRR.

Task 6 Deliverable — Document and report on barriers to meeting target levels of DRR, and create and maintain an information repository that tracks the identification and resolution of barriers.

Task 7 – Develop DRR Network of Methods, Tools and Applications

This Task will involve creating a web portal that will be a virtual center of excellence concerning regarding DRR methods, technologies, and applications. This will include processes and procedures for estimating DRR market potential, and public and private values of DRR. It will also include information on best practices for implementing DRR and the role of enabling technologies and systems. The steps to be taken in this Task include:

- Develop a virtual center of excellence for DRR information and project results using web portal and library protocols that will make all the information, products, and reports from this effort accessible to participating countries.
- Manage a periodic DRR Project newsletter to project participants, which will include

information from the OA on recent and upcoming deliverables, new functionality of the Project Portal, and recent industry events involving demand response.

Task 7 Deliverable – A website and portal that provides access to DRR information, tools, and best practices developed through this work effort. A DRR Newsletter from the OA Country-specific centers of excellence can be developed at each country’s discretion.

Task 8 – Deliver Products and IP to IEA DSM Programme and Project Participants

This Task will focus on the delivery of the intellectual property created in the DRR Project to the IEA DSM Programme and the participating countries.

- Turn over of DRR Project Portal to IEA DSM IT team and training for ongoing operation, maintenance and support
- Conduct regional workshops (4) to deliver project products and tools to country stakeholder groups and conduct training.
- Deliver Final report to IEA DSM Executive Committee

Task 8 Deliverable – Transfer DRR Project Portal operation, maintenance and training to IEA DSM Programme IT team and conduct 4 regional workshops with Country Experts and Stakeholder teams. Complete DRR Project final report and submit to ExCo

Task XIII Project Portal

An important aspect of the IEA DRR Task XIII project is the sharing of knowledge and best practices in planning and deploying effective, reliable demand response resources (DRR) within the participants’ markets. The challenge to this goal is the fact that the participating countries are spread around the globe in different time zones and have different methods of communicating and sharing information. Today’s internet technology provides an exciting and effective approach to overcoming this challenge – a web-based project portal has been created to serve as a virtual center of knowledge for all participating countries. All you need is three things to access the DRR Portal: 1) an Internet browser, 2) a user ID, and 3) a password.. The portal will contain all the latest news, information, research, tools, meeting information, presentations, newsletters, and all the other valuable information being gathered and created to support the deployment of DRR around the world.

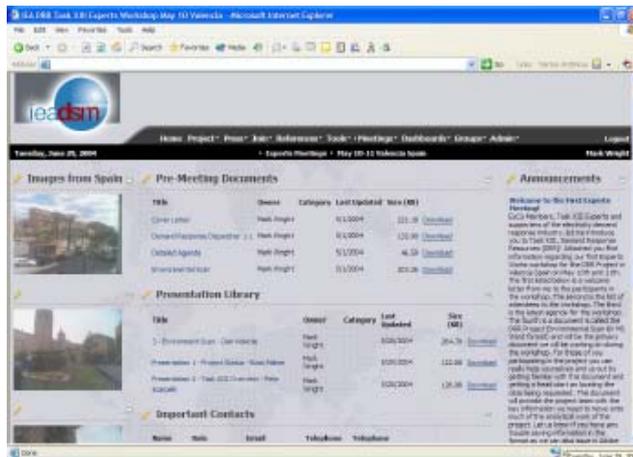
The portal, located at:

www.demandresponseresources.com

is very easy to use and navigate. The cascading menu system located at the top of the page provides quick access to any and all sections available to the user logged in to the system.

Portal Content

The initial display of the home page will only show the information that is available to the general public. Once you are logged in with the user ID and password provided, you will be able to see menus for all areas of the portal available to you. The portal is organized to make information easy to find. The site map below provides a quick view of all portal areas and is also available on the portal for reference once you start using the portal on a regular basis.



Portal Organization

In general, the portal is organized by major topic with subtopics available through a drop down menu.

Public Section

This section contains project information, press releases, how to join, and contact information.

Private Section

This section is restricted to registered users and contains:

- Reading Library with a well organized collection of published articles, case studies, research, and white papers on many topics relevant to demand response
- Project Repository containing the intellectual property developed by the project which is restricted in distribution to only participating countries
- Project Presentations library with all presentation materials from multiple venues cataloged and organized by topic
- Newsletters - Archive of all current and past Demand Response Dispatcher newsletters
- Intellectual property section containing all toolkits, models, and guides developed by

the project to enable deployment of effective Demand Response Resources within any market

- Meeting Information section with pages for each ExCo Meeting, Experts' Meeting, or supplemental workshops with pre-meeting documents, presentation libraries, attendees lists, meeting minutes, and important logistical information for attendees
- Collaboration areas for the various country stakeholder groups
- The portal will also accommodate private areas behind the Country Dashboards that can be accessed by the in-country team, but are not shared with the rest of the Task XIII project team.

NOTES