

“Connecting
Electricity Customers
to Markets”



Bjørn Walther, MS in electrical engineering, is working in Statnett, the Norwegian TSO



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STATNETT'S OPTION MARKET FOR FAST OPERATING RESERVES

by Bjørn Walther and
Inge Harald Vognild

OBJECTIVES

The Norwegian System Operator, Statnett, must dispatch sufficient operating reserves to balance the system in real time. If generation cannot meet demand Statnett will be penalized financially if it must disconnect load to save the system.

Statnett needs a minimum of 2000 MW of fast operating reserve for the Norwegian Balancing Market. Due to the limited generation margin, there is a risk that all Norwegian generating capacity might be sold in the day-ahead Elspot market on winter week days both to cover Norwegian demand and to be exported. To comply with the Regulations, Statnett developed an options market to secure sufficient fast operating reserves in high demand periods. This Reserves Option Market was launched in 2000.

From the beginning, Statnett has encouraged the demand side to participate in this market. Demand side participation would increase the competition as well as the total of potential regulating resources. It would also be essential for further development of demand side price flexibility.

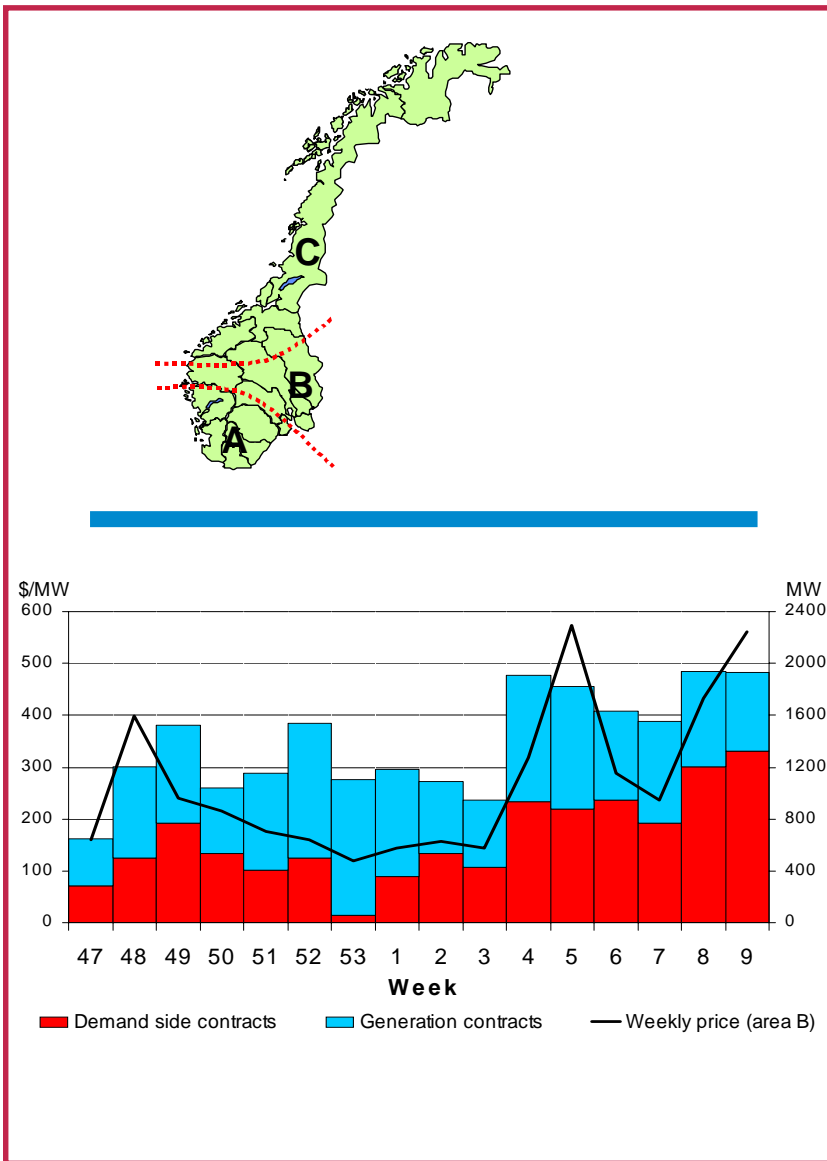
Statnett also expected the market of operating reserves to give financial incentives for refurbishment of old units as well as installation of new ones; thus contributing to improved capacity balance.

CONCEPT AND EVOLUTION SO FAR

The Reserves Option Market secures sufficient regulating power for the Balancing Market. Statnett is purchasing the right (option) to dispatch regulating resources in generation as well as in demand. Both resources compete on equal terms. In the early phase, the contracts lasted 1-12 months.

From the autumn of 2004, the contracts have been made weekly.

Because of network constraints, the Norwegian system is divided into three areas, A, B and C, as shown in Fig. 1. Fig. 2 shows the total generation and demand volumes purchased in winter 2004/05 until week 9 for areas A+B+C. The price in area B is also shown. Notice the substantial portion of demand side contracts and weekly price variations.



Offers are based on area, option price, and size (a minimum of 25 MW). Offers must state potential restrictions regarding duration of continuous activation and interval between activations. Such restrictions result in price reductions based on agreed terms. Bids may be presented for 8 weeks at a time if desirable. Trades for the next week may be adjusted until the weekly gate closure on

Thursday at noon.

Thursday between noon and 14:00 Statnett systematizes the offers and analyses the amount to be purchased in each area. The cheapest offers are chosen up to the desired volume. Other factors influencing choices may be network conditions and the different regulating qualities of generation and demand. Marginal pricing is applied for the purchase which means that the most expensive offer accepted in an area defines the price of all contracts in that area. Normally, option prices vary between the three areas.

For special reasons, the System Operator may need to contract reserve at one particular location. Such a purchase is called a "special option" and is paid as bid without affecting the pricing of the other purchased reserves.

Thursday at 14:00, Statnett posts information about the concluded purchase for the next week on the Internet. The total areawide purchase of reserves in generation, demand and the price are published at [www.statnett.no](http://www.statnett.no/default.aspx?ChannelID=1074).

Reserves contracted on Thursday have to be offered to the Balancing Market on all weekdays between 06:00 and 22:00 the next week, with the hourly activation price to be determined by the owner. Upon activation order, required response time is 15 minutes. Unavailability of contracted resources shall be reported immediately to the System Operator. The option price will then be

reduced according to agreed terms.

The change from a monthly to a weekly market reduces uncertainties due to weather forecasts and export/import expectations. Participants are more certain when deciding about volumes and prices to be offered. Statnett can tailor the purchase better to the needs.

The purchase of reserves is financed through the grid tariff. Statnett has been allowed an increase of income to recover the expected costs. The allowed income will be adjusted every 5 years. So far, the historical cost has been 6 – 12 M•/year.

EXPERIENCES

The Reserves Option Market has been welcomed by generators as well as consumers. A market-based purchase is in compliance with the Regulations.

The Reserves Option Market has resulted in a substantial volume of demand to compete with generation. A number of consumers have found it financially interesting to prepare for demand disconnection on short notice. Mainly big industrials have participated, though there is a potential for smaller demand to participate. Statnett is initiating pilot projects to arrange packages of smaller consumers and encouraging more consumers to bid demand disconnection in the day-ahead Elspot Market, especially in periods with high spot prices.

In addition to the weekly contracts in the Reserves Option Market, Statnett has entered into a few bilateral agreements of 5-10 years' duration with generators. The agreements have contributed to rehabilitation of old units and increased the size of units to be installed. At the same time Statnett has secured some of the operating reserves at an interesting cost. Additional agreements will be considered. More information is available at www.statnett.no.

Bjørn Walther, MS in electrical engineering, is working in Statnett, the Norwegian TSO. He is Development Manager for Statnett's Reserves Option Market, which is a market-based tool for catalyzing sufficient resources

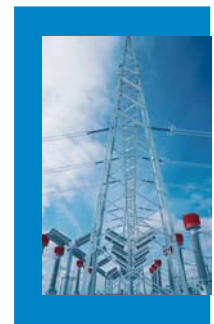
into the Norwegian Balancing Market. He has more than 30 year's experience from system operation and was also engaged in developing the Norwegian power market. This market was later extended to a common Nordic Power market. Bjørn can be reached at bjorn.walther@statnett.no.

Inge Harald Vognild, MS in electrical engineering, is working in Statnett, the Norwegian TSO. He is Programme Manager for "Increased participation from medium-sized consumption in the Balancing Market". Inge has more than 10 year's experience from grid expansion planning and from the National Control Centre of Statnett. He has also experience from the Regulator of the Norwegian Electricity Industry. Inge can be reached at inge.vognild@statnett.no.

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Flash!

The IEADSM Annual Report for 2004 is now available on the project portal located at www.DemandResponseResources.com. There is also a new Task XIII project roadmap that makes navigation to all project deliverables and work groups very easy. Look under the References menu for both new items.



We welcome your feedback on this newsletter. Questions, comments or requests for future articles for the Demand Response Dispatcher should be addressed to the Task XIII Operating Agent, Ross Malme via email malme@retx.com. Copies of past issues of this newsletter may be found on the Task XIII project Internet portal: www.demandresponseresources.com



by Pete Scarpelli

Task XIII held the 3rd project Experts Meeting in San Francisco, California, on February 2-3, 2005. California's PIER Demand Response Research Center (DRRC) hosted the meeting in cooperation with Pacific Gas & Electric Company (PG&E).

Task XIII and the DRRC also arranged a Joint International Demand Response Seminar following the Experts Meeting. The DRRC team shared the status the demand response (DR) research efforts they are investigating. Several Task XIII members reciprocated by sharing the development of DR activity in their markets. Everyone enjoyed hearing about DR activities taking place around the world. The Operating Agent thanks all Task XIII members for participating.

Unlike the previous two meetings, the San Francisco meeting was a technical working session rather than project planning and setup sessions. Members shared a substantial amount of recently developed project work with the entire Expert Team for review and discussion. Among the topics, we discussed the preliminary DR Benchmark results and a related DR Product database. During these discussions, the OA Team received feedback on the tools developed to date. The OA Team is using this feedback to revise the current toolkits.

The team dedicated a significant portion of the

two-day meeting to strategy and methodology for assessing DR valuation. The proposed strategy is designed to assess the net present value of DR based on a portfolio of supply resources. It will also use probabilistic modeling to adapt to a variety of possible market scenarios (e.g. transmission line failure). Most participants felt this methodology would produce a reasonable value for DR. However, the team also recommended that we consider the value DR may have to various market actors. Dr. Violette will be circulating a detailed implementation spec for all participants to review in the near future.

Subtask 8, Implementation, was another important topic of discussion in San Francisco. This subtask involves the delivery of the final project toolkits. It will also be a forum for the Country Experts to share the impacts the Task XIII toolkits have had on their ability to improve DR capabilities inside their countries. At the April ExCo meeting, the Operating Agent will discuss possible meeting forums for the delivery, what each country thinks should be shared, and with whom it should be shared.

Task XIII is entering its busy season. During the next 4 to 6 months, there are several things which will require help from all country experts. This will include the acquisition of technology case studies, the collection of information for the DR program database, and Subtask 8 planning. To keep

on track, we agreed to have individual monthly teleconferences with each Country Expert team. This will allow us to provide more personal assistance and focus on each team's individual needs.

The next Experts Meeting will be held in Stockholm, Sweden. It is tentatively scheduled for June 13-14, 2005. This will be another technical working session and likely will focus on DR valuation, DR technologies, and DR market barriers. We will circulate a proposed agenda and

travel information in early May. We look forward to seeing you there.



Pete Scarpelli is Vice President, Marketing and Business Development at RETX. Pete is responsible for driving the strategy and business development efforts for RETX. He is the inventor of RETX's Load Management Dispatcher (LMD) application and the co-inventor of RETX's Regional Negawatt Hub (RNH) application.



by Mark Wright

Starting in March, each country's expert or stakeholder group is being scheduled for an individualized teleconference to address progress on the work plan and to assist or clarify how the OA team can help. The first round of individual teleconferences seems to have been a great success. Nearly every participant indicated that this process was preferred to the previous process because they were able to have a focused conversation about their individual needs. Ove Grande even quipped that, "you are right on track with this (new process)". The new process seems to allow a more open discussion about issues directly impacting each party. Whereas, it seems that in the open forum some people were reluctant to ask questions about a particular issue because they thought it was too specific to their situation.

After hosting several web conferences designed to keep participating countries up to date, we heard the feedback loud and clear that most members would prefer individual conference calls on project progress. In a forum at our San Francisco meeting, the experts suggested that an individualized call would provide better interaction on work being performed and in discussing specific challenges.

As a result, the OA has changed our monthly interactions to focus exclusively on individual situations instead of the larger group setting of the Web Conferences.

The web conferencing tools are still available if needed, but now the monthly meetings will be conducted by phone. We are entering the project phase where the toolkits are delivered for testing and deployment and we will see multiple data requests.

Also, the ExCo members are considering presentations of DR Market Implementation Strategies early next year. With all this activity, strong interaction with each country's team becomes even more important, and the OA team desires to help wherever possible.

Contact Pete Scarpelli, pscarpelli@retx.com, if you do not have your next monthly teleconference scheduled. We stand ready to help.

Spring ExCo Meeting Lapland, Finland



Sariselka/Ivalo, Finland

by **Ross Malme**

Finland will be the host for the 25th meeting of IEA DSM Executive Committee on Wednesday and Thursday April 20-2, 2005. Prior to the meeting a demand response workshop will be held in Helsinki, Finland, at the Hotel Crown Plaza. This will feature Task XI, Time of Use Pricing, facilitated by Richard Formby, the Operating Agent, and Task XIII, Demand Response Resources facilitated by its Operating Agent, Ross Malme. Parties interested in attending the Workshop should contact Finland's ExCo representative Seppo Karkkainen via email at seppo.karkkainen@vtt.fi.

Seppo has arranged a unique venue for this ExCo meeting in Lapland, north of the Arctic Circle (see map above) at the Hotel Riekonlinna in Ivalo/Saariselkä. At this meeting, the ExCo Chairman,

Hans Nilsson, will propose a new Action Plan for the IEA DSM Implementing Agreement. The proposal addresses how to make the Implementing Agreement more relevant to the challenges facing the countries participating in the IEA DSM Implementing Agreement. It will create a new platform for presenting the important products and work produced by the Agreement.

This meeting promises to be the most intriguing ExCo meeting yet both because of the subject matter and the unique culture of Northern Finland.

Seppo can provide registration information for the meeting and hotel at the email above or you can contact Anne Bengtson at: anne.bengtson@telia.com

Task XIII Presentations

by Ross Malme and Mark Wright

The Operating Agent for IEA DSM Task must have a Task Information Plan that communicates the work of the project to the Country Experts and to the IEA DSM Executive.

The plan also should promote the work externally to the industry. In the first half of 2005 the project was, or will be, featured in a number of electricity industry meetings and Workshops including the following:



DISTRIBUTECH 2005

DistribuTECH is one of the leading industry conferences for electricity transmission and distribution.

For the last two years Ross Malme, Operating Agent for Task XIII has served on the steering committee for the selection of papers to be presented on demand response and automatic meter reading.

This year's North American conference, held in San Diego, California, on January 25-27, featured a panel of experts from the US presenting several different perspectives on the project. Ross Malme chaired the panel which included Dan Delurey, Executive Director of the Demand Response Coordination Committee (DRCC), Dr. Dan Violette, CEO of Summit Blue Consulting and Chief

Economist on the project, and Mark Wright, CIO of RETX, who is responsible for overall project management of Task XIII.



San Diego, California

Dan Delurey summarized both the challenges and approach the DRCC is taking on Task XIII. Because the USA electricity industry includes several very different market structures, policies encouraging demand response must be very flexible. Dan Violette, who has primary responsibility for Subtask IV, valuation of demand response, explained that traditional valuation methodologies undervalue demand response because they fail to allow for risk in the analysis. Dan explained how he hopes to include risk in the approach the project is taking to value demand response portfolios. Mark concluded by describing the challenges in managing a project which stretches across 12 time zones, 4 continents and 11 different languages. Mark reviewed the use of the project Internet portal and of resources like webcasts. These have been valuable in managing project deadlines, deliverables and holding down overall project management and travel costs.



CALIFORNIA PIER MEETING

In conjunction with the San Francisco Task XIII Expert's Meeting, Lawrence Berkeley National Laboratories, the California PIER Demand Response Research Center and the Pacific Gas and Electric (PG&E) Energy Center held a one-day workshop on demand response activities in California and around the world.

Electric reliability problems similar to those which plagued California in 2000 and 2001 again may be right around the corner. To address this, the State of California has created the PIER Demand Response Research Center to focus on demand response R&D. The state has also established a demand response goal for each of the three investor-owned utilities to build an equivalent to 5% of their maximum demand.

In the morning session Mary Anne Piette, Executive Director for the PIER Center, joined several demand response experts from around the State. They discussed how they are meeting the challenge and how Task XIII members can apply the techniques they are developing. Pete Scarpelli of the Task XIII OA Team opened the afternoon session featuring presentations by several countries participating in Task XIII including Norway, Australia and Finland.



NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS (NARUC)

NARUC is a national association of state public utility commissioners in the USA. While the Federal Energy Regulatory Commission (FERC) regulates primarily the wholesale and interstate activities of the US electricity industry, NARUC members regulate all retail and intrastate activities of the industry.

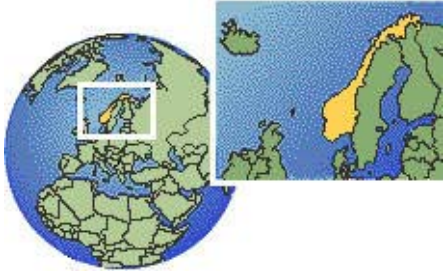
FERC and NARUC are the two entities primarily responsible for setting energy policy on the federal and state level. They are key in establishing business rules to promote a robust demand response industry in the USA. NARUC invited Ross Malme to present the progress of Task XIII and to give some recommendations that NARUC and its member commissioners can follow to promote the demand response industry. The presentation was well received. The OA, FERC, DOE and NARUC will plan a joint workshop in 2006 to present the deliverables from the project and to plan for implementation.



PEAK LOAD MANAGEMENT ALLIANCE (PLMA)

The PLMA is a trade association for the demand response industry of North America and was an instrumental partner in developing the work plan and initial proposal for Task XIII. The PLMA continues to be a tremendous forum for presenting the work of Task XIII to both US and international audiences. The Spring PLMA meeting will be held in Atlanta, Georgia, on April 27-29 the week following the IEA DSM ExCo meeting in Finland. Ross Malme and Dan Violette, both Board of Directors of PLMA will present the current status of Task XIII and the vision for its completion in 2006.





NORDIC WORKSHOP
ANNOUNCING TWO TIMELY NORDIC
WORKSHOPS

Once again our colleagues in the Nordic region have taken the lead in debating whether adding incremental capacity is better through demand response or through new generation. This issue's lead article reviews Norway's capacity shortage and how Statnett, the Norwegian TSO, is evaluating the alternative ways to obtain it to balance its markets and meet the security goals of its electrical system.

On Monday and Tuesday, April 25th and 26th, Statnett, Enova and The Research Council of Norway will host two one-day seminars on this most intriguing subject. Monday will feature several speakers, including Task XIII Operating Agent, Ross Malme, discussing the value of demand response in electricity markets. The seminar on Tuesday will focus on the specific capacity problems in Norway and the greater Nordic region. Discussion will cover the alternative approaches to address the problem.

Registration information on the seminar can be found at www.energy.sintef.no/arr/Capacity, or by contacting Ove Grande at SINTEF at +47 73 59 72 00



FINLAND WORKSHOP

To take advantage of the April ExCo meeting in Finland, Seppo Kaarkainen has arranged to for a one-day workshop on Task X, Time of Use Metering, and Task XIII, Demand Response Resources.

This will be a great opportunity to gain exposure to the plans for demand response in Finland and for us to share the work of Task XIII with Finland's stakeholder group.



**EUROPEAN ELECTRICITY METERING:
OPPORTUNITIES FOR ENERGY SAVINGS AND
COLLABORATION ON EUROPEAN PROJECTS
ISPRA, ITALY, 7 MARCH 2005**

This workshop was organized by the European Commission DG Joint Research Centre in collaboration with BEAMA to examine the challenges and opportunities brought about by European Energy policy and forthcoming EC Directives. The workshop brought together leading players in the European metering industry, utilities, policy makers and experts to explore these opportunities and identify where collaboration would be beneficial and how it could be achieved. Mark Wright was asked to present an update on the progress of IEA DSM Task XIII and to offer perspectives on the need for advanced metering to support demand response programs in any electricity market. There was an excellent exchange of information and experiences among the participants with particular interest in the challenges of justifying the investment in advanced metering, improving customer acceptance of various efficiency and demand response programs, and developing a common set of standards for advanced metering communications. The workshop concluded with a call to action to create a new project to further collaboration within the EU and promote advancement of these types of programs.

Task XIII



The Year in Review

by Mark Wright

It has been a full year since Task XIII officially started. With the amount of work scheduled for the summer and fall of 2005, we can take comfort in what we accomplished during the first year. Let's stroll through the events of this past year and recall some good times, hard work, and new insights on implementing demand response around the world.

- Overall work plan and budget were finalized.
- The position paper was written and circulated within the participating community.
- The project portal was established and populated with content
- The market data collection templates were prepared and circulated to the participating countries.
- The first Experts Workshop for Task XIII was held in Valencia, Spain, on May 10-11, 2004, with all participating countries invited to attend.
- The Economic Working Group formed and focused on the development of DRR Potential and Valuation Toolkits in subtasks 3 and 4. It held its first meeting in Copenhagen, Denmark.
- Project Guidebooks were created for each country to aid in the creation of country specific analysis and plans to support Demand Response Market Implementation Strategies.
- The project portal expanded to include a research library, collaboration areas for working groups and stakeholder groups, and early drafts of the intellectual property.
- The State of the Practice Working Group formed to focus on subtask 5 and will research and catalog the current and future technology options available to DR programs.
- The second Experts Workshop was held in Milan, Italy on September 20-21, 2004.
- The Operational Working Group formed to focus on subtask 6 and will collect critical information from existing DR programs to formulate strategies for overcoming barriers to DR programs.
- The Market Characterization Toolkit was published and most countries completed a Marketplace Overview survey. Many built a proxy model of their marketplace to examine potential Demand Response Resources.



- The DR Communication Toolkit was published to help stakeholder groups formulate effective communications strategies for gaining support of DR in their respective markets.
- The DR Research Library expanded with worldwide contributions focused on DR Consumer Marketing Strategies, DR Evaluation Studies, DR Program Design, and DR Technologies & Applications.
- The DRR Potential Toolkit was published for use by all participating countries and included a process guide, survey instruments, a proxy database, and an analytical report on results to date using

the toolkit in selected markets.

- The third Experts Workshop for Task XIII met in San Francisco, California, on February 2-3, 2005.
- Work is nearly completed on the DR Valuation Toolkit, including a two volume Guidebook on DRR Valuation and Market Analysis:
 - Volume (1): Valuation and Market Assessments for DRR Investment and Planning
 - Volume (2): Guidelines for DRR in Resource and Portfolio Planning
- Work started on the Technology Assessment Toolkit which will include evaluation templates, process guides for selection of technologies, and a catalog of technology products available now or in the near future.
- The fourth Experts Workshop for Task XIII is scheduled for Stockholm, Sweden, on June 13-14, 2005.



Upcoming Events

Upcoming Events		
Event	Date	Location
Advanced Meters for Energy Efficiency and Renewables Workshop	March 7, 2005	Ispra, Italy
National Demand Response Workshop	April 19, 2005	Helsinki, Finland
ExCo Meeting	April 20-21, 2005	Lapland, Finland
Peak Load Management Alliance (PLMA)	April 27-29, 2005	Atlanta, Georgia
Task XIII Experts Meeting	June 13-14, 2005	Stockholm, Sweden
Task XIV (White Certificates) Experts Meeting	June 16, 2005	Lund University, Sweden
USA Demand Response Seminar	June 21, 2005	Washington DC, USA
Demand Response vs New Generation Capacity	April 25 - 26, 2005	Oslo, Norway