DSM spotlight

July 1998

The Newsletter of the International Energy Agency Demand-Side Management Programme

Reflections from the Past Chairman

As I reflect on my five years as Chairman of the IEA DSM Programme, I am proud of what has been accomplished by the 76 experts and the members of the Executive Committee. Perhaps the Programme's greatest strength has been its ability to adapt to the fast changes occurring in the energy industry. We have recognized from the start the important link between energy and global environmental issues, such as climate change and greenhouse gases. And, it is encouraging to see that the results of the latest political events vigorously underline the importance of our work in energy efficiency. For example, the Kyoto Protocol strongly emphasizes the necessity of energy efficiency and acknowledges that it is a demand side issue.

Highlights of the Programme's work show the impact that this international collaboration is having on DSM. The Task on a database for DSM technologies and programmes has developed an instrument for gathering information and evaluating their impacts. This database is a valuable resource for anyone designing large-scale DSM programmes. The Task on communication technologies has made major breakthroughs in shaping communication instruments that enable companies to serve customers and for customers to obtain useful services with appropriate technology. The cooperative procurement Task has designed a procedure for forming customer buyer groups to demand improvements in specific technologies, such as clothes dryers, incandescent lamps, copiers, industrial motors and LED traffic signals.

In addition, the results from the Task on methods for integrating DSM into resource planning will be used in a new Task on the use of DSM in changing utility businesses. I think that the work of both these Tasks should be of great interest to many countries as it covers all types of regulatory regimes and mechanisms. Also, the recently completed Task on implementation of DSM in the marketplace should be of interest to many countries as its activities tested utility DSM market strategies in all types of economies.

The Programme's work and expertise provide a wealth of information and resources for all the participants, and hopefully, the number parties to benefit from this Programme's work will continue to grow. I am confident that over the next five years, the Programme will make significant strides in the area of demand-side management and energy efficiency. And I welcome the new chairman, Jan Moen, Director of Regulation and DSM at the Norwegian Water Resources and Energy Administration.

The DSM Spotlight is published four times a year to keep readers abreast of recent results of the IEA Demand-Side Management Programme and of related DSM issues. The viewpoints or policies expressed in this newsletter do not necessarily reflect those of the International Energy Agency, the IEA Demand-Side Management Programme member countries, or the participating researchers.

For more information on the Programme, its work and contact addresses, please visit our web site at ***http://dsm.iea.org***

Forming New Buyer Group for LED Traffic Lights

What is a LED?

Light-emitting diodes (LEDs) were first introduced to the market 20 years ago as the workings of the first digital wrist watches—the watches which illuminated the time in red when a button was pushed. Although LED technology quickly disappeared from wrist watches and calculators, the technology was applied to hi-fi amplifier displays, automobile dashboards, telephones, televisions, fax machines, fiber cable telecommunications and traffic lights.

LED technology is particularly applicable to traffic lights because LEDs have a "signal" character and are not meant to be seen directly or used to illuminate things. Also, LED traffic lights are significantly more efficient than the traditional incandescent lights, a 10-watt LED disk versus a 70-watt incandescent lamp, and have a longer life expectancy, 12 years. The economic savings from this technology are substantial, for example data from the Stockholm LED project, which began in 1996, show:

- 71% savings in the annual electricity costs.
- Estimated 75% savings in maintenance costs.

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V

Work on Implementing DSM Technology in the Marketplace Concludes

Task V, *Investigation of Techniques for Implementation of Demand Side Management Technology in the Marketplace*, took on the challenge of how to improve marketing strategies for DSM programmes in residential, small commercial and small industrial sectors of the market. For the past four years, Task experts from Finland, the Netherlands, Norway, Spain, Sweden and Tanzania have worked on developing a set of analysis tools to identify effective marketing components of government and utility DSM programmes. The international collaborative nature of this Task gave a richness and depth to the work, and to capitalize on this, 32 national DSM programmes were documented and 9 pilot programmes were initiated.

Task V Activities

Over the course of the Task, participants carried out a series of DSM marketing activities. First, the experts identified a common methodology for developing DSM programmes. Then a questionnaire was created to determine the effectiveness of, and similarities and differences of existing DSM programmes in the participating countries. The results from this questionnaire were analyzed and grouped according to three basic promotional concepts—marketing of energy efficient products, behavioral change and utility image. In addition, 32 existing programmes were documented and an Action Plan was designed to cover, in detail, the steps required to develop DSM activities. The Task concluded with an evaluation of each of the pilot programmes.

Pilot Programmes

The pilot programmes proved to be a valuable activity as Task experts were involved in the design as well as evaluation of these programmes. A total of nine pilot programmes, one or more projects in each of the participating countries, were initiated to test a variety of DSM marketing strategies. To manage these programmes, target groups were selected using a "micromarketing approach," that is a geographical categorizing of customers into Basic Market Units that are homogeneous in customer characteristics, such as equipment level, network development costs, income, values, etc. By creating these subgroups based on similar characteristics and interests, the customers' needs and concerns could be more readily addressed.

At the conclusion of each pilot programme, an evaluation was conducted using a common evaluation framework developed by the Task participants. The evaluation was divided into the following four main areas 1) background and documentation of programme, 2) customer attitudes of programme participants and non-participants, 3) trade ally attitudes (intermediaries used to carry out the programme), and 4) utility's evaluation. This evaluation framework not only provided a means for evaluating a specific programme, but also to analyze and compare results among the nine programmes.

Results from each pilot programme are included in "Techniques for Implementation of Demand Side Management Technology in the Marketplace: Final Report." This report will be available in the fall of 1998 from the Task Operating Agent.

Lessons Learned

Highlights of the lessons learned from the Task V evaluation of existing DSM programmes and the nine pilot programmes are:

- Customer attitudes concerning energy use were similar in all the participating countries.
- Problems associated with marketing residential DSM programmes were the same for all utilities, regardless of size.
- The performance of DSM marketing strategies are impacted by the low cost of electricity and many customers' not knowing the benefits of energy efficiency.
- The public sector is always, in some way, connected with DSM programmes.
- DSM campaigns produce a cumulative effect on customers which implies that less effort will be required when implementing future DSM actions.

Conclusions

The primary conclusion of the Task's work is that "micromarketing" is valuable when applied to the residential sector. Other

Pilot Programmes Implemented under Task V

Country	Entity	Programme Objective
Finland	HÄME:	Market a time of use tariff
	SAVO	Determine how to avoid network investments
	VATAJANKOSKI	Develop a service chain
Netherlands	NUON	Promote purchase of high efficiency appliances
Norway	NVE & STAVANGER	Develop user-friendly energy bills
Spain	ENDESA	Promote efficient lighting
Sweden	HALMSTAD	Develop "definitive" invoices (based on meter reading)
	NUTEK & Utilities	Determine how marketing of electrically efficient white goods can be stimulated
Tanzania	TANESCO	Promote power factor correction

conclusions drawn from the Task work are:

- It is possible and beneficial to transfer marketing experiences among countries.
- The "workshop system" was a valuable process in the development of the pilot programmes. Special workshops were held during Task meetings to provide a forum for the ongoing design and evaluation of specific pilot programmes.
- DSM actions should be carried out even in deregulated markets. And, governments and institutions should support DSM actions by acknowledging DSM's contribution to social benefits.
- In a deregulated market, utilities can become more competitive if DSM is part of their marketing activities.

You can learn more about the results of Task V from the following reports and the IEA DSM web site.

- "Techniques for Implementation of Demand Side Management Technology in the Market place: Final Report" will be available in the fall of 1998. To order contact the Task Operating Agent, Juan Comas.
- The distribution of the following reports are restricted to individuals from countries which participated in this Task. To order, please see the IEA DSM web site for the Task expert in your country.
  - "Basic Methodology Documentation and Working Plans of Participating Countries"
  - "Marketing Analysis of DSM Programmes"
  - "Questionnaire Analysis of Programmes developed in Annex V"
  - "Reports Provided by Participants on Programmes developed in Annex V"
  - "Action Plans and Evaluation Areas of Programmes developed in Annex V" ■

For more information contact the Task V Operating Agent, Juan Comas, FECSA, e-mail: jcomas@fecsa.es or see the IEA DSM web site.

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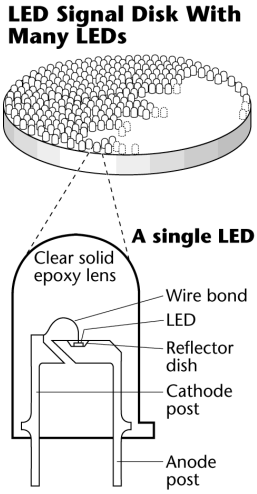
- 88% savings in annual electricity savings (in Stockholm, incandescent traffic lights require 4.8 GWh and LED lights require 0.6 GWh).



The LED Buyer Group

DSM Task III, *Cooperative Procurement of Innovative Technologies for Demand Side Management*, is considering adding to its roster of procurement activities a buyer group for LED traffic lights. As with the other buyer groups formed under this Task, the goal of the LED lamp buyer group is to increase the demand for this technology by creating product specifications for improved LED lamps and then offer to purchase them. This uniform demand for an improved technology will in turn stimulate manufacturers to produce a product that meets the group's requirements.

The LED traffic light procurement activity will build upon the LED market emerging from the City of Stockholm's ongoing procurement project of 20,000 LED lamps before the end of 1999. In an effort to create a sustainable market (lower cost per light and European/international standardized specifications) for LED traffic lights, Task III experts have proposed that BorlŠnge Energi, the municipal utility of a small city in central Sweden take the lead in forming a buyer group for red, yellow and green LED traffic lights. The experiences from Stockholm's procurement project and those in other countries will provide Task experts with important lessons learned and help to expedite the development of technical specifications for the lights.

The proposed Task schedule is to form a LED lamp buyer group and hold the first buyer group meeting in the summer/early autumn of 1998. In November, Task participants will start their analysis of market characteristics and standards' requirements for each participating country. The LED lamp specifications are to be finalized in the spring of 1999 and the procurement specifications are to be issued in the autumn/winter of that year. ■

More information can be obtained from the Task III Operating Agent, Hans Westling, Promandat AB, Sweden, e-mail: hans.westing@promandat.se or the LED project coordinator, Nils Borg, Borg&Co. AB, e-mail: Nils@borgco.se. (See the IEA DSM web site for address, telephone and fax numbers.)

http://dsm.iea.org

Visit the IEA DSM web site for more information on Programme activities and publications and the names of contacts.

VIII Demand Side Bidding in a Competitive Electricity Market

To stay abreast of the changing needs of DSM programmes, the IEA DSM Programme is initiating a Task on Demand Side Bidding. The main objective of this new Task, Demand Side Bidding in a Competitive Electricity Market, is to help participating countries develop demand side bidding policies as a means to achieve sustainable development goals. The challenge to meet obligations under the Kyoto Protocol has left many countries wondering how they can achieve their agreed upon goals since the reduction of greenhouse gas emissions will be difficult to achieve unless there is a significant reduction in the growth of demand for energy. If countries are to meet their climate change obligations and act to protect the environment then new mechanisms are needed to encourage demand reduction rather than increased generation. For electricity supply markets this means looking for opportunities to reduce generation output and improve efficiency through demand reduction.

The trend toward competitive electricity markets and the fragmentation of electricity industries, as is happening in Australia, New Zealand, Scandinavia, the UK, and parts of the US, has made it difficult for traditional DSM programmes to reduce generation output or increase efficiency.

As a result, in countries with established competitive markets for electricity generation and supply, schemes are emerging under the name of Demand Side Bidding (DSB). Although there is no internationally agreed upon definition, these schemes all aim to treat an offer of demand reduction from the customer and an offer of increased output from a generator in the same manner.

In theory, DSB schemes offer an ideal opportunity to offset generation with demand reduction and to allow customers to receive direct payments just like a generator. In practice, however, many DSB schemes fall short of meeting their objectives. It could be that some DSB schemes are failing because customer payments are lower than the value of the lost load. To address this type of problem and others, Task VIII experts plan to identify the types of DSB schemes that are successful and unsuccessful and the reasons for their success or lack of it. They will develop a fundamental understanding of the market place for competitive generation in each of the participating countries as well as determine how Demand Side Bids can be balanced against Generation Bids.

This new Task should be of particular interest to countries that are operating or developing competitive markets for electricity generation or supply. The Task results will help governments examine the role of DSB in their electricity markets and to establish realistic goals for such DSB schemes. The Task also should be of interest to countries with more limited competitive electricity markets as they too require mechanisms in which DSB could be incorporated.

As for countries with working DSB schemes, this Task will provide an opportunity to compare their experiences with those of other countries, and to learn about new DSB strategies designed to provide additional benefits and overcome any shortcomings that might exist in current schemes. And, all the participating countries will benefit from the new DSB schemes that are to be designed during the Task. These new schemes will be designed to target the most appropriate customers and loads, as well as meet the objectives of customers, generators, suppliers, network operators, regulators, and those responsible for national environmental policy.

The first Experts' Meeting for the new Task was held last month in the UK. Representatives from Australia, Finland, Norway, Spain and the UK participated in the meeting. The meeting participants spent two days revising the Task scope, objectives and expected results so as to meet the needs of the participating countries. The goals of the Task are to include:

- Establish a common set of definitions and classifications of DSB
- Facilitate cross-fertilization of ideas from one market to another.
- Examine both the benefits and potential shortcomings of DSB schemes.
- Demonstrate how to develop successful DSB schemes that attract customers and achieve national policy goals, including market efficiency, lower costs, increased security of supply, better asset utilization, as well as environmental benefits of generating electricity more efficiently. ■

For information on this new Task contact the Task VIII Operating Agent, Frank Sharman, EA Technology, United Kingdom, e-mail: fws@eatl.co.uk. (See the IEA DSM web site for address, telephone and fax numbers)

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Narrowband vs. Wideband Communication Systems

Task II participants are turning their attention to wideband communication media as a means to help utilities and potential DSM and Value Added Service providers assess the pros and cons of investing in and developing wideband communication systems. This new work will investigate the evolution and migration of DSM and related functions from narrowband to wideband communication systems.

Rapid development in the installation of wideband (>144k bits/sec) communication systems is taking place within telephone companies and organizations, generally outside utilities. These systems are being developed to accommodate Internet access and competitive telephone and cable television services. Much of the wideband communication infrastructure already installed for residential customers is one-way communication and used for cable television services, but due to additional demands for telephone services and systems, enhancements to these systems to two-way communication are being carried out. And a significant increase in the installation of two-way wideband systems for residential customers is now taking place in many countries using a variety of media.

Utilities and Value Added Service providers are faced with the decision of whether to invest in narrowband channels in order to implement utility Value Added Services in the short-term or to expand the business and provide additional services and invest in wideband infrastructure. An alternative to investing in wideband infrastructure is to wait until other organizations have installed the communication infrastructure and then piggyback on to it if the economics are right. The problem this poses is that utilities have customers who can benefit from the needed services now using narrowband channels.

These types of issues require an examination of the costs and benefits between narrowband and wideband communication systems. Task II will tackle these issues by investigating and quantifying the technical and financial benefits of both communication media as it is applied to customer/utility functions. Task participants will also determine the impact of different migration strategies on communication system design and hardware and the benefits of installing narrowband with migration to wideband as opposed to installing wideband at the outset.

Task activities are to include: collecting data from participating countries on wideband communication penetration, strategies and costs; identifying the most probable routes for providing one- and two-way wideband channels to different customer types and the estimated time before wide-scale availability; collecting data from participating countries on the requirements for and costs to carry out DSM, energy efficiency and related functions using one- and two-way wideband communication channels; studying different communication migration strategies for customers and services; quantifying cost implications of different migration strategies; and quantifying the strengths and weaknesses of each migration strategy and identifying the most effective communication strategies to meet present and future needs. ■

For more information on this new work contact the Task II Operating Agent, Richard Formby, EA Technology Limited, United Kingdom, e-mail: jrf@eatl.co.uk. (See IEA DSM web site for address, telephone and fax numbers.)