

WINTER PEAK DEMAND REDUCTION SCHEME - IRELAND

This is the 13th article in a series highlighting the case studies of DSM Task XV, Network Driven DSM. This Task demonstrated that DSM can be successfully used to support electricity networks in two main ways 1) by relieving constraints on distribution and/ or transmission networks at lower costs than building 'poles and wires' solutions, and 2) by providing services for electricity network system operators, achieving peak load reductions with various response times for network operational support.

INTRODUCTION

In Ireland, demand for electricity over the winter period is very "peaky". Ensuring security of supply is expensive and encouraging customers to manage electricity usage can reduce costs.

The Winter Peak Demand Reduction Scheme (WPDRS) was introduced in winter 2003/04 as an incentive to business customers to reduce electricity consumption during the power system's peak hours (5 pm to 7 pm) in winter months. Many industrial and commercial customers continue to participate in the scheme.

In 2003/04, the WPDRS was open to:

- customers in the eligible market (ie large commercial and industrial customers);
- who were supplied by one of the three independent electricity suppliers (ie retailers);
- who had appropriate interval metering (ie quarter-hour metering).

A similar scheme, the Winter Demand Reduction Initiative, was available to customers supplied by the incumbent electricity supplier, ESB Public Electricity Supply (ESB PES).

Customers applied in advance through their supplier to join the WPDRS. In 2003/04, each customer committed to reducing consumption between 5 and 7 pm every business day from November to February. This reduction was achieved through reducing energy use or utilising on-site generation.

Customers received a payment for reliably delivering this committed reduction. In 2003/04, the total available payment was EUR210 per megawatt-hour of load reduction. Of this total, EUR160 per megawatt was a reliability payment and EUR50 per megawatt-hour was an energy payment.

RESULTS

In 2003/04, a total of 639 customers was eligible to take part in WPDRS and 186 (29%) signed up. A total of 106MW of committed load reduction was offered by these customers, whose total baseline demand was 410MW. The four largest contributors to the eligible load reductions offered were from: cement and paper industries (38% of eligible customers reductions offered), manufacturers of agricultural products (24%), office/banking/retail (23%) and refrigeration/meat industry (17%) (see Figure 1).

Winter Peak Demand Reduction Scheme - Ireland

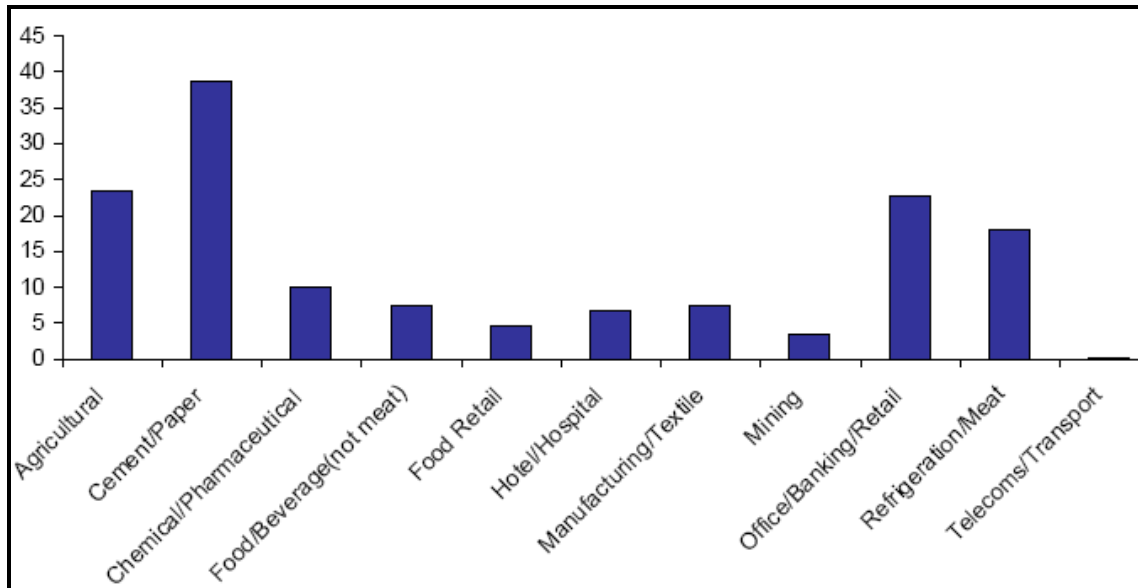


Figure 1. Percentage of Eligible Load Offered

Of those customers who signed up to the WPDRS, 29% succeeded in reliably reducing consumption to their committed level and earned full payment. A further 9% curtailed to their committed level on average, but had high daily variation in their curtailment. A further 19% set their committed level incorrectly, but had low variation in their curtailment. A further 18% set their committed level incorrectly, and also had high day-on-day variation in their curtailment. Finally, 25% of participants entirely failed to curtail. No overall change in participants' methods of curtailing load was evident over the four months.

Four participants exported electricity from on-site generators to the grid and produced roughly 13MW of load reduction between them.

In 2003/04, the WPDRS paid out a total of EUR2.4million to the participants (customers), comprising EUR610,000 in energy payments plus EUR2,392,000 in reliability payments, less EUR598,000 in capped reliability rebates. This yielded a cost of EUR180 per megawatt-hour reduction. The three independent electricity suppliers received a 5% administration payment of EUR120,000.

Overall, those participants who were successful earned nearly EUR20,000 each over the four winter months, making it a lucrative scheme for those who could curtail their consumption to committed levels.

In 2003/04, the peak load reduction achieved was an average of 82.5MW in November, 83.0MW in December, 84.4MW in January and 81.3MW in February. This was 1.85% of the winter peak load of 4320MW. Compared with 2002/03, the peak on the system was reduced by about 80 MW and its shape was altered from a sharp peak occurring at about 5.30 pm to a flatter peak occurring from about 5.30 to about 6.30 pm (see Figure 2).

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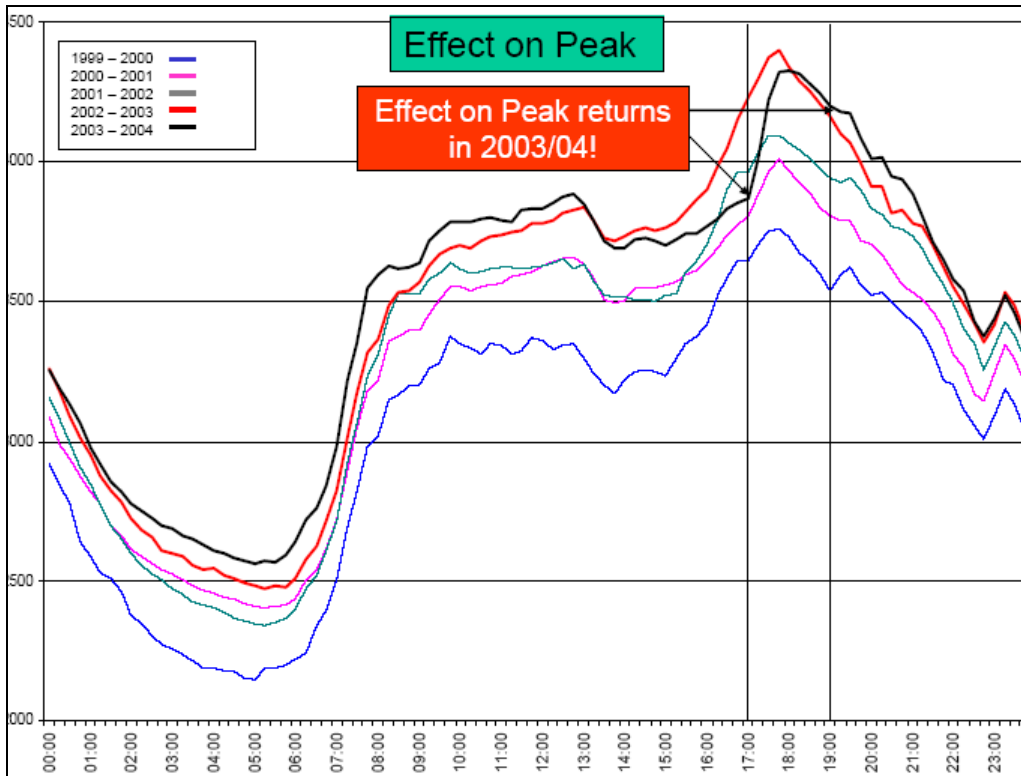


Figure 2. Effect on Winter Peak

The demand reduction achieved through the WPDRS led to the 2003/2004 winter peak being 1.8% lower than the 2002/03 peak, even though demand for the entire year increased by roughly 3% (see Figure 3).

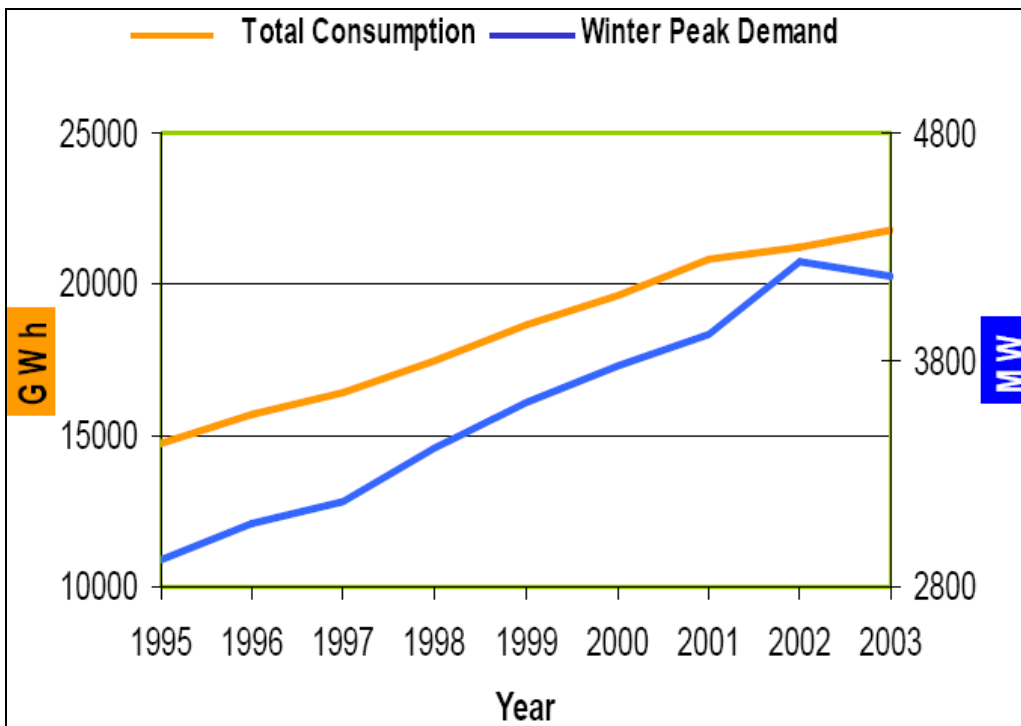


Figure 3. Reduction in Winter Peak Demand

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The load reduction achieved was quite reliable on a daily basis; 95% of the time, the achieved load reduction lay between 72MW and 88MW.

This article was contributed by David Crossley, Managing Director of Energy Futures Australia Pty. Ltd and Senior Advisor at The Regulatory Assistance Project. For more information on this case study and others, visit Task XV, Network Driven DSM at:

<http://www.ieadsm.org/ViewTask.aspx?ID=17&Task=15&Sort=1>.