



Demand Management Case Study

Commercial & Industrial Customer Demand
Response



1. Overview

As part of AusNet Services' demand management strategy, we engage large commercial and industrial customers to reduce demand during times of network constraint in selected parts of our network. Should a customer's electricity consumption pattern add to the particular network feeder peak demand, and they have the ability to reduce their consumption during a peak demand period, they are approached for voluntary demand management opportunities. A customer may be able to reduce their consumption through switching on temporary generation, or reducing discretionary load such as pumps, air conditioners and process plant.

In 2012 AusNet Services launched a project to approach businesses across the electricity distribution network to discuss demand management opportunities. We targeted customers who were connected to sections of the electricity distribution network where there was a benefit in reducing demand. In some areas, little to no growth in new customers was expected and energy consumption had dropped, however peak demand had increased during summer. This peak demand issue occurs during the afternoon and evening on hot summer days (typically above 35 degrees Celsius) when residents use their air conditioners, and can cause excessive strain on the electricity network.

2. Objectives

The primary objective of this project was to develop and trial the following elements of a demand management process for large commercial and industrial customers:

- contractual structure;
- dispatch and response communications protocols;
- evaluation of firmness of demand response; and
- evaluation of impact on feeder peak demand.

3. Implementation

For the customer used as an example for this case study, the original network load forecast indicated a potential future overload of 6.1% (refer Figure 4). They had the capability to shift production schedules at relatively short notice. From a demand management perspective the customer was able commit to removing demand of up to 800kW from the network for up to 4 hours at a time.

Discussions with the production manager revealed the plant was making use of the Critical Peak Demand (CPD) tariff that rewarded them for demand reductions on so-called Critical Peak Demand Days (refer www.ausnetservices.com.au). They occasionally shifted the timing of their operations to later in the evening, as shown in Figure 1.

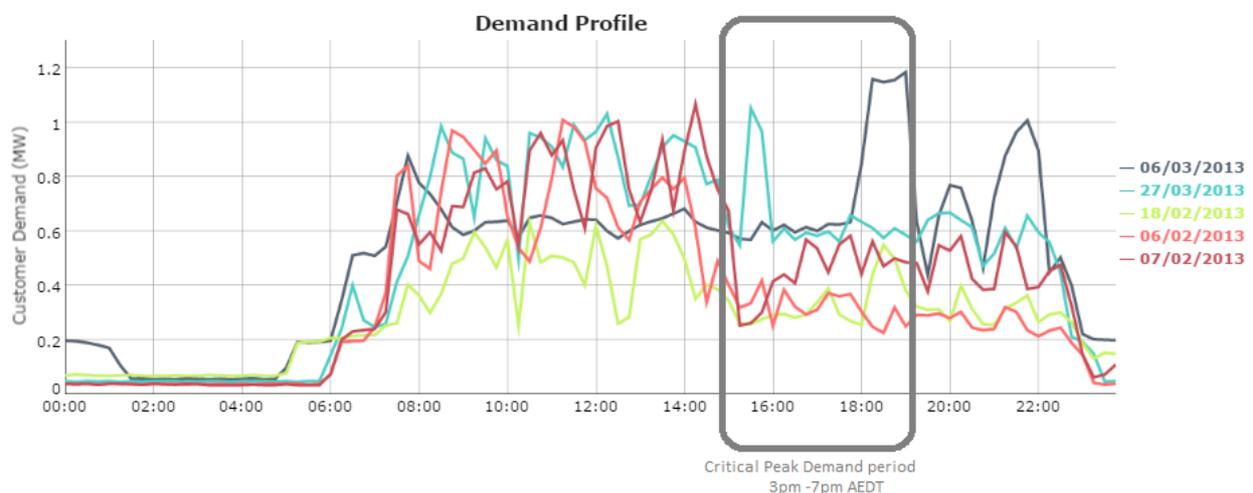


Figure 1. Customer Demand on Critical Peak Demand Days, pre-2015.

In order to support our Demand Management initiative, they would also be able to respond to ad-hoc Demand Reduction Days notifications dispatched by the Customer and Energy Operations Team (CEOT) at AusNet Services.

We improved our customer engagement process and summer demand management agreement, and executed a Network Support Agreement for this customer in 2013/14.

4. Results

AusNet Services, in collaboration with the customer, achieved a very positive result from this Network Support Agreement. Not only did the customer improve their Critical Peak Demand response performance in 2015, as depicted in Figure 2, they also participated in the ad-hoc Demand Reduction Days to provide local network support.

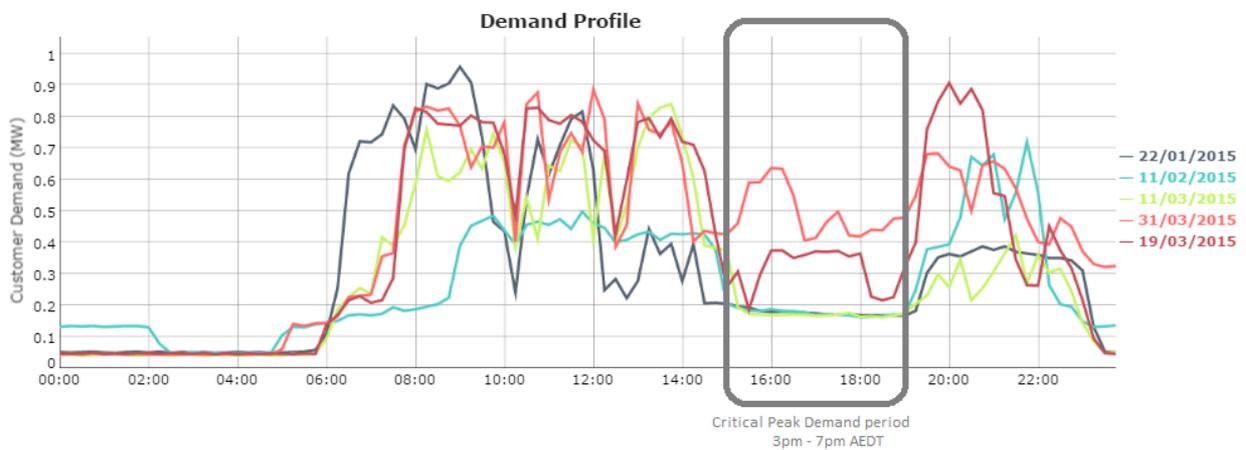


Figure 2. Improved Customer Demand Response on Critical Peak Demand days in 2015.

Figure 3 shows an example where the customer received prior notification from the AusNet Services Customer and Energy Operations Team (CEOT, our control centre), and their demand response resulted in a reduction to the peak demand on the feeder in the afternoon. The customer resumed operations in the evening when feeder demand was lower, and was financially rewarded for their demand reduction earlier in the day.



Figure 3. Customer Performance on Demand Reduction Day (bottom)

This result suggests that the trialled communications protocol and financial incentives are appropriate to deliver a demand reduction.

It is essential to have consistent, reliable responses from customers if demand management is to be used to defer network investments - referred to as “**firmness**”. The customer’s firmness was evaluated at the end of the 2015/16 period, and their contract adjusted from 800kW to 500kW based on their actual response performance.

Figure 4 shows the forecast overload (as a percentage above network maximum rating) for this feeder across the past few years. As can be seen from Figure 4, the original overload forecast for the particular feeder did not materialise in 2015/16, which proves the value proposition of a flexible tool such as demand management to address network constraints and risks in a cost efficient manner.

		Feeder overload forecast date (10%POE)		
		2015/16	2016/17	2018/19
	Number of customers on feeder			
2015 Forecast (10%POE)	3656	3.8%	3.8%	6.1%
2016 Forecast	3339	-	-17%	-13.4%

Figure 4. Feeder overload forecast from Distribution Annual Planning Reports

With combination of

- the demand management contract, and
- reconfiguration of the network to achieve a reduction of 8.7% in the number of customers connected to the feeder,

the demand was reduced as shown in Figure 4. The Demand Management contract provided interim relief until the reconfiguration project was executed, and the forecast revised.

As of summer 2016/17, AusNet Services has expanded the Commercial and Industrial Demand Management Portfolio throughout its distribution network to a total of 22.5 MW, across 25 commercial and industrial customers. This portfolio is constantly adapted to meet changing network requirements.