

Demand side options An international perspective



Nigel Cornwall Managing Director

What we will cover

- The problem
- A solution
- Practical experience
- Is gas different?
- Some thoughts on possible progress

Costs of unplanned interruption

"Outages cost facilities an average of \$4,000 to \$11,000 each, although many end users suffer much greater losses. For example, one semiconductor manufacturer reports that a single five-second outage could cost the company \$12 million in lost production alone - the equivalent of its entire annual electricity bill."



Key economic costs and benefits



Typical mechanisms

Method	Description
Real-time pricing	Customers are charged a market-based price for all or a portion of their loads. Prices are provided either day-ahead or the morning-of use, sometimes against indeces. Prices may vary by hour, or by peak/off-peak period. Customers can control costs by managing usage relative to these
Voluntary load curtailment	indexed or real-time prices Customers are offered a price for curtailing load during peak price or demand periods. Customers are not obligated to respond, but are paid the energy value of their curtailment if they do
Committed or contracted load curtailment	Customers commit to curtail loads. The commitment is generally limited to specific time-frames and to a specific number of events. Customers can be paid a capacity payment for the commitment, plus an energy price when they are required to curtail.
Committed DG	Same as committed load curtailment, except that response is backed by distributed generation or fuel switching.
"Ancillary services"	Customers commit to curtail loads when dispatched within the confines of non-spinning or replacement reserve markets. Customers are paid a capacity payment and an energy payment when dispatched.

Example - GPU

Customer Preferences	Voluntary Load Reduction Program Options			Seasonal Savings Program Options		
	VLR*AM	VLR*PM	VLR*DO	SS: 2-HR	SS: Day- Ahead	SS: Both
Lots of Advance Notice	Day-Ahead Morning Notice	Day-Ahead Afternoon Notice	Short (2 Hr) Notice	All Short Calls	Morning Ahead Calls	Some Short Calls
Predictable/Fixed Incentive	No Fixed Payment	No Fixed Payment	No Fixed Payment	Fixed Payment	Fixed Payment	Significant Fixed Payment
Limited Tolerance for Risk	Moderate Risk (once pledged)	Moderate Risk (once pledged)	Least Risky	Significant Risk	Moderate Risk	Significant Risk
Participate Only Emergencies	\bigcirc	0	•	•		\bigcirc
Desire for Largest Incentive per event	Fair Share Incentive	Strong Incentive	Significant Incentive	Significant (few events)	Significant Incentive	Significant Incentive (more events)
Limit the Number of Offers	O Most Frequent Offers	Most Frequent Offers	Limited Offers	Limited Offers	Up to 20 Events	Up to 25 Events
Flexibility in Deciding Whether to Participate	Voluntary Participation	Voluntary Participation	Voluntary Participation	No Flexibility Mandatory Participation	No Flexibility Mandatory Participation	No Flexibility Mandatory Participation



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Some other examples

- SCE -- 200,000 customers (res. and ag.) with 280 MW
- GPU -- 80,000 customers with 80 MW
- PEPCO -- 150,000 customers with 200 MW
- FP&L -- 600,000 customers with 700 MW
- Fla. Power -- 470,000 customers with 470 MW
- ComEd -- 68,000 customers with 80 MW
- NSP -- 250,000 customers with 250 MW

Experience with gas

- Nominations, tolerances and penalties on stress days
- Limits to contract quantities, capacity rights
 - priority customers
 - must supply, "protection" levels/insurance volumes
 - blocks of energy
 - firm, non-firm rights
- Sell back pools, daily spot markets
- Rotated curtailment, reduction queues



Gas is not that different

- Various grounds put forward:
 - balancing roles?
 - incentives?
 - operations daily vs. half hourly balancing?
 - response parameters?
 - participant requirements?
- Same operator, same legal framework, same objectives, similar customer issues

Barriers

Regulatory	Commercial		
 Limited routes to market 	 Price visibility 		
-network operators	 Supplier uncertainty over 		
-customers	investment		
•28 day switching rule	•Customer uncertainty over prices		
–cost recovery Network	 Prices for peak power 		
operator incentives	 Tariffs from supplier 		
 Price elasticity 	•Gest of reguinment drome		
 Demand elasticity 	 Infrastructure has been 		
 Wider attitudinal barriers 	dismantled		
•"It will be over next year"	•Process fit		
	 Proven control methods 		
Sociological			
	Technological		

Direction of longer-term work

- Explore customer attitudes to the market:
 - understanding of market design
 - level of interest in demand-side initiatives
 - expectations of suppliers and third-parties in delivering programmes
 - support for existing demand-side product offerings
 - suggestions for enhancing market design
- Database recording quantitative statistics on:
 - demand-side programs being offered by market participants
 - level of customer involvement

Key points

- Wide experience of examples of demand side management around world
- Supply fears a factor but efficiency & innovation
- Regulatory, contractual and mixed solutions
- Electricity has been focus because of instantaneous balancing imperative but many different approaches in gas too
- Many lessons and pointers for network operators, suppliers and customers here
- An enduring requirement, not just winter 05/06



Thank you for listening

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