



Ethnic Communities' Council of NSW Inc.

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Mr John Tamblyn
 Chairman
 Australian Energy Market Commission (AEMC)

Submission

NERA/AEMC report: Review of the role of demand side participation in the National Electricity Market

Dear Secretariat,

Ethnic Communities Council of NSW (ECC) welcomes the opportunity to comment on the AEMC's report "Review of the role of demand side participation in the National Electricity Market, prepared by NERA.

As we all known there is not sufficient demand side participation (DSP) take place in the NEM to hence an efficient interaction between electricity demand and supply. The market doesn't work if it only addresses supply resources. Price signals only work if the customer has access to timely information about the value of energy over time and place, and the ability to act on that information.

DSP is needed in the NEM since its benefits include:

- o Lower prices for all and reduced price volatility
- o Enhanced market efficiency and increased system reliability
- o Security of supply – relief of network congestion & peak loads reduction
- o Efficient long-term investment planning - reduced both T&D and generation system investments
- o Reduction of short-term market power abuse
- o Enhanced risk management options and increased customer choice

Experiences of Demand Response programs from USA could be found on page 3 to page 7 in this submission.

Classification of 2003 ISO DSP Programs USA ¹

ISO	Reliability-based		Market-based	
	Contractual	Voluntary	Bid-based	Price-taker
CA ISO	Participating Load Program	---	---	---
NE ISO	<ul style="list-style-type: none"> • Real-time DRP • Real-time Profiled 	---	Day-ahead DRP	Real-time Price Response Program

¹ Kathan, D., 2003, FERC's Role in Demand Response, presented at IEA International Symposium on Demand Response, Sep. 2003, NYC

	Response Program			
NY ISO*	ICAP-SCR	EDRP	DADRP	---
PJM	---	Emergency Load Response Program	Economic Load Response Program – Day-ahead option	Economic Load Response Program – Real-time option

*Details of Demand Response Programs from NY ISO could be found at Section II 5.

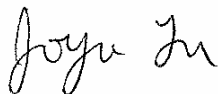
However, due to the nature of the NEM ie energy market (kWh) instead of capacity market (kW), the value of DSP is not fully recognized, like it in the day-ahead market from overseas. The detailed discussions of electricity capacity market could be found at CRA’s report: Short-term Forward Market (see APPENDIX). We recommend the establishment of capacity market in the NEM to enable the capacity trade and DM clearing price settled day-ahead. Market rules that accommodate demand response serve all players and resources need to be in place as well.

Principles for DSP Program Design:

- Continuity and Simplicity are critical²
 - ✓ Annual program changes should be kept to a minimum
 - ✓ Programs should run for at least 2-3 years (permanent is better)
 - ✓ Coordination with environmental agencies, state regulators is needed
- Participation requires education
 - ✓ Potential customers can develop curtailment plan – developing a bidding strategy is more difficult
 - ✓ ISOs can teach mechanics – third party organizations should handle bid strategy training
- Customers need to be paid to participate
 - ✓ At least in the beginning
 - ✓ Customers on flat retail tariffs have no incentive to participate
- Demand side resources should be capable of setting marginal price
- Customers need to see and react to real-time prices (RTP)
 - ✓ Greatest benefit comes form adoption of RTP
 - ✓ Adoption level doesn’t need to be high to achieve significant marginal price impact

If you have any questions about this submission, please do not hesitate to contact me on 02 9319 0288.

Sincerely yours,



Joyce Fu
Energy Program Coordinator
Ethnic Communities’ Council of NSW Inc.

² King, C., 2003, Demand Response Programs in New York’s Wholesale Electricity Market, presented at IEA International Symposium on Demand Response, Sep. 2003, NYC

Demand Response Programs Experiences from USA

I. What is Demand Response?

Demand Response Programs, once called Load Management, include “traditional” capacity reservation and interruptible/curtailable rates programs as well as voluntary demand bidding programs offered by either Load Serving Entities (LSEs) or regional Independent System Operators (ISOs).³ Demand Response Programs are grouped into two broad categories: “reliability-based” (contingency) programs that operate in response to system contingencies and “market-based” programs that are triggered by wholesale market prices.

ISO offered Demand Response Programs, USA

Feature	Function of DR in ISO Markets				
	Emergency	Day Ahead Electricity	ICAP	Ancillary Services	Balancing
Notice	2 hours	Prior afternoon	2 hours of less	5 – 30 minutes	Hours to minutes
Duration	4 or more hours	As bid by customer and scheduled by ISO	2 or more hours	As bid by customer and dispatched by ISO	1 - 8 hours
Frequency	As dispatched by ISO		Unlimited, most likely in summer months		Self-dispatched when available
Reservation payment	None	None	Yes (6 month market value)	Yes (daily markets)	None
Performance Payment	Yes	Yes	In some cases	Yes	Yes
Example Value	\$0.5/kWh	\$0.05 - \$0.99 /kWh	\$0.05 - \$0.5/kWh	\$0.01 - \$0.99 /kWh	\$0.01 - \$0.5 /kWh
Penalty	None	Market Price	Cash and participant privilege penalties	Market price	None
Reference	NYISO EDRP	NYISO DADRP	NYISO ICAP 2002	CAISO & ISO-NE Class I	ERCOT, Load as a Resource

(Kintner-Meyer, M., Goldman, C., Sezgen O. and Pratt, D., 2003, Dividends with Demand Response, LBNL-52980, available at <http://eetd.lbl.gov/EA/EMS/reports/LBNL-52980.pdf>)

II New York USA Experiences

1. NYISO/NYSERDA Relationship⁴

New York Independent System Operator (NYISO)

--- Administers three demand response programs that pay for demand reductions

New York State Energy Research and Development Authority (NYSERDA)

--- supports these programs by reimbursing costs associated with technologies that enable demand response

2. Zones and Reliability Requirements

New York Independent System Operator (NYISO) manages New York Control Area (NYCA) that consists of all New York territories formerly served by the regulated

³ Heffner G., 2002, “Configuring Load as a Resource for Competitive Electricity Markets – Review of Demand Response Programs in the US and Around the World” in the proceeding of the 14th Annual Conference of the Electric Power Supply Industry; Download from: <http://eetd.lbl.gov/EA/EMP/>

⁴ Smith, C., 2003, Technologies and Approaches for Demand Response, presentation at Association of Energy Services Professionals International (AESP) Brown Bag Seminar, Sep 18, 2003.

utilities/networks. The peak load is around 31,000MW in summer and the market is worth US \$5.2 billion. NYISO has organized the NYCA into 11 geographical zones that reflect the location of transmission lines, load centres and generation facilities.

3. Market Participants

The primary NYCA market participants are Generators, Load Serving Entities (LSE), i.e. retailers, Direct Customers (DC), Customer Service Providers (CSP) and Transmission Owners (TO). LSEs buy Installed Capacity (ICAP) and energy and sell these services to end-users. LSEs are either regulated subsidiaries of the former utilities and providers of last resort, or new unregulated service providers. 95% of retail service is provided by the regulated LSEs.

CSPs sell the aggregated energy curtailment from end-users that have procured energy from other LSEs. The CSP was introduced to increase load curtailment participation by end-users where the LSE might not offer this capability.

In the New York energy market, the types of energy trading consists of bi-laterals (50% of volume), day-ahead market (DAM, 45-50% of volume) and real-time market (RTM, 5% of volume). Bi-laterals are direct trades between generators and LSE at undisclosed prices.⁵

4. Price Determination

The ICAP market is settled no later than the month in which energy consumption occurs. ICAP can be bought or sold in 1 month and six-month strips. On average, ICAP costs vary from \$1/kW-Month to \$9/kW-Month in the areas having in-zone capacity deficits.

The DAM determines hourly prices in each zone. The clearing price for this market is referred to as the DAM-Location Based Marginal Price (LBMP). The RTM serves to balance differences between planned (day-ahead) requirements and actual (hour-ahead) usage. Because of sheer volumes, the DAM-LBMP has the greatest impact on the energy prices that all customers pay. The DAM-LBMP has averaged \$58/MWh since the NYISO began operations. During extreme summer peaks conditions, the DAM-LBMP can spike sharply to levels in excess of \$500/MWh.

5. NYISO Price Responsive Load Programs

In NYCA, three demand responsive programs that providing financial incentives to end-users have been established since 2001: Emergency Demand Reduction Program (EDRP), Installed Capacity Special Case Resources (ICAP SCR) and Day-Ahead Demand Reduction Program (DADRP).

- EDRP is a short-notice program relying on the ability of **voluntarily** reducing their demand for a short period of time, in exchange for payment. It is available to interruptible load and emergency backup generation.
- ICAP SCR is a reserve capacity program that **contracts** resources to meet NYISO supply requirements over a specified contract period.
- DADRP is a customer-initiated economic **bidding** program, where participants offer their load reduction (ex. strike price (\$/MW), curtailment amount (MWs), start time and duration) into the wholesale market one day in advance.

The EDRP provides incentives for performance in response to a NYISO declared emergence. The program is voluntary, but end-users must register with the NYISO to

⁵ Douglas, P., Coup, D. and Osei-Antwi, D. 2002, "Price Responsive Load Programs in the New York Wholesale Electricity Market" in the proceeding of the 2002 ACEEE Summer Study.

be eligible for performance payments. Load curtailment could be from back-up generation or by shutting down equipment. EDRP plays the training ground and prepares customers for both ICAP SCR and DADRP.⁶

The DADRP, available to interruptible load only, allow load reductions to be bid into the DAM. The DADRP is activated prior to EDRP; and the EDRP provided the means for dispatchable load reduction in response to conditions arising after the DAM had settled.

The features and benefits of EDRP, DADRP and ICAP SCR are summarized in the following Table.

	Market Function	Eligibility	Event Notice	Duration	Performance Payment (US\$)	Non-compliance penalty
EDRP	Emergency Energy	>100kW, can aggregate within zones	Day-ahead warning, 2 hr event notice	Min. of 4 hours	Greater of \$0.5/kWh or RTM LBMP	None
ICAP-SCR			21 hours ahead warning, 2 hr event notice	As contracted ; 4-hour minimum call	Up-front capacity payment (\$/kW market value of ICAP), plus energy payment (greater of RTM LBMP or \$0.5/kWh)	Resources de-rated in the future
DADRP	Economic Energy	>1MW, can aggregate within zones	Bid by 5am DAM, notice by 11am of schedule for the next day	As bid, multi-hour strips allowed	Greater of bid \$/kWh or DAM LBMP	Greater of DAM or RTM LBMP

- All programs require hourly interval meter with 2% accuracy of better.
- All programs require a Customer Baseline Load, which is the average of 5 highest energy consumption blocks corresponding to load reduction period from last 10 days.
- Participants may participate in either EDRP or ICAP SCR, but not both. ICAP SCR resources are called before EDRP.
- On-site generation is not allowed as an option under DADRP

(Summarised from NYSEDA, "Get in the Game with Three Electric Load-Management Programs", available at <http://www.nyserda.org/programs/pdfs/drpprimer.pdf> and "Reduce Energy...Get Paid", available at <http://www.nyserda.org/programs/pdfs/demandreduction.pdf>)

Past EDRP/ICAP-SCR Experience

Year	Participants / MW	Events	Load curtailed (MW, as % of peak)	Energy curtailed (MWh)	Load factor during event* (%)	Payment (US\$ million)	Average cost (US \$/kW or \$/kWh)
2001	292 / 712MW	23 hrs (Downstate) 17 hrs (Upstate)	425 (1.4%)	8,159	0.22%	\$4.2 million	\$10/kW or \$0.51/kWh
2002	1,711 / 1,481 MW	22 hrs (Downstate) 10 hrs (Upstate)	668 (2.1%)	6,632	0.11%	\$3.3 million	\$5/kW or \$0.50/kWh
2003	1,536 / 1,708MW	22 hrs (Upstate & Downstate)	683 (2.2%)	12,714	0.21%	\$7.2 million	\$11/kW or \$0.57/kWh

(Breidenbaugh, A., 2004, NYISO Demand Response Programs for 2004, presented at NYDPA/NYSERDA/NYISO Demand Response Workshops, NYISO)

*Load factor (%) = Energy p.a. / peak load x 8760 hrs [ex. 8159 / (425*8760) = 0.22%]

⁶ Breidenbaugh, A., 2004, NYISO Demand Response Programs for 2004, presented at NYDPA/NYSERDA/NYISO Demand Response Workshops, NYISO

6. NYSERDA Peak-Load Reduction Program (PLRP)

The Peak-Load Reduction Program provides financial support for modifications to on-site equipment such as upgrades to energy management systems, lighting and air conditioning controls, emergency generator switch gear and interval meters. NYSERDA has up to **\$10.5 million** allocated for PLRP for summer 2004.

6.1 Program Objectives:

- Drive the market for energy-efficient products and services
- Control and reduce loads on specific NY electric utility systems
- Accelerate the replacement of old, inefficiency products
- Enable customers to participate in New York Independent (NYISO) or TO's emergency programs
- Educate public on energy efficiency and to shift consumption to off-peak periods

6.2 Program types for business

<p>PERMANENT DEMAND REDUCTION EFFORTS Permanent Demand Reduction Efforts (PDRE) provides incentives to install permanent energy efficient equipment that will reduce facility peak demand during the summer peak-demand period.</p> <ul style="list-style-type: none"> • Minimum project size is 20 kW; aggregation encouraged. • Incentives are provided for heating, ventilation and air-conditioning (HVAC) equipment, lighting equipment, motors, fuel cells, wind turbines, photovoltaic (PV), and other select measures. • Lighting measures must be hard-wired installations. Screw-in lamps and/or ballasts and fossil-fuel-fired generators are not eligible. 	<p>LOAD CURTAILMENT/SHIFTING Load Curtailment/Shifting (LC/S) is a short-notice program that provides incentives for equipment installation, allowing facilities to curtail demand in response to a constrained electric grid or predefined price signal.</p> <ul style="list-style-type: none"> • Minimum project size is 100kW. • LC/S provides incentives for technologies that enable facilities to curtail demand upon notification from the NYISO when the grid becomes strained, or an LSE when localized distribution constraints occur. • To qualify, LC/S participants must register in a NYISO Demand Response Program, acceptable Load Serving Entity (LSE) load-management program, Time-of-Use, or Real-Time-Pricing program. • Demand reductions from micro turbines, generation, or cogeneration equipment are ineligible.
<p>DISPATCHABLE EMERGENCY GENERATOR INITIATIVES Dispatchable Emergency Generator Initiatives (DEGI) enable owners of emergency/backup generators in the Con Edison service territory to transfer electric load to their generators in response to a NYISO notification.</p> <ul style="list-style-type: none"> • DEGI provides incentives to enable building managers to offload all or a portion of the building's load to emergency generators when notified. • Minimum project size is 100KW • DEGI is limited to facilities in the Con Edison service territory that are registered in NYISO Demand Response Programs or transmission owner load-management program. 	<p>INTERVAL METERS Interval Meter (IM) incentives enable facilities to participate in load reduction programs while also providing the facility with critical demand and energy consumption feedback.</p> <ul style="list-style-type: none"> • IM provides incentives for facilities to install interval meters that enable participation in demand response programs. • Minimum project size is 40kW • IM is available to facilities that participate in a NYISO Demand Response Program, an acceptable LSE load-management program, Time-of-Use, or Real-Time-Pricing program. • Incentives for IMs are available for PSC-approved meters and/or meters that provide data acceptable to the NYISO.

(NYSERDA, "Keep the Power Flowing - Four ways for businesses to participate", downloadable at <http://www.nyserdera.org/programs/pdfs/KeepThePowerFlowing.pdf>)

6.3 Projects Incentive Caps

PDRE		LC/S		DEGI		IM (per meter)	
Downstate	Upstate	Downstate	Upstate	Downstate	Upstate	PSC approved	NYISO compliant
\$475/kW	\$225/kW	\$175/kW	\$45/kW	\$125/kW	-----	\$2,500	\$1,200

(Note: Up to 70% of eligible project costs; \$735,000 per facility maximum)