

*Consumer Friendly Markets:
What Should Consumers Really Want?*

Presented by
Scott M. Harvey

Elcon: Coping with Uncertainty and Volatility

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The author is or has been a consultant on electricity market design and transmission pricing, market power or generation valuation for Allegheny Energy Global Markets; American Electric Power Service; American National Power, Calpine Corporation; Commonwealth Edison; Constellation Power Source; Coral Power; Dynegy; Edison Electric Institute; General Electric Capital; GPU; GPU Power Net Pty Ltd; GWF Energy; Independent Energy Producers Association; ISO New England; Midwest ISO; Morgan Stanley Capital Group; New England Power; New York Energy Association; New York ISO; New York Power Pool; Ontario IMO; PJM Supporting Companies; Reliant Energy; San Diego Gas & Electric; Sempra Energy; Mirant/Southern Energy; Transpower of New Zealand Ltd; Westbook Power; Williams Energy Group; and Wisconsin Electric Power Company.

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Retail Access Price = Regulated Retail Rate - Shopping Credit +
Current Wholesale Price Energy, Reserves, etc. +
Competitive Admin Costs and Margin

- If Shopping Credit = Expected (Wholesale Price Energy Reserves, etc.) + Utility Admin Costs
- Then Expected (Retail Access Price) = Regulated Retail Rate + Competitive Admin Costs and Margin - Utility Admin Costs and Margin

Consumer electricity costs can only be reduced by reducing the cost of meeting consumer demand.

- The cost of meeting consumer demand is unchanged if retail access does not change consumer behavior.
- Consumers have no incentive to change their behavior unless they can control and benefit from these changes.
- Changes in consumer behavior will be forthcoming only if consumers have the opportunity to buy power forward, and to sell power they do not consume at the real-time spot price.

Consumers have an interest in an efficient, transparent, competitive real-time spot market.

There are a core set of market rules and practices that experience has clearly shown are necessary in open access wholesale markets.

- ISO real-time dispatch to simultaneously balance the system and manage congestion.
- Open access to the ISO-coordinated spot market.
- LMP pricing.
- Financial transmission rights.
- ISO-coordinated day-ahead market, clearing at LMP prices, reflecting transmission and other reliability constraints.

What should a wholesale market permit consumers to do?

- Buy and sell energy in the day-ahead market
- Enter into bilateral contracts, hedging them against changes in the day-ahead price.
- Settle deviations between their real-time consumption and day-ahead purchases at real-time spot prices.
- Provide reserves, if they are able to reliably reduce consumption within the appropriate time frame in response to system operator instructions.
- Minimize transaction costs.

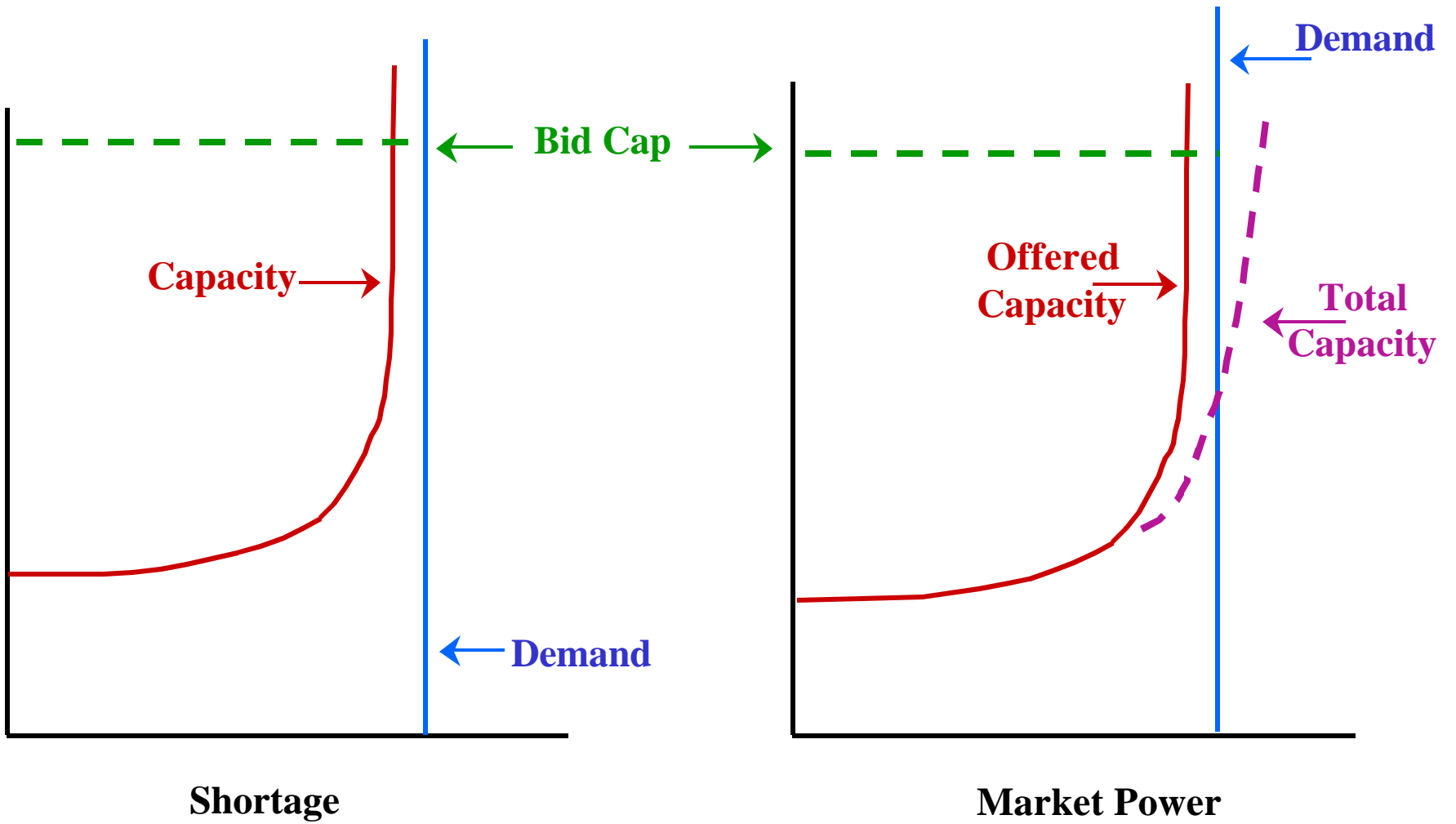
Why should consumers care about LMP pricing?

- LMP pricing is fundamentally a mechanism for determining prices that are consistent with the system operators redispatch.
- LMP pricing in the wholesale market supports system reliability by providing generators with financial incentives to respond to real-time dispatch instructions.
- LMP pricing is a form of market-based pricing, since prices are determined by the bids submitted by market participants and all suppliers are paid the market clearing price at their location.
- LMP and SMD can help reduce consumer rates by enabling more effective use of the transmission system that reduces the cost of meeting load.

Is short-term volatility bad?

- Is it better for a consumer to pay and respond to average annual prices, or to pay and respond to highly volatile prices with the same mean?
 - If the consumer's consumption is fixed and cannot be varied in response to short-term prices, then short-term price volatility is something to hedge and ignore.
 - If the consumer can vary its consumption in response to short-term prices, then consumer welfare rises with price volatility, holding the average price constant.

The critical element is whether consumers are permitted to respond to short-term price volatility.

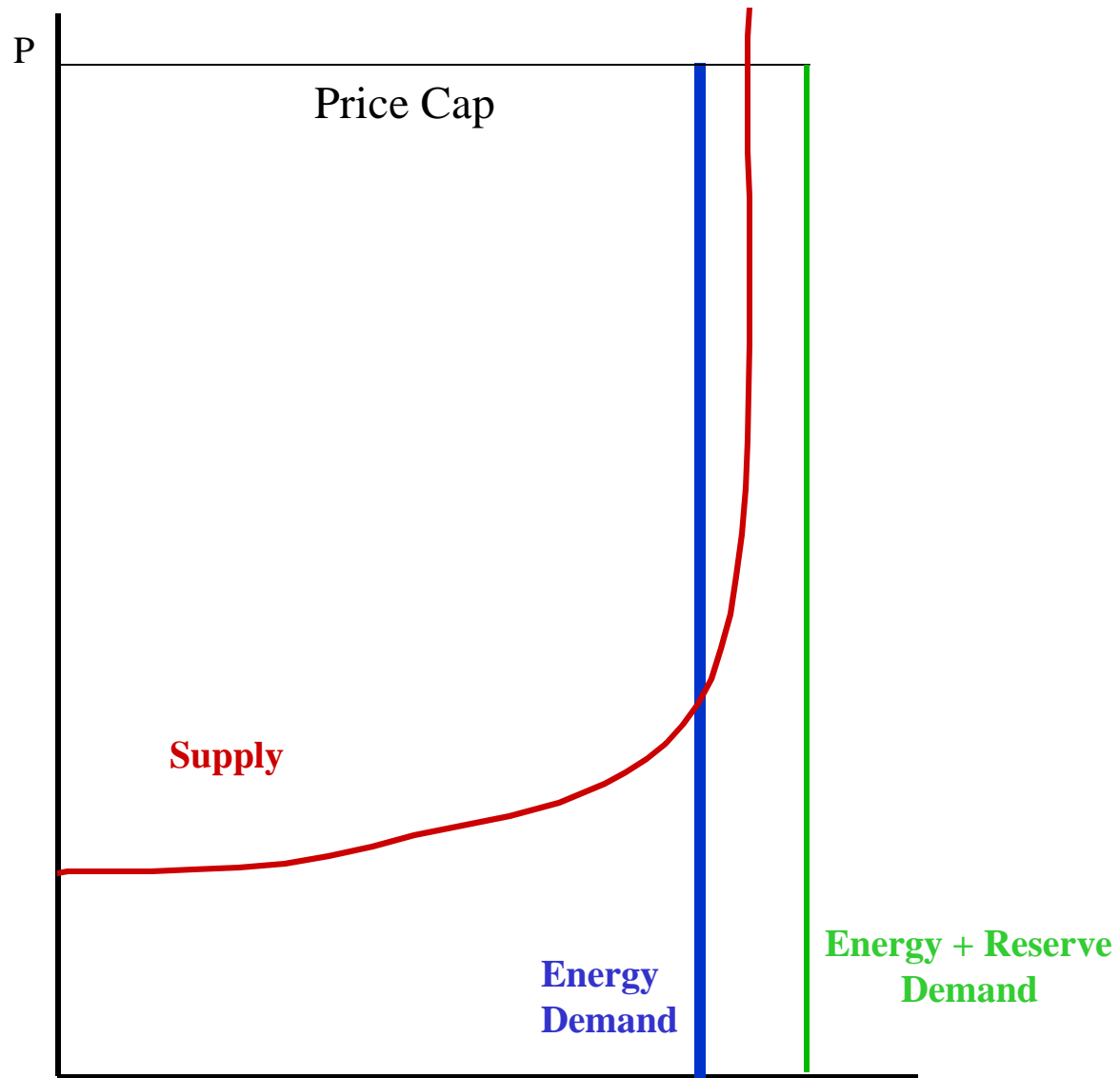


SHORTAGES AND MARKET POWER

Constraints on intertemporal shifting of electricity demand and supply give rise to the potential for high prices arising either from shortages or the exercise of market power.

- It is important to distinguish between shortages and the exercise of market power. It is not an exercise of market power to bid so as to be paid the market price in a shortage.
- The exercise of market power entails withholding output, not merely selling it at the market clearing price.

Supply and Demand in a Reserve Shortage

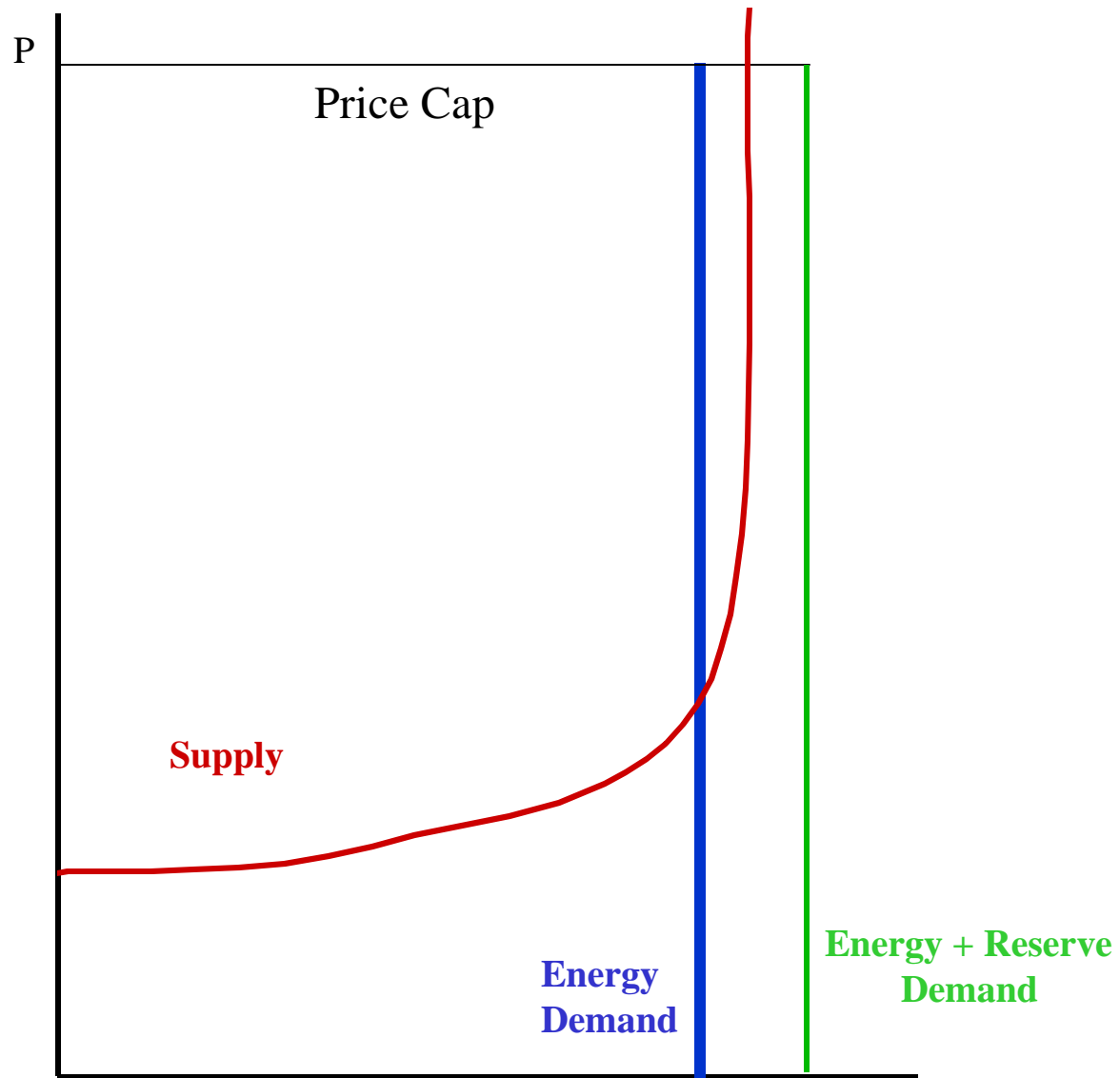


RESERVES AND SHORTAGES

The potential for high prices arising from either shortages or the exercise of market power is tied to NERC and WSCC policies that implicitly require that reserve margins be maintained at any cost.

- High prices almost always arise from a reserve shortage, whether due to supply and demand conditions or market power.
- During high priced periods cheap energy is available, but the capacity capable of providing cheap energy is needed to maintain reserves.
- High prices usually arise from a shortage of capacity, not energy, but high-priced imported energy is often purchased as a means of increasing security by backing down internal generation to maintain reserves.

Supply and Demand in a Reserve Shortage

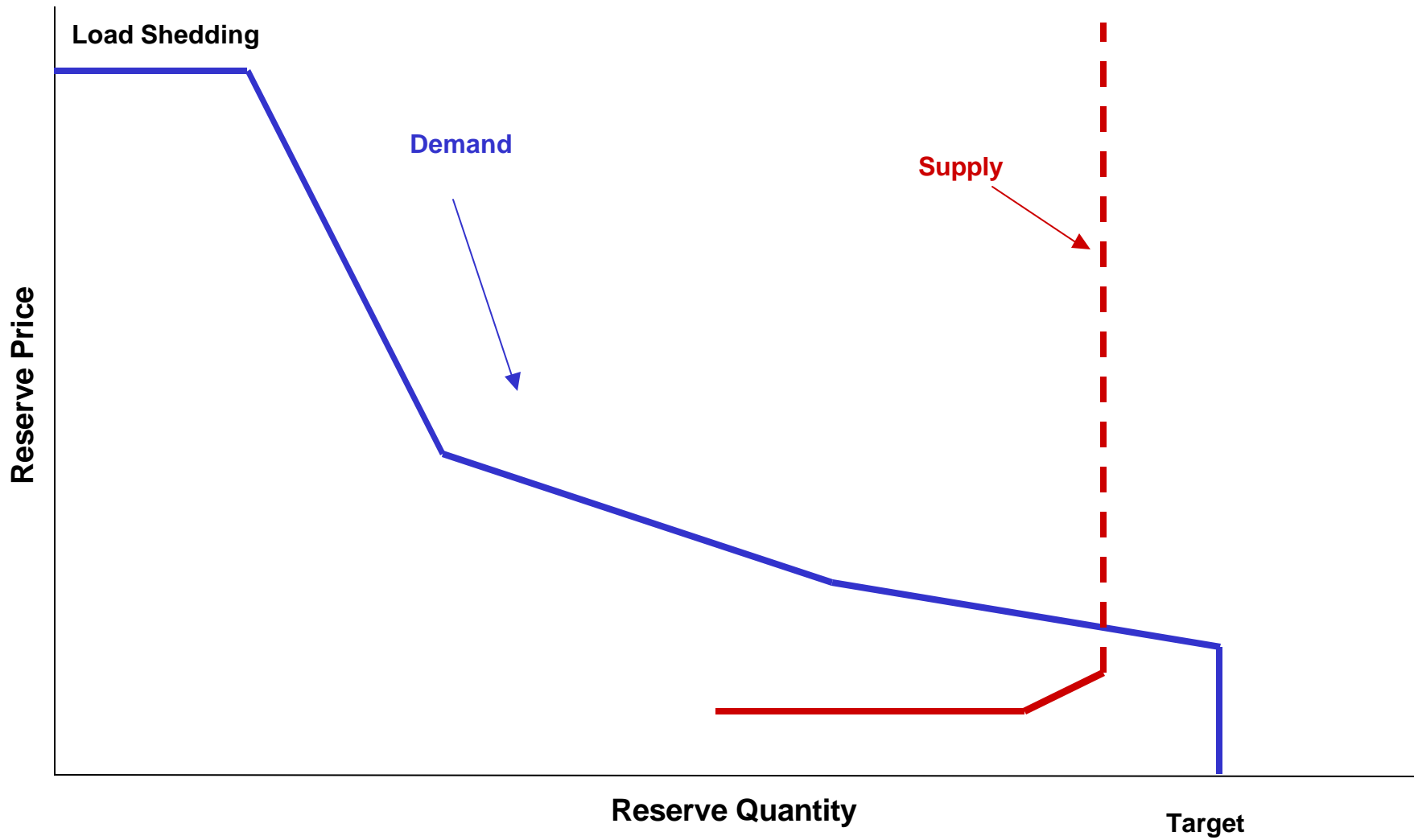


RESERVES AND SHORTAGES

A vertical demand curve for reserves can lead to irrational outcomes because it is inconsistent with the actual operation of the grid.

- A vertical demand curve for reserves implies that system operators would shed load whenever reserves fell below targets.
- In practice, system operators do not shed load to maintain desired reserve targets. This reality implies that the underlying demand curve for reserves is not vertical, because not all reserves have a value equal to the value of lost load.
- This needs to be recognized in the pricing of energy and reserves.

Demand Curve for 30-Minute Reserves

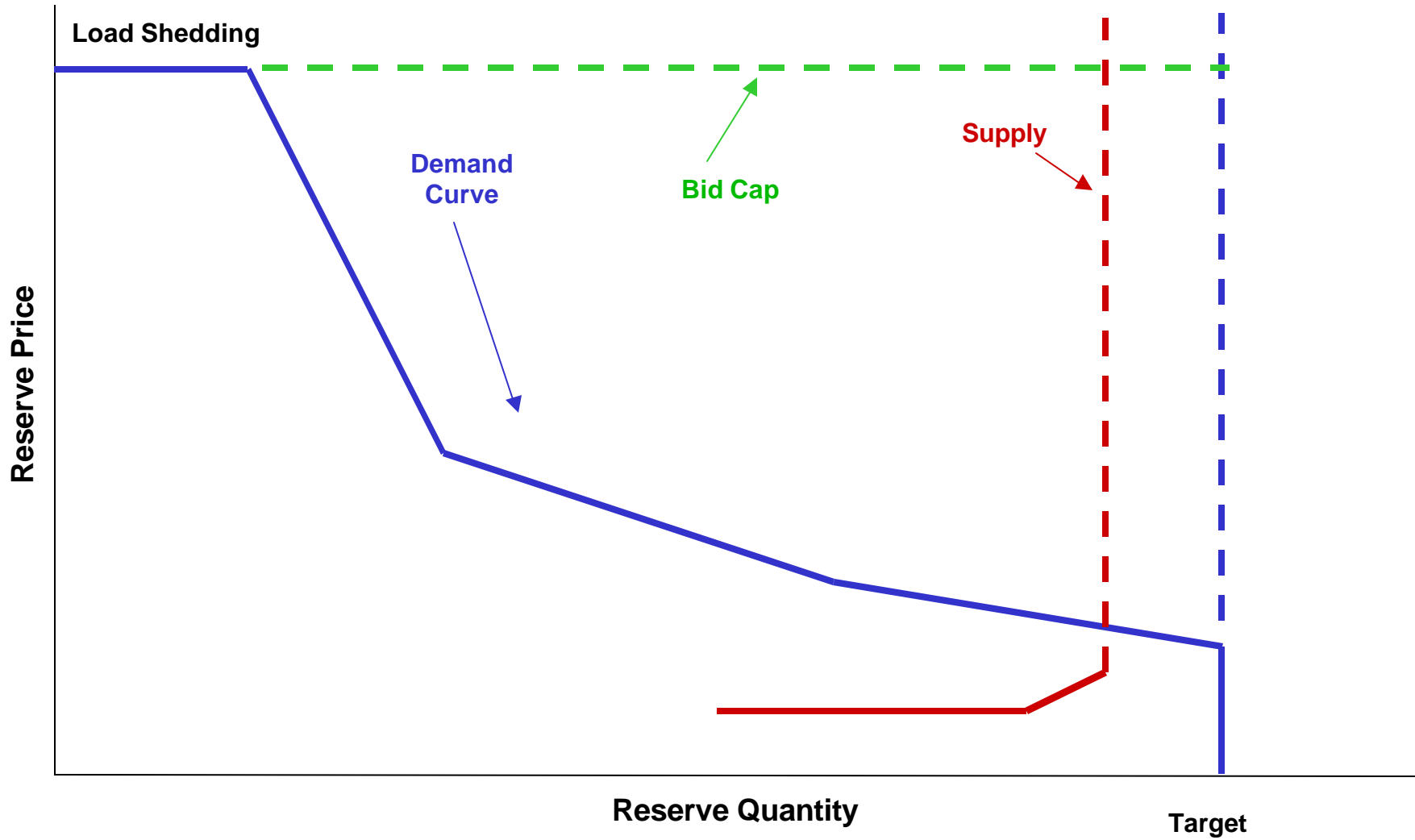


RESERVES AND SHORTAGES

A demand curve approach to reserve procurement would replace a fixed vertical demand for reserves with a demand curve in which the quantity of reserves scheduled would depend both on transmission grid and generator characteristics and as-bid reserve costs.

- The demand curve would be defined to be consistent with the system operator's actual operating policies. If the system operator would not shed load to maintain a given level of reserves, then the system operator should not be willing to pay the value of lost load to maintain that level of reserves.
- In shortage situations, the price of reserves, and energy, would be set by the demand curve.

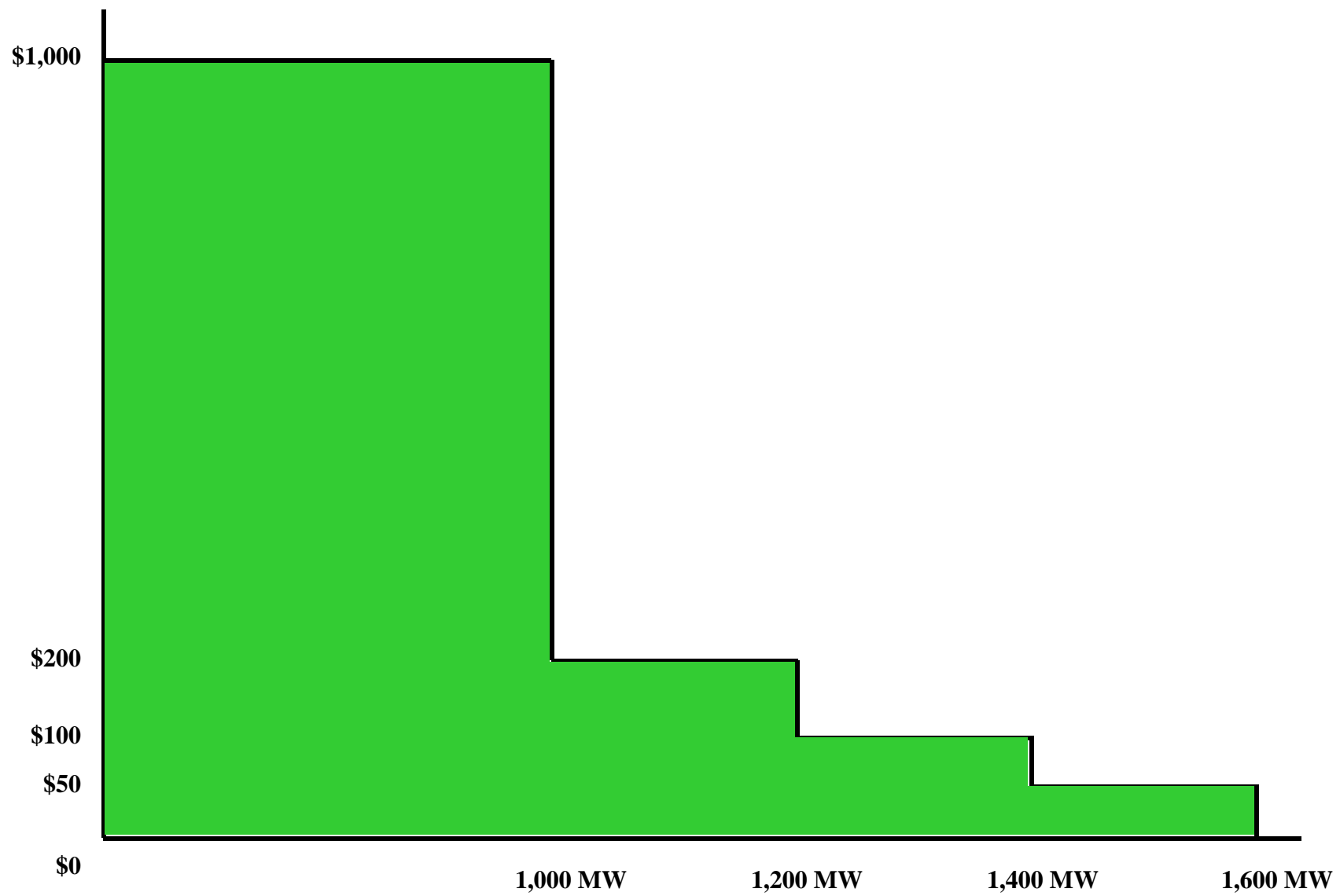
Demand Curve for 30-Minute Reserves



RESERVES AND SHORTAGES

With the system operator's reserve scheduling governed by such a demand curve, the scheduling of incremental reserves to satisfy small reserve deficits (relative to reserve targets) would not result in irrational market clearing prices.

- Reserves that cost more provide than their value to the market would not be scheduled.
- The price of reserves in shortage situations would reflect their value.
- The introduction of a reserve demand curve introduces a slope into the demand for both energy and capacity, reducing the profitability of economic or physical withholding.



NYISO DEMAND CURVES

The New York ISO, in effect, implemented a reserve demand curve during summer 2002.

The amount of 30-minute reserves purchased was reduced by:

- 200 MW if the shadow price of reserves exceeded \$50/MW.
- By another 200 MW if the shadow price exceeded \$100/MW.
- And by another 200 MW if the shadow price of 30-minute reserves exceeded \$200/MW.

SCOTT M. HARVEY (617) 761-0106

sharvey@lecg.com

350 Massachusetts Ave.
Suite 300
Cambridge, MA 02139
(617) 252-9994
(617) 621-8018 – fax

33 West Monroe
Suite 1850
Chicago, IL 60653
(312) 267-8200
(312) 267-8220 - fax

2700 Earl Rudder Freeway So.
Suite 4800
College Station, TX 77845
(979) 694-2421
(979) 694-2442 - fax

2000 Powell St.
Suite 600
Emeryville, CA 94608
(510) 653-9800
(510) 653-9898 – fax

1603 Orrington Ave.
Suite 1500
Evanston, IL 60201
(847) 475-1566
(847) 475-1031 – fax

1200 Smith Street
16th Floor
Houston, TX 77002
(713) 571-1210
(713) 353-4601 - fax

333 South Grand Avenue
Suite 3750
Los Angeles, CA 90071
(213) 621-0228
(213) 621-0277 - fax

424 Church Street
Suite 2550
Nashville, TN 37219
(615) 726-7960
(615) 726-7970 - fax

675 Third Avenue
21st Floor
New York, NY 10017
(212) 468-7878
(212) 468-7879 – fax

335 Bryant Street
Third Floor
Palo Alto, CA 94301
(650) 473-4200
(650) 322-1483 - fax

201 South Main
Suite 450
Salt Lake City, UT 84111
(801) 364-6233
(801) 364-6230 – fax

100 Bush Street
Suite 1650
San Francisco, CA 94104
(415) 398-2000
(415) 398-2039 - fax

3700 State Street
Suite 330
Santa Barbara, CA 93105
(805) 569-2130
(805) 569-2083 - fax

1725 Eye Street, NW
Suite 800
Washington, DC 20006
(202) 466-4422
(202) 466-4487 - fax

1255 Drummers Ln.
Suite 320
Wayne, PA 19087
(610) 254-4700
(610) 254-1188 - fax

Level 3, 12 Viaduct Harbour Ave
Viaduct Basin, PO Box 2475
Shortland St, Auckland, NZ
64 9 913 6240
64 9 913 6241 - fax

Av. Julio A. Roca 781, Piso 4
C1067 ABC Buenos Aires IL
Argentina
54 11 4345 1813
54 11 4345 1814 – fax

40/43 Chancery Lane
London WC2A 1JA
United Kingdom
44 20 7269 0500
44 20 7269 0515 - fax

Level 28, 303 Collins St
GPO Box 5034Y
Melbourne 3000, Australia
61 3 9678 9066
61 3 9678 9009 - fax

Level 24, 9 Castlereagh St
Sydney NSW 3000
Australia
61 2 9221 2628
61 2 9221 0868 - fax

180 Bloor Street West, Suite 1400
Toronto, Ontario M5S 2V6
Canada
(416) 927-0479
(416) 927-7621 – fax

9th Floor, 1 Willeston St.
P.O. Box 587
Wellington, New Zealand
64 4 472 0590
64 4 472 0596 - fax

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