An Assessment of the
Descending Clock Auction for the
Centralized Procurement of
Qualifying Renewable Attribute Certificates by the
New York State Energy Research and Development Authority

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1. Introduction

On June 22, 2004, the New York State Energy Research & Development Authority ("NYSERDA") stated that it is prepared to:

"...serve as the administrator ("CPA") of the central procurement component of the Renewable Portfolio Standard ("RPS"), and is prepared to develop an implementation plan for the CPA component that will include input from interested stakeholders."

NYSERDA also stated that it "envisions the function of the CPA as the procurement of renewable credits from RPS eligible megawatt hours based on aggregate megawatt hour targets to be assigned to the CPA by the Commission."

In addition, NYSERDA stated that it would "be prepared to issue a solicitation as early as the latter part of 2005...."

The utilities listed below¹ have supported (and continue to support) NYSERDA's goals and broader goals of the New York RPS Program. Achieving these goals will entail a concentrated implementation effort by NYSERDA and interested stakeholders, as well as actions by the NYPSC² and others. Recognizing these time constraints, it is appropriate to begin now the development of an understanding of the descending clock

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auction ("DCA") as the vehicle for NYSERDA's acquisition of renewable credits (called "Qualifying Attribute Certificates" in this Paper³), on the premise that NYSERDA will serve as the CPA for the New York RPS Program.

2. Summary

The DCA is a cost-effective, economically efficient means by which NYSERDA could acquire Qualifying Attribute

Certificates. The successful uses of the DCA in other public resource acquisition contexts indicate that a properly designed DCA will produce the lowest costs, attain the RPS targets, and provide assurances to investors and developers of future revenue streams to fund the construction of new renewable facilities. It is accordingly suggested that NYSERDA retain a qualified consultant to assist in the design and conduct of the DCA.

3. Overview of the DCA

The DCA is a "Dutch Auction" that belongs to the family of simultaneous, multiple round auctions. 5

 $^{^{\}rm 2}$ $\,$ The NYPSC's RPS Policy Statement is expected to be available in the near future.

 $^{^{3}}$ See section 7 for a more complete description of Qualifying Attribute Certificates.

This type of auction was first used in auctioning tulip bulbs in Holland (See: http://teaching.ust.hk/~ismt510/lec/Lecture7.ppt, slide 39) and is apparently still in use today for that purpose (See: http://www.hollandinsight.nl/daily/2003/4/11/HI/HI_00_20030411_9/articles/artikel HI 00 20030411 9 145.php).

⁵ The discussion of the DCA in this Paper is a development of the support for centralized procurement by a responsible state agency and the DCA that the utilities have previously expressed in the NYPSC's RPS Proceeding.

A clock auction proceeds in a series of "rounds." In each round, the Auctioneer announces a price (the "going price") for the product being acquired. Bidders bid for the right to provide the quantity of the product they wish to supply at the going price announced by the Auctioneer. Bidders are usually given between 15 minutes and a few hours to decide what quantity of the product they wish to offer to provide in a particular round of the auction.

Following the end of a round, the Auctioneer adds up all bids received at the going price for that round. If the total quantity of the product bid is greater than the quantity to be acquired, the Auctioneer announces a lower going price for the following round - the "clock ticks down."

Bidders then decide how much to offer to supply at the new, lower price. The quantity of the product that a bidder offers to supply in the next round can be the same as or smaller, but not larger, than it offered in a previous round. A bidder in the clock auction must submit bids in every round, and cannot re-enter the auction once it abstains from bidding in a round. When the total quantity bid by all bidders matches the total quantity sought by the Auctioneer, the

See, e.g., Joint Utilities' September 26, 2003 Initial Comments, at 10 -

auction closes. The winners are the bidders in the last successful round of the auction.

Winning bidders in the NYSERDA DCA will be entitled to receive the price for a Qualifying Attribute Certificate determined in the DCA (i.e., the final "going price" cleared by the Auctioneer). Shortly after completion of an auction, and confirmation of the auction results, NYSERDA and the winning bidders would promptly enter into standard form contracts. The standard form contracts will provide that each winning bidder deliver to NYSERDA the quantity of Qualifying Attribute Certificates it bid (or was awarded) in the DCA final round, and that NYSERDA pay for the Qualifying Attribute Certificates, when received, at the winning price in the DCA. The standard form contracts are intended to facilitate the financing and construction of new renewable facilities by establishing the future revenue streams from the Qualifying Attribute Certificates.

4. Advantages of the DCA

The DCA offers a number of advantages as the acquisition method for Qualifying Attribute Certificates.

• The DCA is an open, uniform price auction. It is a market-based negotiation mechanism that is conducted

Depending on the details of the auction protocols, the final round quantities may be pro-rated among the final round bidders through, for example, a transparent, pre-determined formula.

according to explicit rules, provides transparent prices, and promotes efficient investment.

- In a DCA, the more efficient, least-cost suppliers can prevail because the less efficient suppliers will withdraw from the auction as the price ticks down.
- Determination of the winners is simplified. No complex evaluation of competing proposals incorporating differing terms and conditions, or variable pricing assumptions, is necessary. The potential for subsequent disputes should be minimal.
- Because the going price and the quantity of the product are both known at the conclusion of the auction, the total cost of the acquisition is also known. This facilitates development of reliable projections for NYSERDA's future financial obligations⁷ to meet payments called for in the standard form contracts NYSERDA will enter into with the winning bidders.
- If more than one product is purchased (i.e., Main Tier vs. SBC-like Tier), then separate descending clock auctions can be held for Main Tier and SBC-like Tier Qualifying Attribute Certificates. The length of the procurement term as well as the price can be varied for different products.

The DCA has been used successfully in a number of public acquisition contexts. The New Jersey Board of Public Utilities employed a DCA in the acquisition of basic generation services ("BGS").8 This technique has been credited with contributing to notable cost reductions.9 Another public

It is assumed that NYSERDA's funding requirements will be met through an "SBC-like" element that will be determined by the NYPSC at the levels appropriate to meet NYSERDA's needs. The NYPSC's Policy Statement is also expected to specify whether state, municipal, and ESCO suppliers will participate in the funding.

 $^{^{\}mbox{\scriptsize f}}$ The DCA design for the BGS was developed by NERA at the request of the New Jersey utilities. Source:

http://www.bauer.uh.edu/gemi/news/electricity_auction.ppt

Acquiring Electric Supply, The New Jersey Basic Generation Service

resource acquisition involving a DCA was the UK's successful 2002 acquisition of Greenhouse Gas Reductions, 10 which was structured to purchase emission reductions at minimum cost. 11

5. Conducting the DCA

a. Attributes Certificate Ladder

It has been assumed that NYSERDA's acquisition will be structured around the concept of a "ladder." An illustrative Qualifying Attributes Certificates Ladder is attached as Exhibit 1. For purposes of illustration, this Paper assumes a five-year contract term that commences one- to two-years forward for the purchase of Qualifying Attribute Certificates from the winning bidders. It is recognized that a different term for the contracts between NYSERDA and the winning bidders may be determined to be appropriate after consultation with

6

Solicitation Process, Peter M. Yochum, New Jersey Board of Public Utilities, May 20, 2004 (Source:

http://www.irps.ilstu.edu/beyond2006/Yochum.ppt).

As described in one paper: "Earlier this year [2002], the United Kingdom government initiated a Greenhouse Gas Emissions Trading Scheme (ETS) intended to facilitate an efficient reduction in greenhouse gas emissions...this Internet auction was quite successful, and yielded 4 million metric tons of emission reductions at apparently a lower cost than if incentives had been allocated by non-market means." See, Comments on Internet Auctions, by Lawrence M. Ausubel, Professor of Economics, University of Maryland, Before the Federal Trade Commission's Public Workshop on "Possible Anticompetitive Efforts to Restrict Competition on the Internet," October 10, 2002; source:

http://www.ftc.gov/opp/ecommerce/anticompetitive/panel/ausubel_auctions.pdf

Variations of clock auctions have also been employed to sell
entitlements of energy capacity in Texas (See:

http://www.puc.state.tx.us/nrelease/2000/120400.cfm), French electricity option contracts (See: http://www.edf.fr/download.php4?coe_i_id=20467 and Comments on Internet Auctions, by Lawrence M. Ausubel, supra), portions of the electromagnetic spectrum by the FCC, and shares of stock in Google's IPO.

market participants.

The one- to two-year forward forecast of upcoming DCA acquisition amounts would be publicized by NYSERDA approximately three months ahead of the auction. The forecasted quantity would be for the quantity required for the first year of the five-year strip. The quantity of Qualifying Attribute Certificates to be purchased from eligible renewable resources would be the same for each of the five years. 12

For example, in the latter part of 2005 NYSERDA could hold an auction for Qualifying Attribute Certificates to be delivered in each of the five years from 2006 to 2010. The number of Qualifying Attribute Certificates procured in each of these years would be the renewable resource requirements amount targeted for 2006. In the following year, 2006, there would be a five-year auction for the period 2007 to 2011 that would be based on the incremental amount of Qualifying Attribute Certificates needed to meet the forecast for 2007. This incremental amount would be purchased for each year from 2007 to 2011. To meet the targeted goal for the year 2013, the DCA held in 2011 will procure Qualifying Attribute Certificates for the period 2013 to 2017. (See Exhibit 1 for

Although the quantities to be purchased using the ladder would be fixed annual amounts, it is anticipated that, as discussed in section 6, Reconfiguration Auctions will provide flexibility to winning bidders in meeting their contractual obligations to supply the annual amounts.

an example of how this could work.)

b. Matching Targets and Bid Quantities

It is anticipated that the NYPSC will adopt a "schedule" of RPS "targets." The attached table (Descending Clock Auction Example, Exhibit 2) depicts an example of how the auction might match the quantities of Qualifying Attribute Certificates bid in the auction with the NYPSC-specified targets. In this example, the clearing price was set at the price in round 5 because round 6 did not produce a total commitment that met the target. To illustrate how a "target" could be met exactly, the winning bidders were awarded a pro rata share of their quantities offered in round 5. The Auctioneer will retain the discretion to award the quantities offered in round 5 and thereby acquire slightly more than the target number of Qualifying Attribute Certificates.

It is also anticipated that the Auctioneer will have the discretion to develop an initial going price and price reduction increments for the DCA "rounds" that reflect anticipated near-term market conditions at the time of the DCA.

Auctions should be scheduled with sufficient frequency to attain the RPS "targets" over the time period of the RPS Program. The Auctioneer should have the ability to adjust the quantities acquired in any particular DCA, within some

reasonably narrow bounds (for example, 5 to 15% of the amount to be acquired in that auction). These adjustments would be intended to account for market conditions at a particular time. The Auctioneer would not have discretion to change the overall NYPSC-specified RPS "targets." 13

The flexibility described above is desirable to acquire Qualifying Attribute Certificates in the most cost-effective way and alleviate potential strategic withholding by bidders. The DCA should be subject to an independent, ongoing review of effectiveness by a qualified expert, to review the results attained and make recommendations for any appropriate future improvements.

c. Bidder Qualifications

Both NYSERDA and market participants have legitimate interests in assuring that the outcome of a DCA is not influenced by bids from parties lacking the commitment or financial resources needed to bring a project to fruition upon winning the solicitation. A bidder qualification stage of the DCA is anticipated, in which parties proposing to participate in the DCA would provide requisite financial information, commit to abide by NYSERDA's bidding rules, and provide any appropriate financial assurances. The bidder qualification

 $^{^{13}}$ It may be desirable that a Memorandum of Agreement between NYSERDA and the NYPSC be developed.

stage of the DCA may also appropriately include a requirement for indicative bids, so as to assist the Auctioneer in establishing the initial "going price" and show that sufficient bidders are expected to participate.

d. Auction Rules

The DCA allows for various arrangements regarding the dissemination of information in the auction. How much information should be published, and in what form, should be evaluated by NYSERDA after receipt of stakeholder input, and revised as actual experience may suggest.

In general, only the Auctioneer sees bid submissions.

Bidders see the information selected for them in a bidder report, which the Auctioneer publishes following the end of each round to assist in developing more informed bids in the subsequent rounds.

Specific auction activity rules governing the involvement of participants are indicated. For example, such rules would likely include controlling the rate at which auction prices would "tick down" (i.e., decrease) until the supply and demand are balanced, and rules controlling the quantity of Qualified Attribute Certificates that each participant may bid in each round of the auction.

Any competitive solicitation can produce undesirable results if not designed, implemented and monitored

appropriately. Potential difficulties can be avoided through proper DCA design, and appropriate market monitoring to assure the presence of adequate liquidity and the absence of gaming or market power.

6. Reconfiguration/After-the-Fact Auctions

It is desirable that "Reconfiguration" auctions be held to allow winning bidders to cover changes in their positions that may result from schedule changes or project modifications, and allow them to true up any discrepancies between their contractual commitments and their actual production of Qualifying Attribute Certificates.

Discrepancies may be caused by variations in the projected forced outage rates or availability of the renewable resource.

Reconfiguration auctions generally mean auctions held after the initial DCA for a given RPS "target" increment, but prior to or during a given year of delivery of the Qualifying Attribute Certificates. "After-the fact" auctions refer to an additional reconfiguration auction, held after the year of delivery, as a "last chance" opportunity for suppliers to match Qualifying Attribute Certificates to their contractual commitment for the year.

An illustrative "Timeline of DCA, Reconfiguration & After-the-Fact Auctions for 2010 Target Acquisitions" is shown in Exhibit 3.

The availability of periodic Reconfiguration Auctions in the time period following a given DCA through the target year, and of an After-the-Fact Auction, can help to stabilize market prices for Qualifying Attribute Certificates by providing additional liquidity. While an anticipation of sustained supply/demand imbalances for Qualifying Attribute Certificates can be expected to produce either higher (short supply) or lower (long conditions) prices, the availability of relatively frequent Reconfiguration and After-the-Fact Auctions should allow participants to price their expectations more precisely as market conditions change, thereby tending to dampen abrupt price changes.

7. Related Considerations

This Paper assesses the DCA in the context of a New York RPS Program that has not been fully specified at the present time. Hence, some assumptions regarding the RPS Program have been required.

The assumptions largely relate to RPS Program elements that must be defined whether or not the DCA is ultimately adopted, and the specifications of these elements are not dependent on whether the DCA is adopted. They simply need to be known prior to the auction, and specified to the extent appropriate in the auction protocols, so that potential bidders can properly value their offerings:

- Attribute Certificates This Paper assumes that Attribute Certificates will be produced by all generation facilities (see discussion of GIS/GATS, below), and that the Attribute Certificates produced by RPS "eligible" facilities will be called Qualifying Attribute Certificates. Attribute Certificates are a separate product from the energy, capacity and ancillary services produced by a generating facility. Attribute Certificates would be defined with sufficient completeness to allow tracking and record-keeping (and to permit RPS "eligible" market participants to price their offerings). They would be valid for some reasonable term.
- Qualifying Attribute Certificates —One Qualifying Attribute Certificate will be produced per MWH of energy produced by an RPS-eligible facility. It has been assumed that a Qualifying Attribute Certificate will represent all of the environmental advantages resulting from the production of a MWH by an RPS "eligible" renewable facility. 14
- GIS/GATS This Paper assumes that an adequate system to administer, manage, and report the status of Attribute Certificates (called the Generation Information System ("GIS") in New England and the Generation Tracking System ("GATS") in PJM) will be established. The GIS will allow tracking of both energy production by generators and the corresponding Attribute Certificates.
- Assurance Mechanisms Since most, if not all, of the facilities "eligible" to participate in the RPS will not be operational at the time of the solicitation, this Paper assumes that any RPS—qualifying renewable resource will provide financial assurances (e.g., credit-worthiness requirements,

¹⁴ The precise characteristics that would be included in the Qualifying Attribute Certificate (e.g., SOx, NOx, carbon attributes, etc.) have yet to be determined. A complete and precise definition of the New York Qualifying Attribute Certificates is necessary whether or not NYSERDA decides to adopt the DCA model.

The GIS need not be operational at the time the first DCA is conducted by NYSERDA, but should be operational by the time the first facility receiving an RPS premium commences commercial operations.

corporate guarantees, bonds or other forms of enforceable obligations, deficiency charge provisions) found to be appropriate after consultation with interested parties. 16

• Banking and Borrowing — This Paper assumes that banking and borrowing of Qualifying Attribute Certificates will be allowed within specified limits, as well as Reconfiguration/After-the-Fact Auctions, to provide reasonable flexibility to suppliers to meet their contractual obligations to NYSERDA.

8. Conclusion

Use of the DCA by NYSERDA to acquire Qualifying Attribute Certificates offers several significant advantages and no apparent disadvantages. Retention of a qualified consultant is suggested to assist NYSERDA in the design and implementation of the DCA and to help expedite the implementation process.

The assurance mechanisms determined to be appropriate by NYSERDA after receiving input from market participants and other interested parties will be incorporated into bidder qualification requirements and into the standard form contracts.

EXHIBIT 1 - DCA CERTIFICATE LADDER EXAMPLE

2012 auction year								1.8	1.8	1.8	1.8	1.8
2011 auction year							1.7	1.7	1.7	1.7	1.7	1.7
2010 auction year						1.8	1.8	1,8	1.8	1.8	1.8	1.8
2009 auction year	*				1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
2008 auction year	,,,			1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
2007 auction year			1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
2006 auction year		1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
2005 auction year	1.5	1.5	1.5	1.5	1.5	1.5	1,5	1.5	1.5	1.5	1.5	1.5
Cumulative Quantity (million MWH)	1.5	3.2	5.0	6.6	8.4	10.2	11.9	13.7	13.7	13.7	13.7	13.7
RPS Year>	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017

Notes:

- 1. Example uses a 2013 target of 13.7 million MWH
- 2. Each auction will be conducted prior to its first target year so suppliers will have sufficient time for financing and construction.
- 3. RPS Premiums, based on DCA results, are paid for quantities shown in the patterned area of the ladder.
- 4. Starting in 2011, the Quantity shown without pattern are assumed to transition from receipt of an RPS Premium to post-RPS Premium status with continued production from the facilities.

EXHIBIT 2 - DESCENDING CLOCK AUCTION EXAMPLE

2006 RPS Target for Qualifying Attribute Certificates

1,500,000

MWH

Analysis completed before each strip auction			.,						
	Projected Qualifying Attribute Certificates for 2006								
Supplier>	Δ	B	Ç	<u>Total</u>					
	(MWH)	(MWH)	(MWH)	(MWH)					
Existing - Qualifying for RPS	250,000	200,000	0	450,000					
Planned - Qualifying for RPS	200,000	500,000	600,000	1,300,000					
Total	450,000	700,000	600,000	1,750,000					

	Target	Offer Price	Qualified Rer	newable Resc	ources Bid			
	A HAR	A.B.A.B.A.B.	<u>A</u>	<u>B</u>	<u>C</u>	Total	Excess	Cost Estimate
	(MWH)	(\$/MWH)	(MWH)	(MWH)	(MWH)	(MWH)	(MWH)	(\$/Year)
Round 1	1,500,000	\$50	450,000	700,000	600,000	1,750,000	250,000	\$87,500,000
Round 2	1,500,000	\$45	450,000	700,000	550,000	1,700,000	200,000	\$76,500,000
Round 3	1,500,000	\$40	450,000	650,000	550,000	1,650,000	150,000	\$66,000,000
Round 4	1,500,000	\$37	450,000	650,000	500,000	1,600,000	100,000	\$59,200,000
Round 5	1,500,000	\$35	450,000	600,000	500,000	1,550,000	50,000	\$54,250,000
Round 6	1.500.000	\$33	450,000	575.000	450.000	1,475,000	(25,000)	\$48,675,000

The Auction Clearing Price is \$35/MWH.

Once Clearing Price is established, the target can be proportioned to the winning suppliers

	Target	Clearing	Δ	<u>B</u>	<u>C</u>	<u>Total</u>	Projected Cost
Pro Rata Share	(MWH)	Price	(MWH)	(MWH)	(MWH)	(MWH)	(\$/Year)
Awarded	1,500,000	\$35	435,484	580,645	483,871	1,500,000	\$52,500,000

An alternative would be to award each supplier its bid quantity in the winning round, which will lead to a total commitment above the Target, and could reduce the Target for the next year.

Actual 2006 Production

Actual Cost to Customers

	Target	<u>A</u> ·	<u>B</u>	<u>C</u>	<u>Total</u>	<u>Excess</u>	Supplier Revenue	
Actual	(MWH)	(MWH)	(MWH)	(MWH)	(MWH)	(MWH)	(\$/Year)	
Production	1,500,000	400,000	580,645	483,871	1,464,516	(35,484)	\$51,258,060	
Suppliers are paid for their production level up to their commitment level.								

Supplier A is short 35,484 MWH in 2006, and could cover the Deficiency by participating in Reconfiguration Auctions held during 2006 or in an After-the-Fact Auction held in early 2007.

[&]quot;Actual Cost to Customers/Supplier Revenue" will equal "Projected Cost" if Supplier A does make up its 35,484 MWH shortfall through the Reconfiguration Auctions or some other bi-lateral arrangement.

Exhibit 3 - Timeline of DCA, Reconfiguration & After-the-Fact Auctions for 2010 Target Acquisitions

