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PENNVEST Nutrient Credit Trading: Spot Auction Participation Phase

Markit / New York / October 2016

Leading provider of financial information services globally

2003	**10**	**22**	**3,000+**	**3,616+**	**$1.07bn**	**$488m**
founded	countries	offices	institutional customers	employees	2014 revenue	2014 adjusted EBITDA

Organisations

Banks	Corporates
Asset managers	Insurance companies
Hedge funds	Securities firms
Private equity funds	Clearing firms
Venture capital funds	Software / data vendors

Coverage

Equities	FX
Credit	Structured finance
Loans	Commodities
Rates	CDS
Bonds	Environmental

Individuals

Traders	Compliance officers
Risk managers	Valuation analysts
IT professionals	Actuaries
Investment professionals	Research analysts
Portfolio managers	Trading operations

Enhancing transparency | Reducing risk | Improving operational efficiency

Markit's Role in Nutrient Credit Trading:

- Offer Enrollment & Eligibility services through our Markit Counterparty Manager(MCM) system

- Provide auction services, including training on Submitting Bids and Offers using Markit Environmental Registry

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PENNVEST's Role in Nutrient Credit Trading:

- Provide public operated treatment works and regulated point sources with a cost-effective alternative to meet their nutrient discharge permit requirements

- Reduce risk perceived by credit sellers and buyers that may inhibit growth of the nutrient credit market

1. Markit Environmental Spot Auction Participation Process Overview
2. 2-Round Auction Guidelines
3. Logging into Markit Environmental Registry
4. Sellers
   - Accept certified credit transfers into their Registry accounts
   - Submit single-year offers on Markit Environmental Registry*
   - Update offers on Markit Environmental Registry
5. Buyers
   - Submit single-year bids on Markit Environmental Registry*
   - Update bids on Markit Environmental Registry
6. Participants view auction results
7. Settlement Cycle

*Note: 3-year strips will not be available in this Spot Auction

Markit Environmental Spot Auction Participation Process Overview

Markit Environmental Spot Auction Participation Process Overview

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By Oct 26th

PENNVEST informs potential auction participants on their eligibility to participate in the auction through MCM

→

By Oct 31st
Eligible Participants Deliver (3) originally executed signature pages for Sales/Purchase Agreements and collateral documents to PENNVEST

→

Nov 2nd (9am – 11am)

Sellers and Buyers submit offers and bids on Markit Environmental Registry for **Round 1**

Nov 2nd (5pm)

Markit notifies Sellers and Buyers of auction results for **Round 2.** Sellers and Buyers can view their results in MCM

←

Nov 2nd (2pm – 3pm)

Sellers and Buyers submit offers and bids on Markit Environmental Registry for **Round 2**

←

Nov 2nd (1pm)

Markit notifies Sellers and Buyers of auction results for **Round 1**. Sellers and Buyers can view their results in MCM

Post –Nov 2nd Auction

Markit transfers MATCHED certified credits into Pennvest Settlement Account on Markit Environmental Registry

→

According to each Seller's delivery schedule:

Certified credits become verified.

PENNVEST will provide registration numbers from DEP.

Delivery of the credits will occur in accordance with the Sales/Purchase agreements

Markit Environmental Spot Auction Participation Process Overview

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1. **On or before Nov 2nd:** Deadline to deliver (3) originally executed signature pages for Sales/Purchase Agreements and Collateral documents (if applicable) to PENNVEST (Forum Building, Room 434, 607 South Drive, Harrisburg, PA 17120 Attn: Heather Myers). **Note**: You cannot submit bids/offers until executed signature pages are received.

2. Once Agreements and Collateral documents are signed by PENNVEST, a PDF version will be uploaded into MCM and accessible for printing.

3. Once credits become verified and registered, PENNVEST will provide registration numbers for payments made on the delivery dates set forth in the agreement.

4. For questions regarding this process, contact Robert Boos @ 717-783-4493 or **rboos@pa.gov**
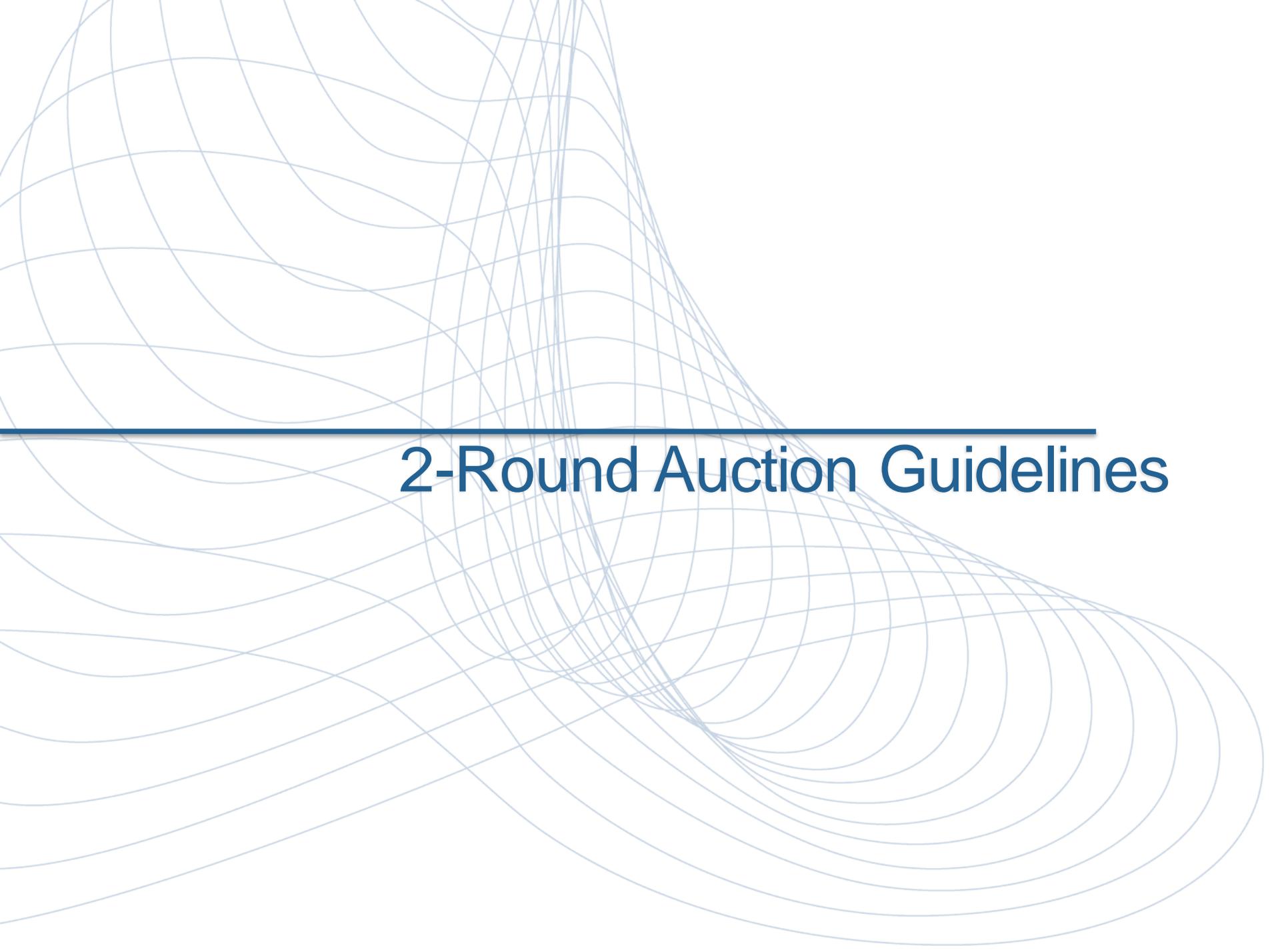
2-Round Auction Guidelines

Auction Style

- Auction will consist of two sealed bid and offer auction rounds

- Both Round 1 and Round 2 will result in settlement prices and transaction of credits

- In Auction Round 2, Buyers and Sellers can only bid or offer for the same combination of compliance year/watershed and nutrient type as Round 1

Example 1:

- Buyer or Seller participated in Spot Auction Round 1
- Buyer or Seller submitted a 2016 PARTIAL Potomac Phosphorus bid or offer
- This participant can submit any combination of the following products in Spot Auction Round 2:
  - 2016 PARTIAL Potomac Phosphorus
  - 2016 All/NONE Potomac Phosphorus
- This participant will be allowed to change the quantity and price for their bid or offer

Example 2:

- Buyer or Seller participated in Spot Auction Round 1
- Buyer or Seller submitted a 2016 ALL/NONE Potomac Phosphorus bid or offer
- This participant can submit any combination of the following products in Spot Auction Round 2:
  - 2016 PARTIAL Potomac Phosphorus
  - 2016 All/NONE Potomac Phosphorus
- This participant will be allowed to change the quantity and price for their bid or offer

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Example 3:
- Buyer or Seller didn't participate in Spot Auction Round 1
- This buyer or seller cannot participate in Spot Auction Round 2

Example 4:
- Buyer or Seller participated in Spot Auction Round 1
- This buyer or seller can choose to participate or not in Spot Auction Round 2

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Basic Auction guidelines:

- The goal of the auction is to maximize fills.

- Suggestion to participants: *partial bids and offers will increase the likelihood of your auction success.*

- If a participant is participating in the auction as both a buyer and a seller, he/she cannot submit bids and offers for the same product type/water year (watershed/nutrient type/water year). E.g. if a participant submits a bid and offer from his/her account for Susquehanna Nitrogen credits for water year 2016, both the bid and the offer will be discarded.

- Buyers can only bid up to the dollar amount limit established in their eligibility letter.

- Sellers can only offer credits up to the credit limit established in their eligibility letter.

- For further details on auction rules, please consult the PENNVEST Nutrient Credit Clearinghouse Rulebook which can be found at:

   http://www.portal.state.pa.us/portal/server.pt/community/nutrient_credit_trading/&popUp=true

Logging into the Markit Registry

Logging into Markit Registry

1. Navigate to www.markit.com.
2. Click LOG IN.

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3. This will call up a Login screen. Insert your email address and password and press the "Login" box.

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4. After logging in, you will be prompted to select your Markit Product. Click "Registry" and then on the "Save" button.
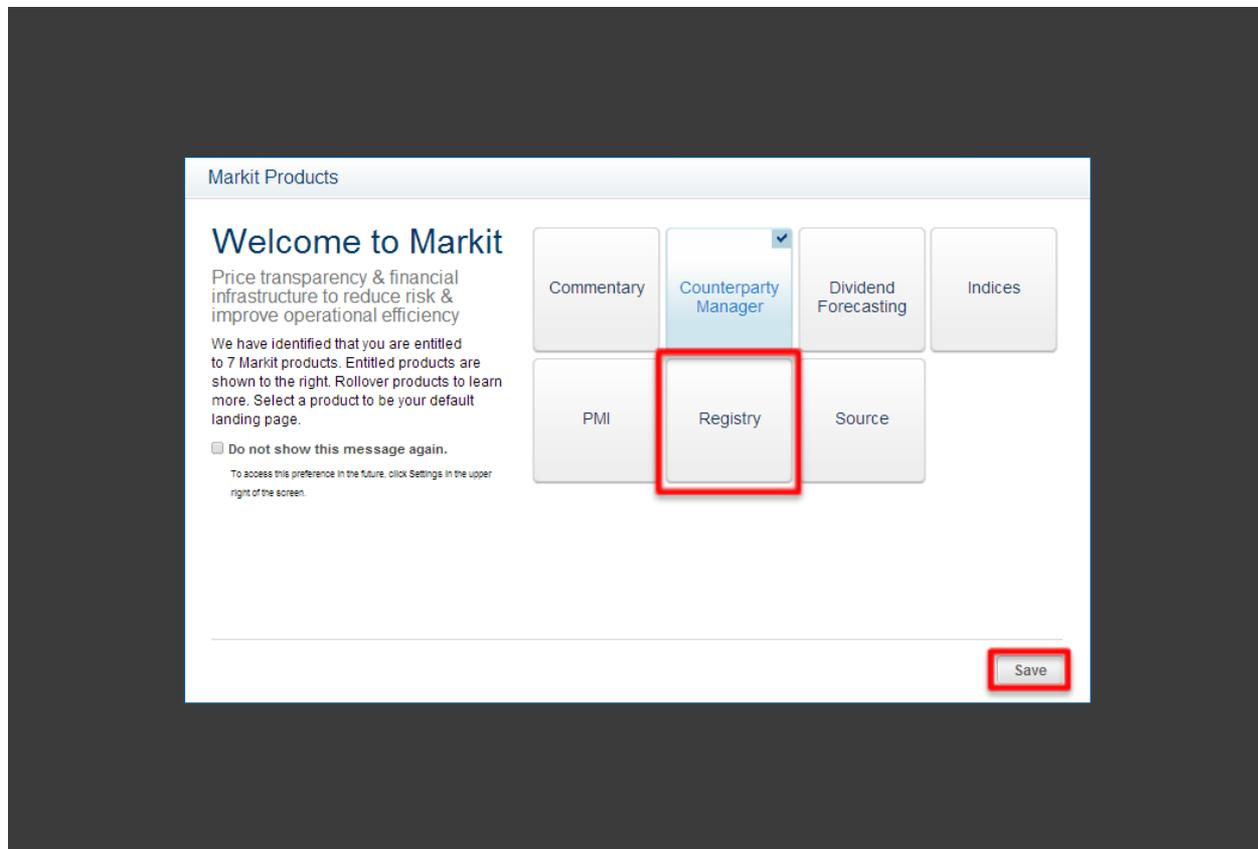
5. To confirm your identity, you will be prompted to enter a unique session code by clicking 'Generate Session Code'

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6. You will be emailed a session code that you will then enter "Enter Session Code" field on the landing page, and click 'Verify'

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Markit Registry Session Authorization Code

Dear JH Test User 3,

You have requested an authorization code to verify your new session for the Markit Environment Registry. Please enter the code into your account online when prompted.

Session Code: CoLSoO

Please note that this code is case-sensitive.
If you did not request a new session authorization code, please contact the Markit Operations team at the contact information listed below.

Kind Regards,
Markit Environmental Registry Operations Team

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| My Account Summary | Manage My Units | My Projects and Issuances | RFI | Bids/Offers | User |

Authorization Code

ⓘ **Sending your session cod**
Email has been sent.

Please enter session code that you've received. Please note that session code will expire after '3' minutes. If code is not used within '3' minutes, a new code will need to be generated.

Enter Session Code: [   ] Verify

7. Once you are successfully logged into Markit, you will be presented with the Markit Registry landing screen.

Note: Only Sellers will have populated fields in the credit summary field.

Sellers accept credit transfers into their registry accounts

Sellers accept credit transfers into their registry accounts

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1. PA Department of Environmental Protection (DEP) will post seller's credits in Markit Registry 2 to 3 days prior to the auction

2. Amount of credits that will be posted into Seller's registry account will equal the amount that was confirmed by DEP and approved by PENNVEST in accordance with the enrollment eligibility letter.

3. Once credits are posted, they will be transferred into Seller's registry account

4. Seller will receive the email notification of the incoming transfer. See sample email ➡

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Transfer Pending Notification

Dear JH Test User 4,

Thank you for your request to Transfer credits on the Markit Environmental Registry.

The following is a copy of the transfer details:

Common Transfer Details:

Target Account ID: 100000000047774
Target Account Name: MER2.9 Auctions
Transfer Date: 2015-05-22 17:41:45
Comments:

Transfer Details:

Source Account ID: 100000000001953
Source Account Name: DEP VOSTRO
Project Name: CCTest 4-29 Potomac
Standard Name: PA PENNVEST / DEP Chesapeake Bay Nutrient Trading
Vintage Year: 2015
Quantity: 500
Credit Type: lbs/year
Serial number: PENNV-SCU-US-100000000078047-01102014-30092015-72145370.466-72145869.466-MER-0-P
Unit Class: CERTIFIED

Additional Information:

Nutrient Type : Nitrogen
Watershed : Potomac

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Sellers accept credit transfers into their registry accounts

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5. To accept transfer, log into Markit Registry

6. Navigate to 'Manage My Units' Page

7. Click on 'Pending Transfer (Customer)' button

8. The following form will display
9. Confirm Transfer amount and click on the 'Approve' button

Sellers accept credit transfers into their registry accounts

10. Credits will become active in your account
11. Please note that you will have separate credit blocks for different combinations of Watershed/Nutrient Type that were verified by DEP.

Sellers submit offers on Markit Registry

Sellers submit offers on Markit Registry

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1. Log into Markit Registry

2. Click on 'Manage My Units' Page

3. Select block of credits that you want to offer on the auction by highlighting the row

4. Select 'Auction" icon from the sub-menu bar

5. Select 'Enter Auction Offer"

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6. The following form will display

7. Populate all fields marked with an asterisk

8. Enter Auction name from the drop-down list

9. Enter quantity of credits and offer price (Note: You do not have to offer all of available credits)

10. Select "Partial" or 'All or None'.

11. Agree to the "Auctions Terms of Use"; click on 'OK' button

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12. A confirmation offer form will display.

13. Review and confirm details; then click "Yes" button – the offer is now submitted.
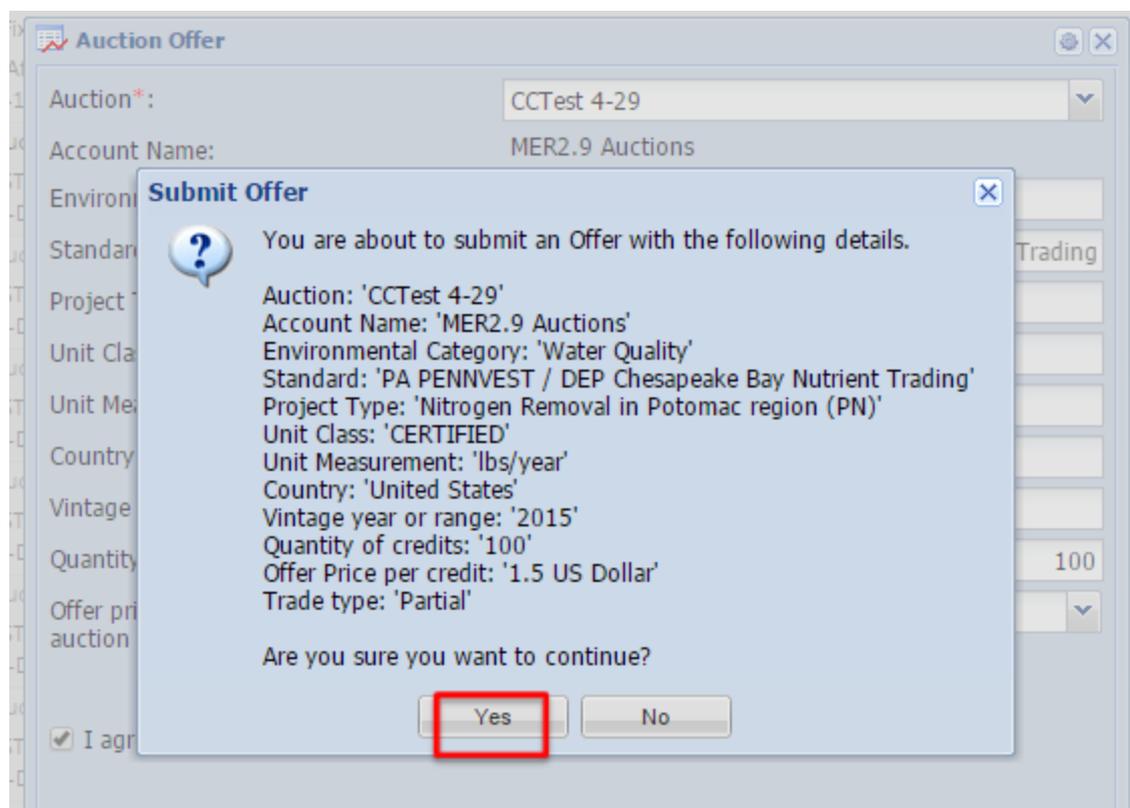
Sellers submit offers on Markit Registry

13. Navigate to the "Auctions" menu to view your submitted offer

14. Click on "Choose Auction" drop-down to select the auction name

15. 'Delta' column will indicate how much of the pre-qualified quantity amount remains, based on the submitted offer amounts

Sellers submit offers on Markit Registry – What is the Product Name?

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The Product Name provides information about the credit that is being offered at the auction. Product Name captures the watershed, nutrient type and vintage year.

For the Nov. 2nd Spot Auction, the Product Names will be reflected as noted in the table below.

Product Name	Description
SU-N-16	Susquehanna Nitrogen 2016
SU-P-16	Susquehanna Phosphorus 2016
PO-N-16	Potomac Nitrogen 2016
PO-P-16	Potomac Phosphorus 2016

Sellers update offers on Markit Registry

Sellers update offers on Markit Registry

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1. Please note that **Sellers are able to change their offers, while auction window is open (Nov 2nd : Round 1 from 9am – 11am; Round 2 from 2pm – 3pm)**

2. In order to change your offer, you must first "un-list" it from the auction and then create a new one

3. To un-list an offer, navigate to 'Auctions" menu

4. Identify the offer that you wish to un-list and check the box. Click on the "Un-list" button

5. The following form will display; click on the "Yes" button once you have confirmed

6. Navigate back to 'Manage My Units' Page to list a different offer

Buyers submit bids on Markit Registry

Buyers submit bids on Markit Registry

1. Log into Markit Registry

2. Click on 'Manage My Units' Page

3. Hover over 'Auction' on the sub-menu bar

4. Click on 'Enter Auction Bid' menu item
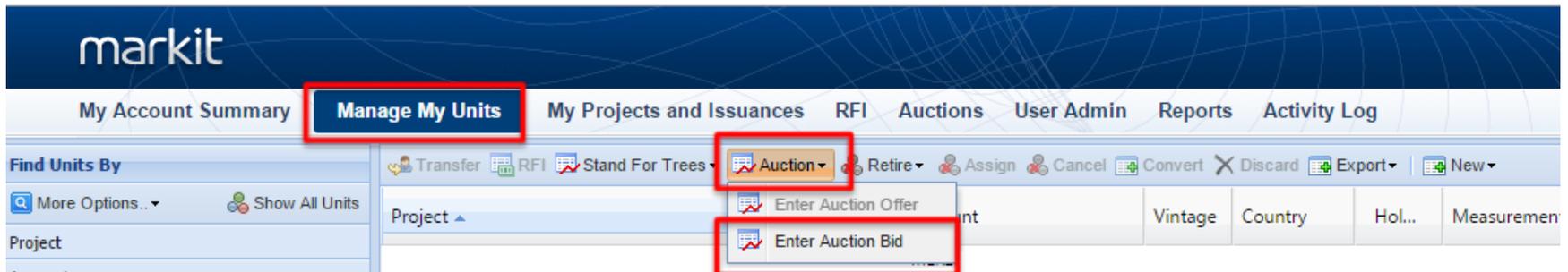
5. The following form will display.

6. All fields marked with an asterisk **must** be populated.

7. Indicate whether the bid is 'Partial' or 'All or None'

8. Agree to the "Auctions Terms of Use"

9. Click on 'OK' button

10. A confirmation submit bid form will display

11. Confirm details and click "Yes" button. The bid is now submitted

Buyers submit bids on Markit Registry

12. Bid will be visible on Auctions page

13. Select the auction from the 'Choose Auction" drop-down

14. 'Delta' column will indicate how much of the pre-qualified dollar amount remains, based on the submitted bid amounts and bid prices

Buyers submit bids on Markit Registry – What is the Product Name?

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The Product Name provides information about the credit that is being bid for at the auction. Product Name captures the watershed, nutrient type and vintage year.

For the Nov. 2nd Spot Auction, the Product Names will be reflected as noted in the table below.

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SU-N-16	Susquehanna Nitrogen 2016
SU-P-16	Susquehanna Phosphorus 2016
PO-N-16	Potomac Nitrogen 2016
PO-P-16	Potomac Phosphorus 2016

Buyers update bids on Markit Registry

Buyers update bids on Markit Registry

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1. Please note that **Buyers are able to change their bids, while auction window is open (Nov 2nd : Round 1 from 9am – 11am; Round 2 from 2pm - 3pm)**

2. In order to change your bid, you must first "un-list" it from the auction and then create a new one

3. To un-list a bid, navigate to the "Auctions' menu

4. Identify the bid that you wish to un-list and click on the "Un-list" box on the sub-menu bar

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5. The following form will display

6. Click on 'Yes' button to un-list your bid.

7. Navigate back to 'Manage My Units' Page to list a different bid
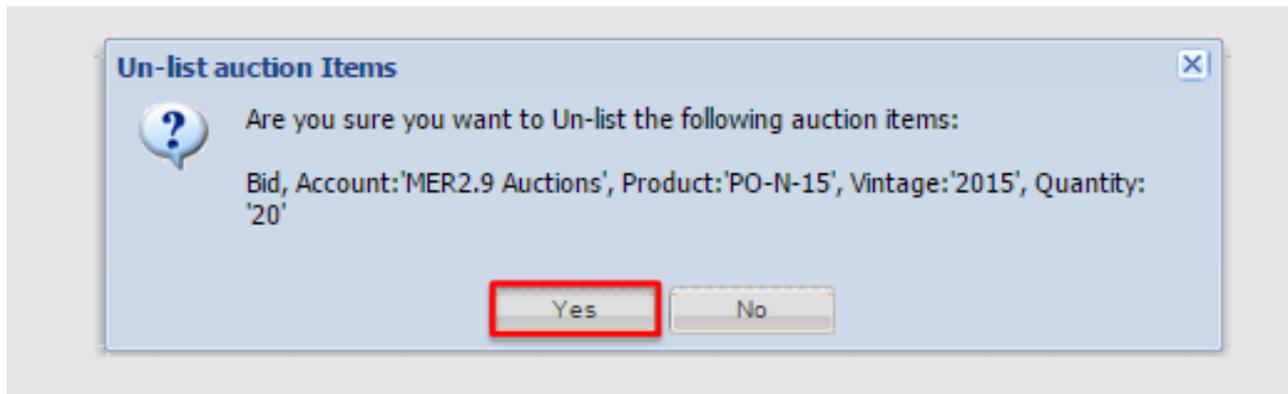
Participants view auctions results

Participants view auctions results

1. After each auction round is completed, Markit will notify all auction participants via email that their results are available in their 'My Counterparty Documents' folder on Markit Counterparty Manager (MCM)

2. Expect to receive notification on **Nov 2nd** at approx. **1:00pm for Round 1**

3. Expect to receive notification on **Nov 2nd** at approx. **5:00pm for Round 2**

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4. To view your auction results, navigate to www.markit.com website

5. Click on the green "Login" box

6. Insert your email address and password.
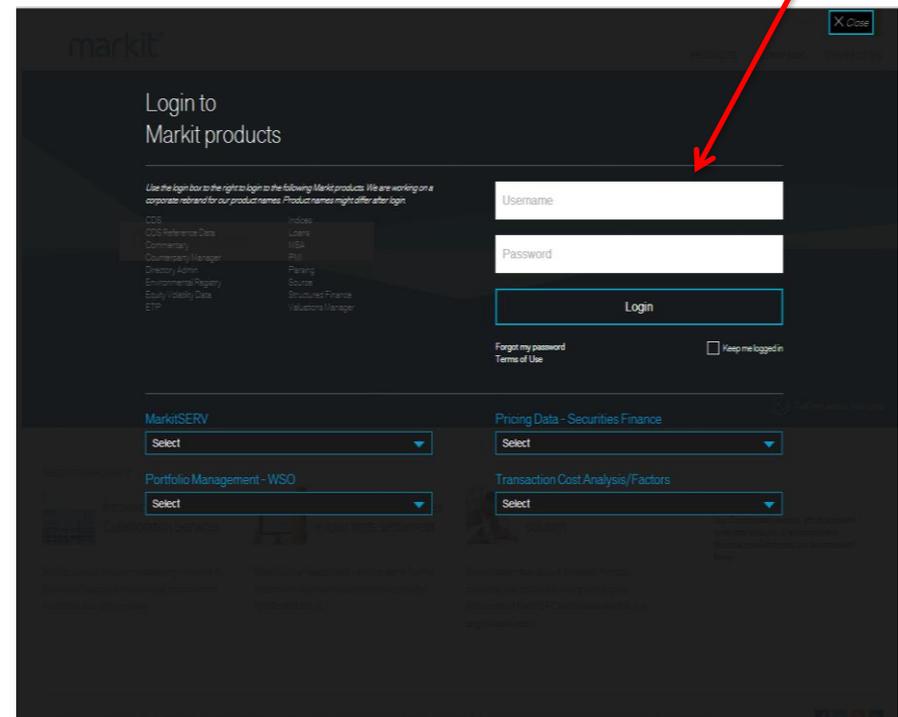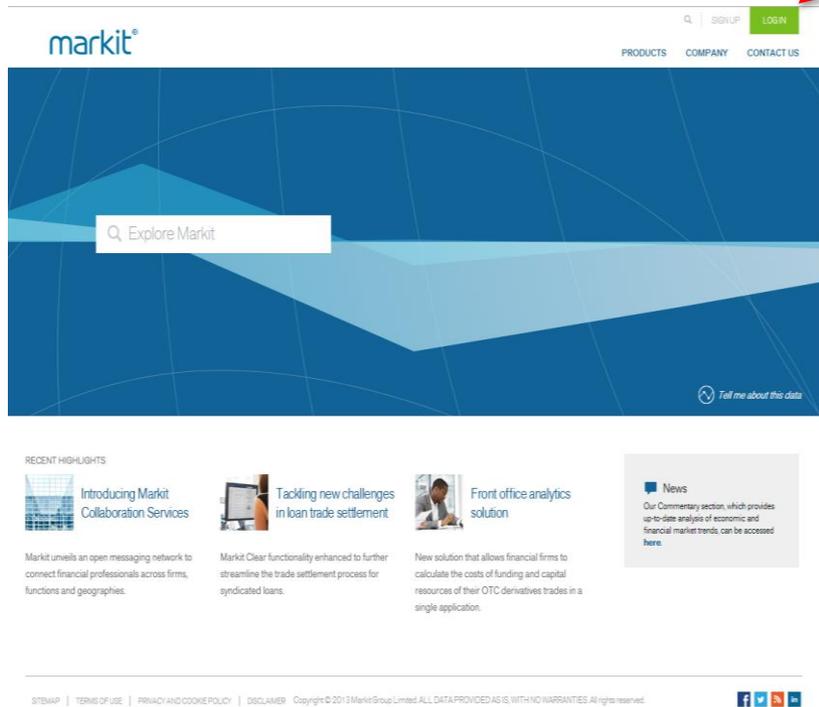
7. After logging in, you will be prompted to select your Markit Product. Click on "Counterparty Manager" and then click "Save."
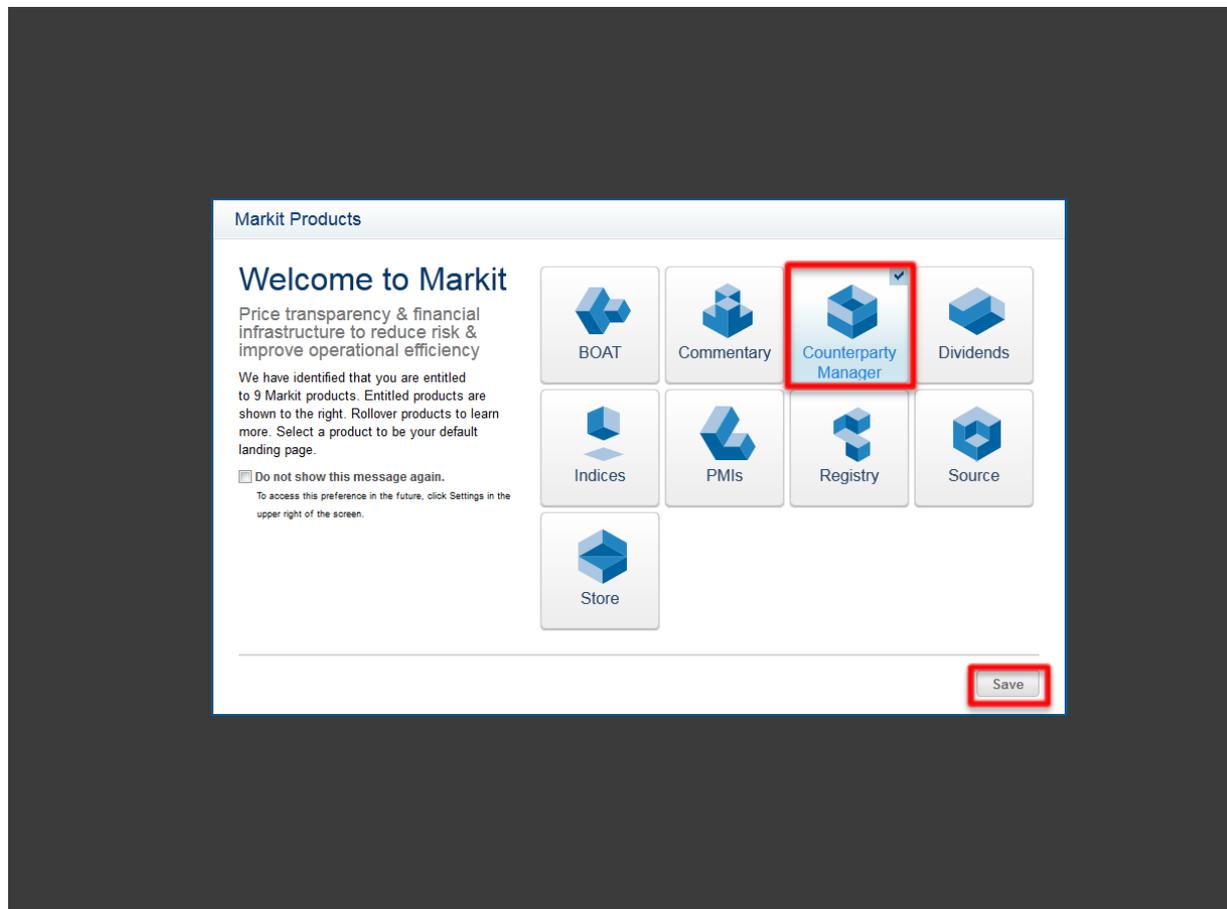
8. Hover over 'View'

9. Navigate to 'Counterparty Documents' page

10. Click on 'all document(s)' hyperlink

11. Look for the document type: "Auction Results (Private)"

12. Click on the document's icon

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13. If successful, Seller's Auction results document will look like this:

Winning offers		Offer Price ($)	Offer Quantity	Offer Type	Final Price ($)	Quantity Sold	Amount	Fee Per credit	Total Fee	Total Amount Owed from Pennvest ($)
Credit: SU-P-14										
		3.60	1,500.00	ALL/NONE	5.30	1,500.00	7,950.00	0.025	37.50	7,912.50
										Amount=Quantity Won*Final Price
										Total Fee= Quantity Won*Fee per credit
										Amount Owed from Pennvest= Amount - Total Fee
										SU-P-12 - Susquehanna Phosphorus 2012

14. If successful, Buyer's Auction results document will look like this:

Winning bids		Bid Price ($)	Bid Quantity	Bid Type	Final Price ($)	Quantity Won	Amount	Fee Per credit	Total Fee	Total Amount Owed to	Pennvest ($)
Credit: SU-P14											
		7.00	1,500.00	ALL/NONE	5.30	1,500.00	7,950.00	0.025	37.50	7,987.50	
										Amount=Quantity Won*Final Price	
										Total Fee= Quantity Won*Fee per credit	
										Amount Owed to Pennvest= Amount + Total Fee	
										SU-P-12 - Susquehanna Phosphorus 2012	
										SU-P-13 - Susquehanna Phosphorus 2013	
										SU-P-14 - Susquehanna Phosphorus 2014	

15. Please note that results will show 0 in total amounts and final quantities columns for buyers and sellers who did not win any bids or offers:

TEST SELLER Private Results for Pennvest Forward Auction March 19th , 2014									
Winning offers									
Credit: PO-N-14	Offer Price ($)	Offer Quantity	Offer Type	Final Price ($)	Quantity Sold	Amount	Fee Per credit	Total Fee	Total Amount Owed from Pennvest ($)
	3.20	2,000.00	PARTIAL	0.00	0.00	0.00	0.025	0.00	0.00

Amount=Quantity Won*Final Price

Total Fee= Quantity Won*Fee per credit

Amount Owed from Pennvest= Amount - Total Fee

SU-P-12 - Susquehanna Phosphorus 2012

Winning bids									
Credit: PO-N-14	Bid Price ($)	Bid Quantity	Bid Type	Final Price ($)	Quantity Won	Amount	Fee Per credit	Total Fee	Total Amount Owed to Pennvest ($)
	2.00	2,000.00	PARTIAL	0.00	0.00	0.00	0.025	0.00	0.00

Amount=Quantity Won*Final Price

Total Fee= Quantity Won*Fee per credit

Amount Owed to Pennvest= Amount + Total Fee

SU-P-12 - Susquehanna Phosphorus 2012

Settlement Process

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Definition: Auction Settlement Price

The definition for settlement price is listed in the PENNVEST Nutrient Credit Clearinghouse

Rulebook (Version 7) on page 43:

- The settlement price is calculated on a **weighted average** basis between the **lowest bid** and

  highest offer prices that either **cross or touch** in the auction.

Example

Only Matched Quantities are included in calculations

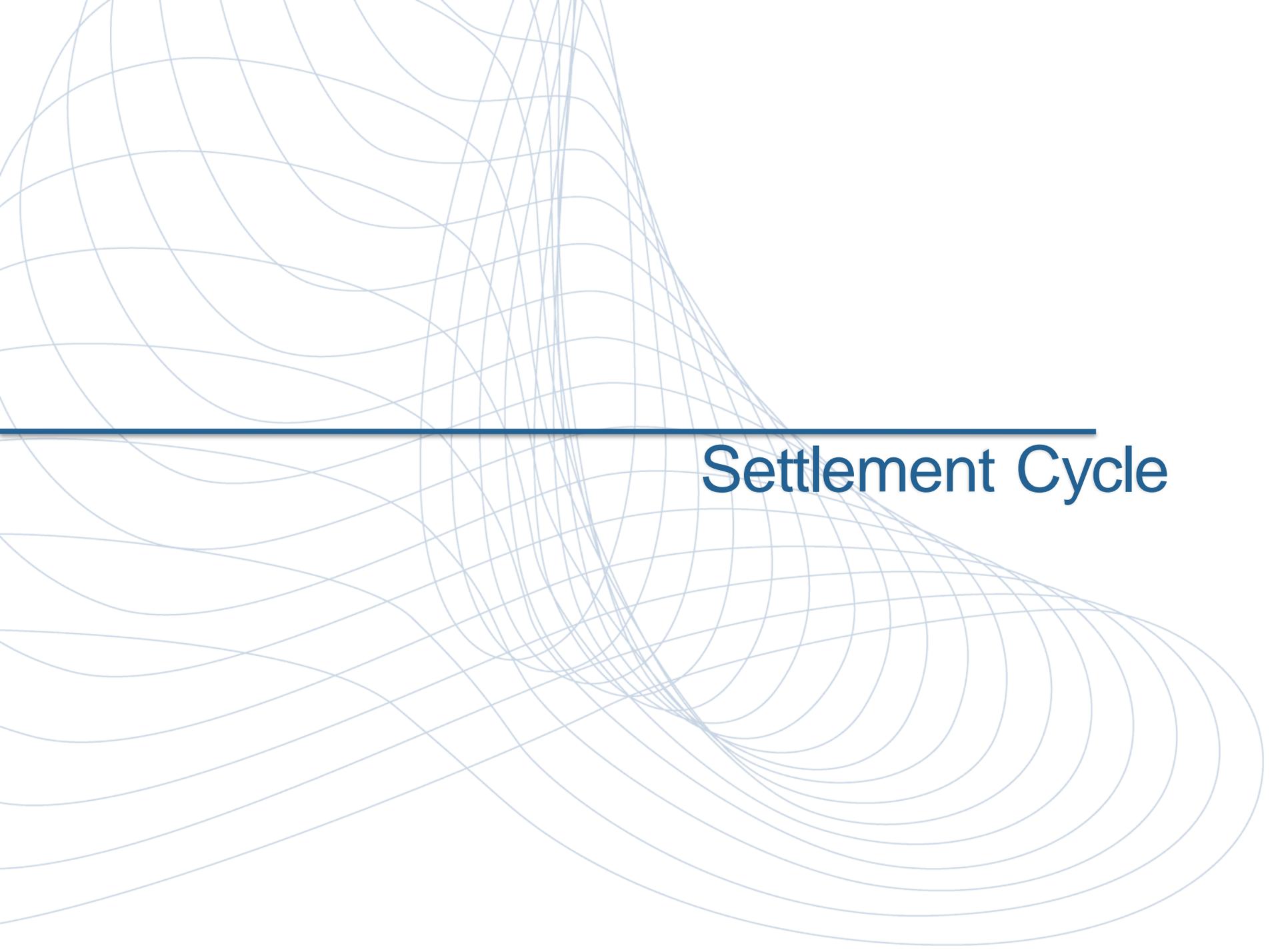| Buyers		Bid Price	Quantity	Matched/ Quantity Won	Amount	Fee per credit $0.025	Total Amount Owed to PENNVEST
bid 1	partial	$3.40	70000	70000	$ 133,700	$ 1,750	$ 135,310
bid 2	partial	$3.03	40000	40000	$ 76,400	$ 1,000	$ 77,320
bid 3	partial	$2.49	10000	10000	$ 19,100	$ 250	$ 19,330
bid 4	partial	$2.38	90000	90000	$ 171,900	$ 2,250	$ 173,970
bid 5	partial	$2.13	70000	20000	$ 38,200	$ 500	$ 38,660
bid 6	partial	$1.20	10000		$ -		Unmatched Bid

Sellers		Offer Price	Quantity	Matched/ Quantity Won	Amount	Fee per credit $0.025	Total Amount Owed by PENNVEST
offer 1	partial	$0.80	20000	20000	$ 38,200	$ 500	$ 37,660
offer 2	partial	$1.50	90000	90000	$ 171,900	$ 2,250	$ 169,470
offer 3	partial	$1.63	90000	90000	$ 171,900	$ 2,250	$ 169,470
offer 4	partial	$1.76	30000	30000	$ 57,300	$ 750	$ 56,490
offer 5	partial	$2.56	80000		$ -		Unmatched Offers
offer 6	partial	$2.73	80000		$ -		

Settlement: (2.13*20000+1.76*30000/(20000+30000) = $1.91

Winners

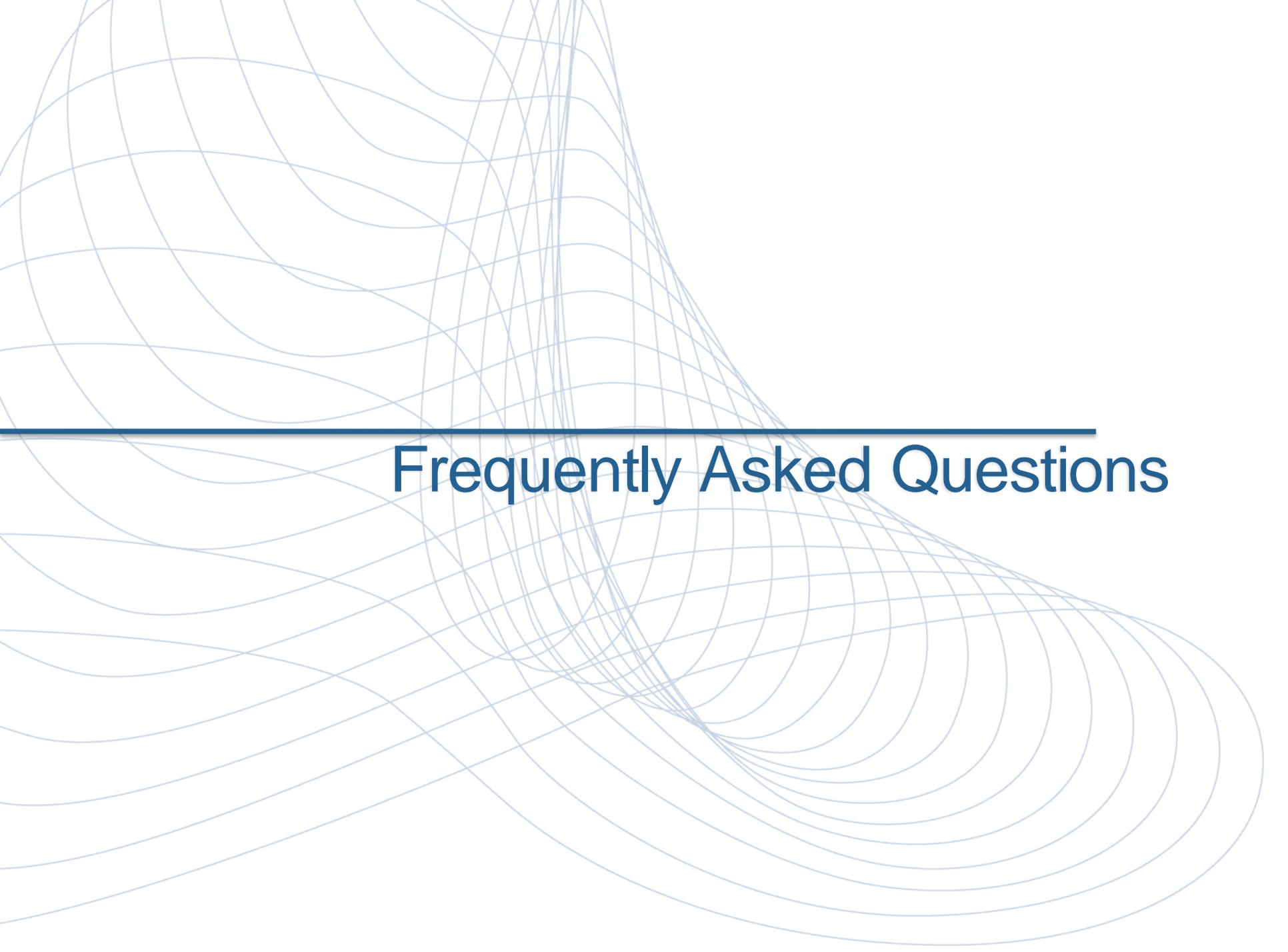Lowest bid price   Lowest bid quantity   Highest offer price   Highest offer price quantity

The settlement price is calculated on a **weighted average** basis between the **lowest bid** and **highest offer prices** that either **cross or touch** in the auction.

Settlement Cycle

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Post – Nov 2nd Auction

Markit transfers MATCHED credits into the Pennvest Settlement Account on Markit Environmental Registry

According to each Seller's delivery schedule:

Certified credits become verified.

DEP will provide registration numbers and PENNVEST will deliver in accordance with the Sales/Purchase agreements

Frequently Asked Questions

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Q: How much should I offer my credits for?

A: While PENNVEST and Markit are unable to consult on pricing your credits, results from previous auctions are available on Markit's website: http://www.markit.com/Product/Pennvest

Q: What is the difference between listing my credits as "ALL/NONE" or "PARTIAL"?

A: The way you list your credits will determine how they are matched. Credits that are listed as "ALL/NONE" will only be sold or purchased if the entire quantity can be sold or purchased, while credits that are listed as "PARTIAL" will be matched up to the amount that is available.

Q: How is it that my offer price was lower than the final settlement price but I wasn't successful?

A: The final settlement price is the weighted average between the lowest bid and the highest offer. Therefore, it's possible your offer, while being below the settlement price, doesn't fit within the range calculated for the quantities matched based on bids submitted.

Markit Counterparty Manager (MCM) and Markit Registry:

- www.markit.com
- Click on "LOG IN" box in upper right-hand corner [LOG IN]

PENNVEST Nutrient Credit Trading Program:

- For historical auction results, auction timeline, training materials, please visit: http://www.markit.com/Product/Pennvest

Markit Environmental Auctions Team:

- environmental.auctions@markit.com
- Telephone: 917-441-6668

Thank you.

markit mines data
pools intelligence
surfaces information
enables transparency
builds platforms
provides access
scales volume
extends networks
& transforms business.

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