COMMERCIAL AND INDUSTRIAL ENERGY EFFICIENCY AUCTION PROGRAM REVIEW

PRESENTATION TO THE ENERGY WASTE REDUCTION COLLABORATIVE

MAY 16, 2017

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NAVIGANT

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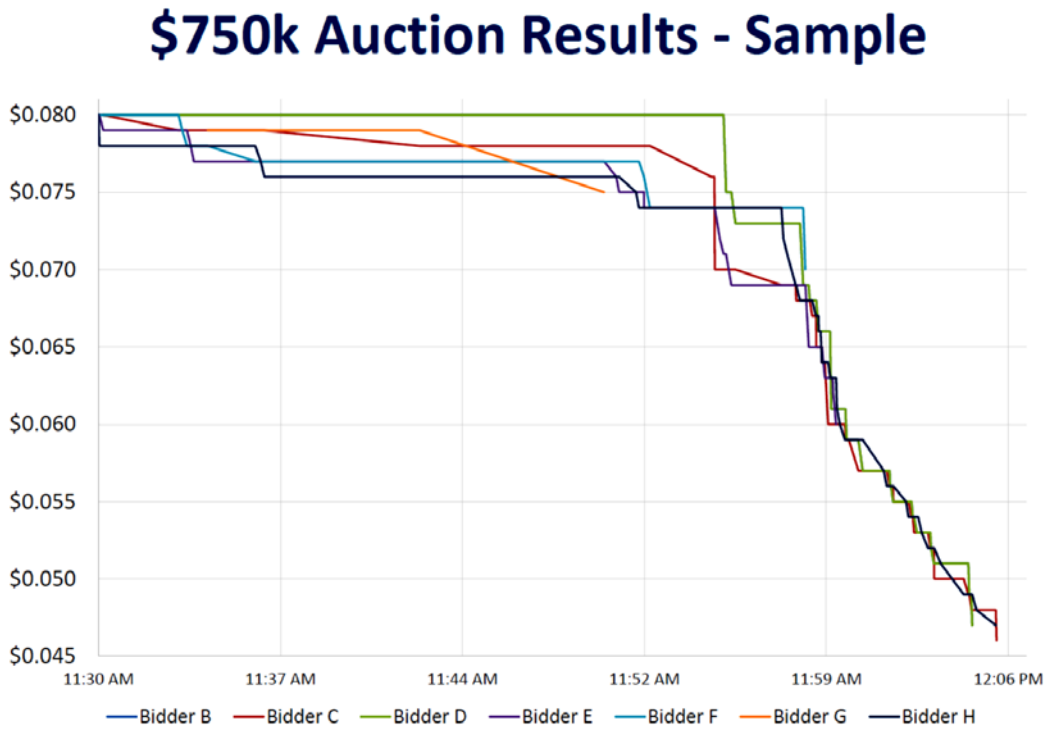
C&I Energy Efficiency Auction Program Review

Energy Efficiency Auctions, also known as reverse auctions, are designed to reduce the cost of delivering electric and gas savings and identify the customers' minimum acceptable incentive amount.

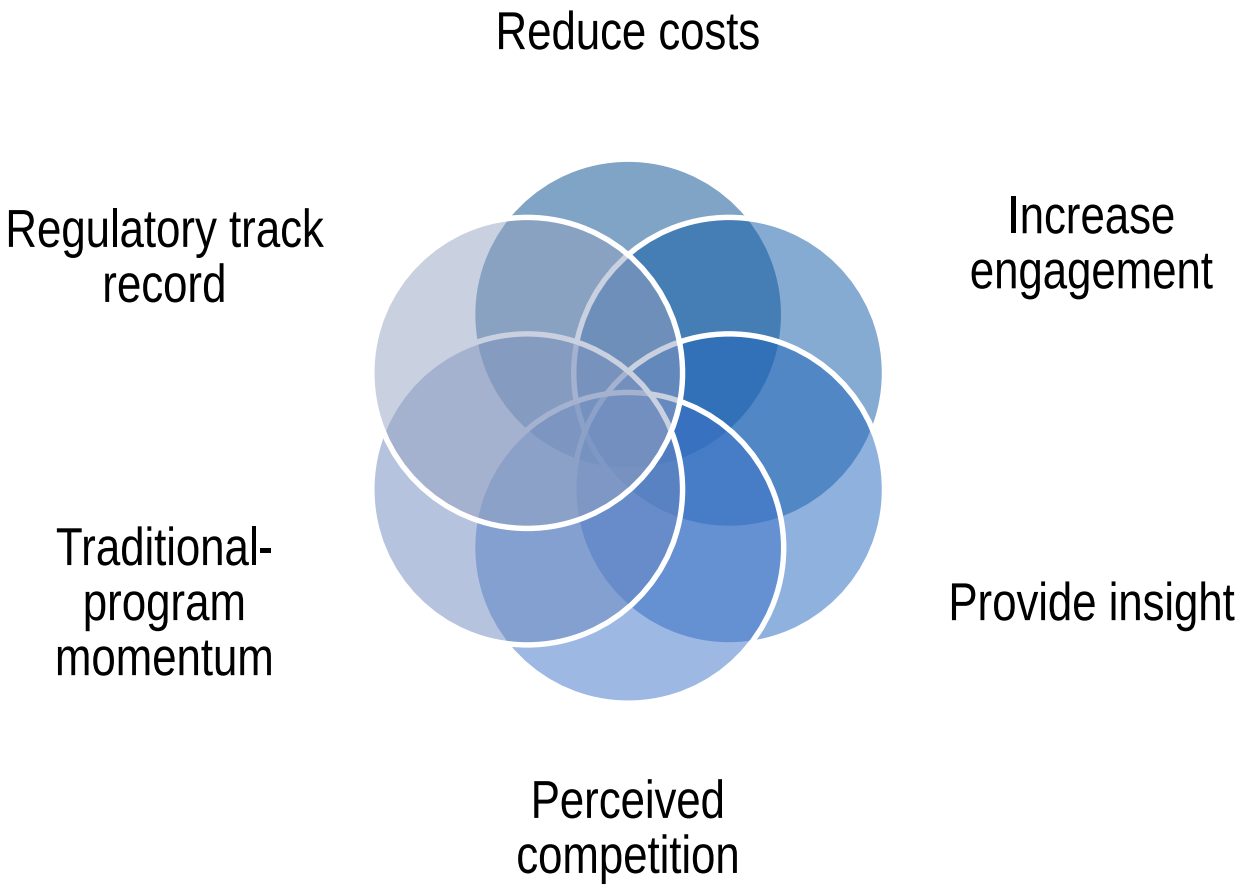
- The bidding process starts with an established maximum incentive per kWh and/or therm.
- Pre-qualified participants bid down the incentive to a level at which they are willing to complete the energy efficiency project(s).
- Customer competition for incentives identifies the market-based, minimum acceptable incentives for different measures reducing overall costs.
    - Overlay Consulting estimates a 40% reduction in incentive and marketing costs for utilities.
- Can be integrated into existing Custom programs, providing an opportunity for incentivizing large capital projects that may be underserved by existing incentive structures.

Figure 1-1. C&I ENERGY EFFICIENCY AUCTION PROGRAM REVIEW: Example Auction Results



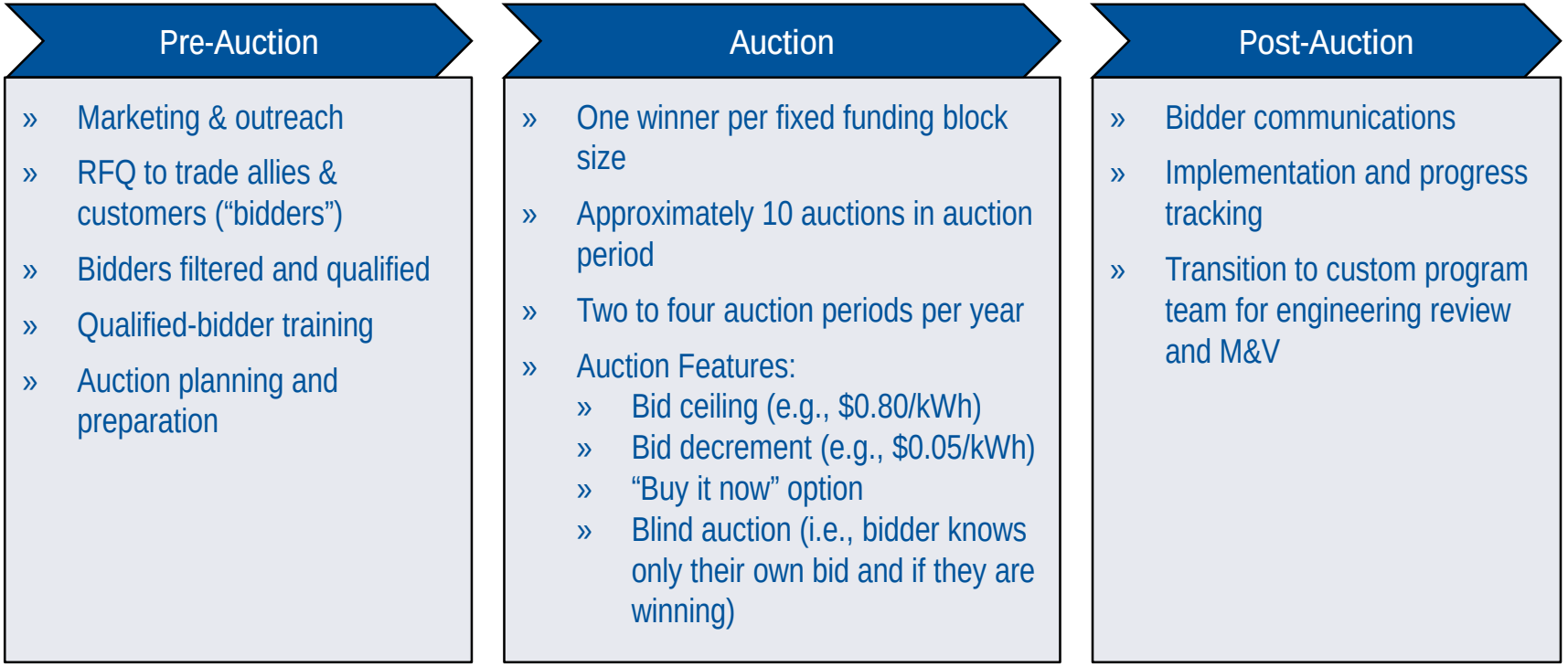
Source: Rybalt, Angie. "Bid to Win Reverse Auction Program." Presentation at the 25th Annual Meeting of the Association of Energy Services Professionals (AESP). 11 Feb. 2015.

Energy Efficiency Auctions innovatively reduce program delivery costs while integrating with existing program approaches. These programs also deviate dramatically from business-as-usual, introducing some key, but addressable, concerns and risks.



Auction programs typically have three stages and are similar to an eBay auction, where participants have to establish an account (pre-qualification), participate in an auction, and, if they win, proceed to implementation.

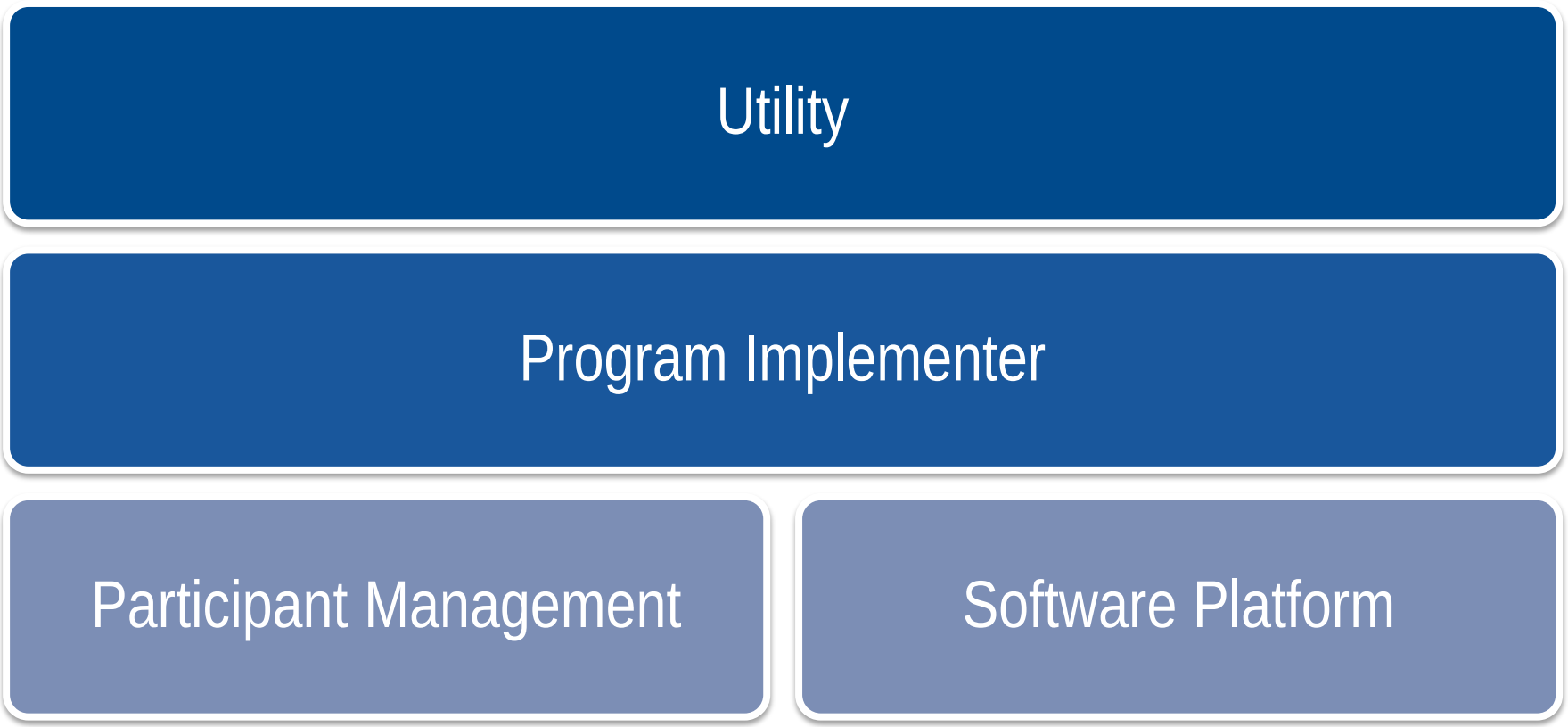
Figure 2-1. C&I ENERGY EFFICIENCY AUCTION PROGRAM REVIEW: Example Energy Efficiency Auction Process



Source: Navigant

Stakeholder buy-in and management is a key component to the operation of Energy Efficiency Auction programs.

Figure 2-2. C&I ENERGY EFFICIENCY AUCTION PROGRAM REVIEW: Utility-Program Implement Relationship Example



Source: Navigant

Marketing and outreach can target a variety of program participants, trade allies, and market delivery partners.

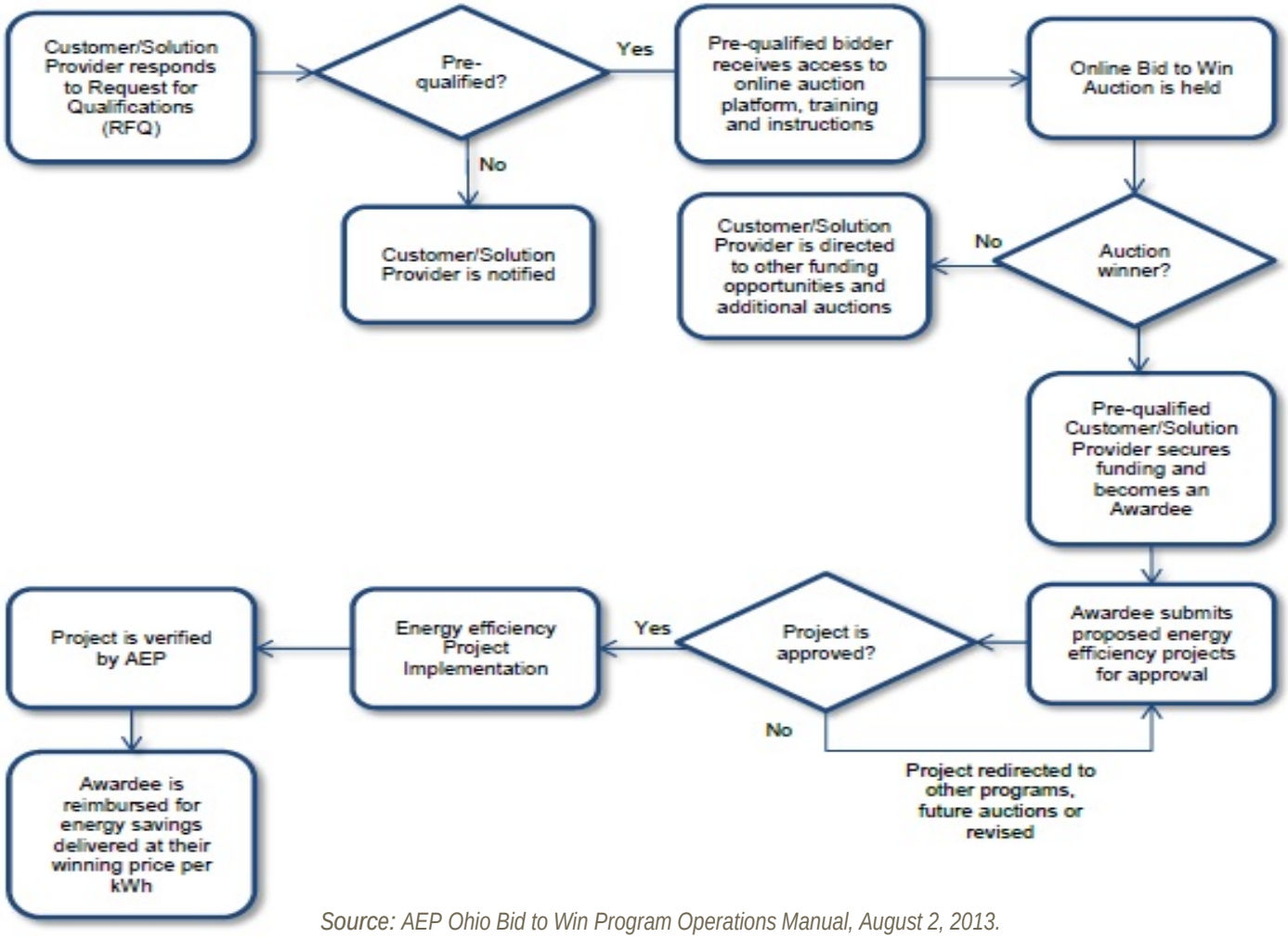
Figure 2-3. C&I ENERGY EFFICIENCY AUCTION PROGRAM REVIEW: Customer and Trade Ally Types Targeted by Energy Efficiency Auction Programs

Targeted Sectors	Targeted Bidders	Key Market Delivery Partners
Commercial Customers	Energy Service Companies (ESCOs)	Customer Associations
Industrial Customers	Installation Contractors	Trade Associations
	Engineering and Consulting Firms	Manufacturers and Retailers
	Eligible Customers	Account Managers

Source: Navigant

The process of moving customers and trade allies through an Energy Efficiency Auction involves coordination and planning, where the program implementer works closely with the participant and the utility to ensure success.

Figure 2-4. C&I ENERGY EFFICIENCY AUCTION PROGRAM REVIEW: AEP Ohio Bid to Win Program Process Map

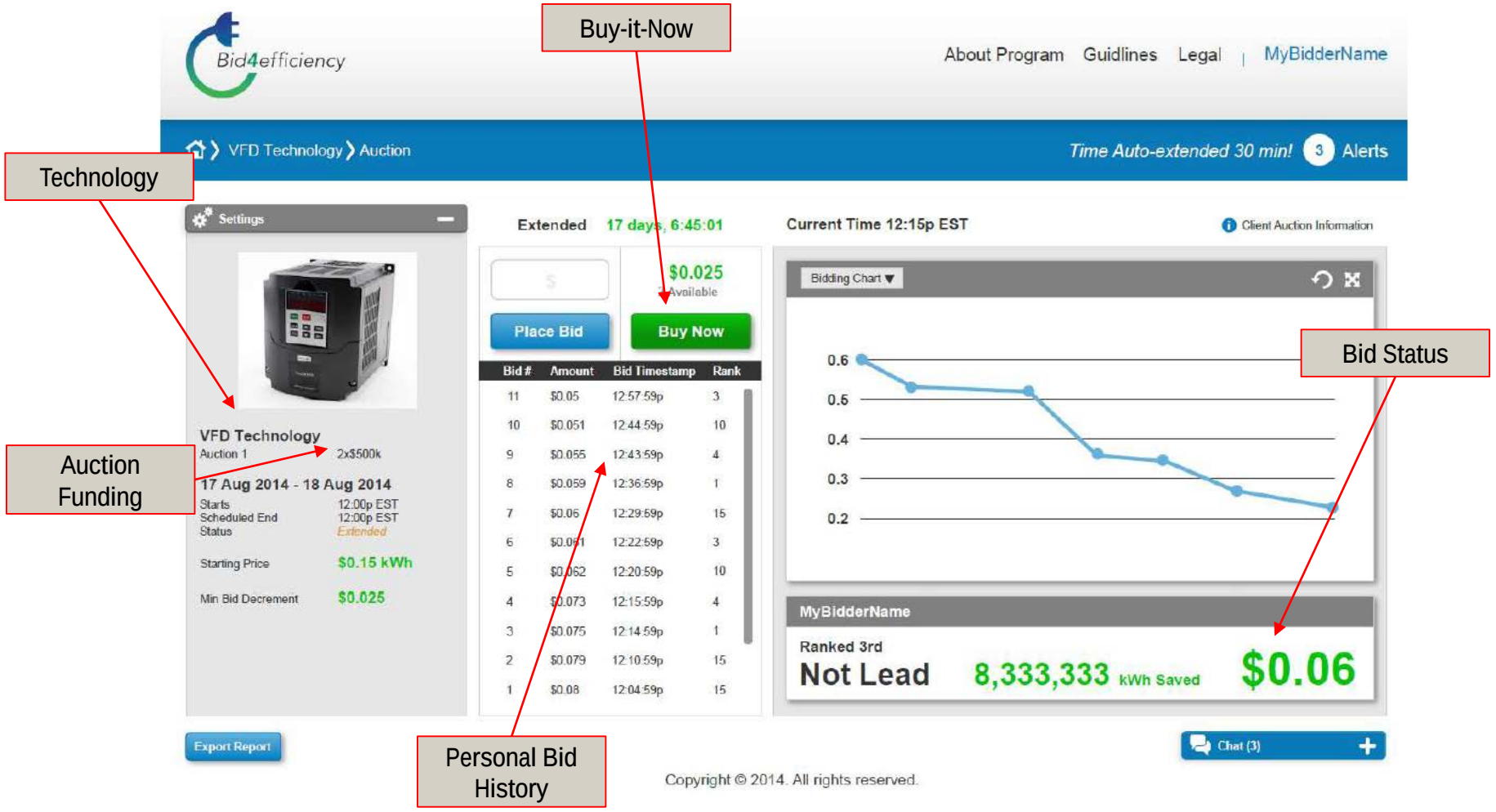


Source: AEP Ohio Bid to Win Program Operations Manual, August 2, 2013.

AEP Ohio's Bid to Win program established a process map early on in the program to identify steps participants should follow while moving through the program. This allows for coordination of program channeling for those who fail to be pre-qualified for the auction as well as for "near-participants," who do not win their auctions.

AEP Ohio uses a platform that is similar in many ways to eBay, but utilizes a blind-auction approach and provides bidders with personal bid history information, bid status, auction details, and a "Buy-it-Now" option.

Figure 2-5. C&I ENERGY EFFICIENCY AUCTION PROGRAM REVIEW: AEP Ohio's Bid4efficiency Auction Platform



Source: Rybalt, Angie. 2015. "Bid to Win Reverse Auction Program." Presentation at the 25th Annual Meeting of the Association of Energy Services Professionals (AESP). 11 Feb. 2015.

In researching Energy Efficiency Auctions at other utilities, Navigant found awareness and flexibility are two keys to success.

The Navigant team recommends the following best practices:

Figure 3-1. C&I ENERGY EFFICIENCY AUCTION PROGRAM REVIEW: Best Practices

Lesson Learned	Description
Broad awareness is vital to good participation, which in turn is vital to successful auctions	• **Validate the goals/objectives** upon which the program is based. Understand clearly if target customers are actually underserved and if this is the right approach. • **Emphasize education and awareness** – take the appropriate time for marketing and outreach up front; higher bid volume will drive down bid prices and assure that the best, committed bidders succeed. • **Do not rush** program implementation - only initiate first auction after developing sufficient awareness and buy-in of potential participants and trade allies. • **Minimize requirements** – restrictions only serve to reduce the size of the bidder pool. Include both medium and large C&I customers.
Flexibility in auctions is key to participation and customer interest	• Host **more auctions** with different size funding blocks – this enables bidders to align auctions with project size. • Utilize **technology-specific auctions** (assuming each auction is based on a set incentive bucket size).

Energy Efficiency Auction Programs can reduce the costs of delivering energy efficiency to customers, while also allowing for flexibility in tailoring program options to meet customer needs.

Navigant's review of Energy Efficiency Auction programs revealed several key findings:

Figure 3-2. C&I ENERGY EFFICIENCY AUCTION PROGRAM REVIEW: Key Findings

C&I Energy Efficiency Auction Program Review
Energy Efficiency Auctions reduce costs of delivering energy efficiency to customer by driving down the cost of energy savings. AEP Ohio reduced incentive levels by a much as 63% via reverse auctions.
Reverse Auction programs provide insight into customer buying decisions and cost hurdle rates that make projects cost effective for customers. Customers' bids in the auction tell utilities what incentive levels will make a measure cost effective and drive a customer or trade ally to do the project.
Program design allows for increased engagement with customers and trade allies. The auction process allows utilities to more closely engage with large customers having engineers on staff through the auction process. Engagement with trade allies during the qualification process will build stronger relationships and help assure quality delivery.
Energy Efficiency Auction programs open new doors to saving energy by allowing for flexibility in program offerings. Programs can address various measure types and end-uses, allow the bundling of measures, and can account for measure life in auction offerings.
Perceived competition among program implementers can limit project channeling. Working to build buy-in among stakeholders can diminish internal competition and enable the movement of customers towards the "correct" program types to generate savings.

Navigant reviewed several Reverse Auction or Energy Efficiency Auction programs to provide a sense of other programs operating across the country.

Navigant reviewed the following programs:

- AEP Ohio
- Con Edison of New York
- Energizing Missouri
- Focus on Energy - Wisconsin
- Hawaii Energy

AEP Ohio

AEP OHIO unit of American Electric Power

Bid4efficiency Program

Program Period: August 2014 - Present

Requirements:

- AEP Ohio customers using over 200,000 kWh per year or a registered Solution Provider
- Pre-qualification (customers or service providers) and mandatory training and mock auctions
- Project Types: Standard Prescriptive, Custom, New Construction, Retrofit Early Retirement (RET), and Replace on Burnout/End of Natural Life (ROB)
- Any project size

Structure:

- Bidding starts at ceiling price = $0.08/kWh saved
- 1 auction per block – each block differs by dollar value and by measure (e.g., $500,000 for VFDs)
- Bidders can only win one auction
- "Buy it Now" and "Auto Low Bid" options
- Non-winning bidders are offered a default incentive rate 10-20 percent lower than the lowest winning bid
- Winners that achieve 80% or more of total awarded auction incentive amount receive a $0.005 per kWh bonus
- Software platform by Overlay Consulting

Outcomes:

- 37 auctions covering $15 million in incentives
- Average incentive cost of $0.034 per annual kWh saved
- Average incentive cost that is 32% lower than Custom Program and 63% lower than Prescriptive Program
- Realized 50+ gigawatt hours in gross unverified annual energy savings and 30% of savings for entire C&I portfolio

Current Status: Ongoing. Bid4efficiency is positioned to channel participants across the C&I portfolio and was the recipient of the 2016 MEEA Inspiring Efficiency Innovation Award.

Source: https://aepohio.com/save/business/programs/EnergyEfficiencyAuction/

AEP Ohio

AEP OHIO unit of American Electric Power

Bid to Win Program

Program Period: October 2013-January 2014

Requirements:

- Pre-qualification (customers or service providers)
- Project size: 3 GWH or higher
- Project Types: New Construction, Retrofit Early Retirement (RET), and Replace on Burnout/End of Natural Life (ROB)
- EUL ≥ 10; Payback ≥ 10 year

Structure:

- Bidding starts at ceiling price = $0.08/kWh saved
- 1 auction per block – block sizes vary

Outcomes:

- 3 auctions covering $4.2 million in incentives
- $0.053 average winning bid (7 bidders)

Challenges:

- Not enough qualifying customers
- Qualifying services providers already well served
- Winning bid worse than price in normal program
- Because these customers were already served by the Custom Program, they were redirected there to get better incentives by their service providers.

Current Status: Closed

Source: https://www.aepohio.com/info/news/viewRelease.aspx?releaseID=1485

Con Edison of New York

Brooklyn Queens Demand Management (BQDM) Demand Response (DR) Auction

Program Period: 2016-2018

Funding: $200 million in incentives to defer nearly $1 billion in capital upgrades to build a new substation

Program sought to reduce peak load by 52 MW in the BQDM area

Requirements:

- DR providers had to have ability to:
  - Systems – receive and send event notifications and submit enrollments electronically
  - Portfolio – enroll at a minimum 50 kW across their portfolio
  - Financial – meet certain financial requirements since the program had financial penalties to achieve the desired MW reductions
- Pre-qualification and selection of bidder type (i.e., Mutually Exclusive or All-or-Nothing)
- Solution Types: Curtailment, Generation, or Energy Storage
- Bidders could bid on "products" periods of time to reduce demand (e.g., 8 p.m. – 12 a.m.)

Auction:

- Each bid quantity was constrained by a minimum of 50 kW and a maximum of 2,000 kW
- Accepted offers for 22 MW of peak hour DR from 10 providers
- Payments ranged from $215/kW/year to $988/kW/year depending on the amount of power reductions and the demand management technology used

Current Status: Ongoing

Sources: Bradley, Dan. 2016. "Minimizing Distributed Energy Resources (DER) Acquisition Cost Through Auctions. Presentation at the 34th PLMA Conference Distributed Energy Resource Integration Interest Group. 7 Nov. 2016.

Energize Missouri

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Best Price Efficiency Program

Program Period: 2010/2011

Funding: $3,000,000 – American Recovery and Reinvestment Act of 2009 (ARRA) funded

Administered by the Missouri Department of Natural Resources

Evaluation:

- Savings: 63,954,187 kWh
- Grants: $2,315,566
- Average cost: $0.0362/kWh saved
- Projects: 1,067

Auction:

- 3 reverse auctions, 16 winning providers – have 2 years to identify and complete projects
- Pricing:
  - Two blocks at $500,000 at average of $0.0325/kWh saved
  - Four blocks at $250,000 at average of $0.0286/kWh saved
  - Ten blocks at $100,000 at average of $0.1062/kWh saved

Current Status: Closed

Sources: http://www.mwalliance.org/node/1267
http://energy.mo.gov/energy/docs/ARRASEPMissouriFinalReport.pdf

Focus on Energy - Wisconsin

Focus on Energy and Wisconsin Public Service Trade Ally Bonus Bid

Program Period: August – November 2012

Funding: $2,000,000 – solely as a bonus (above and beyond existing incentives)

Included efficiency and renewables

Pricing:
- Efficiency ceiling: $0.15/kWh
- Renewables ceiling: $0.60/kWh

Target customers:
- Industrial up to 1,000 kW
- "Main Street" up to 500 kW

Auction:
- 2 auctions for industrial/main street with $1.2 million total awards across 8 winners
- 2 auctions for renewables with $800,000 in awards across 5 winners

Project completion required within 12 months

Current Status: Closed

Sources: *https://focusonenergy.com/sites/default/files/supporting_documents/WPS_BonusBid_Program_Guidelines.pdf*
https://focusonenergy.com/wps/business/bonus-bid

Hawaii Energy

Hawaii Energy Efficiency Auction
Program Period: August 2014 – May 2015
Funding: $2.1 million with $977,000 allotted for residential projects and $1.14 million earmarked for commercial projects
Bidders had to propose projects designed to reduce energy consumption and meet one or more of the following criteria: » Improved Cost-Effectiveness: Projects that are more cost-effective than existing Hawaii Energy offering in both first year and lifetime energy savings » Increased Penetration of Market Segments: Projects that address needs in high energy consumption and/or hard-to-reach areas » Mass-Installation: Projects that result in a mass installation of energy-efficient technologies » New and Innovative: Innovative projects that are not currently being incentivized by Hawaii Energy
Target customers: » Contractors, developers, energy efficiency solution providers, energy service companies, energy vendors, and property managers » Small businesses, restaurants, residents in smart metered neighborhoods, and educational institutions
Auction: » Hawaii Energy received over 60 applications and 4 applicants were selected (one residential and three commercial) and were estimated to save more than 8.14 million kWh during the first year with an estimated energy savings of more than $2.03 million based on an average residential and commercial rate of $0.28/kWh » Applicants not selected were evaluated for other potential financial incentives offered by Hawaii Energy
Current Status: Closed

Sources: *https://hawaiienergy.com/images/Auction/documents/HawaiiEnergyAuctionFAQ.pdf*
https://hawaiienergy.com/for-contractors/auction/138-cea-intro-3

The goal of impact evaluation for C&I reverse auction programs, in addition to comparison with filed regulatory targets, is to verify the contracted $/kWh has been fulfilled.

An auction program may be expected to have a larger scope and more complex measures than typical custom projects. Customers bid to the lowest $/kWh, and then are responsible for implementing the implied kWh savings based on the amount of the incentive reward. Customers are paid upon validation of the savings.

Impact evaluations for C&I reverse auction programs are consistent with custom evaluations. Since the aggregate scope of auction projects may be larger and more complex than average custom projects, metering of power and proxy variables to reduce uncertainties such as baseline conditions, as well as interval data analysis, would be expected for auction impact evaluations.

Figure A-1. C&I ENERGY EFFICIENCY AUCTION PROGRAM REVIEW: Impact Evaluation

To reduce risks associated with project non-performance and assure the contract $/kWh saved:

- It is recommended to meter and thoroughly document the baseline for large projects in an auction program, to reduce the uncertainty in the savings calculation
- It is recommended that the implementer should have substantial custom experience and employ a high degree of rigor in verifying the projects

International Performance Measurement and Verification Protocol (IPMVP) Option B (power metering) or Option C (billing or interval data analysis) are typical impact evaluation approaches for projects with large aggregate savings[1]

Source: Navigant

[1]International Performance Management and Verification Protocol (IPMVP). http://evo-world.org/en/

Several strategies can be employed to assess Energy Efficiency Auction programs from a process research perspective.

Process evaluation research of Energy Efficiency Auction programs involves a number of stages of analysis based on the flow of the program.

Pre-Approval
Programs typically require participants to become pre-approved to participate, which requires the potential participant to complete a program application and provide supporting documents assuring the program that the potential participant is capable of completing a project and in some cases already has a project idea in mind.

Auction
Customers and trade allies that become pre-approved are subject to auction training and practice prior to participating in the auction, where they become bidders. During training, web usability research can help inform program processes and improve auction functionality and competition. Those who fail to win their auctions can be referred to as "near-participants," who can provide insights into program spillover and channeling.

Implementation
Those who win their auctions become "participants," who typically take part in additional training to prepare for the implementation stages of the program and can provide a comprehensive look at the program operations.

Process Evaluation activities should at a minimum include:

- Interviews with Utility Program Staff
- Interviews with Implementation Contractors
- Review of Program Marketing and Training Materials
- Creation/Review of Program Theory and Logic Model

Process Evaluation activities may also include:

- Near-Participant Surveys
- Web Usability Study of Auction Participants
- Participant Interviews