All-Source Competitive Solicitations: State and Electric Utility Practices

Presented by Dr. Fredrich Kahrl, 3rdRail Inc.
Lisa Schwartz, project manager and technical editor
Berkeley Lab Electricity Markets and Policy Department

Public Webinar - April 8, 2021
Disclaimer
This presentation was prepared as an account of work sponsored by the United States Government. While this presentation is believed to contain correct information, neither the United States Government nor any agency thereof, nor The Regents of the University of California, nor any of their employees, makes any warranty, express or implied, or assumes any legal responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by its trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or The Regents of the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof, or The Regents of the University of California.

Ernest Orlando Lawrence Berkeley National Laboratory is an equal opportunity employer.

Copyright Notice
This presentation has been authored by an author at Lawrence Berkeley National Laboratory under Contract No. DE-AC02-05CH11231 with the U.S. Department of Energy. The U.S. Government retains, and the publisher, by accepting the article for publication, acknowledges, that the U.S. Government retains a non-exclusive, paid-up, irrevocable, worldwide license to publish or reproduce the published form of this manuscript, or allow others to do so, for U.S. Government purposes.
Webinar logistics


- We're recording the webinar and will post the recording at the link above.

- Because of the large number of participants, everyone is in listen mode only.

- **Please use the Q&A box** to send us your questions and comments any time during the webinar.

- Moderated Q&A will follow the presentation.
Acknowledgments*

Thanks to the following Advisory Group members for our Future Electric Utility Regulation series for reviewing a draft of this report:

Chair Jeffrey Ackermann (Colorado Public Utilities Commission), Jan Beecher (Institute of Public Utilities, Michigan State University), Steve Corneli (Strategies for Clean Energy Innovation), Jordy Fuentes (Arizona Residential Utility Consumer Office), Steve Kihm (Slipstream), Kristin Munsch (National Grid), Delia Patterson (American Public Power Association), Rich Sedano (Regulatory Assistance Project), Chair Ted Thomas (Arkansas Public Service Commission) and Jordan White (Western Electricity Coordinating Council)

Thanks also to additional reviewers:

Elaine Ulrich and David Meyer (U.S. Department of Energy); Sydney Forrester, Chuck Goldman, Pete Larsen and Andy Satchwell (Berkeley Lab); Julie Baldwin and Jesse Harlow (Michigan Public Service Commission); Anna Sommer (Energy Futures Group); and Tim Woolf (Synapse Energy Economics)

The U.S. Department of Energy’s Grid Modernization Initiative supported this work with funding from the Office of Electricity and the Office of Energy Efficiency and Renewable Energy—Solar Energy Technologies Office.

*Affiliations as of report completion in June 2020
Future Electric Utility Regulation Series

Distributed Energy Resources (DERs), Industry Structure and Regulatory Responses

Distribution Systems in a High DER Future: Planning, Market Design, Operation and Oversight

Performance-Based Regulation in a High DER Future

Distribution System Pricing With DERs

Recovery of Utility Fixed Costs: Utility, Consumer, Environmental and Economist Perspectives

The Future of Electricity Resource Planning

The Future of Centrally-Organized Wholesale Electricity Markets

Regulatory Incentives and Disincentives for Utility Investments in Grid Modernization

Value-Added Electricity Services: New Roles for Utilities and Third-Party Providers

The Future of Transportation Electrification

Utility Investments in Resilience of Electricity Systems

Renewable Energy Options for Large Utility Customers

Reports, webinar slides and recordings at feur.lbl.gov

Next topic: Equity in utility regulatory decision-making
About the Author

Dr. Fredrich Kahrl is an independent researcher and consultant. He has worked with North American regulators and utilities on a range of critical issues facing the electricity industry, including grid modernization investment economics, distribution system platforms and markets, wholesale market design and evaluation, resource planning, retail rate design, and resource adequacy program design. Previously, he was a Director at the consulting firm Energy and Environmental Economics (E3). He holds Ph.D. and M.S. degrees in Energy and Resources from the University of California, Berkeley, and a B.A. in Philosophy from the College of William & Mary.
Report Overview

► Describes principles, practices, and emerging issues in all-source competitive solicitations by vertically integrated utilities
  ▪ Includes utilities that participate in markets run by a regional transmission organization/independent system operator and those that do not
    • Does not cover publicly owned utilities or rural coops
► Focuses on procurement to meet bulk power system needs
► Also describes competitive solicitation practices for non-wires alternatives for distribution system needs
  ▪ Needs identification, procurement process, evaluation and project selection, and outcomes from recent solicitations
All-Source Competitive Solicitations

- **All-source**: All potential resources can participate in the solicitation.
- **Competitive**: All sellers meeting minimum eligibility criteria, including utilities and their affiliates, can participate in the solicitation.
- *Report does not seek to adjudicate what is and is not “all-source” or “competitive”*

---

**Diagram:**

- **Market-based portfolio of new resources, from among a range of resource types**
  - All-source competitive solicitation
  - Customer programs administered by utilities and third parties

- **New resource portfolio, based on targeted amounts of specific types of resources from integrated resource plan**
  - **Renewable resources**
  - **Dispatchable generation resources**
  - **Energy storage resources**
  - **Distributed energy resources**

---

**All-Source Competitive Procurement**

**Limited-Source Resource Acquisition**
Key Takeaways (1)

► **State PUCs play a critical role in building confidence in the fairness and integrity of the solicitation process.** Achieving a competitive process with innovative offers requires thoughtful design and implementation.

► **Utility resource plans provide a foundation for all-source solicitations.** It’s important to consider how resource plans and all-source procurement will interact.

► **All-source competitive procurement can complement state energy policies.** Moving to technology-neutral procurement is not intended to supersede state energy goals.

► **Net value is a more important metric than cost in evaluating bids.** Utility resource evaluations must compare technologies with very different operating characteristics.

► **Ongoing efforts are needed to improve bid evaluation methods.** Methodological challenges include capacity credit, value of real-time flexibility, congestion management, transmission and distribution (T&D) deferral, and natural gas price risk.
Key Takeaways (2)

► New opportunities are emerging for participation of distributed energy resources (DERs) in all-source solicitations. Still, utility DER programs will remain an important procurement mechanism.

► Unique evaluation challenges for energy storage warrant systematic analysis by utilities. States can require utilities to ensure they are capturing the full benefits of storage.

► Ensuring comparable evaluation between utility-owned and non-utility-owned resources presents ongoing challenges for public utility commissions. Three key challenges to creating a level playing field are debt equivalence, development and performance risks, and contract length.

► For investor-owned utilities, independent evaluators (IEs) play essential roles in all-source solicitations. IEs help ensure that solicitation and selection processes are objective and impartial.
Historical Perspective and Current Trends

► All-source competitive procurement first emerged in the 1980s, as a response to the federal Public Utility Regulatory Policies Act (PURPA).

► Some states have required utilities to use all-source competitive solicitations for decades.

► Recent increased interest in all-source competitive solicitations is driven by rapid technological change:
  ■ Technology cost uncertainty
  ■ Steep declines in solar, wind, and battery costs
  ■ Portfolio effects of wind, solar, and energy storage
  ■ Renewed interest in demand-side resources
Range of cost estimates based on a screening study for Northern Indiana Public Service Company’s (NIPSCO’s) 2016 IRP (blue bars) and average bid prices for asset sale/option in NIPSCO’s 2018 all-source competitive solicitation (orange dots)

- **Wind:** $1,457/kW
- **PV:** $1,151/kW
- **PV + storage:** $1,183/kW
- **CCGT:** $960/kW
Trends: Adapting to an Evolving Market

Responses to requests for proposals (RFPs) for Public Service Company of Colorado’s (PSCo’s) all-source solicitations in 2013 and 2017. The 2017 results illustrate the emergence of solar PV, storage, and innovative hybrid resources—pairings with storage.
Storage: An Emerging Resource

Storage is not new to utility planning and procurement.
- Pumped storage and, to a lesser extent, flywheels and compressed air energy storage

Recent interest is driven by declining battery costs and expanding functionality.

Storage has unique characteristics, especially batteries.
- Short lead time, modularity, siting flexibility, operational flexibility, T&D substitute, energy limits

Storage functionality and value are not always well captured in utility resource evaluations.

Hybrid resources are creating new evaluation challenges.

Example Storage Values

<table>
<thead>
<tr>
<th>Energy arbitrage</th>
<th>Ancillary services</th>
<th>Capacity</th>
<th>Reliability and resilience</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Traditional energy price arbitrage</td>
<td>- Frequency regulation</td>
<td>- System resource adequacy</td>
<td>- Backup generation</td>
</tr>
<tr>
<td>- Day-ahead and real-time price arbitrage</td>
<td>- Operating reserves</td>
<td>- Local/zonal resource adequacy</td>
<td></td>
</tr>
<tr>
<td>- Congestion management</td>
<td></td>
<td>- Distribution</td>
<td></td>
</tr>
<tr>
<td>- Renewable energy integration</td>
<td></td>
<td>- Transmission</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The all-source competitive procurement process generally has five main steps.

- **Resource needs identification through utility resource plan**
- **RFP instrument design**
- **Offer evaluation and selection**
- **Contract negotiations**
- **Commission approval of results**

Commission requirements guide the process.
- Use of independent evaluators, stakeholder review, when utilities must use competitive procurement, timelines and deadlines for procurement process, requirements for RFP documents, and evaluation procedures and methods

Design of all-source competitive solicitations involves multiple tradeoffs.
- Including flexibility, transparency, timeline, and bidder requirements
Resource Needs Identification

Identifying resource needs for all-source solicitations is technology-neutral.
- Capacity, energy, reserves
- Other needs are difficult to meaningfully define \textit{ex ante}.

Capacity is typically the binding constraint.
- Interpretation of capacity varies
- Load-resource balance, including retirements

Additional information may be helpful to bidders
- Location
- Drivers of need

Actual procurement may differ from identified needs
- Some flexibility is helpful
RFP Instrument Design

► RFP instrument refers to the process, documents, and communications used to solicit resource offers.

► Key elements of RFP instrument design include:
  ◼ Documents and information for bidders
  ◼ Process and timeline
  ◼ Eligibility requirements
  ◼ Products solicited
  ◼ Confidentiality

► Many elements require careful design and consideration.
  ◼ Practices in other states can be a useful reference.

► Key considerations for all-source competitive solicitations include:
  ◼ Products — defining resource categories
  ◼ Eligibility — minimum size and types of DERs
Please use the Q&A box to send us your questions and comments any time during the webinar. We’ll address as many as we can following the presentation.
Offer Evaluation and Selection (1)

► Utilities consider price and non-price factors in evaluating bids.
  ■ Non-price factors may include development and contract risk, bidder financial viability, technology viability, policy compliance benefits, resource diversity, transmission system impact, resilience, environmental impact, and utility financial impact.

► Economic evaluation is a key challenge in all-source solicitations because of potential diversity of bids.
  ■ Different ownership structures and contract lengths
  ■ Resources with different operating characteristics
  ■ Different combinations of resources within the same bid (hybrids)
  ■ Bids for resources that are shaped or firmed with energy storage or energy market purchases

► Need for flexibility and judgment in evaluation is a key reason for using IEs.
Evaluating bids for resources with different operating characteristics requires a way to compare benefits and costs on an equivalent basis.

Net value (benefits – costs) is a more meaningful metric than cost.
- Utility models may already capture net value.

Two general approaches to modeling net value
- Portfolio expansion
- Net value evaluation

Net market value framework used in Southern California Edison’s 2013 all-source solicitation
Offer Evaluation and Selection (3)

► Models used in bid evaluations need ongoing enhancements to accurately capture the benefits and costs of emerging resources.

► Increasing emphasis on capturing value of energy storage
  ■ Focus on real-time prices, congestion, T&D capacity value

► Capturing variable energy generation requires higher spatial/temporal granularity in models, new approaches to assessing, and managing capacity value risk.

► Level of transparency for analysis of utility fuel price risk varies.
  ■ Balance between physical and financial hedging

Real-time market prices in MISO on 8/6/20
Procurement of Non-Wires Alternatives for Distribution Systems

- Targeted procurement of DERs may defer or avoid some distribution system capital expenditures.
  - DERs must be located at specified locations on the distribution system and operate at specified times.

- Solicitations for non-wires alternatives (NWAs) are typically all-source.
  - Eligible resources include all types of DERs: energy efficiency, demand response, distributed generation, and distributed energy storage.

- Ideally, NWA procurement is fully integrated into the distribution planning process.

- At scale, NWA procurement will interact with bulk system resource procurement.
  - Affects loads and resource values

Consolidated Edison’s capital planning process for non-wires solutions
Source: Consolidated Edison’s Distributed System Implementation Plan (2018)
Key Lessons from Non-Wires Procurement

► A growing number of utilities have held all-source solicitations for non-wires alternatives.
   ■ Utilities in California, New York, Rhode Island

► Actual procurement (MW) is still small but may grow with electrification. Battery cost declines may create new opportunities.

► Procurement of NWAs requires ongoing enhancements.
   ■ Improved distribution system data, forecasts, and time-sensitive values of DERs
   ■ New methods and tools for evaluating need and resource values
   ■ Better matching of solicitation process and developer lead times
   ■ More standardized contracts with greater clarity on performance risks and incentives
   ■ Support for DER aggregation
   ■ Better integration of non-wires resources into utility operating practices and procedures

► Overlapping federal and state jurisdictional issues remain unresolved—for example, dual participation of DERs as NWAs for utility distribution systems and as resources bid into centrally organized wholesale electricity markets.
Conclusions

► Interest in all-source competitive solicitations is growing across the U.S.
  ■ Can help to reduce cost uncertainty and discover competitive pricing across a range of resources
  ■ Enables integrated procurement of resources that have interactive effects (e.g., wind, solar, and storage)
  ■ Can facilitate coordination between bulk power system resources and DER procurement

► All-source competitive solicitations are complex.
  ■ Require thoughtful process design and implementation
  ■ Involve trade-offs between stakeholder participation, transparency, time, flexibility, and discretion

► Evaluation is the central challenge of all-source competitive solicitations.
  ■ Methods must be able to compare different resources on an equivalent basis.
  ■ Models need ongoing improvements.

► Independent evaluators play essential roles in all-source solicitations.
  ■ IEs help ensure that solicitation and selection processes are objective and impartial.

► At the distribution level, NWA procurement shows promise but requires continued improvements.
ELECTRICITY MARKETS & POLICY

https://emp.lbl.gov/
Follow us on Twitter @BerkeleyLabEMP.
Sign up for our mailing list to stay up-to-date on our publications, webinars and other events.

For more information:
Lisa Schwartz
lcschwartz@lbl.gov