GRID MODERNIZATION LABORATORY CONSORTIUM
U.S. Department of Energy

Zero-Export Feeder Through Transactive Markets

Project Team:
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HELICS User and Developer Meeting 2021
Existing and Ongoing Use Cases (Session 2)
May 11, 2021
Virtual

NREL Transforming ENERGY

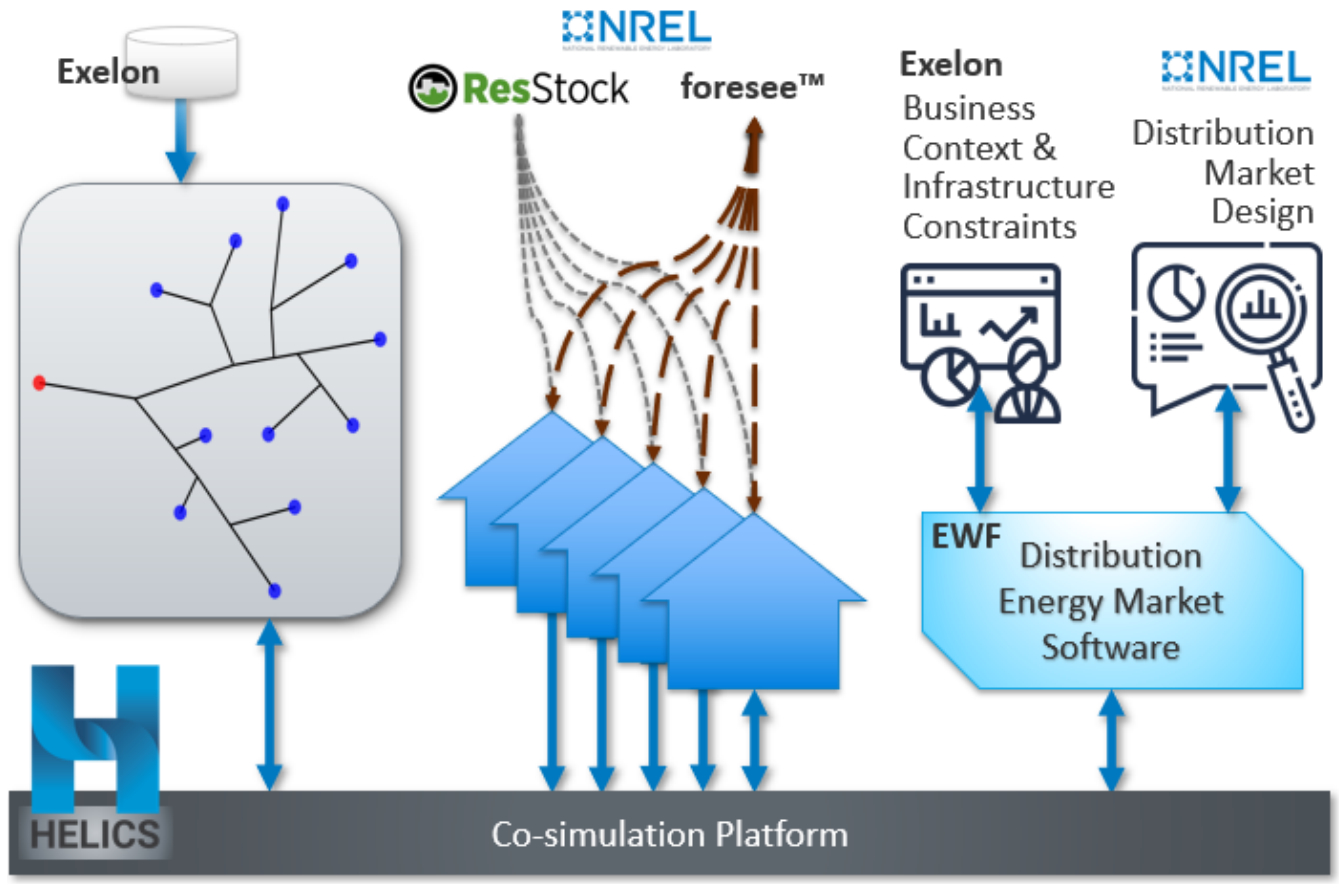
Exelon Corp.

Energy Web Foundation

Project Summary

Zero-Export Feeder Through Transactive Markets

- How can distribution utilities:
  - Enable increased hosting capacity of Distributed Energy Resources (DER)
  - Manage infrastructure requirements and investments
  - All while delivering reliable, cost-effective electricity?
- In this project, we address these challenges through a transactive energy market
  - Zero export at the feeder head
  - No direct control of devices, price driven only
- Collaboration between Exelon, EWF, and NREL has enabled us to pool expertise from specific domains

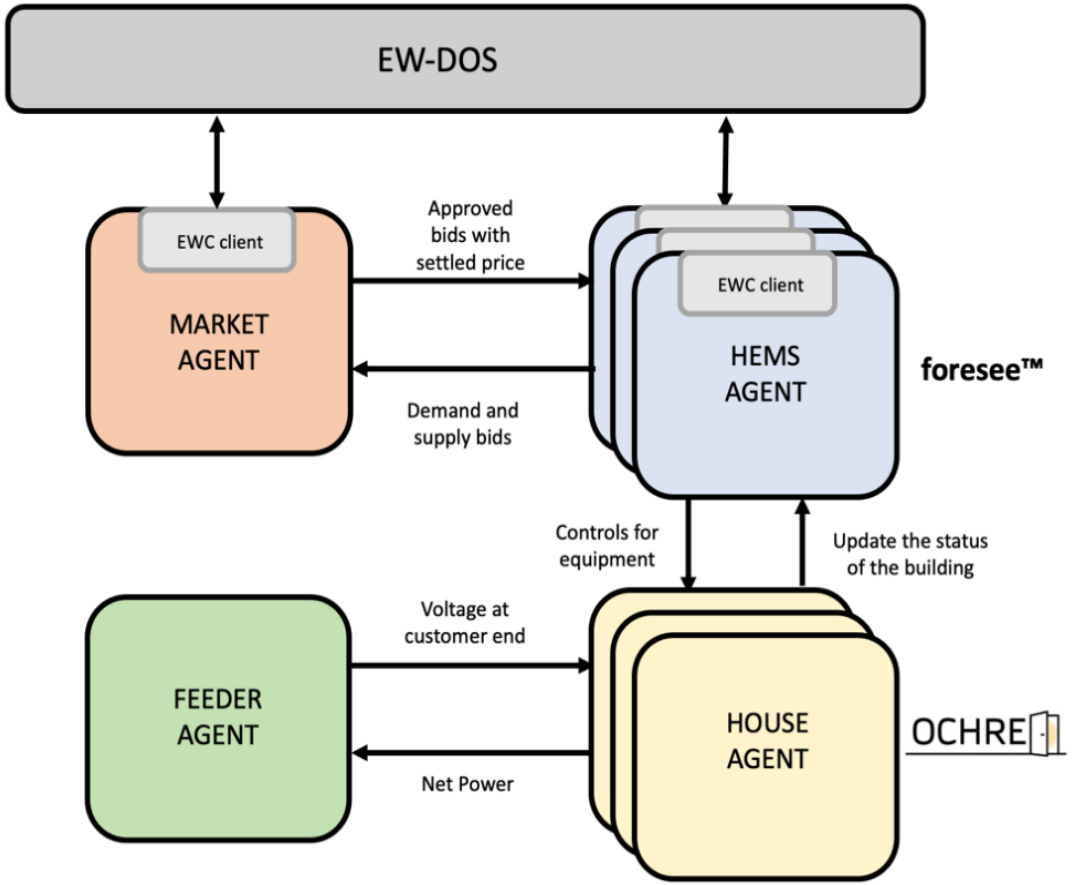


Project design and components

POC: Dylan Cutler (Dylan.cutler@nrel.gov
Team: NREL, EWF, Exelon
Funding: EWF & Exelon (Funds-in TSA), DOE OE (High-Impact Project)

Zero-Export Feeder Through Transactive Markets

- Includes residential market participants (and associated HEMS), market, and feeder agents (~1500 total agents)
- Actual feeder model and calibrated home models
- Running a pseudo-wholesale, day-ahead and real-time market
- Interfaced with EWF's Energy Web Chain for securely managing distributed identities and market transactions



HELICS Agents and data pathways

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D. Cutler, T. Kwasnik, S. Balamurugan, T. Elgindy, S. Swaminathan, J. Maguire, D. Christensen. 2021. "Co-simulation of Transactive Energy Markets: A Framework for Market Testing and Evaluation". International Journal of Electrical Power and Energy Systems 128