

December 14, 2022

CT X2231 Heat Pump & Electrification Study

Kickoff meeting



Research Objectives

1. **Illuminate best practices** regarding fossil fuel to electric conversion and [program] design efforts in existing and new buildings in the residential, industrial, and commercial sectors.
2. **Identify and characterize new and emerging target measures** to help support electrification efforts in residential, commercial, and industrial buildings.
3. **Analyze the technical, economic, and market potential** for beneficial electrification in CT.



Research Outputs

1. **A characterization of existing conditions** in CT related to beneficial electrification, inclusive of current programs, building stock, equipment saturations, and demand- and supply-side market actor readiness.
2. **A detailing of electrification measures** (technology maturity, relevant applications, strengths and weaknesses, market availability, and mapping of tech and building types) for consideration in CT.
3. **A summary of programmatic and policy best practices** for promoting beneficial electrification observed outside of CT that can inform efforts within the state.
4. **An estimate of the market potential** associated with identified electrification measures (for which sufficient data exists to support modeling) in CT.
5. **A list of specific programmatic and/or policy recommendations** for realizing the qualitative identified and quantitatively modeled electrification potential; recommendations will be actionable, specific to CT's existing conditions, and leverage observed best practices.



How Activities Inform Research Outputs

	Characterize Existing Conditions	Identify Electrification Measures	Identify Best Practices	Estimate Market Potential	Provide Recommendations
Data Planning & Review	X				
Program Benchmarking		X	X		X
Market Characterization	X	X	X	X	
Potentials Modeling	X	X		X	X
Program and Policy Recommendations	X	X	X	X	X



Data Planning & Review

1. Create an exhaustive list of all market ready building electrification measures
2. Enumerate research questions to answer and market intelligence to gather
3. Identify any relevant existing information (recent studies, RASS, etc.)
4. Map research questions and market intelligence needs to existing secondary sources
5. Review whether the existing sources are sufficient for this purpose
6. Identify and prioritize information gaps (i.e., where primary data collection would be beneficial)
7. Map information gaps to primary data collection activities that are happening as part of this work, as well as concurrent CT HP research (i.e., which study is best positioned to provide each piece of information (and when)



Program Benchmarking

1. Review current and proposed building electrification efforts in CT.
2. Review building electrification efforts in other states, identify barriers, solutions and lessons learned.
3. Provide recommendations tailored to CT market based on our review of other programs that will help the state make progress on building electrification and decarbonization efforts.

Methodology: Literature review and interviews with up to five project managers or researchers.



Market Characterization

1. Assess each building electrification measure's:
 - Technology maturity
 - Current and anticipated future adoption rates
 - Supply of technology
 - Barriers and opportunities
 - Approximate cost
 - Best applications
 - Workforce readiness (identify gaps in contractor and distributor capabilities for supporting each electrification measures)



Market Characterization (cont.)

2. Gather information regarding “upcoming” or “emerging” (i.e., not yet market ready) electrification measures.
 - Discuss with supply side what are they working on, what are they bringing to market next, what is the target audience, consider future role in CT

Methodology: Literature review and interviews with:

- Supply-side: manufacturers (n=10), distributors (n=10), contractors (n=20).
- Demand-side: new construction (building firms=9), building managers and owners (MF, C&I) (n=30).



Potential Modeling

1. Conduct a workshop with EA Team and stakeholders to define model's granularity, duration, scenarios, programmatic, and nonprogrammatic measures.
2. Prepare inputs from market assessment and concurrent HP studies.
3. Conduct load research for measures and building to calculate net load.
4. Estimate technical, economic and achievable potential model for heat pumps.

Methodology: Model and documentation.



Program and Policy Recommendations

Aggregate results to provide actionable and specific recommendations for designing and/or implementing beneficial electrification efforts in CT.

- Likely to be sector and/or measure specific recommendations.
- Likely to include time-based recommendations (short, medium and long term).



Timeline & Budget



Timeline

Activities	Period
Data Planning and Review	Dec 2022 – Jan 2023
Program Benchmarking	Dec 2022 – Mar 2023
Market Characterization	Jan 2023 – Dec 2023
Potential Modeling	Nov 2023 – Mar 2024
Program and Policy Recommendations	Feb 2024 – Apr 2024



Budget

Activities	Budget
Data Planning and Review	\$32,000
Program Benchmarking	\$45,000
Market Characterization	\$160,000
Potential Modeling	\$118,000
Program and Policy Recommendations	\$45,000
Total	\$400,000



Questions?

