Accelerating decarbonization in deep commercial retrofits

A roadmap for retrofit success

Current landscape, key challenges and successful strategies.

Lower grid impact

Higher market adoption

Lower market adoption

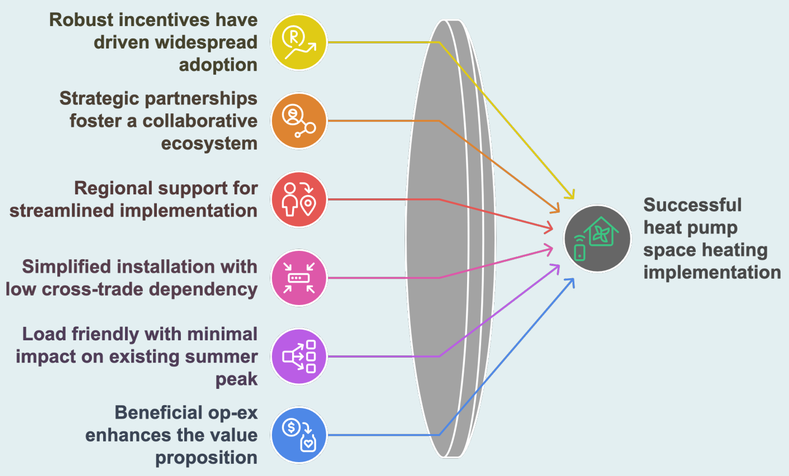
High grid impact

High success

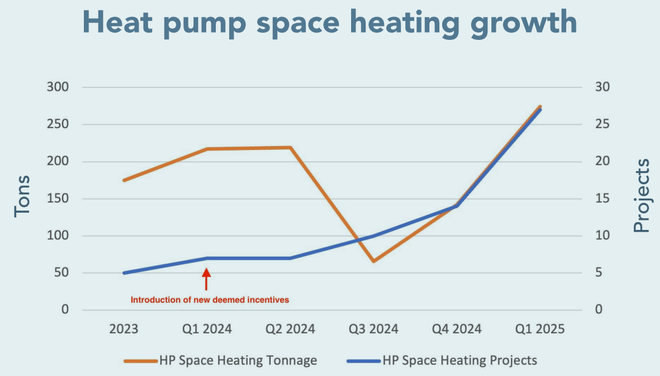
Heat pump space heating (HPSH)

Current status: Building on momentum

Pathways to heat pump success



Heat pump space heating growth



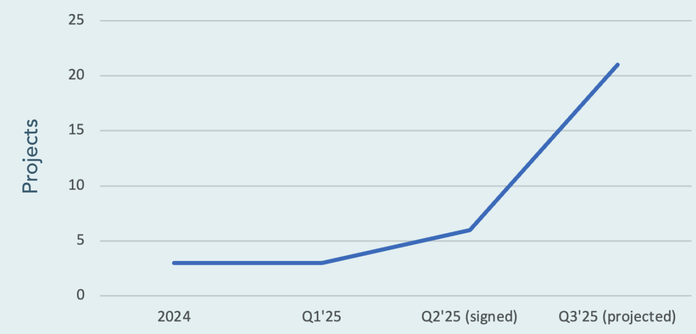
Low success

Heat pump water heating (HPWH)

Current status: Unlocking growth potential in 2025

Heat pump water heater adoption challenges

Heat pump water heating projects

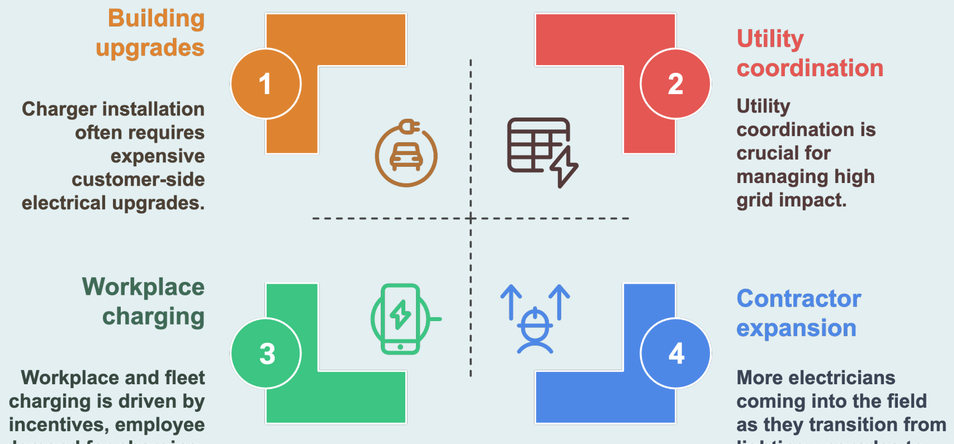


Moderate success

Electric vehicle supply equipment (EVSE)

Current status: Navigating grid constraints

EV charging strategy analysis

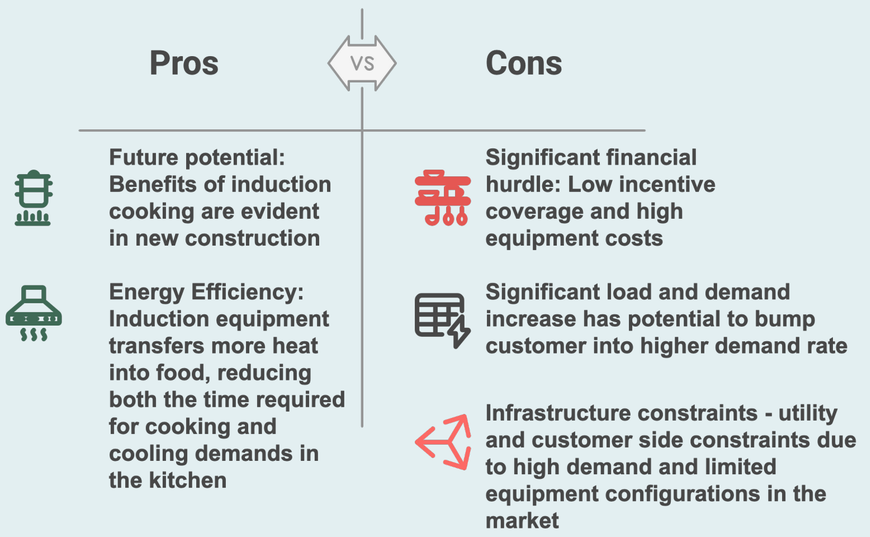


Non-Starter

Electric commercial food service (E-CFS)

Current status: Overcoming cost barriers

Electric commercial food service (E-CFS)



SMUD®

Deep commercial retrofit:
Breaking through barriers, electrifying the future

- SMUD's Community Impact Plan and Business District Electrification funding removes cost barrier
- Once the cost barrier is eliminated, the program team can innovate to overcome the challenges preventing broad adoption

Grid and gear impact

Issue	Solution
Understanding capacity on existing infrastructure	• Streamlined Grid Capacity Evaluation process
Utility side upgrades	• Maximize energy efficiency opportunities to reduce load • Scale down project back (ex. fewer EV handles) • Schedule necessary line work early in the project
Customer side electrical upgrades	• Balance measure recommendations • Analyze total project load requirements through independent consulting service

Bill impact

Issue	Solution
Characterizing cost of fuel switching	• Incorporate accurate model for kWh / therm savings in proposal tool
Rate bump to higher demand rate	• Scale project down • Utilize control technologies to avoid coincident measure use
Cost recovery for new energy loads (ex. EVSE)	• Provide 3 years networked EVSE and maintenance • Ensure EV driver payment system is functional • Adjust cost of charging to optimize revenue

Measure equivalence

Issue	Solution
Gas to induction cooking performance	• Ensure hob wattage sized to match need
Hot water intensive applications	• Ensure proper load and refresh models • Utilize scalable split heat pump systems as needed • Early engagement with County health

Trade ally coordination

Issue	Solution
Multi-measure projects	• Engage multiple trade specialists to contribute expertise • Assign "prime" to lead project
Permitting complexity	• Pull measure permits separately to expedite project • Have independent consultant look at holistic electrical impact

Showcasing success

Capital City Elks Lodge IBPOEW #1147

Full building electrification

Measures: Lighting, heat pump space heating, smart thermostats, heat pump water heating, refrigeration, electric / induction cooking equipment, main service panel upgrade.

Project cost: $149,044

Annual kWh reduction (Energy efficiency): 8484 kWh

Annual Therm reduction: 2066

Customer pain points:

- Ineffective heating/cooling prevented using building as desired
- Insurer threatening policy cancellation due to old electrical panel and gas fittings

Key learnings:

- Sized project to avoid transformer upgrade
- Post-install induction training for kitchen volunteers
- Pulling single permit for all measures created significant delay to work-start
- Order tank cover with electric fryer

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