

Inclusive Utility Investment in California

Household Energy Upgrade Fund – International learnings for the Australian market

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Bruce Mast

On behalf of TECH Clean California



Partner Profiles

California



Santa Clara County

- **Silicon Valley Clean Energy (SVCE)**

- Public agency serving 13 jurisdictions in Santa Clara County
- Electricity retailer serving 270,000 residential and commercial customers
- 715+ MW renewable + storage PPAs under contract
- \$77M in on-bill customer savings, \$28M invested in customer programs



- **TECH Clean California**

- \$120 million initiative to drive market adoption of heat pumps and heat pump water heaters for existing homes in CA
- Authorized by SB 1477, funded by gas IOU ratepayers under the auspices of the CPUC
- Key activities include incentives, workforce training, consumer inspiration campaign, and 6 pilots, including Inclusive Utility Investments



Introduction to Inclusive Utility Investments



Barriers to financing in the clean energy economy

Traditional consumer debt financing products are poorly suited for Low- and Moderate-Income (LMI) households as well as renters:

“Do you own your home?”

“Do you have a good credit score?”

“Do you have solid income?”

Yet financing remains essential to achieve the needed scale of decarbonization investments

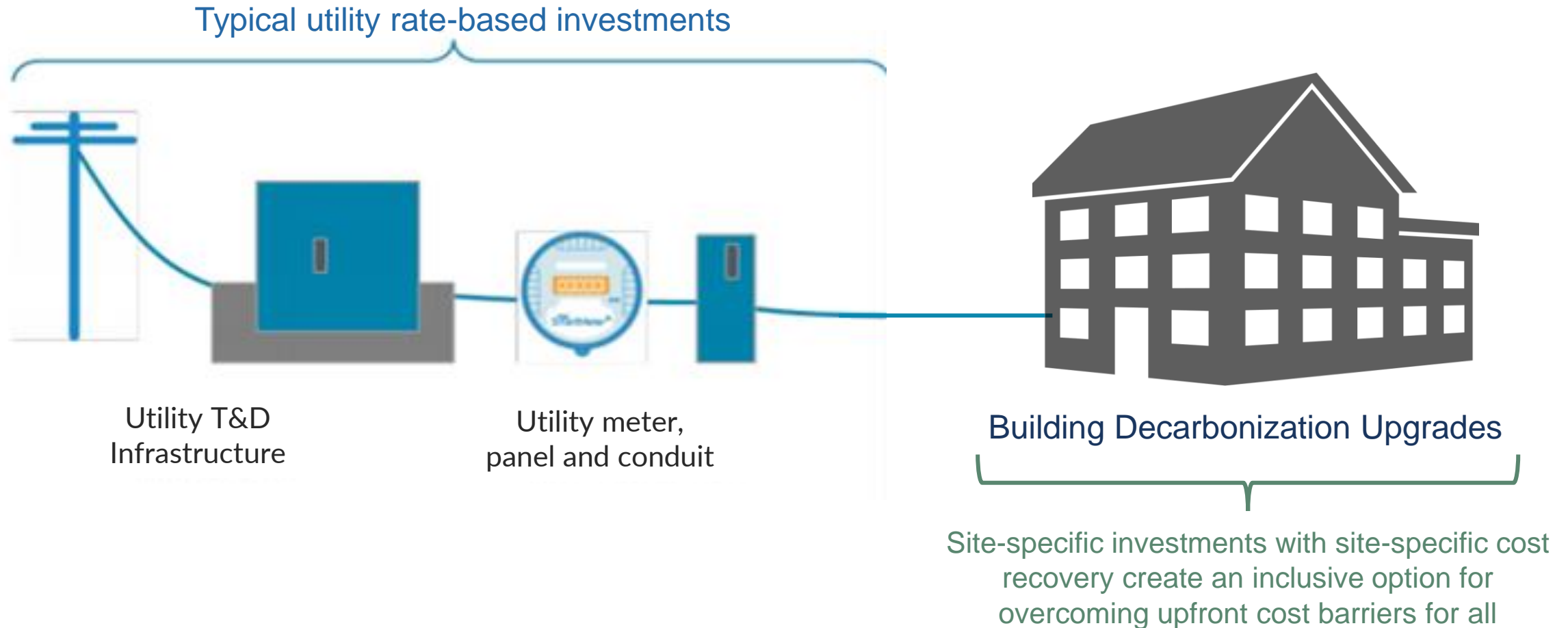
The needed scale of decarbonization investments in California's LMI households dwarfs available public funding.

- **The Need: ~\$72.5 billion** (2.9 million LMI customers, @ ~\$25k per home electrification upgrade)
- **Available funds: ~\$6.6 billion over 10 years** (including \$450 million for CA from Federal Inflation Reduction Act incentives)

In the absence of financing, a fully subsidized “direct-install” approach would require **more than 100 years** for California to achieve its residential decarbonization goals.

Q. What are Inclusive Utility Investments?

A. Site specific investments on tariffed terms with on-bill cost recovery



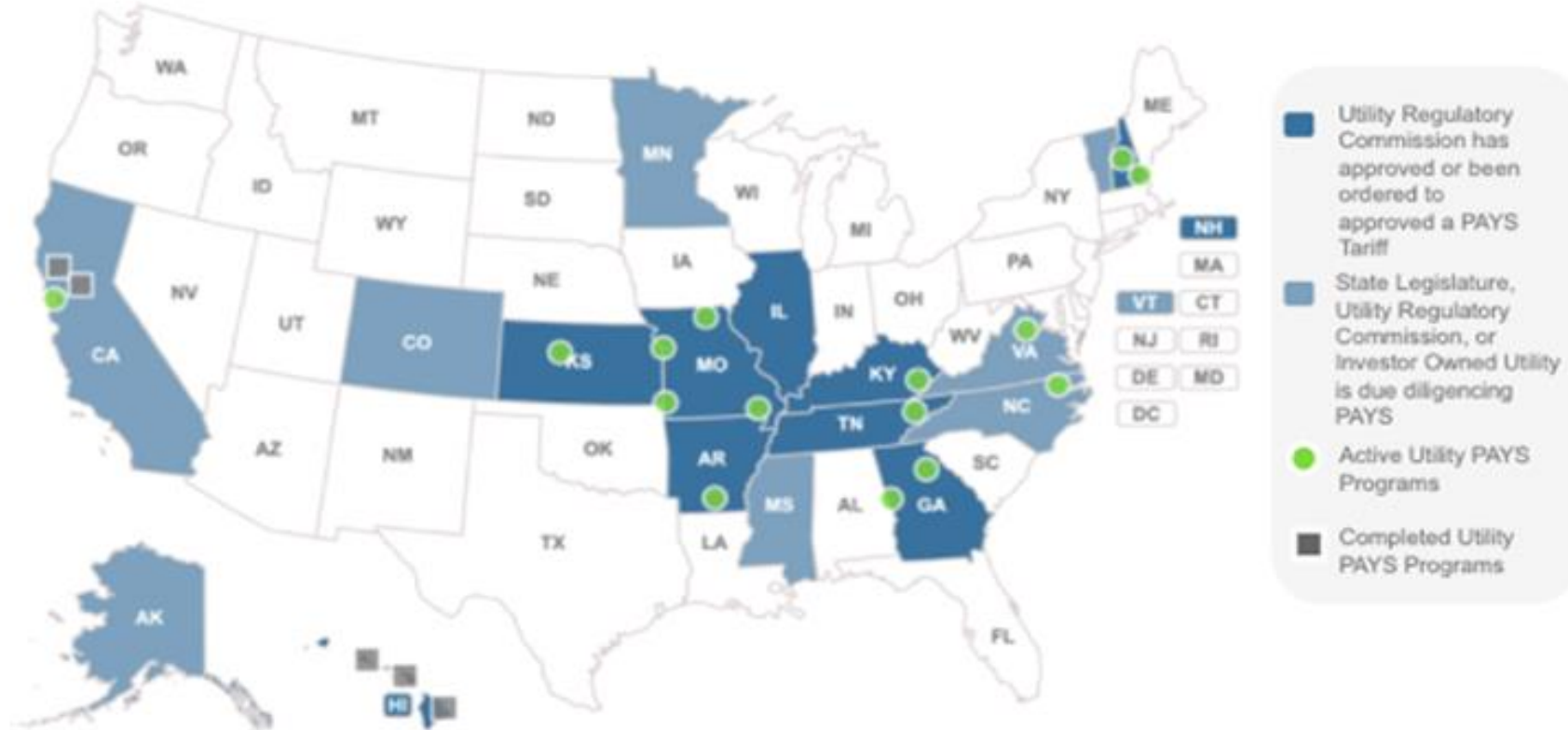
Inclusive Utility Investments should not be confused with debt-based financing.

IUI reduces rather than increases customer financial obligations. Concerns about debt-based programs for LMI are largely inapplicable to IUI.

Customer Benefits	OBF	IUI
• No upfront participant cost for cost effective upgrades	✓	✓
• No credit or income qualification required		✓
• Renters are eligible		✓
• Estimated savings <u>exceed</u> cost recovery charges		✓
• Payments end if upgrade fails and is not repaired		✓

Inclusive utility investments for energy efficiency have a track record of reaching underserved market segments

Inclusive Utility Investment via Pay As You Save® as of 2022



See also https://www.energystar.gov/products/inclusive_utility_investment

Map courtesy of LibertyHomes. See <https://www.libertyhomes.org/pays-landscape>. Pay As You Save® and its acronym, PAYS® are trademarks held by Energy Efficiency Institute, Inc. (EEI)

IUI programs for energy efficiency have accelerated investments compared to conventional loan programs

Comparison for building efficiency upgrades

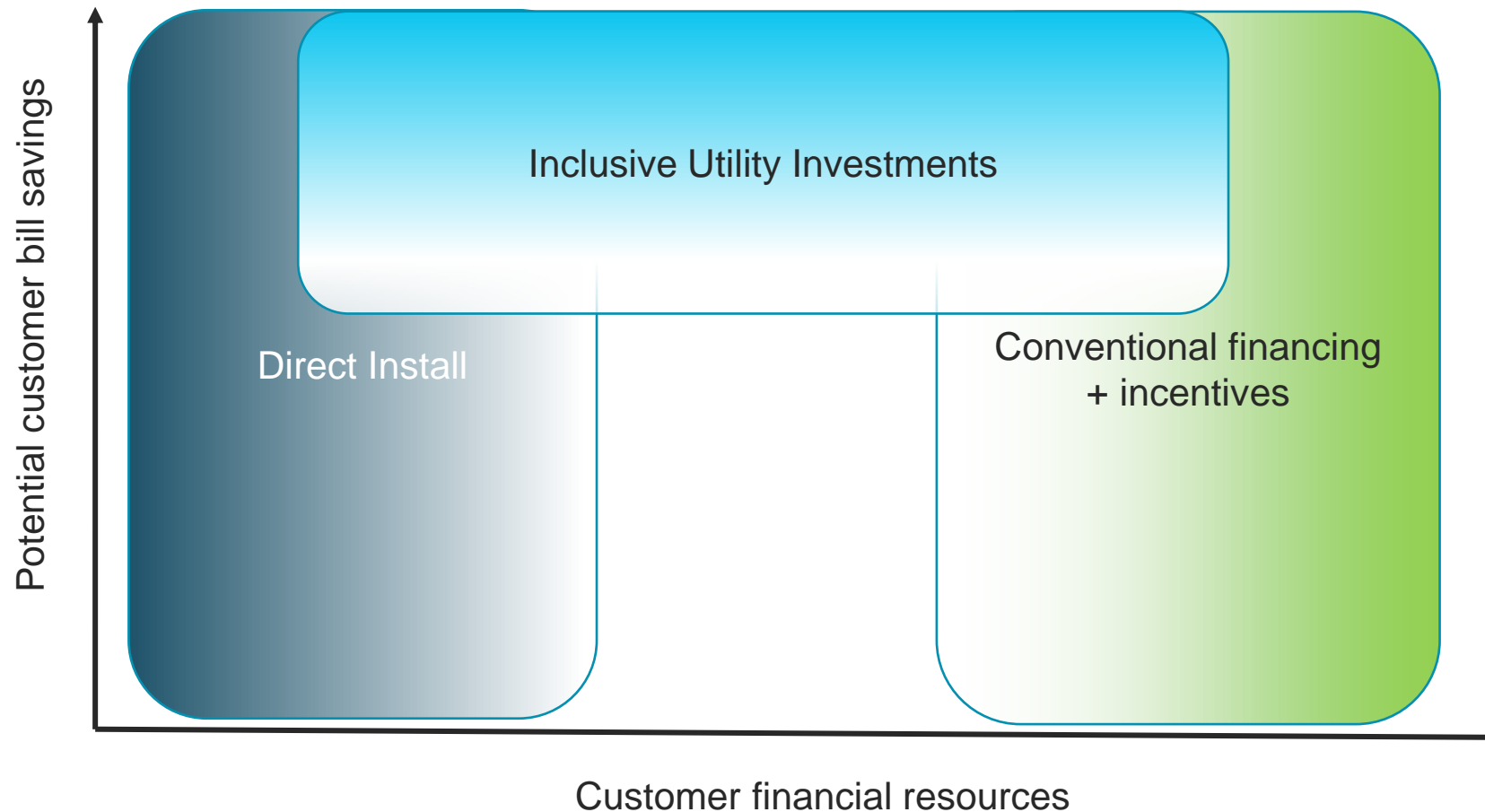


Investment acceleration is a product of these multiples.

- ✓ No consumer loan, lien, or debt
- ✓ Reaches renters and low-income
- ✓ Higher uptake rates
- ✓ Deeper energy & carbon savings

IUI's Role in the Program Portfolio

- Expand residential customer access to decarbonization upgrades and accelerate investments



Roles & Responsibilities

Distribution Utility

- Adopt IUI tariff
- Establish parameters for Retailers to access investment capital
- Secure capital and make it available to the Retailer
- Recover costs via tariffed charge on customer bills
- Remit revenues to capital providers
- Recover program costs from ratepayers

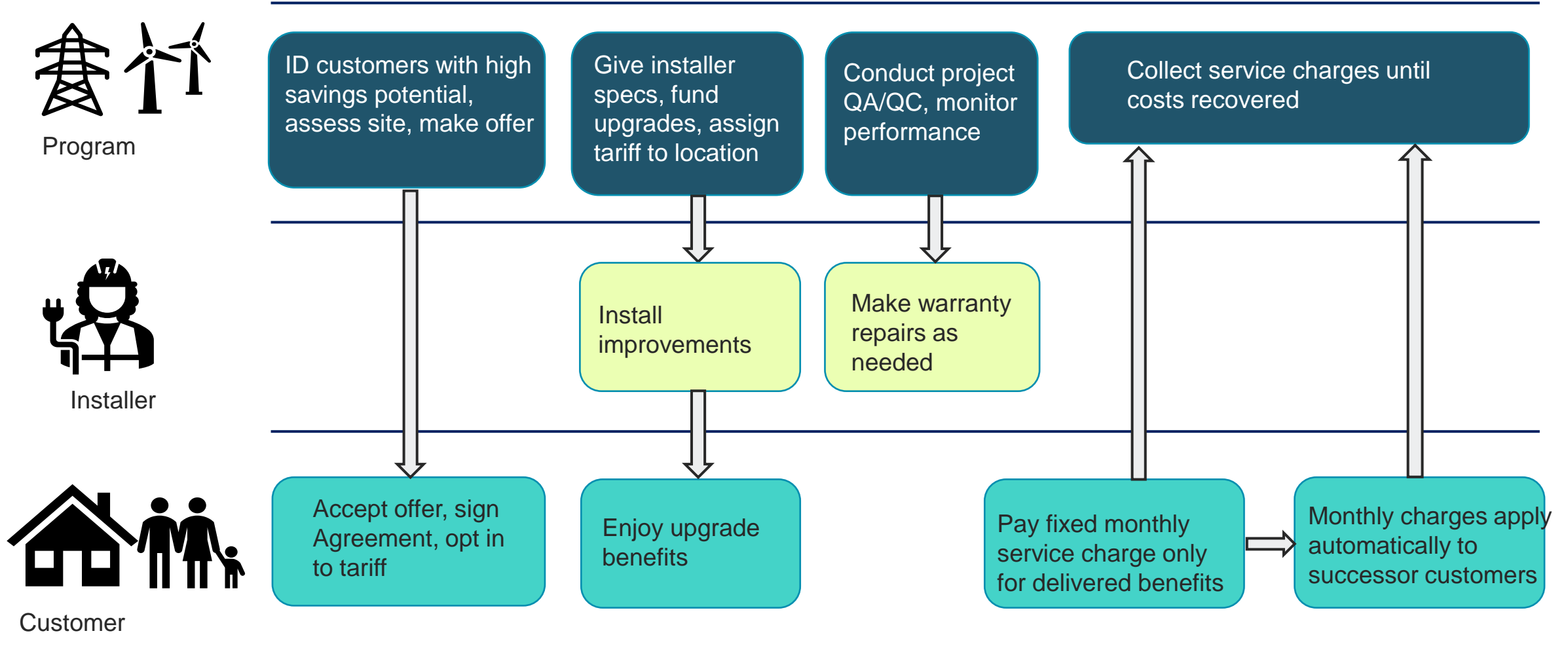
Electric Retailer

- Meet utility program requirements
- Hire and oversee Implementer
- Approve implementation plan
- Lead community engagement
- Conduct QA/QC of improvements
- Transmit IUI Service Charge info to Utility
- Conduct M&V
- Manage financial & regulatory compliance

Program Implementer

- Develop implementation plan
- Operational responsibility for customer acquisition, cost containment, & quality control
- Hire & manage installers
- Per approved implementation plan...
 - Handle marketing and customer acquisition
 - Conduct all phases of project origination: site assessment, project scope & specifications development, permitting, financial analysis, determine IUI capital contribution
 - Manage O&M, customer service

Inclusive Utility Investments: a Customer View



Protection for Successor Customer Savings

		Successor Customers		
		Low usage	Typical usage	High usage
Current customers	Low usage	Low savings opportunity, no IUI investment, no successor customer risk		
	Typical usage	Lower than expected savings AND utility bills	Successor customer enjoys expected benefits	Actual successor customer savings exceed expectations
	High Usage	Current customer's savings do not accrue to successor customer		Successor customer enjoys expected benefits

Customer risk: Successor customers may be at risk if cost recovery is determined by current customer's high usage and savings

Protection: Calculate cost recovery charge based on savings derived from typical operating assumptions.

Thank You!

For more information, contact:

Bruce Mast, on behalf of TECH Clean California
bruce@ardenna-energy.com

Appendices

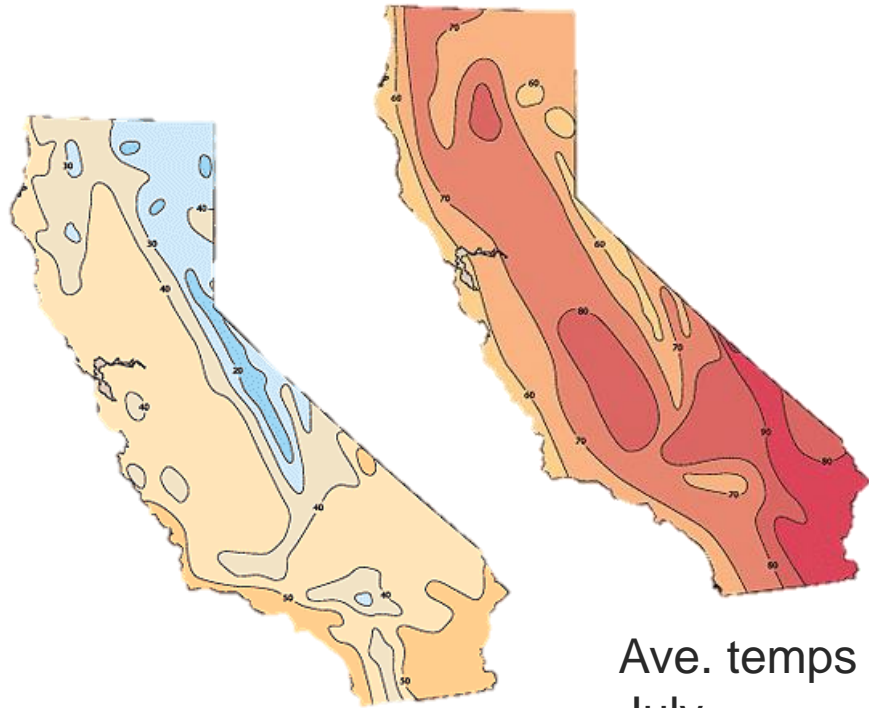
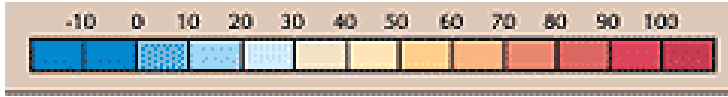


A Brief History of Public Utilities Commission’s “Clean Energy Finance Options” Proceeding (R.20-08-022)

- Sept. 4, 2020: CPUC issued Order Instituting Rulemaking (OIR) to Investigate and Design Clean Energy Financing Options for Electricity and Natural Gas Customers
- March 5 & Nov. 19, 2021: CPUC issues Scoping Memos. Directed IOUs and interested parties to file proposals for innovative finance programs that
- April 15 & June 15, 2022. SVCE & TECH jointly submitted draft & final IUI Pilot proposals. Additional proposals submitted from PG&E, SCE, SDG&E, SCG, CAEATFA, and LGSEC (SBCE)
- Aug. 10, 2023: CPUC issued Decision 23-08-026. Directs IOUs and SVCE to establish a TOB Working Group within 45 days and file a joint finalized TOB Proposal within 270 days (ie, May 2024), using SVCE proposal as a starting point.

California's Climate

Energy Commission Climate Zones
www.energy.ca.gov/maps/climate_zone_map.html



Ave. temps in January

Ave. temps in July

CZ 1: North coast-- foggy most of the year

CZ 10-13: inland climates-- hot dry summers, increasing population & AC loads

CZ 2-9: coast climates--generally mild temps year-round, biggest urban areas

CZ 16: mountains, snow in winter, less than 80°F (27° C) in summer

CZ 14 & 15: Mojave and Sonora Deserts—hot!



TECH+SVCE Proposal for an IUI Pilot in California



IUI Pilot Proposal

- 500 heat pump HVAC, 500 heat pump water heaters, EE improvements as needed
- Target high energy users
 - Space heating: >400 Therms per year
 - Space cooling: >1,600 kWh per year
 - Water heating: >360 Therms per year
- Customer eligibility: Independent of income or credit standing but subject to good utility bill payment history
- Year 1: focus on middle-income single-family customers with aging mechanical systems
- Year 2: expand outreach to lower income tiers and multifamily

Capital Source	Amount
Utility incentives	5,685,000
IUI contribution	\$5,657,969
Participants and/or ratepayers	4,776,101
Total Investment	\$16,119,070
Customer bill savings	\$7,259,670
Bill savings net of cost recovery charges	\$1,601,701
Avoided equipment replacement costs	\$10,087,000

Note: financials are from June 2022 proposal and are no longer current.

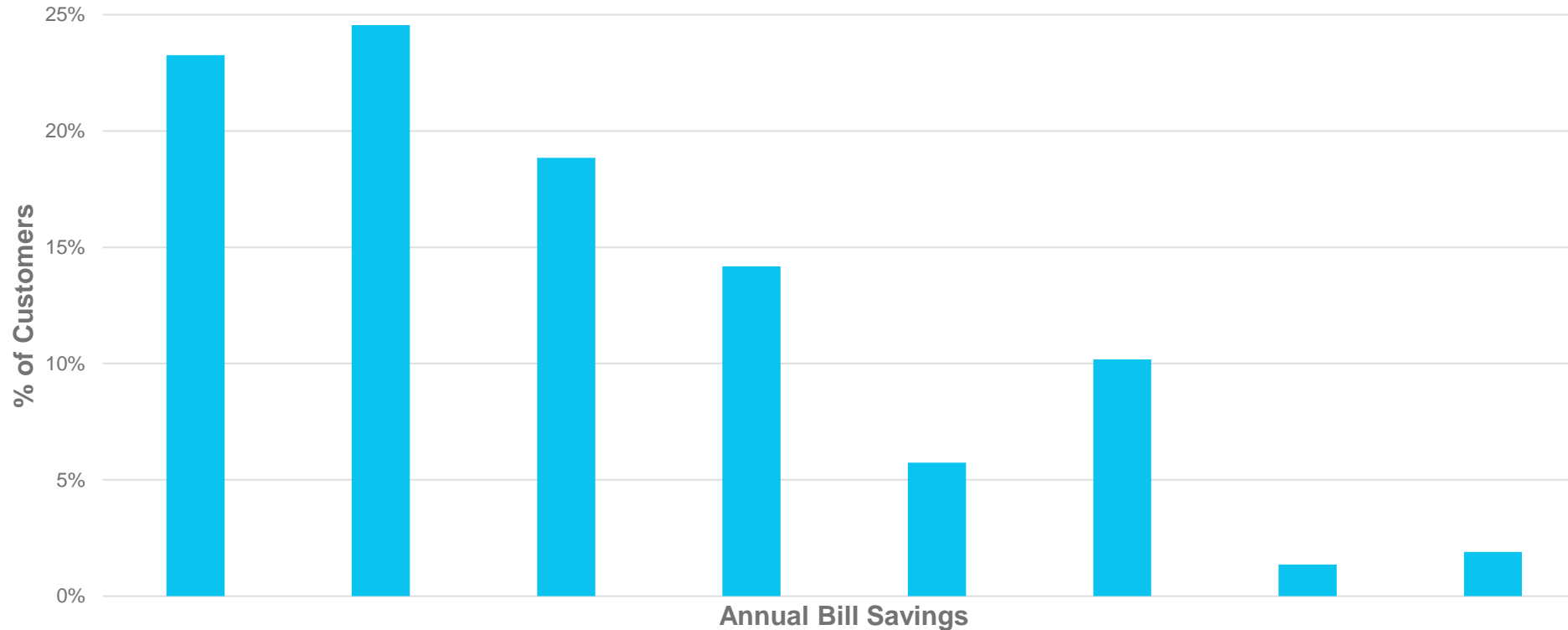
Eligible Technologies (Draft)

Any technology that helps customers save money and reduce GHG emissions can be considered

Technology	Specification
Core Measures	
Heat Pump HVAC	Package, split, mini/multi-split, 18 SEER, 10 HSPF, with Internet-enabled smart thermostat
Heat Pump Water Heater	240V, COP 3.1 or better, > 55 gal., follow SGIP spec; or retrofit-ready (120V)
Energy-efficient upgrades	Cost-effective reductions in space heating, cooling, and DHW loads
Optional and As-needed Measures	
Pre-wiring	for electric appliances & car charging
Service panel upgrade	As needed
PV system	Optional
Battery storage system	Optional

Meter-Based Customer Targeting

Analyze customer energy consumption to ID customers with highest bill savings opportunities



- **Target customers with HIGH cooling electric usage and HIGH heating gas usage**
- From analysis of HP+HPWH impacts for selected Bay Area communities, assuming PG&E electric EV2, gas G-1, 30% improvement in heating and cooling loads

Project Pro Forma-Owner Occupied, Space Conditioning

- **Step 1.** Maximize available incentives
- **Step 2.** Calculate IUI contribution: net project cost, up to 80% of bill savings over cost recovery period
- **Step 3.** Any unfunded project cost becomes a customer copay
- Model can accommodate multiple measure packages (See Installation Cost and Incentives Table)
- Need to add contribution for grid benefits

Line	Project Pro Forma	Project Scope: HPSH+EE
1	Total Project Cost	\$21,783
2	Existing Incentives	\$15,705
12	Net Project Cost	\$6,078
14	Cost Recovery Period	10
15	Annual bill savings	\$829
16	IUI max contribution / Project	\$6,632
17	Homeowner IUI contribution to principal	\$5,077
20	Homeowner IUI monthly service charge	\$55.27
21	Homeowner's net annual savings	\$166
27	Funding Gap / Copay requirement	\$1,001
32	Annual Therm Savings	300.0
33	Annual Electricity Savings	-538.2
34	Lifecycle GHG reductions	15.5

Project Pro Forma-Rental Housing, Space Conditioning + DHW

- **Step 1.** Maximize available incentives
- **Step 2.** Calculate landlord contribution
- **Step 3.** Calculate IUI contribution: net project cost – landlord contribution, up to 80% of bill savings over cost recovery period
- **Step 4.** Any unfunded project cost becomes a customer copay

Line	Project Pro Forma	Project Scope: HPSH+HPWH+EE
1	Total Project Cost	\$27,336
2	Existing Incentives	\$23,430
12	Net Project Cost	\$3,906
13	Landlord cost share	\$3,906
14	Cost Recovery Period	10
15	Annual bill savings	\$948
16	IUI max contribution / Project	\$7,587
22	Tenant IUI contribution to principal	\$0
25	Tenant IUI monthly service charge	\$0
26	Tenant net annual savings	\$948
28	Tenant Funding Gap / Copay requirement	\$0
32	Annual Therm Savings	661.1
33	Annual Electricity Savings	-2140.5
34	Lifecycle GHG reductions	33.4

Customer HVAC Savings Sensitivity Analysis

ID	Parameter	Default Value	Analysis Range	Impact on customer bill savings	Value (annual bill savings / unit)
A	Winter electric rate	\$0.308	\$0.049 to \$0.334	As A increases, savings strongly decline	-\$1638 per \$1
B	Summer electric rate	\$0.429	\$0.080 to \$0.565	As B increases, savings strongly decline	-\$1520 per \$1
C	Gas rate	\$2.55	\$1.75 to \$2.83	As C increases, savings very strongly increase	\$485 per \$1
D	Baseline Gas DHW Efficiency (COP)	0.53	0.5 to 0.96	As D increases, savings moderately decline	-\$491 per COP
E	HPWH COP	3.5	2.8 to 4.07	As E increases, savings moderately increase	\$86 per COP
F	Daily hot water usage (gal/day)	68	22.2 to 85	As F increases, savings weakly increase	\$1.75 per gal/day
G	Baseline Furnace AFUE	0.78	0.78 to 0.99	As G increases, savings moderately decline	-\$646 per AFUE
H	HP HSPF	10	7.2 to 11	As H increases, savings strongly increase	\$46 per HSPF
I	Baseline AC efficiency (SEER)	10	10 to 18	As I increases, savings moderately decline	-\$30 per SEER
J	HP Cooling Efficiency (SEER)	18	15.2 to 21.5	As J increases, savings moderately increase	\$14 per SEER
K	EE improvement to HVAC loads	30%	0% to 50%	As K increases, savings moderately increase	\$11.50 per percentage point
L	Baseline annual heating usage (Therms)	300	200 to 600	As L increases, savings moderately increase	\$0.87 per Therm
M	Baseline annual cooling usage (kWh)	1800	100 to 2,000	As M increases, savings strongly increase	\$0.32 per kWh

SVCE+TECH Proposal for Customer Protections



Which customer risks are in scope and out of scope?

- **In scope**

- Performance-based savings
- Equipment degradation and failure
- Unethical sales practices
- Allocation of tenant and landlord costs and benefits
- Impacts on successor customers
- Nonparticipating customer costs and benefits

- **Out of scope**

- Exogenous changes in household income and expenses
- Exogenous changes in household energy usage patterns
- Inflation
- Rate changes?
- Tenant rent increases and evictions?

Mitigation design principle: cost of mitigation must be less than the cost of the unmitigated risk.

Protections Against Unethical Sales Practices

- Hire a Program Operator and assign full responsibility for customer acquisition and cost containment
- Program Operator manages installers as subcontractors. RFP to select best qualified, most price-competitive installer(s) capable of handling forecasted project volume.
- **Program Operator handles all functions that could otherwise create installer conflict of interest**, plus functions that offer economies of scale. Examples:
 - Project planning, including site assessment, project scope and specifications development, project permitting
 - Financial analysis, including site data collection, energy modeling, determination of IUI capital contribution
 - Customer acquisition
 - Bulk purchase of materials
- **Installation contractor's role limited to installation services**, based on pre-determined project scope and specifications. Financial compensation determined by negotiated fee schedule.
- Benefits:
 - **Shields customers from unscrupulous sales tactics**
 - Removes customer hassle to recruit contractors and evaluate bids (often with limited knowledge of how to do so)
 - Directly addresses many (but not all) project cost drivers
 - Minimizes duplicative site visits
 - Exercises market buying power for cost containment

Protections Against Performance Risks

- **Project Planning Phase Protections**

- Program Operator develops project scope or budget, not the installing contractor
- Adopt best practices & QA protocols for developing savings estimates
- Build in 20% buffer between expected annual savings and Program Service Charge

- **Post-Retrofit Protections Under Consideration**

- Limited customer- and measure-specific savings guarantee (to distinguish performance issues from changes in customer behavior and lifestyle)
- Investigate causes of mispredictions in pilot projects and incorporate lessons learned into revised program protocols

Protections Against Equipment Failure and Performance Degradation

- **Tariff Terms**
 - Charges stop if upgrades stop working until they are repaired and working again.
- **Installation Quality Control**
 - Require installers to provide geo-coded and date-stamped video and photographic documentation of all equipment installations
 - Require or reward installers for systems commissioning of new mechanical systems
 - Program Operator to perform quality-control inspections and acceptance testing of equipment installations on at least a sampled basis
 - Charge installers for failed inspections and increase project sampling rates
- **Warranties**
 - Require extended manufacturer warranties (e.g., 10-12 years) on installed equipment
 - Require installer to provide a one-year warranty on labor
- **Feedback loop: post-installation fault detection and diagnostics**
 - Perform “big data” analytics of metered energy consumption data, smart thermostat data (HVAC), and hot water controls to detect possible instances of equipment performing outside of design parameters
 - Dedicated customer service for the duration of cost recovery charge (i.e., expected measure life)
 - Program Operator investigate suspect cases via customer phone interviews, site visits, as appropriate

Tenant Protections

Design principles:

- Landlord must consent to let the utility program sponsor install upgrades.
- Landlords continue to have a fiduciary duty to provide space heating and hot water services to tenants.

Recommendations:

- Require landlord cost share for space heating and hot water upgrades
- Calculate cost share as a specified percentage of like-for-like replacement cost, minus remaining value of existing equipment
- Apply waterfall provisions for landlord cost share, incentives, and IUI Program Service Charge structured to minimize tenant obligations, maximize benefits
- Monitor program impacts on rents, evictions; adopt additional tenant protections as needed

Application of Tariff Terms to Successor Customers

Design principles:

- Ability to assign tariff to site rather than a person and apply terms to successor customers is a critical feature for resolving landlord-tenant split incentive barrier and spreading cost recovery over the measure life
- Cost recovery line item is for an essential service, like generation, transmission, and distribution. No opt in / opt out.

Notification requirements

- For home buyers, record a Resource Efficiency Notice on the property records, per Senate Bill 1112 (Becker)
- For renters, require landlord to notify prospective tenants

Best practices under consideration

- Utility include notification in new customer welcome letter
- If possible, communicate expected utility bill savings on the bill in conjunction with the cost recovery charge