Northern Rural Energy Network

Residential Whole House Program

Implementation Plan

Revised November 5, 2025

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Implementation Plan

Program Overview

The Northern California Rural Regional Energy Network's (also known as the Northern Rural Energy Network or NREN) Rural Residential Whole House program is a comprehensive Energy Efficiency (EE) and Electrification program that aims to reduce energy usage, peak load, and greenhouse gas (GHG) emissions for residential customers in the Sierra Nevada, Lake County, and North Coast rural regions, with an emphasis on serving Hard-to-Reach (HTR), disadvantaged, and underserved communities. Since NREN territories have low population density and are geographically isolated, it is challenging for investor-owned utility (IOU) programs to cost-effectively serve the customers in those regions. The program intends to address that gap by providing services from organizations that have built trust through a continued presence offering energy efficiency programming in the North Coast, Lake County and Sierra Nevada communities. The program provides home energy assessments, technical assistance, incentives, and turnkey installation services to increase adoption of EE, demand response (DR), and electrification projects in rural areas. Additionally, customers will realize safety benefits and increased comfort from the whole house approach. Over time, this leads to more cost-effective programs in harder to reach areas, returning customers with persistent energy savings, and rural communities leading by example.

Program Budget and Savings

Table 1: Program Budget and Savings		
1	Program Name	Rural Residential Whole House Program
2	Program ID number	RRN002
3	Program Implementer	NREN
4	Portfolio Administrator	NREN
5	Program Implementer Type (IOU Core, Third-Party Solicited, REN/CCA)	REN
6	Portfolio Segment (Resource Acquisition, Equity, Market Support, or Codes and Standards)[1]	Resource Acquisition
7	Total Program Budget	$7,921,413
8	Program Budget by Year	2024: $106,203 2025: $2,531,238 2026: $2,394,608 2027: $2,889,364
9	Program Duration (Start Date - End Date)	2025-2027
10	Total System Benefit (TSB) (Total Program TSB and TSB by Program Year)	2024: $0.00 2025: $129,682.44 2026: $555,635.73 2027: $940,643.35

[1] D.21-05-031 Ordering Paragraph 2

Table 1: Program Budget and Savings		
11	CO_2 (Lifecycle, First Year, Net, Gross)	Net: 353.46 Gross: 447.03 Lifecycle Net: 5361.18 Lifecycle Gross: 6649.35
12	KW (First Year, Net, Gross)	Net: 340.34 Gross: 387.93
13	KWh (Lifecycle, First Year, Net, Gross)	Net: -409174.27 Gross:-217104.79 Lifecycle Net: 716728.50 Lifecycle Gross: 7557049.86
14	Therms (Lifecycle, First Year, Net, Gross)	Net: 84948.86 Gross: 88205.05 Lifecycle Net:1383410.53 Lifecycle Gross: 1436653.36
15	Program Cost Effectiveness: Total Resource Cost (TRC): (Total TRC and TRC by Year)	2025: 0.18 2026: 0.28 2027: 0.38 Total: 0.28
16	Program Cost Effectiveness: Program Administrator Cost (PAC): (Total PAC and PAC by Year)	2025: 0.22 2026: 0.32 2027: 0.42 Total: 0.32
17	Market Sector(s) (i.e., residential, commercial, industrial, agricultural, public or cross-cutting) If multi-sector, provide estimated % of the total budget for each sector)	Residential
18	Program Type (i.e., Non-resource, Resource)	Resource Acquisition
19	Delivery Type(s) (i.e., Upstream-Manufactured, Midstream-Distributor, Midstream-Retail, Downstream, Downstream - Direct Install,[2] Codes & Standards)[3]	Downstream Deemed, NMEC
20	Intervention Strategies (e.g., Strategic Energy Management (SEM), Market Access Program (MAP), Direct Install, Incentive, Finance, Audit, Technical Assistance, Advocacy, Training, Marketing and Outreach, etc.)	Direct Install, Incentive, Assessment, Technical Assistance
21	M&V Methods (e.g., Deemed, Custom, NMEC – Population, NMEC – Site, SEM M&V, Randomized Controlled Trial (RCT), Other (if applicable, describe Other M&V method))	NMEC - Population, Deemed

[2] https://cedars.sound-data.com/deer-resources/deemed-measure-packages/guidance/
[3] Database for Energy Efficiency Resources (DEER) 2026 Delivery Types

Implementation Plan

1. Program Description:

NREN's Rural Residential Whole House program is a comprehensive Energy Efficiency (EE) and Electrification program that aims to reduce energy usage, peak load, and greenhouse gas (GHG) emissions for residential customers in the Sierra Nevada, Lake County and North Coast rural regions, with an emphasis on serving Hard-to-Reach (HTR), disadvantaged, and underserved. Since NREN territories have low population density and are geographically isolated, it is challenging for investor-owned utility (IOU) programs to cost-effectively serve the customers in those regions. The program intends to address that gap by providing services from organizations that have built trust through a continued presence offering energy efficiency programming in the North Coast, Lake County and Sierra Nevada communities. The program provides assessments, technical assistance, incentives, and turnkey installation services to increase adoption of EE, demand response (DR), and electrification projects in rural areas. Additionally, customers will realize safety benefits and increased comfort from the whole house approach. Over time, this leads to more cost-effective programs in harder to reach areas, returning customers with persistent energy savings, and rural communities leading by example.

2. Performance Tracking:

The program will use the following measures for success:

- Total System Benefit (TSB)
- Energy and demand savings
- GHG saved
- Movement towards increasing TSB
- Movement towards increasing TRC
- Direct Install Project conversion rate (indicator)
- Percent of services rendered to HTR customers

3. Program Delivery and Customer Services:

The program will prioritize Residential HTR, disadvantaged, and/or underserved rural customers in NREN territories regardless of demand or annualized kWh. However, NREN will not deny services to Residential customers that don't qualify as HTR, disadvantaged, or underserved. NREN will provide referrals to third-party programs and PG&E programs when applicable and available. NREN will coordinate with PG&E through the Joint Cooperation Memorandum process to monitor available programs and provide referrals.

The program initially launched in Humboldt County, which was previously served by downstream deemed programs through RCEA's programs, most recently as a CCA, an Elect-to-Administer Program Administrator, and before that, the Redwood Coast Energy Watch program. The program will expand into Sierra Business Council's region, currently served by Sierra Nevada Energy Watch, a local government partnership and also into Mendocino, and Lake Counties, which have not recently been served by direct install programs. The intention is to build on RCEA and SBC's last decade of implementation and innovation to maximize ratepayer benefit in their rural counties. RCEA and SBC will work closely with NREN's partners in Lake County, Lake Area Planning Council (Lake APC) and Mendocino County, Mendocino Council of Governments (MCOG) to transfer knowledge and assist launching the program in these areas.

Through their extensive experience in their regions, RCEA and SBC have consistently observed that money, time, and knowledge are the key barriers to local energy efficiency adoption. The program plan is built around creating drivers to overcome each of those barriers to action. As long-time direct install implementers, both RCEA and SBC have experienced success using these drivers:

- Building trust and leveraging existing trusted relationships built by RCEA and SBC in their own communities.
- Reducing confusion by providing a single point of contact to support navigating the energy programs and services available to the customer.
- Providing technical support.
- Offering rebates and incentives tailored to the communities' needs.
- Providing turnkey solutions that include project management and direct installation services.
- Educating customers about DR and electrification in addition to energy efficiency.
- Building relationships with local contractors and providing entry points for them to participate in the program.

NREN's program design is intended to be adaptable to changes in regulatory framework, the market, and community needs. The program design and delivery reflect the current environment and are intended to be adjusted with future changes. Since the implementing organizations are based within the communities they serve, they can easily adapt to changes.

4. Program Design and Best Practices

The NREN regions are rural and geographically isolated communities. Programs based in urban centers often do not reach customers in these communities as it is not cost effective. Low

population density and long distances between rural homes and urban-based service providers means more labor and travel costs to implement projects that might show proportionally smaller savings for the program portfolio. NREN programs are meant to fill that gap and can more cost effectively serve the regions by being based within them. Other rural challenges include:

- Fewer skilled contractors
- Lack of funding for projects
- Limited information and knowledge
- Strained capacity to manage projects

The program is designed to directly address these challenges by:

- Leveraging NREN's Residential Equity program to provide no-cost assessments focused on addressing the needs of the customer and their home, leading to a proposal for energy actions and identifying Direct Install and Downstream measure opportunities.
- Leveraging other programs to provide a comprehensive service (including NREN's Residential Equity program and Finance program).
- Using community facilities that install new technologies through NREN's Public Equity and Commercial Rural Energy Efficiency programs as demonstration sites to showcase the technology to residential customers in those communities.
- Creating easy-to-access rebates that can be tailored to drive adoption.
- Aligning customers with Participating Contractors for Direct Install eligible projects.
- Pairing installed measures with behavioral change, DR, and controls to maximize the avoided costs and savings to the customer.
- Partnering with local contractors, or out-of-area contractors that are willing to travel for batched projects.

The program will offer Incentivized measures, which may include the following:

- ENERGY STAR appliances
- HVAC controls and maintenance
- Pipe insulation and water saving measures
- Envelope measures
- Heat pump HVAC, water heaters, dryers, and pool heaters
- Other fuel substitution measures

Program delivery will utilize three levels of service:

- The "Rebate Catalog" - Self-serve rebates where customers install high efficiency products and then submit an application and documentation for a rebate.

- "Residential Direct Install" - Direct installation by program staff and participating contractors, with the intention of minimizing out-of-pocket costs and significantly reducing upfront expenses to perform the retrofit.

- "Residential Whole House" - Comprehensive pre- and post- assessments to ensure proper installation of measures. Focus on increasing safety, efficiency, and comfort by using building science and the whole-house approach to guide recommendations.

The Rebate Catalog will be launched in the initial year in all of the regions following with Residential Direct Install in select areas over years two and three. Development and launch of the Residential Whole House services will begin later with a launch date to be determined.

The initial launch of the Rebate Catalog will be in Humboldt County building on RCEA's successful CCA funded rebate catalog. Once the full Rebate Catalog service is launched in the second half of 2025, incentives may differ across the territories served, particularly based on climate zone and adoption rate. Rebate Catalog incentives will be offered as downstream delivery with incentives and rebates set per unit of measure following CPUC guidelines. The downstream rebate catalog launch will use deemed methodology as it is the most feasible and cost-effective platform to rapidly deploy services while the program explores the feasibility and cost-effectiveness of using the Normalized Metered Energy Consumption (NMEC) platform. The program will evaluate data access, data collection requirements, measurement and verification requirements, processes, and costs associated with using the NMEC platform. Once the program has determined that NMEC is appropriate for the program design, does not unreasonably impede program operations, and is cost-effective, the program will transition the rebate catalog to the NMEC platform. Once the program has adopted the NMEC platform for the rebate catalog, savings will be based on NMEC measurements in the year following project completion. Using NMEC will capture savings associated with behavior changes, controls, DR, and/or envelope upgrades. Using NMEC will also address existing conditions that are often well below industry standards in rural areas.

NREN will develop a Residential Direct Install service that will include heat pumps, heat pump water heaters, and building envelope measures. The Residential Direct Install service will use a Participating Contractor model. The specifics of the Participating Contractor model are still in development. The program will explore the feasibility and cost-effectiveness of using the NMEC platform for Direct Install services in the same manner described above for the Rebate Catalog. Once the Residential Direct Install service design is finalized, this Implementation Plan will be updated.

NREN will develop a Residential Whole House service that will bundle several measures into one comprehensive project addressing efficiency, comfort, health, and safety. The Residential

Whole House service will incorporate test-in and test-out assessments and Combustion Appliance Safety Testing. The program will explore the feasibility and cost-effectiveness of using the NMEC platform for Residential Whole House services in the same manner described above for the Rebate Catalog. Once the Residential Whole House service design is finalized, this Implementation Plan will be updated.

NREN's Residential Whole House program design is flexible, adaptive, and innovative. We will explore and incorporate new offerings over time that will advance and be consistent with State goals while aligning to and supporting new local emerging markets.

5. Innovation:

Innovative elements of the program include:

- Taking a customer-centric approach.
    - Rather than approaching customers with pre-determined measures and solutions, the customer's unique needs will be aligned with available services.
    - As we perform comprehensive assessments for our customers, the small size of our program allows us to adapt our suite of measures to best fit our local community's interests and needs.
    - Through our pre-qualification process, we can direct customers to the best solution for their needs and eliminate the need to "shop" across programs.
- Using projects from the NREN Commercial Energy Efficiency program or Public Equity program as demonstration sites for residential customers to see heat pump and other high efficiency equipment in action in their communities.

Identifying future integrated demand-side management (IDSM) opportunities. Because assessments are comprehensive, opportunities for DR, controls, load shifting, vehicle electrification, and integration of energy technologies will be identified and encouraged when they align with the customer's best interest.

- Customer/site-centric database:
    - The program will utilize a database that will be customer centric, capturing interests, built environment, and program enrollment data for each customer.
    - The database will track program performance and adjust measures and offerings to best serve customers.
    - The data will also be used to target outreach to customers who are a good fit for new program offerings.

6. Pilots:

The Residential Whole House program does not have any pilot elements.

7. **Workforce Education and Training:**[4]

The Residential Whole House program does not provide any WE&T but will leverage other programs.

8. Workforce Standards:[5]

At the time of the program launch, the program will not offer non-residential services that include the installation of HVAC equipment or advanced lighting controls. The General Workforce Standards set forth by the CPUC shall apply. For projects receiving support from NREN, compliance with CPUC mandated Workforce Standards will be verified before project commencement as appropriate.

9. Disadvantaged Worker Plan:[6]

The program does not currently plan to utilize subcontractors, but to any extent applicable the program will comply with CPUC Provisions for Disadvantaged Workers as appropriate and allowable by law. NREN is committed to supporting job access for Disadvantaged Workers. This program may leverage newly trained contractors from NREN's WE&T program. Many of the zip codes in NREN's regions are qualified as high unemployment zones by CalEnviroScreen.

10. Market Access Programs

The Residential Whole House program is not a Market Access Program

11. Additional information:

No Additional Information applies to the Residential Whole House program.

[4] D.18-05-041, pages 20-21 and Ordering Paragraph 7
[5] D.18-10-008, Ordering Paragraph 1-2 and Attachment B, Section A-B, page B-1
[6] D.18-10-008, Attachment B, Section D, page B-9

Supporting Documents

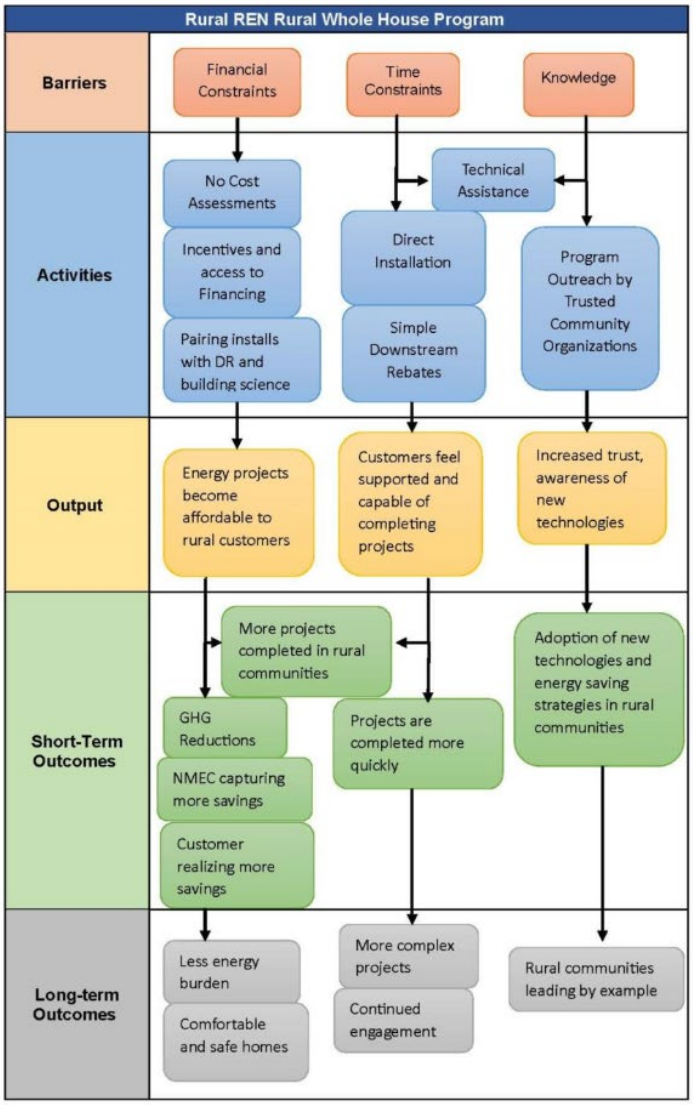
1. Program Manuals and Program Rules

The Program Manual will be submitted as Attachment A.

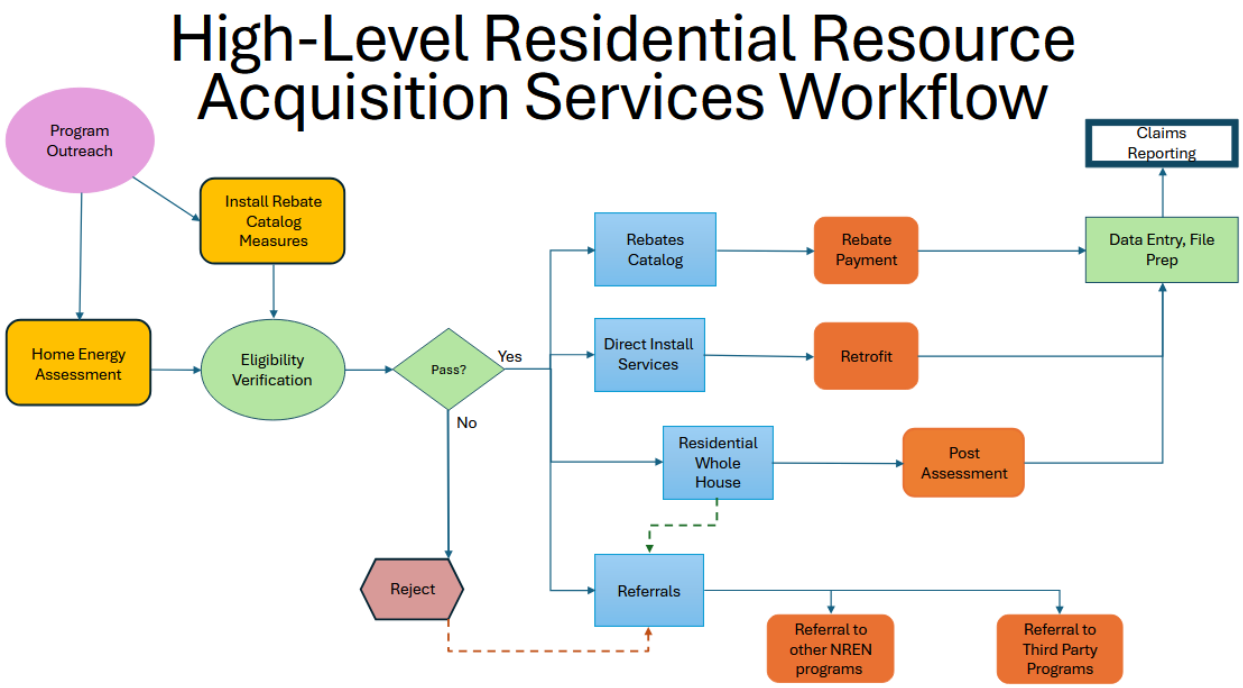
2. Program Theory and Program Logic Model:[7]

The program theory is building trust, educating customers, and providing incentives that will lead to projects with persistent energy savings, increased GHG savings, and benefits to the grid.

[7] The graphical representation of the program theory showing the flow between activities, their outputs, and subsequent short-term, intermediate, and long-term outcomes. California Evaluation Framework, June 2004


Rural REN Rural Whole House Program
Barriers
Financial Constraints
Time Constraints
Knowledge
Activities
No Cost Assessments
Technical Assistance
Incentives and access to Financing
Direct Installation
Program Outreach by Trusted Community Organizations
Pairing installs with DR and building science
Simple Downstream Rebates
Output
Energy projects become affordable to rural customers
Customers feel supported and capable of completing projects
Increased trust, awareness of new technologies
Short-Term Outcomes
More projects completed in rural communities
Adoption of new technologies and energy saving strategies in rural communities
GHG Reductions
Projects are completed more quickly
NMEC capturing more savings
Customer realizing more savings
Long-term Outcomes
Less energy burden
More complex projects
Rural communities leading by example
Comfortable and safe homes
Continued engagement

3. Process Flow Chart:



4. Measures and Incentives:

The program will offer the following measures:

Workpaper	Measure Name	Incentive
SWAP001	Refrigerator or Freezer, Residential	$50.00 - $150.00
SWAP003	Clothes Dryer, Residential	$50.00 - $350.00
SWAP004	Clothes Washer, Residential	$50.00 - $150.00
SWAP006	Dishwasher, Residential	$100.00
SWAP007	Room Air Conditioner, Residential	$15.00 - $75.00
SWAP008	Room Air Cleaner, Residential	$10.00 - $100.00
SWAP015	Efficient Electric Cooking Appliances, Residential	$150.00 - $750.00
SWAP013	Cooking Appliances, Residential, Fuel Substitution	$200.00 - $750.00
SWAP014	Heat Pump Clothes Dryer, Residential, Fuel Substitution	$450.00 - $750.00
SWHC044	Ductless HVAC, Residential, Fuel Substitution	$338.00 - $1,600.00
SWHC045	Heat Pump HVAC, Residential, Fuel Substitution	$338.00 - $1,600.00
SWHC049	Ducted AC and HP HVAC Equipment, Residential	$288.00 - $800.00
SWHC050	Ductless Heat Pump, Residential	$288.00 - $800.00
SWBE006	Ceiling Insulation, Residential	$0.93

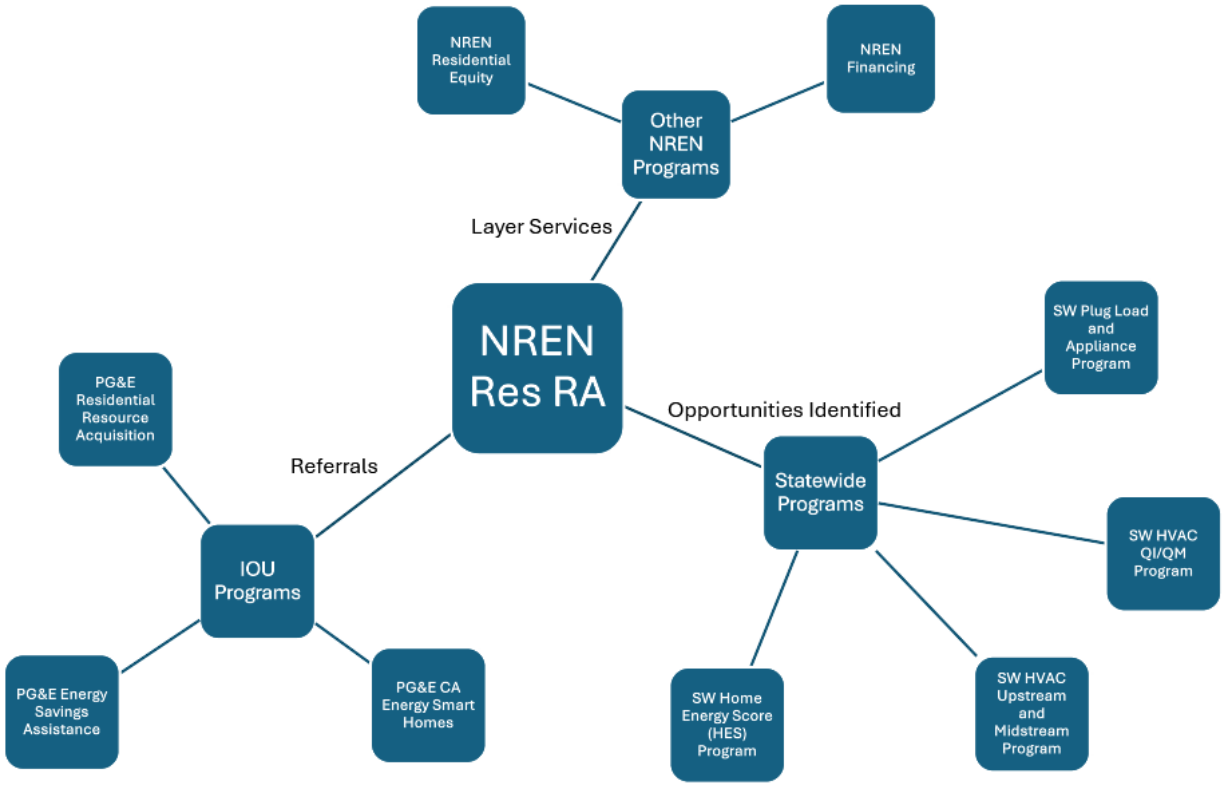
SWBE007	Wall Insulation, Residential	$0.88
SWHC039	Smart Thermostat, Residential (Direct Install)	$150.00
SWSV001	Duct Seal, Residential (Direct Install)	$0.69
SWWH014	Heat Pump Water Heater, Residential	$600.00 – $1,000.00
SWWH025	Heat Pump Water Heater, Residential, Fuel Substitution	$700.00 - $1,000.00
SWWH026	Water Heater Pipe Wrap, Residential (Direct Install)	$150.00-$180.00

Measure Application Types	Baseline	Incentive calculation	Custom Cap	Deemed Cap
NR	Code/ISP	Based on IMC, savings, market	NA	100% of IMC
AR	Existing	Based on IMC, savings, market; Custom based on calculated savings	100% of FMC for DI 100% of ARC for Downstream	100% of FMC
AOE	Existing	Flexible, based on IMC, savings	NA	100% of IMC

Software Tools

Custom lighting for multifamily will be calculated using MLC if offered.

5. Diagram of Program



6. Program Measurement & Verification (M&V)

The program will apply data collection strategies including program enrollment and participation tracking, pre- and post-installation data, contractor reporting, and quality assurance.

The program will track the following program targets as part of its measurement and verification protocol:

Quantitative Program Targets

Metric	2025	2026	2027
Budget	$2,620,585	$2,942,106	$1,564,732
TRC	0.18	0.22	0.23
TSB	$129,682.44	$159,336.29	$162,140.74
Net kWh	-245969.46	-383505.95	-383505.95
Net kW	12.13	17.91	17.91
GHG (Tons)	70.83	70.83	70.83
HTR (%)	70%	70%	70%

In addition to the above quantitative metrics, this program will also track equity metrics such as tracking participation by disadvantaged communities and hard-to-reach customers. The program will also track performance by including post-install surveys and participation rates.

NREN will employ an internal process for evaluation including regular reviews of workflow efficiency, contractor compliance, and customer experience. The program will also document pre-existing conditions in rural homes for additional data collection. NREN will maintain records of customer eligibility and enrollment as well as installation to support EM&V efforts. These EM&V efforts will lead to continuous improvement intended to refine measure offerings, increase outreach efforts, and improve incentive structures.

During initial program launch, the program will utilize a deemed savings methodology due to its practicality and cost-effectiveness in terms of rapid deployment of services to ratepayers. After program launch, NREN will evaluate the feasibility and cost-effectiveness of the NMEC platform based on data access and availability, data collection requirements, measurement and verification protocols, operational processes, and associated costs. NREN intends for this phased approach to ensure immediate services to its ratepayers and program continuity while supporting future adoption of NMEC methodology where appropriate.

7. Normalized Metered Energy Consumption (NMEC) Program M&V Plan:

The program will evaluate the feasibility and cost-effectiveness of the NMEC platform for potential future modifications of the program. Once the NMEC platform is established NREN will develop a NMEC Program M&V Plan.