

BayREN - Heat Pump Water Heater Regional Market Transformation

Section I: Summary of Project

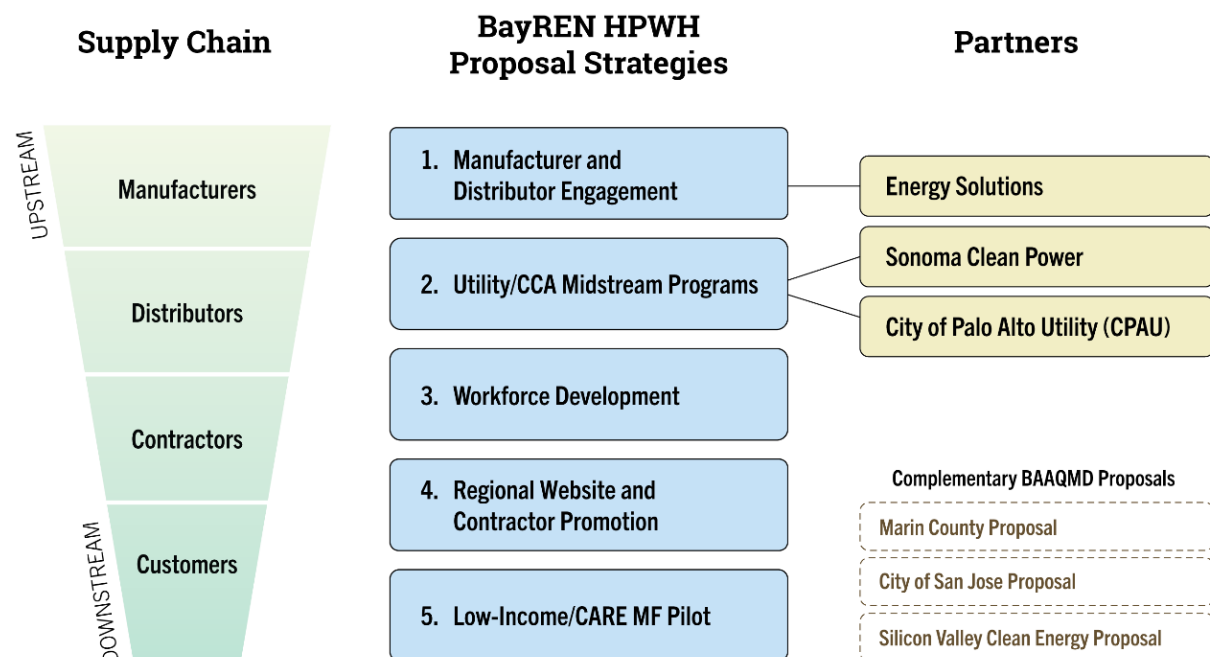
The San Francisco Bay Area Regional Energy Network (BayREN) project, “**Heat Pump Water Heater (HPWH) Regional Market Transformation**” will address five barriers to greater market adoption of energy efficient HPWHs in order to produce significant, long-lasting benefits. These barriers are:

1. Lack of readily available HPWHs for emergency water heater replacements
2. Downstream (directly customer-facing) incentive programs are not scalable
3. Lack of qualified contractors who can install and/or promote HPWHs
4. Lack of homeowner education on HPWH technology
5. Barriers to fuel switching in utility ratepayer-funded energy efficiency programs

Municipal utilities SMUD and City of Palo Alto (CPAU) have offered downstream HPWH incentives since 2016 but have not overcome these market barriers.

As shown in Figure 1, the BayREN team has developed five strategies to address these barriers, engaging partners Energy Solutions, Sonoma Clean Power, and CPAU to provide key upstream and midstream measures, and complementing other proposals offering downstream (customer-facing) incentives.

Figure 1: BayREN Strategies for HPWH Regional Market Transformation



Air District funding is critical for three reasons. First, this funding allows a regional approach to supply chain engagement not limited to individual jurisdictions or CCA service territories. Second, Air District funds can be used to promote switching from gas appliances to electric appliances. Energy utility ratepayer funds cannot be used in this way under current California Public Utility Commission regulations and therefore cannot fund this project, although ratepayer funds are leveraged in this proposal. Finally, this is a key moment when HPWHs are present in the market but have not been widely adopted because of the barriers discussed above, and Air District funds can, through this

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project, transform the water heater market throughout the region in addition to directly increasing the number of HPWHs in use.

Section II: Strategic Approach

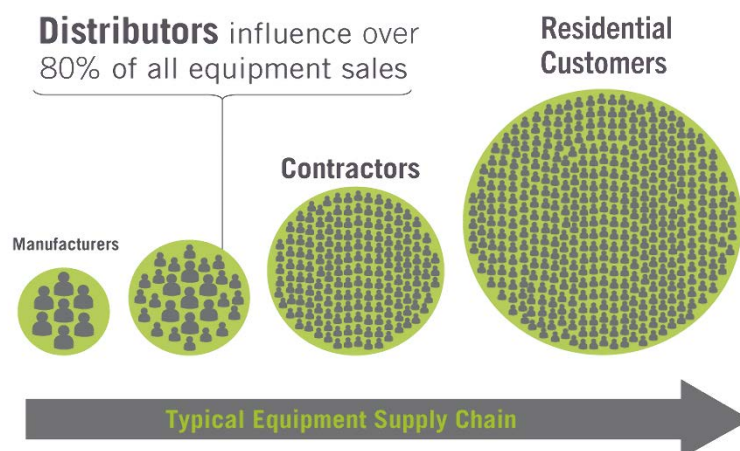
Ninety percent of Bay Area homes have water heaters that use natural gas, a fossil fuel that emits GHGs when transmitted and burned. Replacing these with electric water heaters improves indoor air quality and safety. As electricity becomes carbon-free in the Bay Area, switching to electric water heating will be essential for meeting the Air District's (and the State's) GHG reduction goals. HPWHs are more efficient than gas water heaters and electric resistance water heaters,¹ and HPWHs with a tank have an added value of storage, with the ability to load shift so that water can be heated at lower demand times of use.

Through five strategies, developed to address known barriers at every point in the supply chain, this project will change the market for hot water heaters throughout the San Francisco Bay region while complementing proposals that provide downstream incentives and marketing in targeted areas. We have included letters of support from Marin County, City of San Jose, and Silicon Valley Clean Energy.

Strategy #1: Engage market actors higher in the supply chain for greatest leverage

Early adopter communities, including Palo Alto and Berkeley, learned that water heater contractors were not offering HPWHs as an option for emergency replacements, in part because the equipment was not readily in stock. The project team will serve as a bridge between the national distribution channels and local programs. Energy Solutions, a key partner in this proposal, has an established network of relationships within the manufacturer, distributor and contractor communities in the Bay Area and beyond, which will facilitate our engagement with these market actors (see commitment letter). They recently won a CEC grant of \$1 million to deploy an online platform, TradePro Connect, and other tools in California. To provide matching support for this project, they will use the Bay Area as a demonstration region. The project team will map out the manufacturer, distributor and contractor network for the entire Bay Area, and communicate the growing market opportunity in the Bay Area. As illustrated by Figure 2, the market supply chain for HPWHs is where a regional program can have the most cost-effective impact. In order to really move the HPWH market, interventions should target the midstream of the supply chain, before products reach the

Figure 2: Distributors are a highly effective leverage point



¹ HPWHs have a coefficient of performance of 2.8, compared to 0.6 for gas water heaters and 0.9 for electric resistance water heaters.

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consumer. In a study by DNV GL for the CPUC in 2016 on HVAC systems, it was found that 81% of customer purchases were influenced by distributor recommendations.²

Strategy #2: Coordinate with municipal utilities, CCAs and local governments for regional consistency

An incentive given to a distributor can have 9 times the impact of an incentive given to a homeowner.³ However, a midstream incentive program can be difficult to implement at a small scale. Utilizing best practices learned from an existing midstream incentive program offered through partner Sonoma Clean Power, this project will bring a midstream program to the region, thereby streamlining the process for all Bay Area municipal utilities and CCAs.

In developing this proposal, the BayREN team identified numerous municipal utilities and CCAs interested in promoting building electrification and implementing future incentive programs. The City of Palo Alto has committed to matching incentive funds for this project (see commitment letter) as our first partner utility for the regional market transformation program. We plan to work with additional municipal utilities and CCAs (see support letters from Alameda Municipal Power and Peninsula Clean Energy) to help them understand the cost-effectiveness of offering distributor incentives in lieu of, or in conjunction with, downstream incentives.

Additionally, if the Air District funds this project and any of the complementary proposals from Marin County, City of San Jose, or Silicon Valley Clean Energy, the project teams will work to leverage the regional market development for greater impact, while cross-promoting their local incentives to the key supply chain actors.

Strategy #3: Workforce development – contractors, building departments, and trade allies

Workforce development is essential for market transformation on a regional level. HPWHs require trained installers who can assess a site for suitability, recognize the cooling effect of the appliance on the space, and provide electrical and plumbing work. Manufacturers and PG&E already offer some contractor training, and the BayREN team will leverage those while also providing additional training opportunities as needed. To ensure support for HPWHs at local building departments and through the permitting process, BayREN will provide training through its Codes & Standards Program to local building department staff about HPWHs to assist homeowners and contractors at the counter, and to review and inspect HPWH projects.

The project team will also develop new curriculum for contractors on financing, including options such as federal solar tax credits, PACE, and the statewide Residential Energy Efficiency Loan (REEL) program. Even when incentives are unavailable, the high upfront costs of HPWHs can be mitigated by offering an attractive financing package. Additionally, because installation costs for HPWHs are lowest when bundled with other technologies, the project team will work with programs such as Sunshares (BC3), PACE providers, and solar companies to help them cross-promote HPWHs to customers purchasing solar photovoltaic (PV), electric vehicles (EV) or charging stations by providing information and educational materials. Letters of support are attached from Sunshares (BC3) and three PACE providers.

² HVAC1 NTG Final Report (2016), DNV GL for the CPUC, p. 4.

³ The 900 Percent Solution: Upstream Best Practices across HVAC and Multiple Technologies, Cornejo & Barnacle,

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Figure 3: Trainings Included in this Program

Training Content	Target Audience	Problem Addressed
A. HPWH installation (new and leveraged trainings)	Contractors Designers	Contractors unfamiliar with HPWHs submit unrealistic bids and contribute to the high variation in installation costs
B. HPWH installation and inspection requirements (BayREN match)	Building Departments	Counter staff are unaware of HPWH installation requirements and benefits; building inspectors may be unaware of specific requirements
C. Financing for HPWHs (new content)	Lenders, homeowners	High upfront cost Uncertainty about financing
D. PV and HPWHs (new content)	PV installers and financiers	Solar contractors are unaware of HPWHs and compatibility with solar
E. EV and HPWHs (new content)	EV sales staff and charging station installers	EV and EV infrastructure sellers are unaware of HPWHs and shared need for electric panel upgrades

As mentioned, project partner Energy Solutions is providing access to an online platform, TradePro Connect, for contractor services. TradePro Connect is a services marketplace connecting customers to a network of qualified professionals, helping with bidding and energy services. The tool can be used by homeowners as well as distributors and contractors. Trained contractors can enroll in TradePro Connect, and BayREN's website will direct residents to the platform to obtain multiple competitive bids for HPWH installation.

Strategy #4: Develop homeowner education to support contractors and partner organizations

This project includes homeowner education that leverages existing industry outreach channels, and BayREN's single-family energy efficiency outreach. BayREN's members conduct ongoing homeowner workshops and events in all nine-counties of the Bay Area and will be promoting these HPWH resources. Target homeowners are 1) early adopters who are ready to take the next step, and 2) those with a failing water heater who need an emergency replacement unit.

Education components include:

- Addition of homeowner education to the BayREN website, explaining the value of heat pump water heaters and providing a basic costing tool.
- Informational flyer on the benefits of heat pump water heater replacement. Brochures will be provided to trained contractors, partner utilities and CCAs as a marketing tool.
- Digital AdWords campaign to capture search inquiries for water heater replacement. This campaign will target single-family homeowners who need to replace their water heaters due to age or other factors. The campaign will point homeowners to educational information on BayREN's website and the TradePro Connect platform for contractor bids.

Strategy #5: Install fuel switching measures in Low-Income and CARE communities

BayREN's Multifamily Building Enhancements (BAMBE) program is the most successful and cost-effective whole-building multifamily retrofit program in California, incentivizing over 5,000 units per year. We already have property owners in our pipeline interested in installing HPWH equipment in their buildings, but current CPUC regulations, specifically the "three-prong test," prohibit the use of

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utility ratepayer funds to replace natural gas water heaters with electric water heaters because of cost-efficiency. The Air District grant will allow this program to provide an additional subsidy so that the HPWHs become cost-effective per the CPUC's definition and can be installed as part of the BAMBE program.

The pilot will exclusively serve CARE and low-income communities in the Bay Area. CARE and low-income communities are also communities with high multifamily housing concentrations, making this approach particularly appropriate.

Figure 4: Program Strategies, Elements, and Timeline

Strategy	Element	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
		2018	2019			2020			
1. Supply Chain	Manufacturer & distributor engagement	•				•			
2. Utility/CCA Coordination	City of Palo Alto, Sonoma Clean Power	•	•	•	•				
	Other Municipal Power agencies & CCAs	•	•	•	•	•	•	•	•
3. Workforce Development	Contractor recruitment	•	•	•					
	Host minimum of 15 trainings		•	•	•	•	•	•	
	Enroll 50+ contractors in TradePro Connect		•	•	•				
4. Consumer Education	Launch homeowner website & flyers				•	•			
	Digital campaign promoting TradePro Connect					•	•	•	•
5. HPWH Installations	Pilot in 250 low-income or CARE multifamily units		•	•	•	•			
	Installations from midstream incentive programs			•	•	•	•	•	•
	Installations from TradePro Connect							•	•

Key Partners & Roles:

BayREN is a nine-county collaborative that implements energy efficiency solutions at a regional scale. StopWaste, which is the lead agency for BayREN in Alameda County and for this proposal, has a 15 year track record of designing market transformation programs for the buildings sector. This proposal leverages the following BayREN programs:

- **Single-Family:** BayREN's local government members are a trusted voice for homeowners and conduct outreach to promote single-family home upgrades.
- **Multifamily:** BayREN offers free technical assistance and rebates to multifamily property owners throughout the Bay Area, and a financing referral service.
- **Codes and Standards:** BayREN provides specialized trainings to local government planning, building and sustainability staff, on building code inspection and innovative policies.
- **Financing:** BayREN engages with PACE providers who finance and install solar PV, along with electric system upgrades.

Energy Solutions is a respected industry leader that has been designing midstream incentive programs in 20 states over the past 20 years. Energy Solutions brings its relationships with manufacturers and distributors, and an online platform for coordinating contractor services, TradePro Connect.

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The City of Palo Alto has implemented a downstream incentive program for HPWHs since 2016, and their experience has informed the key barriers addressed by this proposal. The City of Palo Alto is BayREN's initial utility partner in implementing a midstream incentive program.

Sonoma Clean Power (SCP) recently launched a midstream incentive program to single family homeowners and received a \$13 million CEC grant that will be used to provide a brick and mortar storefront. SCP will be a key advisor on the regional program's design and implementation.

Section III. Connection with Air District Goals and Objectives

The Heat Pump Water Heater Regional Market Transformation project supports the over-arching goal of the Climate Protection Grant Program of accelerating implementation of the Air District's 2017 Clean Air Plan. This proposal will assist the Air District in moving towards the vision for 2050 set forth in the 2017 Plan by helping to decarbonize buildings, reduce dependence on gas, increase energy efficiency, and allow for load-shifting from peak demand times through HPWH storage and controls. In addition, this project will support all six objectives of the Air District's Climate Protection Grant Program.

Objective 1: Support measure(s) outlined in the Air District's 2017 Clean Air Plan.

Our proposal would accelerate work on the following control measures (in order of direct relevance):

- **BL2: Decarbonize Buildings:** This project will transform the Bay Area market for hot water heaters, paving the way for a shift from fossil fuel powered water heaters to efficient electric heat pump water heaters. The 2017 Clean Air Plan recognizes the need for that shift and notes that "existing residential and commercial buildings will need to switch from fossil fuels to low-carbon electricity . . . [for] water heating." (p. 5/17)
- **BL3: Market Solutions:** HPWHs must be seen as the superior product that they are for widespread increase in installations. This project will use market-based solutions in the form of midstream incentives to increase promotion of HPWHs by distributors and contractors.
- **EN2: Decrease Electricity Demand:** Electric HPWHs have a significantly higher Coefficient of Performance than gas water heaters or other types of electric water heaters, which results in lower demand for electricity. In addition, these water heaters can use electricity during off-peak times and store hot water until needed, to reduce peak electricity demand.

Objective 2: Achieve air quality co-benefits.

By removing barriers to electric heat pump water heaters, BayREN's proposal will accelerate replacement of water heaters that rely on fossil fuels with efficient water heaters powered by low carbon electricity. This replacement will reduce criteria pollutants and toxic air contaminants as well as greenhouse gases.

Objective 3: Accelerate local implementation of GHG reduction policies and programs.

Cities across the region express the need for market support to accelerate heat pump water heater adoption (see attached letter of support from the City of Berkeley, and key partner Palo Alto). This proposal will provide support for all jurisdictions in the region and assist them in working towards their energy efficiency, decarbonization, and electrification goals.

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Objective 4: Engage and benefit impacted/CARE communities.

Part of our proposal includes leveraging BayREN's Multifamily Building Enhancements program to provide subsidies for electric heat pump water heaters as part of multifamily upgrades for approximately 250 apartments in low-income and CARE communities.

Objective 5: Implement innovative approaches.

Although the technology and equipment are readily available, HPWHs only constituted 1% of water heater installations in 2018. Addressing all five identified barriers together in one comprehensive, regional program is an innovative approach to increasing the use of HPWHs.

Objective 6: Create replicable solutions for the Bay Area and elsewhere.

The scale of our proposal ensures that every part of the region can benefit. This approach will be replicable in other regions as well; see attached letter of support from the Tri-County Regional Energy Network (3C-REN).

Section IV: Potential for GHG reductions

BayREN estimates that funding this project will result in steadily increasing GHG reductions, with an estimated annual reduction of 862 MTCO₂e by 2020 going up to an annual reduction of 10,002 MTCO₂e in 2025, as shown in Figure 5 below. Estimated cumulative GHG reductions due to this project from 2018-2025 would be 20,748 MTCO₂e. GHG reductions would begin during the first year of the project.

Figure 5: Estimated Annual GHG reductions⁴

	Reductions per year by 2020	Reductions per year by 2022	Reductions per year by 2025
Single family households served	1,010	2,002	12,500
GHGs reduced (net) MTCO ₂ e	758	1,503	9,378
Multifamily households served	250	750	1,500
GHGs reduced (net) MTCO ₂ e	104	312	624
Total GHG reductions net MTCO₂e	862	1,815	10,002

The GHG reductions from this project will come from both market transformation activities and directly subsidized units. In addition, efforts are progressing to remove the limitations on fuel switching, and data from our multifamily low-income/CARE pilot will contribute evidence to support regulatory changes. We assume that CPUC regulations will be revised by 2020 to allow gas to electric conversions, thereby allowing increased use of HPWH as replacement water heaters in both single family and multifamily buildings. Due to this project's market transformation efforts, we estimate that 25% of single-family Bay Area HPWH installations starting in 2021 will be attributable to this project. We also assume that we will sustain 250 multifamily units served annually in the BayREN multifamily program, even without Air District funding once CPUC regulations are revised. Additional assumptions used are described below.

⁴ GHG reductions are calculated using the conversion factors listed in the proposal guidelines (0.005 MTCO₂e/therm, 0.197 MTCO₂e/MWh. Detailed calculations available upon request.

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Single Family GHG reduction assumptions

With 2.6 million housing units in the Bay Area,⁵ and an average life of 13 years per water heater, this proposal anticipates 10% of the replaced water heaters in 2025 will be HPWH (20,000), reaching a total of 50,000 HPWHs installed to date. To achieve that total, we expect an increase over 7 years with residents choosing HPWH on distributor recommendations due to the midstream incentive programs and the TradePro Connect platform linking contractors and households for emergency replacement.

In 2020, a statewide water heater incentive program is expected to launch, and this market will be primed to accelerate the pace of HPWH installations, reaching more than 20,000 installed in 2025. These scenarios are likely given the performance of upstream incentive programs in New England, with sales increasing eight-fold over one year's time.

Additional assumptions are:

- Single family home hot water use for a three-person household is 46 gallons/day
- Gas use for hot water is 180 therms/year per HPWH (reduced MTCO₂e)
- Electricity use for HPWH is 760 kWh/year per HPWH (increase in MTCO₂e)
- After 2021, 25% of new HPWH installations can be attributed to BayREN program efforts
- No GHG emission reductions were calculated due to decrease in gas leakage, although leakage contributes to GHG emissions (around 1%) and impacts air quality

Multifamily GHG Reduction Assumptions

Multifamily installations under the BAMBE program include customized HPWH equipment that can match the property's needs. Assumptions for these installations include:

- 25 in-unit gas water heaters: -185 therms, +877 kWh per unit (net -0.75 MTCO₂e)
- 15 in-unit gas space heating: - 49 therms, + 14 kWh per unit (net -0.24 MTCO₂e)
- 1 central water heater (60 units): - 8100 therms, + 42000 kWh (net -32.23 MTCO₂e)
- 2 central water heaters (15 units each): - 2025 therms, + 10,500 kWh (net -8 MTCO₂e)
- 2 HPWH for tenant shared laundry: - 860 therms, + 7,600 kWh (net -2.8 MTCO₂e)
- 2 HPWH for pool heating: - 8,000 therms, + 48,000 kWh (net -30.5 MTCO₂e)

Section IV: Potential for GHG reductions

The following metrics will be tracked and used to measure the success of the program.

Figure 6: Metrics of Success

Program Target	Metrics of success
Supply Chain	Number of manufacturers/distributors engaged through program
	Number of TradePro Connect enrolled contractors in region
Utility/CCA coordination	Number of utilities/CCAs assisted
Workforce Development	Number of industry professionals trained
Homeowner Education	Number of views of regional website
	Clicks on Google AdWords
Installations of HPWHs	Number of HPWH units installed

⁵ <http://www.bayareacensus.ca.gov/bayarea.htm>

BayREN - Heat Pump Water Heater Regional Market Transformation

Attached Letters of Support

1. Letters of Commitment from Key Project Partners

- City of Palo Alto Utility
- Energy Solutions
- Sonoma Clean Power (CCA)

2. Letters of Support from Complementary Proposals for Air District Funding

- Marin County
- City of San Jose
- Silicon Valley Clean Energy (CCA)

3. Letters of Support from Additional Municipal Utilities and CCAs

- Alameda Municipal Power
- Peninsula Clean Energy (CCA)

4. Letters of Support from Workforce Development Partners

- Passive House California
- Business Council on Climate Change (BC3, Sunshares)
- PACE Funding (PACE)
- Renovate America (PACE)
- Renew Financial (PACE)

5. Letter of Support from Outside the Bay Area

- San Luis Obispo County and Tri-County Regional Energy Network (3C-REN) in Santa Barbara, Ventura and San Luis Obispo Counties

6. Others

- City of Berkeley



UTILITIES DEPARTMENT

250 Hamilton Avenue, 3rd Floor
Palo Alto, CA 94301
650.329.2241

May 10, 2018

Jennifer Berg, BayREN
Metropolitan Transportation Commission
375 Beale St.
San Francisco, CA 94105

RE: LETTER OF SUPPORT FOR BAAQMD GRANT

Dear Ms. Berg:

The City of Palo Alto is pleased to partner with BayREN on the *Heat Pump Water Heating (HPWH) Regional Market Transformation Project*. This project will help jurisdictions in the nine county region to reduce greenhouse gas emissions from existing buildings. This concept directly supports BAAQMD's Clean Air Plan (2017) strategies to: 1. Promote energy and water efficiency in existing buildings; 2. Promote a switch from natural gas to electricity for space/water heating in buildings; and 3. Allow load-shifting from peak demand times through HPWH controls. There is incredible potential to reduce energy consumption and greenhouse gas (GHG) emissions associated with residential water heating, and this project will help realize those savings consistent with Senate Bill 350 (2015), Assembly Bill 32 (2006), Assembly Bill 802 (2015), and other state guidance.

We support BayREN as the ideal organization to lead a regional market transformation program for residential HPWHs. By leveraging their experience in designing and implementing effective energy efficiency programs along with support from local governments, municipal utilities and CCA's, BayREN is well positioned to deliver a successful program. The City of Palo Alto looks forward to collaborating with the BayREN team to accelerate building electrification and transforming the market for HPWHs.

We support the regional program approach which can catalyze market transformation and address the many persistent barriers that cannot be addressed on a local scale. These barriers include, but are not limited to: high upfront costs, lack of readily available HPWHs for emergency replacements, lack of trained contractors for installations, lack of homeowner awareness on HPWH technology, and lack of funding source for fuel switching programs. BayREN's proposed program will address these barriers through a multi-pronged approach, including direct engagement with the manufacturers, distributors, contractors and homeowners.

The City of Palo Alto Utilities (CPAU) is the only carbon neutral gas and electric utility in the world and is committed to demonstrating leadership on the path to a sustainable future. In order to meet the City's aggressive GHG emission reduction goal of 80% below 1990 by 2030, the City recognizes the need to pursue electrification in the buildings and transportation sectors. CPAU is one of the first cities in California to offer aggressive downstream HPWH rebates, along with comprehensive online resources for our customers. We have also co-hosted HPWH workshops with Passive House California to raise public awareness of HPWH technology. However, given the limited geographic coverage of Palo Alto, the overall impact of CPAU's activities on the HPWH market is limited. In order to affect profound HPWH

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market transformation, local governments, utilities and CCAs must pool their resources to pursue a coherent set of strategies to increase HPWH adoption.

The City of Palo Alto commits to supporting the BayREN project as a utility partner, providing in-kind contribution of \$11,000 for CPAU staff time and matching incentive funds in the amount of \$35,000 over two years to support the regional HPWH market transformation program. CPAU will target a total of 70 HPWH units installed in our service territory during the grant contract period (2018-2020). CPAU staff will use outreach materials created by the BayREN proposal for Palo Alto residents as well as work alongside SunShares and Passive House California to reach Palo Alto residents.

I am confident that this project will advance regional and State goals and help local governments reduce energy use and GHG emissions.

Respectfully,

DocuSigned by:
Ed Shikada
F2DCA19CCC8D4F9...

Ed Shikada
General Manager of Utilities
City of Palo Alto



ENERGY SOLUTIONS

May 9, 2018

Jennifer Berg, BayREN
Metropolitan Transportation Commission
375 Beale St.
San Francisco, CA 94105

RE: LETTER OF SUPPORT FOR BAAQMD GRANT

Dear Ms. Berg:

Energy Solutions is pleased to partner with BayREN on the *Heat Pump Water Heating (HPWH) Regional Market Transformation* project. This project will help jurisdictions in the nine county region Reduce GHGs from Existing Buildings. This concept directly supports Clean Air Plan (2017) strategies to 1. Promote energy and water efficiency in existing buildings, 2. Promote a switch from natural gas to electricity for space/water heating in buildings, and 3. Allow load-shifting from peak demand times through HPWH controls. There is incredible potential to reduce energy consumption used for residential water heating and this project will help realize those savings consistent with Senate Bill 350, Assembly Bill 32, Assembly Bill 802, and other state guidance.

The program will use a multi-pronged approach to increase the uptake of electrification measures and the number of HPWHs in homes, including direct engagement with manufacturers, distributors and contractors who implement water heater replacements. We support a regional program approach which can catalyze market transformation and address the many persistent barriers that cannot be addressed at a local scale. These barriers include, but are not limited to a lack of readily available HPWHs for emergency replacements, incentive programs that are not scalable, a lack of trained contractors for installations, homeowners who don't yet know the benefits of HPWH technology, and barriers to fuel switching in utility ratepayer-funded energy efficiency programs.

Energy Solutions was recently awarded a Statewide EPIC Procurement Group 4 Procurement grant to deploy solutions to address installation and procurement barriers to the adoption of energy efficiency and decarbonization measures throughout the state of California. As part of this grant, Energy Solutions is funded to develop upstream manufacturer and distributor market transformation interventions tailored to the California supply chain. Energy Solutions, as part of its scope of work funded by the CEC EPIC grant, pledges to bring \$150,000 in match funding to this BayREN proposal to support program design, supply chain market actor engagement, and contractor network management and training towards the objectives of this proposal.

I am confident that this project will advance regional and State goals and help local governments reduce energy use and GHG emissions.

Sincerely,

Chris Burmester, Vice President of Products and Strategy
Energy Solutions



Local. Renewable. Ours.

May 9, 2018

Jennifer Berg, BayREN
Metropolitan Transportation Commission
375 Beale St.
San Francisco, CA 94105

RE: LETTER OF SUPPORT FOR BAAQMD GRANT

Dear Ms. Berg:

Sonoma Clean Power (SCP) is pleased to provide this letter of support for the BayREN grant application *Heat Pump Water Heating (HPWH) Regional Market Transformation*. As an organization driven by a goal of reducing greenhouse gas emissions, SCP strongly supports tools and strategies that advance the deployment of heat pump water heaters, and feels as though this project will help to realize the goals of California legislation such as Senate Bill 350, Assembly Bill 32, Assembly Bill 802. We feel that BayREN is a good entity to lead this proposed regional effort.

SCP is a public, locally-run "community choice" power provider in Sonoma County. SCP is the default electric generation provider to all customers in Sonoma and Mendocino Counties with the exception of the Cities of Healdsburg and Ukiah. SCP partners with Pacific Gas and Electric (PG&E), which continues to provide grid management and billing services, while competing with PG&E to provide cleaner and cheaper sources of power. Sonoma Clean Power currently administers a new construction program that incentivizes all-electric construction and is working on the development of a mid-stream heat pump water heater program. We look forward to coordinating with the BayREN team on strengthening our current program models, providing lessons learned from our current efforts, working with California CCAS and municipal utilities to strengthen their heat pump water heater programs, and leveraging the training resources that will be created as a part of this grant application.

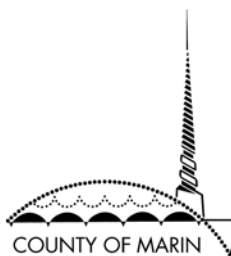
We look forward to collaborating with the team to accelerate electrification, reduce greenhouse gas emissions within the SCP territory, and transform the regional market for residential heat pump water heaters.

Sincerely,

A handwritten signature in black ink, appearing to read "Geof Syphers", is written over a faint, light green background graphic of a mountain range.

Geof Syphers, CEO

Sonoma Clean Power



COMMUNITY DEVELOPMENT AGENCY
PLANNING DIVISION

May 9, 2018

Brian C. Crawford
DIRECTOR

Thomas Lai
ASSISTANT DIRECTOR

Jennifer Berg, BayREN
Metropolitan Transportation Commission
375 Beale St.
San Francisco, CA 94105

RE: LETTER OF SUPPORT FOR BAAQMD GRANT

Marin County Civic Center
3501 Civic Center Drive
Suite 308
San Rafael, CA 94903
415 473 6269 T
415 473 7880 F
415 473 2255 TTY
www.marincounty.org/plan

Dear Ms. Berg:

The County of Marin is pleased to partner with BayREN on the Heat Pump Water Heating (HPWH) Regional Market Transformation project. This project will help jurisdictions in the nine-county region reduce GHGs from existing buildings. This concept directly supports Clean Air Plan (2017) strategies including:

- Promoting energy and water efficiency in existing buildings,
- Promoting a switch from natural gas to electricity for space/water heating in buildings, and
- Allowing load-shifting from peak demand times through HPWH controls.

There is incredible potential to reduce energy consumption used for residential water heating and this project will help realize those savings consistent with Senate Bill 350, Assembly Bill 32, Assembly Bill 802, and other state guidance.

We feel that BayREN is the right entity to lead on a regional program and look forward to collaborating with the team to accelerate electrification and transform the regional market for residential heat pump water heaters. We are excited to support a project which leverages existing BayREN programs and CEC grants, along with support from local governments, municipal utilities and CCAs. The program will use a multi-pronged approach to increase the uptake of electrification measures and the number of HPWHs in homes, including direct engagement with manufacturers, distributors and contractors who implement water heater replacements.

While Marin's efforts focus on local government education and direct-to-consumer rebates, BayREN's approach would provide up- and mid-stream incentives regionally that would be challenging for a local government to coordinate alone. County of Marin staff believes BayREN's proposal in conjunction with our local proposal will amplify the impact of building decarbonization efforts in the region.

I am confident that this project will advance regional and State goals and help local governments reduce energy use and GHG emissions.

Sincerely,

Dana Armanino
Senior Sustainability Planner

May 10, 2018

Jennifer Berg, BayREN
Metropolitan Transportation Commission
375 Beale Street
San Francisco, CA 94105

RE: LETTER OF SUPPORT FOR BAAQMD GRANT

Dear Ms. Berg,

The City of San José is pleased to collaborate with BayREN on the *Heat Pump Water Heating (HPWH) Regional Market Transformation* project. This project will help jurisdictions in the nine-county region Reduce GHGs from Existing Buildings. This concept directly supports Clean Air Plan (2017) strategies to 1. Promote energy and water efficiency in existing buildings, 2. Promote a switch from natural gas to electricity for space/water heating in buildings, and 3. Allow load-shifting from peak demand times through HPWH controls. There is incredible potential to reduce energy consumption used for residential water heating and this project will help realize those savings consistent with Senate Bill 350, Assembly Bill 32, Assembly Bill 802, and other state guidance.

We look forward to collaborating with the BayREN team to accelerate electrification and transform the regional market for residential heat pump water heaters. We will support this project which leverages existing BayREN programs and CEC grants, along with support from local governments, municipal utilities and CCAs. The program will use a multi-pronged approach to increase the uptake of electrification measures and the number of HPWHs in homes, including direct engagement with manufacturers, distributors and contractors who implement water heater replacements.

We support a regional program approach which can catalyze market transformation and address the many persistent barriers that cannot be addressed at a local scale. These barriers include, but are not limited to, a lack of readily available HPWHs for emergency replacements, a lack of trained contractors for installations, homeowners who don't yet know the benefits of HPWH technology, and barriers to fuel switching in utility ratepayer-funded energy efficiency programs.

As this effort aligns with our BAAQMD grant proposed program for electrification incentives and education as well as our carbon reduction goals set out in our recently adopted Climate Smart San José plan, we commit to collaborating with BayREN on program design, marketing, and implementation as appropriate. I am confident that this project will advance regional and State goals and help local governments reduce energy use and GHG emissions.

Sincerely,



Cyndy Comerford
Deputy Director, Climate Smart San José
City of San José



333 W El Camino Real, Ste. 290 | Sunnyvale, CA 94087 | SVCleanEnergy.org | 1-844-474-SVCE

Rob Rennie, Chair
Town of Los Gatos

May 9, 2018

Daniel Harney, Vice Chair
City of Gilroy

Jennifer Berg, BayREN
Metropolitan Transportation Commission
375 Beale St.
San Francisco, CA 94105

Liz Gibbons
City of Campbell

RE: LETTER OF SUPPORT FOR BAAQMD GRANT

Rod Sinks
City of Cupertino

Dear Ms. Berg:

Jeannie Bruins
City of Los Altos

Silicon Valley Clean Energy (SVCE) is pleased to partner with BayREN on the *Heat Pump Water Heating (HPWH) Regional Market Transformation* project. This project will help jurisdictions in the nine-county region Reduce GHGs from Existing Buildings. This concept directly supports Clean Air Plan (2017) strategies to 1. Promote energy and water efficiency in existing buildings, 2. Promote a switch from natural gas to electricity for space/water heating in buildings, and 3. Allow load-shifting from peak demand times through HPWH controls. There is major potential to reduce energy consumption used for residential water heating and this project will help realize those savings consistent with Senate Bill 350, Assembly Bill 32, Assembly Bill 802, and other state guidance.

Courtenay C. Corrigan
Town of Los Altos Hills

Marsha Grilli
City of Milpitas

Burton Craig
City of Monte Sereno

We feel that BayREN is the right entity to lead on a regional program, and look forward to collaborating with the team to accelerate electrification and transform the regional market for residential heat pump water heaters. We will work with this project which leverages existing BayREN programs and CEC grants, along with support from municipal utilities, and other local governments and CCAs beyond our service territory. The program will use a multi-pronged approach to increase the uptake of electrification measures and the number of HPWHs in homes, including direct engagement with manufacturers, distributors and contractors who implement water heater replacements.

Steve Tate
City of Morgan Hill

Margaret Abe-Koga
City of Mountain View

Dave Cortese
County of Santa Clara

Howard Miller
City of Saratoga

Nancy Smith
City of Sunnyvale

We support a regional program approach which can catalyze market transformation and address the many persistent barriers that cannot be addressed at a local scale. These barriers include, but are not limited to a lack of readily available HPWHs for emergency replacements, incentive programs that are not scalable, a lack of trained contractors for installations, homeowners who don't yet know the benefits of HPWH technology, and barriers to fuel switching in utility ratepayer-funded energy efficiency programs.



333 W El Camino Real, Ste. 290 | Sunnyvale, CA 94087 | SVCleanEnergy.org | 1-844-474-SVCE

Rob Rennie, Chair
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Dave Cortese
County of Santa Clara

Howard Miller
City of Saratoga

Nancy Smith
City of Sunnyvale

Silicon Valley Clean Energy is a community choice energy agency serving thirteen Silicon Valley jurisdictions, providing clean, carbon-free power to more than 270,000 residential and commercial electricity customers. In partnership with our 13-member jurisdictions, SVCE is seeking funding under the same BAAQMD Climate Protection Grant Program for a complementary program focused on building electrification and decarbonization in the residential sector.

Specifically, SVCE's proposed 'FutureFit Home' initiative provides direct support for installation of heat pump water heaters (HPWH) in our service territory, and the associated electric service panel upgrades often required for HPWHs. Importantly, these improvements serve as the backbone for transition to a carbon-free all-electric home – including heat pump space heating, EV charging, integrated controls, and high-efficiency electric appliances such as induction cooktops and heat pump clothes dryers. The scope proposed by BayREN focused on regional transformation elements is highly synergistic with SVCE's proposed scope – allowing SVCE to concentrate on specific deployments in our service territory while leveraging regional efforts for general market education and supply chain channel expansion related to HPWHs.

I am confident that this project will advance regional and State goals and help local governments reduce energy use and GHG emissions.

Sincerely,

A handwritten signature in blue ink, appearing to read "Girish Balachandran", with a stylized flourish at the end.

Girish Balachandran
CEO
Silicon Valley Clean Energy (SVCE)



**ALAMEDA
MUNICIPAL POWER**

A Department of the City of Alameda

May 9, 2018

Jennifer Berg, BayREN
Metropolitan Transportation Commission
375 Beale St.
San Francisco, CA 94105

RE: LETTER OF SUPPORT FOR BAAQMD GRANT

Dear Ms. Berg:

The Alameda Municipal Power is pleased to partner with the Bay Area Regional Energy Network (BayREN) on the *Heat Pump Water Heating (HPWH) Regional Market Transformation* project. This project will help jurisdictions in the nine county regions reduce greenhouse gases (GHGs) from existing buildings. This concept directly supports Clean Air Plan (2017) strategies to 1. Promote energy and water efficiency in existing buildings, 2. Promote a switch from natural gas to electricity for space/water heating in buildings, and 3. Allow load-shifting from peak demand times through HPWH controls. There is incredible potential to reduce energy consumption used for residential water heating and this project will help realize those savings consistent with Senate Bill 350, Assembly Bill 32, Assembly Bill 802, and other state guidance.

We feel that BayREN is the right entity to lead on a regional program, and look forward to collaborating with the team to accelerate electrification and transform the regional market for residential heat pump water heaters. We will work with [or support] this project which leverages existing BayREN programs and CEC grants, along with support from local governments, municipal utilities and CCAs. The program will use a multi-pronged approach to increase the uptake of electrification measures and the number of HPWHs in homes, including direct engagement with manufacturers, distributors and contractors who implement water heater replacements.

We support a regional program approach which can catalyze market transformation and address the many persistent barriers that cannot be addressed at a local scale. These barriers include, but are not limited to existing building code and rigid enforcement at the local level, a lack of readily available HPWHs for emergency replacements, a lack of trained contractors for installations, homeowners who don't yet know the benefits of HPWH technology, and barriers to fuel switching with regards to electricity savings goals for utility ratepayer-funded energy efficiency programs.

2000 Grand Street
P.O. Box H
Alameda, CA 94501-0263
www.alamedamp.com

Phone 510-748-3900
Fax 510-748-3975





**ALAMEDA
MUNICIPAL POWER**

A Department of the City of Alameda

Alameda Municipal Power (AMP) has had a residential rebate program for new heat pump water heaters. AMP has, to date, received only two applications. A regional education and promotion program would increase participation and would also be aligned with the City of Alameda's overall GHG reduction goals.

Sincerely,

Sender's Name: Harpreet Singh

Sender's Job Title: Utility Energy Analyst

2000 Grand Street
P.O. Box H
Alameda, CA 94501-0263
www.alamedamp.com

Phone 510-748-3900
Fax 510-748-3975



San Mateo County | Atherton | Belmont | Brisbane | Burlingame | Colma | Daly City | East Palo Alto | Foster City
Half Moon Bay | Hillsborough | Millbrae | Menlo Park | Pacifica | Portola Valley | Redwood City | San Bruno | San Carlos San
Mateo | South San Francisco | Woodside

May 9, 2018
Jennifer Berg, BayREN
Metropolitan Transportation Commission
375 Beale St.
San Francisco, CA 94105

RE: LETTER OF SUPPORT FOR BAAQMD GRANT

Dear Ms. Berg:

The Peninsula Clean Energy (PCE) is pleased to partner with BayREN on the *Heat Pump Water Heating (HPWH) Regional Market Transformation* project. This project will help jurisdictions in the nine county region Reduce GHGs from Existing Buildings. This concept directly supports Clean Air Plan (2017) strategies to 1. Promote energy and water efficiency in existing buildings, 2. Promote a switch from natural gas to electricity for space/water heating in buildings, and 3. Allow load-shifting from peak demand times through HPWH controls. There is incredible potential to reduce energy consumption used for residential water heating and this project will help realize those savings consistent with Senate Bill 350, Assembly Bill 32, Assembly Bill 802, and other state guidance.

PCE is the community choice aggregator (CCA) serving San Mateo County. PCE serves 765,000 residents across 295,000 customer accounts. Our annual load is 3,600 GWh with a peak of 700 MW. Approximately, 2/3 of PCE's load is from non-residential accounts. PCE is governed by a Board of Directors comprised of city council representatives from each city in San Mateo County and two County Supervisors. PCE goals include providing power that is 100% GHG-free by 2021 and 100% renewable by 2025.

BayREN is a highly effective to lead on a regional program and we look forward to collaborating with the team to accelerate electrification and transform the regional market for residential heat pump water heaters. PCE will share information and aim to coordinate with this project as PCE's building electrification strategy is developed. The project leverages existing BayREN programs and CEC grants, along with support from local governments, municipal utilities and CCAs. The program will use a multi-pronged approach to increase the uptake of electrification measures and the number of HPWHs in homes, including direct engagement with manufacturers, distributors and contractors who implement water heater replacements.

We support a regional program approach which can catalyze market transformation and address the many persistent barriers that cannot be addressed at a local scale. These barriers include, but are not limited to a lack of readily available HPWHs for emergency replacements, incentive programs that are not scalable, a lack of trained contractors for installations, homeowners who don't yet know the benefits of HPWH technology, and barriers to fuel switching in utility ratepayer-funded energy efficiency programs. We believe that this project will advance regional and State goals and help local governments reduce energy use and GHG emissions.

Sincerely,

Rafael Reyes
Director of Energy Programs
Peninsula Clean Energy
rreyes@peninsulacleanenergy.com



May 9, 2018

Jennifer Berg, BayREN
Metropolitan Transportation Commission
375 Beale St.
San Francisco, CA 94105

RE: LETTER OF SUPPORT FOR BAAQMD GRANT

Dear Ms. Berg:

Passive House California (PHCA) is pleased to partner with BayREN on the *Heat Pump Water Heating (HPWH) Regional Market Transformation* project. This project will help jurisdictions in the nine county region Reduce GHGs from Existing Buildings. This concept directly supports Clean Air Plan (2017) strategies to 1. Promote energy and water efficiency in existing buildings, 2. Promote a switch from natural gas to electricity for space/water heating in buildings, and 3. Allow load-shifting from peak demand times through HPWH controls. These goals specifically align with the goals and mission of PHCA and the international Passive House standard, so we are happy to lend our support to this shared effort.

There is incredible potential to reduce energy consumption used for residential water heating and this project will help realize those savings consistent with Senate Bill 350, Assembly Bill 32, Assembly Bill 802, and other state guidance. We are happy to have BayREN provide the lead on a regional program, and look forward to collaborating with the team to accelerate electrification to transform the regional market for residential heat pump water heaters. We've been actively working in the region for the past two years to educate the public about Heat Pump Water Heaters. We will work with this project to leverage existing BayREN programs and CEC grants, along with support from local governments, municipal utilities and CCAs. The program will use a multi-pronged approach to increase the uptake of electrification measures and the number of HPWHs in homes, including direct engagement with manufacturers, distributors and contractors who implement water heater replacements.

We support a regional program approach which can catalyze market transformation and address the many persistent barriers that cannot be addressed at a local scale. These barriers include, but are not limited to a lack of readily available HPWHs for emergency replacements, incentive programs that are not

scalable, a lack of trained contractors for installations, homeowners who don't yet know the benefits of HPWH technology, and barriers to fuel switching in utility ratepayer-funded energy efficiency programs.

Passive House California brings specific expertise and focus to the implementation level. Our organization provides an effective bridge between policy and the 'boots on the ground' reality of what gets implemented in the field. Our members have extensive expertise in both the design and installation of Heat Pump Water Heaters as we have been early adopters of this technology and have worked through many of the early barriers to adoption. We are also fortunate to enjoy direct relationships with manufacturers of this equipment, so are uniquely positioned to assist BayREN with the implementation of this program.

I have no doubt that this project will advance regional and State goals and help local governments reduce energy use and GHG emissions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Bronwyn Barry'.

Bronwyn Barry, RA, CPHD

Passive House California Co-President



BUSINESS COUNCIL ON
CLIMATE CHANGE

May 9, 2018

Jennifer Berg, BayREN
Metropolitan Transportation Commission
375 Beale Street
San Francisco, CA 94105

RE: LETTER OF SUPPORT FOR BAAQMD GRANT

Dear Ms. Berg:

The Business Council on Climate Change is pleased to partner with BayREN on the *Heat Pump Water Heating (HPWH) Regional Market Transformation* project. This project will help jurisdictions in the nine county region Reduce GHGs from Existing Buildings. This concept directly supports Clean Air Plan (2017) strategies to 1. Promote energy and water efficiency in existing buildings, 2. Promote a switch from natural gas to electricity for space/water heating in buildings, and 3. Allow load-shifting from peak demand times through HPWH controls. There is incredible potential to reduce energy consumption used for residential water heating and this project will help realize those savings consistent with Senate Bill 350, Assembly Bill 32, Assembly Bill 802, and other state guidance.

We feel that BayREN is the right entity to lead on a regional program, and look forward to collaborating with the team to accelerate electrification and transform the regional market for residential heat pump water heaters. We support this project which leverages existing BayREN programs and CEC grants, along with support from local governments, municipal utilities and CCAs. The program will use a multi-pronged approach to increase the uptake of electrification measures and the number of HPWHs in homes, including direct engagement with manufacturers, distributors and contractors who implement water heater replacements.

We support a regional program approach which can catalyze market transformation and address the many persistent barriers that cannot be addressed at a local scale. These barriers include, but are not limited to a lack of readily available HPWHs for emergency replacements, incentive programs that are not scalable, a lack of trained contractors for installations, homeowners who don't yet know the benefits of HPWH technology, and barriers to fuel switching in utility ratepayer-funded energy efficiency programs.

The Business Council on Climate Change (BC3) is a coalition of San Francisco Bay Area organizations dedicated to forging collaborative, local solutions to climate change. We work together—across businesses, across government agencies, and across economic sectors—to secure a vibrant future for our city and our planet. Through the SunShares program, cities and large employers pool the buying power of their residents to secure discounts from experienced solar firms on residential solar installations and vehicle dealerships on electric vehicle ownership, while also offering no-cost workshops and home solar assessments. The SunShares program educates thousands of homeowners across the Bay Area on how to reduce their personal consumption of fossil fuels at home and make the switch to solar. BC3 is working to expand our educational outreach to include more information on Electrification which could include the benefits of HPWH technology. BayREN's proposed HPWH Regional Market Transformation project will

directly help build BC3's capacity to educate homeowners on the benefits of HPWH, put consumers directly in touch with qualified contractors and increase renewable energy adoption across the Bay Area.

I am confident that this project will advance regional and State goals and help local governments reduce energy use and GHG emissions.

Sincerely,



Christina Armor
Program Director
Business Council on Climate Change



May 9, 2018

Jennifer Berg, BayREN
Metropolitan Transportation Commission
375 Beale St.
San Francisco, CA 94105

RE: LETTER OF SUPPORT FOR BAAQMD GRANT

Dear Ms. Berg:

PACE Funding Group, LLC, would be interested in partnering with BayREN on the *Heat Pump Water Heating (HPWH) Regional Market Transformation* project. This project will help jurisdictions in the nine county region Reduce GHGs from Existing Buildings. This concept directly supports Clean Air Plan (2017) strategies to 1. Promote energy and water efficiency in existing buildings, 2. Promote a switch from natural gas to electricity for space/water heating in buildings, and 3. Allow load-shifting from peak demand times through HPWH controls. There is incredible potential to reduce energy consumption used for residential water heating and this project will help realize those savings.

PACE Funding LLC provides financing to homeowners for energy-and water-efficiency projects. Because credit scores are not used in our credit decision process, our financing is available to a much broader portion of the population than other forms of financing. We believe that all homeowners should have access to programs such as this one, and our form of financing can make a difference in that regard. Also, the attractive rates associated with PACE would provide low monthly payments and therefore maximize the economics for homeowners, making this program as attractive as possible, amplifying the effect of subsidies and driving adoption. Furthermore, we have strong relationships with relevant contractors who would very much like to participate in a program that has the explicit endorsement of BayREN.

We feel that BayREN is the right entity to lead on a regional program, and look forward to collaborating to accelerate electrification and transform the regional market for residential heat pump water heaters. We would be very interested in providing financing to homeowners who participate in this project, with the support of local governments, municipal utilities and CCAs. The program will use a multi-pronged approach to increase the uptake of HPWHs in homes, including direct engagement with manufacturers, distributors and contractors who implement water heater replacements.

We support a regional program approach which can catalyze market transformation and address the many persistent barriers that cannot be addressed at a local scale. I am confident that this project will advance regional and State goals and help local governments reduce energy use and GHG emissions.

Sincerely,

Mark Schmidt
Chief Operating Officer



May 10, 2018

Jennifer Berg, BayREN
Metropolitan Transportation Commission
375 Beale St.
San Francisco, CA 94105

Re: **Letter of support for BAAQMD Grant**

Dear Ms. Berg:

Renovate America is proud to support the efforts of BayREN on the Heat Pump Water Heating (HPWH) Regional Market Transformation project. This project will help jurisdictions in the nine-county region Reduce GHGs from Existing Buildings. This concept directly supports Clean Air Plan (2017) strategies to:

1. Promote energy and water efficiency in existing buildings;
2. Promote a switch from natural gas to electricity for space/water heating in buildings; and
3. Allow load-shifting from peak demand times through HPWH controls.

There is incredible potential to reduce energy consumption used for residential water heating and this project will help realize those savings consistent with Senate Bill 350, Assembly Bill 32, Assembly Bill 802, and other state guidance.

BayRen is well positioned to lead a regional program, and Renovate America looks forward to collaborating with the team to help accelerate electrification. We will support the goals of this project, which plans to leverage existing BayREN programs and CEC grants, along with support from local governments, municipal utilities and CCAs.

We support BayREN's regional program approach which can catalyze market transformation and address the many persistent barriers that cannot be addressed at a local scale. These barriers include, but are not limited to a lack of readily available HPWHs for emergency replacements, incentive programs that are not scalable, a lack of trained contractors for installations, homeowners who don't yet know the benefits of HPWH technology, and barriers to fuel switching in utility ratepayer-funded energy efficiency programs.

Renovate America is the leading provider of Property Assessed Clean Energy (PACE) financing, which the Lawrence Berkeley National Laboratory has cited as one of the nation's most successful forms of financing for home energy and efficiency improvements. PACE empowers homeowners to make energy and efficiency improvements and pay for them over time at a competitive, fixed interest rate through an additional, voluntary line on their property taxes. PACE mobilizes private capital from around the world to invest in saving energy, reducing emissions and creating jobs in local communities. With no cost to local government budgets,





PACE enjoys bipartisan support, and PACE-enabling legislation has been approved by more than 30 states.

Born in California over a decade ago, PACE has allowed the owners of more than 200,000 American homes to make quality energy, efficiency and resiliency improvements to their property.¹ It is estimated that by spurring demand for contractor services, these improvements have created more than 50,000 local jobs. Over their expected lifetime, PACE-financed improvements to date are projected to save over 20 billion kilowatt-hours of electricity, equivalent to powering more than 1.85 million homes for a year; save over 11 billion gallons of water, equivalent to the amount needed to fill over 16,500 Olympic-sized swimming pools; and reduce carbon dioxide emissions by over 4.8 million tons, equivalent to taking more than 935,000 cars off the road for a year.²

Renovate America looks forward to continuing to advance its public-private partnership that is helping meet local, regional and state climate policy objectives through the financing of energy- and water-saving home improvements.

Sincerely,

Dustin Reilich

Dustin Reilich
Senior Director of Market Development
Renovate America

¹ PACENation Market Data. Retrieved from: <http://pacenation.us/pace-market-data/#residential>

² HERO Financing data as of January 2018. Calculation explanations can be found at: <https://www.herogov.com/faq>





May 10, 2018

Jennifer Berg, BayREN
Metropolitan Transportation Commission
375 Beale St.
San Francisco, CA 94105

RE: LETTER OF SUPPORT FOR BAAQMD GRANT

Dear Ms. Berg:

Renew Financial, a leading provider of Property Assessed Clean Energy (PACE) financing, is pleased to support BayREN's application for a BAAQMD grant that will advance their *Heat Pump Water Heating (HPWH) Regional Market Transformation* project. This project will help jurisdictions in the nine county region Reduce GHGs from Existing Buildings. This concept directly supports Clean Air Plan (2017) strategies to 1. Promote energy and water efficiency in existing buildings, 2. Promote a switch from natural gas to electricity for space/water heating in buildings, and 3. Allow load-shifting from peak demand times through HPWH controls. There is incredible potential to reduce energy consumption used for residential water heating and this project will help realize those savings consistent with Senate Bill 350, Assembly Bill 32, Assembly Bill 802, and other state guidance.

We feel that BayREN is the right entity to lead on a regional program, and look forward to collaborating with the team to accelerate electrification and transform the regional market for residential heat pump water heaters. We look forward to collaborating with BayREN in this project which will leverage our own and other privately financed PACE programs, existing BayREN programs and CEC grants, alongside expected support from local governments, municipal utilities and CCAs. The program will use a multi-pronged approach to increase the uptake of electrification measures and the number of HPWHs in homes, including direct engagement with manufacturers, distributors and contractors who implement water heater replacements.

We support a regional program approach which can catalyze market transformation and address the many persistent barriers that cannot be addressed at a local scale. These barriers include - but are not limited to - a lack of readily available HPWHs for emergency replacements, incentive programs that are not scalable, a lack of trained contractors for installations, homeowners who don't yet know the benefits of HPWH technology, and barriers to fuel switching in utility ratepayer-funded energy efficiency programs.

I am confident that this project will advance regional and State goals and help local governments reduce energy use and GHG emissions – both of their own operations and in the tens of thousands of privately owned homes and other buildings around the region.

Sincerely,

Jonathan Kevles
Senior Vice President



**COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PLANNING & BUILDING
ENERGY & CLIMATE SECTION**

Brett Bishop

County of San Luis Obispo

RE: LETTER OF SUPPORT FOR BAAQMD GRANT

Dear Ms. Berg:

The County of San Luis Obispo supports the BayREN the Heat Pump Water Heating (HPWH) program and would seek to replicate the model given permission. We see this program as being in alignment with our county's Climate Action Plan as well as an effective strategy to optimize the benefits of renewable energy resources. Our energy team feels that this program complements our existing programs, could be leveraged for deeper energy savings from existing projects, and significantly reducing noxious gas emissions in our jurisdiction.

This concept directly supports Clean Air Plan (2017) strategies to 1. Promote energy and water efficiency in existing buildings, 2. Promote a switch from natural gas to electricity for space/water heating in buildings, and 3. Allow load-shifting from peak demand times through HPWH controls. There is incredible potential to reduce energy consumption used for residential water heating and this project will help realize those savings consistent with Senate Bill 350, Assembly Bill 32, Assembly Bill 802, and other state guidance. The program will use a multi-pronged approach to increase the uptake of electrification measures and the number of HPWHs in homes, including direct engagement with manufacturers, distributors and contractors who implement water heater replacements.

San Luis Obispo's Energy Section would like to propose adoption of this program to the 3C-REN which also includes the counties of Santa Barbara and Ventura and serves all 28 jurisdictions within the central coast region. We support a regional program approach which can catalyze market transformation and address the many persistent barriers that cannot be addressed at a local scale. These barriers include, but are not limited to a lack of readily available HPWHs for emergency replacements, incentive programs that are not scalable, a lack of trained contractors for installations, homeowners who don't yet know the benefits of HPWH technology, and barriers to fuel switching in utility ratepayer-funded energy efficiency programs.

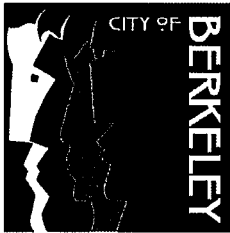
I am confident that this project will advance regional and State goals and help local governments reduce energy use and GHG emissions.

Sincerely,

A handwritten signature in black ink that reads "Brett Bishop".

Brett Bishop

Residential Energy Programs Coordinator



Planning and Development Department

May 9, 2018

Jennifer Berg, BayREN
Metropolitan Transportation Commission
375 Beale Street
San Francisco, CA 94105

RE: LETTER OF SUPPORT FOR BAAQMD GRANT

Dear Ms. Berg:

The City of Berkeley Planning Department is pleased to support BayREN on the *Heat Pump Water Heating (HPWH) Regional Market Transformation* project. This project will help jurisdictions in the nine county region Reduce GHGs from existing buildings. This concept directly supports Clean Air Plan (2017) strategies to: Limit fossil fuel combustion, reduce exposure to air contaminants, and promote a switch from natural gas to electricity for space/water heating in buildings. HPWH are 3 times more efficient than natural gas water heaters and have the potential to significantly reduce water heating energy consumption.

We look forward to partnering with BayREN to accelerate electrification and transform the water heating market. This project leverages grant funded work Berkeley is leading on behalf of Green Cities California (GCC). In June, GCC will convene a dozen cities to develop an electrification action guide for local governments. The action guide will provide critical messaging and strategies to inform BayREN's outreach strategy. As a highly effective regional implementation agency, BayREN is ideally suited to increase the uptake of HPWHs in homes through collaboration with multiple agencies including directly engaging with manufacturers, distributors and contractors who implement water heater replacements.

Transitioning Berkeley's existing houses away from on-site natural gas combustion and toward the use of clean electricity for space and water heater has the potential to reduce our residential emissions by 75%. We support a regional program approach which can catalyze market transformation and address the many persistent barriers that cannot be addressed at a local scale. I am confident that this project will advance regional and State goals and help local governments reduce energy use and GHG emissions.

Sincerely,

A handwritten signature in black ink that reads "Timothy Burroughs" followed by a stylized monogram "BR".

Timothy Burroughs,
Director of Planning and Development

Planning a Safe and Sustainable Future for Berkeley
1947 Center Street, Berkeley, CA 94704 Tel: 510.981.7400 TDD: 510.981.6903 Fax: 510.981.7470
E-mail: sustainability@ci.berkeley.ca.us