ENERGY EFFICIENCY PROGRAM PLAN

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INTRODUCTION

THE CITY OF FREMONT, CA

Fremont is a city of 217,700 residents and 92 square miles[1] located on the east side of San Francisco Bay in California. It is the fourth largest city by population in the Bay Area (after San Jose, San Francisco, and Oakland) and is one of the 100 largest cities in the United States. But it is also a relatively young community; it was created in 1956 when five small farming villages – Mission San Jose, Centerville, Niles, Irvington, and Warm Springs – incorporated. Fremont experienced rapid growth during the 1960's and 1970's, when fossil fuels were inexpensive, roads were less congested, large tracts of agricultural land were available for conversion to housing, and climate change was not a concern. As a result, the majority of Fremont residents live in low- or medium-density single family homes or townhouses, and few residential neighborhoods are within easy walking distance of basic services.

Over the past decade, however, the City of Fremont has demonstrated increasing commitment to environmental sustainability, both community-wide and in its own operations. Although development in Fremont has historically been suburban in character, the City's award-winning General Plan (adopted in 2011) calls for increasing urbanization in key locations around transit, with higher density housing, less land devoted to parking, and an emphasis on mixes of uses. This emphasis on "strategically urban" development is consistent with State, regional, and local goals and policies aimed at reducing greenhouse gas emissions.

FREMONT'S COMMUNITY SUSTAINABILITY PLANNING

In 2006, the State of California passed Assembly Bill 32, the landmark legislation committing California to reduce greenhouse gas emissions to 1990 levels by the year 2020. The City has taken a number of steps to reduce emissions consistent with AB 32. A baseline inventory of Fremont's emissions was completed in December 2008. The inventory indicated that community emissions for 2005 totaled approximately 1.7 million metric tons of CO_2e, of which 56% was generated by transportation, including vehicles traversing Fremont on Interstates 680 and 880. The commercial/industrial sectors generated 26% of emissions, while the residential sector generated 14%. An additional 3% of emissions were the result of the waste sector and 1% from water treatment and transportation. Fremont's municipal government operations generated about 8,820 metric tons of CO_2e, or about one half of one percent of the total community emissions.

Based on the inventory, input from the community, the recommendations of a Council-appointed Green Task Force, and staff analysis, an emission reduction goal of 25% below 2005 levels by 2020 was adopted in 2008. This goal, which is more aggressive than the target set in AB 32, is restated as a General Plan goal in the Conservation Element, as well as serves as the basis for the City's Climate Action Plan.

[1] Based on the Fremont Community Profile 2014: http://www.fremont.gov/DocumentCenter/Home/View/6859

A. *Timeline of Sustainability Efforts & Initiatives*

The following timeline highlights some of the major efforts and initiatives undertaken by the City of Fremont over the past decade in relation to sustainability.

2005

- Fremont Mayor Bob Wasserman signed the U.S. Conference of Mayors Climate Protection Agreement, urging local actions in municipal operations to reduce global warming pollution.

2006

- City Council adopted resolutions to reduce permitting fees for residential to $236 per dwelling unit and non-residential solar electric installations to levels reflecting the actual cost to administer, as recommended by the Sierra Club.2
- City Council adopted the "Sustainability Policy", a resolution encouraging sustainable building and landscaping practices and establishing a policy to obtain LEED Certification at the Silver Level or higher for new City of Fremont buildings over 10,000 square feet.

2007

- Fremont joined ICLEI, Local Governments for Sustainability and the Alameda County Climate Protection Project. The Project was launched by the Alameda County Conference of Mayors in partnership with StopWaste to collaborate on projects that are best addressed on regional scale and that aim to reduce emissions, reduce waste and energy use, and save money.

2008

- The City partnered with ICLEI—Local Governments for Sustainability for completion of the 2005 Baseline Inventory of Greenhouse Gas Emissions (updated in 2014), demonstrating that Community-level emissions for 2005 totaled approximately 1,698,000 MTCO2e. The transportation sector is the single largest contributor at 54%, with building energy use contributing 40% (26% Commercial/Industrial and 14% Residential), solid waste contributing approximately 3%, and water about 1% of the total.
- City Council appointed the citizen-based "Green Task Force" to present recommendations to the City Council addressing opportunities for GHG emission reductions in transportation, land use and community design, economic development, waste reduction and recycling, public outreach and education, energy efficiency and conservation, and storing and offsetting carbon emissions. City Council approved staff's recommendations on the GTF's recommendations, and adopted the City's goal to reduce greenhouse gas emissions 25% by 2020 from the 2005 baseline.

[2] See the Sierra Club Loma Prieta, San Francisco Bay, and Redwood Chapters' 2006 study "Solar Electric Permit Fees in Northern California": http://www.solarpermitfees.org/NorCalPVFeeReport.pdf (updated 2009).

2009

- City Council unanimously adopted a resolution to become a signatory to the Bay Area Climate Change Compact and a participant in the Bay Area Climate Collaborative, a regional collaboration and information sharing effort aimed at reducing the region's greenhouse gas emissions and better positioning the region to qualify for outside funding for future initiatives.
- The City's mandatory recycling of construction and demolition debris ordinance went into effect.
- The City was awarded a US Department of Energy funded Energy Efficiency and Conservation Block Grant (EECBG) of $1.9 million for community energy efficiency and renewable energy projects.
- Summer-based California Youth Energy Services (CYES) free "Green House Calls" was offered to Fremont residents for the first time.
- Council adopted a Clean Technology Business Tax Exemption as an incentive to attract green employers into Fremont by providing both clean tech and biotech firms a payroll tax exemption.

2010

- Under EECBG funding, the City installed a new "cool" roof at the Fremont Main Library, designed to reflect the heat of the sun away from the building, which helps keep the building cooler and reduces the use of air conditioning. (Alameda County will additionally provide solar PV to further reduce net energy consumption.)
- The City began its conversion of municipally owned and operated streetlights to LED (~3,000 of Fremont's 17,000 streetlights upgraded as of June 2014)

2011

- City Council adopted the award-winning General Plan 2030 update. The General Plan includes a "Sustainability Element" as its opening chapter, setting the policy framework for Fremont to "serve as a national model of how an auto-oriented suburb can evolve into a sustainable, strategically urban, modern city."
- The East Bay Energy Watch (EBEW) local government partnership began marketing its energy efficiency assistance and rebate services to Fremont small to medium-sized businesses
- Energy Upgrade CA whole house upgrade rebate program was launched at a statewide level, making whole house upgrade rebates available to Fremont residents
- The City was awarded grant funding from the Metropolitan Transportation Commission (MTC) for the purchase of two all-electric vehicles for the City's fleet, along with two charging stations.

2012

- Council re-authorized the Clean Technology and Biotechnology Business Tax Exemption, extending the exemption through 2019.

- The Renewable Energy Ordinance[3] was incorporated into the City's Municipal Code, providing specific use allowances and flexibility in permitting for solar and wind energy systems and implementing policies of the Conservation Element of the City's updated General Plan that require facilitating energy conservation and renewable energy production in new and existing buildings.
- Alameda County Waste Management Authority's Mandatory Commercial Recycling Ordinance went into effect beginning in July.
- City of Fremont Climate Action Plan was adopted by Council on November 13, providing a roadmap for reducing the City's GHG emissions 25% by 2020 from a 2005 baseline.
- Council created an Environmental Sustainability Commission to update Council on CAP progress.

2013

- Alameda County Waste Management Authority's Single Use Bag Reduction Ordinance went into effect beginning in January, banning plastic bags and placing a 10 cent price requirement on paper and reusable bags at all retail establishments.
- The first meeting was held with the seven-member Environmental Sustainability Commission in May.
- A Sustainability Coordinator was hired in October to oversee the implementation of the Climate Action Plan.
- The City joined the American Solar Transformation Initiative (ASTI), a DOE-funded program under the SunShot Initiative to help municipalities reduce the soft-costs of installing solar and create opportunities that will result in solar market transformation.
- The City contracted with Chevron Energy Solutions (an ESCO) to conduct an investment grade energy audit of municipal facilities and operations to report on energy savings opportunities such as LED streetlight retrofits, water efficiency upgrades, water pump replacement, HVAC retrofits, wireless controls, solar PV, and solar thermal. The report from Chevron will be delivered mid-summer 2014.

2014

- Fremont completed its 2010 GHG Emissions Inventory Update, demonstrating an 11% community-wide GHG emissions reduction from the 2005 baseline inventory level.
- A new standard plan for residential solar permitting (<10kW systems) was implemented in March based on the recommendations of ASTI and the California Solar Permitting Guidebook, allowing designers of PV systems to complete two documents and submit them along with a completed permit application over-the-counter and obtain permits without submitting the plans for a formal review.
- City of Fremont joined the advisory committee of the Commercial Acceleration of Solar Energy (CASE) program to help Silicon Valley businesses increase their use of clean energy. Enabled by the Joint Venture: Silicon Valley and ASTI, CASE-SV brings together the business

[3] The Renewable Energy Ordinance is found in Chapter 18.185 of the Fremont Municipal Code and can be viewed online at http://www.codepublishing.com/CA/Fremont/?Fremont18/Fremont18185.html.

community, municipal governments, and regional organizations to effectively use resources and aggregate their solar energy buying power.
- In partnership with StopWaste, Fremont Libraries, and Dale Hardware, the City of Fremont launched the "Fremont Energy Challenge" as summer residential energy efficiency pilot project.
- The City entered into Power Purchase Agreements with SunEdison for 1.7 MW of solar power at City-owned facilities

B. Existing Community Plans

The City of Fremont's existing General Plan and Climate Action Plan serve as the foundation of Fremont's Energy Efficiency Program Plan for the Georgetown University Energy Prize. The sustainability policies and actions set forth in these two documents, leveraged by existing local and regional energy programs, will be honed into specific community engagement strategies to drive the adoption of energy efficiency and renewable energy projects, resulting in community-wide energy usage reductions.

1) General Plan

Adopted on December 13, 2011 by City Council, the Fremont's General Plan sets the framework for Fremont's planning and policy-making over the next twenty years. As prescribed by Government Code (§65302), Fremont's General Plan include the seven mandatory "elements" or subject categories of Land Use, Circulation, Housing, Conservation, Open Space, Noise, and Safety. It also includes other optional elements that address the top City priorities of Sustainability, Community Character, Economic Development, Parks and Recreation, Public Facilities, Community Plans, and Implementation.

The General Plan's first chapter and central theme is Sustainability, defining it as "as the ability to meet the needs of the current generation without compromising the ability of future generations to meet their needs. In practical terms, a sustainable approach reduces resource consumption, avoids pollution, develops in harmony with the environment, and helps people live healthier lives." The General Plan emphasizes Fremont's desire to become "strategically urban," calling for a focus on transit-oriented development (TOD). While various elements of sustainability are touched upon throughout the General Plan, policies specific to energy conservation are included as follows:

<u>Municipal Energy Efficiency</u>
- Public Facilities policies related to converting the vehicle fleet and providing infrastructure for plug-ins and other vehicles
- Public Facilities policies to continue retrofitting City buildings, install high-efficiency street lights, and work with PG&E to reduce energy consumption in City operations

<u>Community-Wide Energy Conservation</u>
- Conservation policies regarding green buildings standards, promoting building retrofits, and supporting innovative financing mechanisms for energy conservation
- Conservation policy to evaluate the feasibility of a Residential Energy Conservation Ordinance
- Mobility policies promoting public solar plug-in hybrid fueling stations, improved public transit, and promoting walking and cycling as alternatives to driving

- Public Facilities policy to continue to partner with PG&E on conservation programs for the community at-large

Renewable Energy

- Conservation policies promoting the development and use of renewable energy in both municipal and community-wide applications

2) Climate Action Plan

Adopted on November 13, 2012 by City Council, the Climate Action Plan builds upon the sustainability framework set in the General Plan to direct specific implementation policies for achieving Fremont's greenhouse gas emission reduction goal of 25% by the year 2020 from a 2005 baseline. The Climate Action plan focuses on mitigation strategies in the sectors of Land Use and Mobility, Residential and Commercial Energy, Solid Waste, Water, and Municipal Operations, and also includes a chapter on Climate Change Adaptation.

Specific to energy usage, the Climate Action Plan sets the goal of reducing energy use and greenhouse gas emissions at the Municipal and community-wide levels *through energy efficiency strategies, community education, and collaboration with PG&E and other energy program providers.* To achieve this goal, the CAP specifies the following municipal and community-wide energy efficiency and renewable energy "actions":

Upgrade Municipal Operations

M4 Replace high-pressure sodium and mercury vapor lights used on streets and public parking lots with energy- efficient alternatives, such as light-emitting diodes (LEDs).

M19 Evaluate the potential for providing solar, wind, and other renewable energy systems at City facilities.

Energy Advocacy

E-A1 Work towards utilizing existing programs offered by Pacific Gas and Electric for weatherizing the homes of all qualifying low-income households in Fremont.

E-A2 Utilize existing funding programs, such as Community Development Block Grant programs, to achieve energy efficiency improvements in existing and new buildings.

E-A3 Encourage the installation of energy efficiency retrofits by creating a Property Assessed Clean Energy (PACE) program, which allows qualified residential and non-residential property owners to repay the cost of installing energy efficiency retrofits on their property tax bill.

E-A4 Consider establishing 'energy budgets' for newly-constructed and remodeled single family homes over a certain square footage beyond that which is required by State law.

Community Collaboration & Participation

E-C1 Participate in the California Comprehensive Residential Building Retrofit Program, known as "Energy Upgrade California in Alameda County" and funded by the federal America Recovery and Reinvestment Act, to promote residential building retrofits.

E-C2 Continue the annual collaboration with the California Youth Energy Services (CYES) program to conduct residential energy audits and to distribute compact fluorescent light bulbs and

compact fluorescent lamp torchieres as replacements for halogen torchieres in Fremont households.

E-C3 Continue the annual collaboration with the California Youth Energy Services program to conduct residential energy and water audits and to distribute water-saving shower heads and faucet aerators to Fremont households, to replace less efficient fixtures. (This action is also listed in the "Water" Chapter).

E-C4 Continue to partner with Pacific Gas and Electric to offer energy efficiency programs for commercial buildings.

E-C5 Work with Pacific Gas and Electric in a public information and education campaign to encourage every household and business to reduce their energy consumption and to utilize more energy efficient lighting and appliances.

E-C6 Work with Pacific Gas and Electric to increase awareness and use of financial incentives to assist residential and commercial customers to improve energy efficiency.

Energy Action Promotion & Encouragement

E-P1 Encourage the replacement of high-pressure sodium and mercury vapor lights used in existing private streets and private parking lots with energy-efficient alternatives, such as light-emitting diodes (LEDs).

E-P2 Promote tree planting throughout the City, to provide shade on buildings which reduces demand for air conditioning and helps reduce the 'urban heat island' effect.

E-P3 Promote existing solar thermal programs, such as PG&E's Solar Water Heating Rebate and the California Solar Initiative's Thermal Program, to encourage the installation of solar hot water systems in existing and new residential and commercial buildings.

E-P4 Facilitate the adoption of smart grid and other peak load reduction technologies, such as building energy management systems and smart appliances, within new and existing buildings.

E-P5 Consider requirements to provide pre-wiring for future solar PV and other renewable on-site power generation systems in new home construction as part of a Green Building program.

E-P6 Encourage business owners to convert or replace their gasoline-powered gardening equipment, such as lawn mowers, leaf blowers, and edge trimmers, with electric equipment.

E-P7 Provide support and incentives to increase energy efficiencies and partner with others in the private sector, such as real estate and other professionals, to create tools and incentives to achieve this goal.

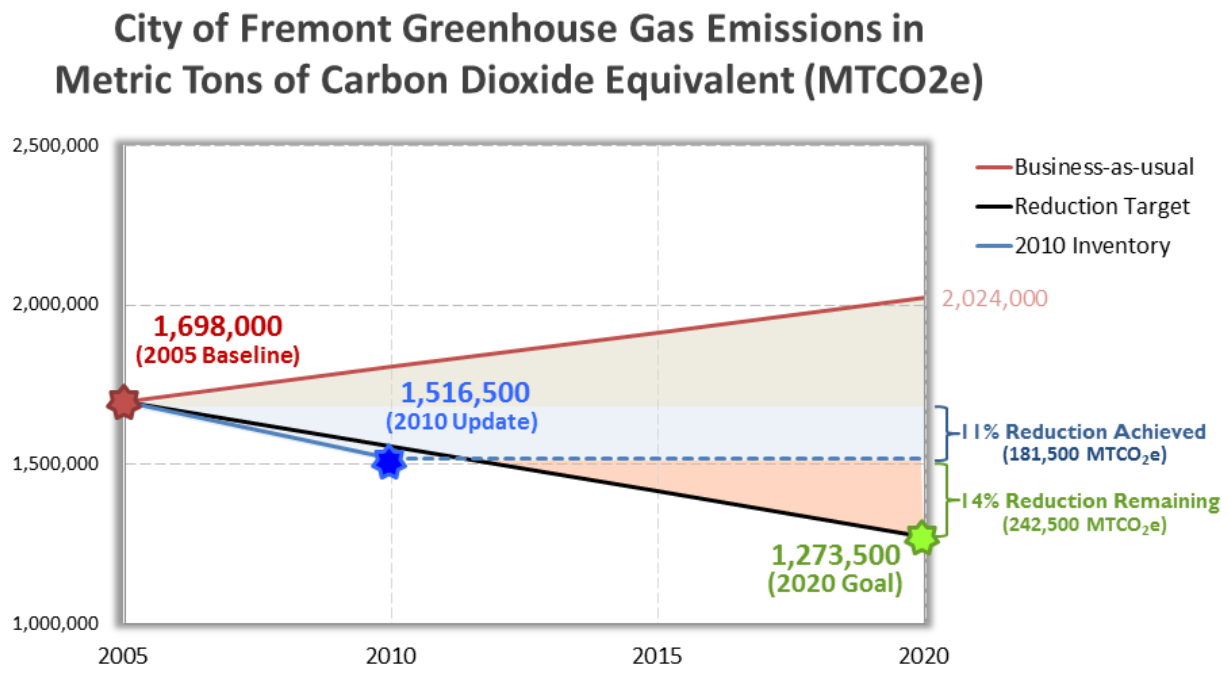
Energy Regulations

E-R1 Eliminate local regulatory barriers to installation of distributed renewable energy systems, such as wind and solar, through revisions to the zoning code and other relevant city policies.

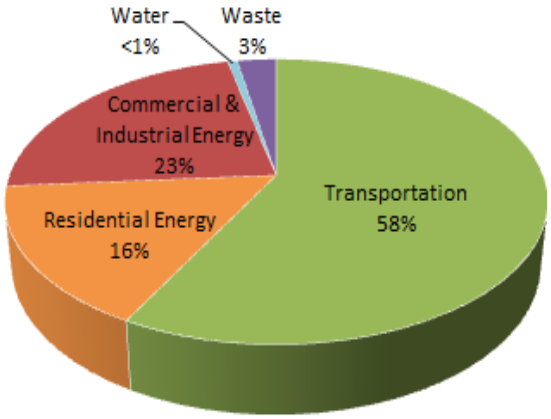
E-R2 Develop and enforce performance standards for exterior lighting of commercial and industrial buildings and parking lots, which will include minimum and maximum lighting levels while providing a safe environment.

C. 2010 Greenhouse Gas Inventory Update

The 2010 Greenhouse Gas Inventory Update, completed in January 2014, utilized the most current methodology to compare 2005 emissions levels with 2010 emissions. This update demonstrated that 2010 community-wide emissions totaled 1,516,500 metric tons of CO_2e, an 11% reduction from the 1,698,000 metric tons of CO_2e of 2005.



The 2010 GHG Inventory Update also considered emissions by sector, adding an additional water sector that was not included in the original 2005 inventory. Similar to 2005, the 2010 update showed that community energy usage accounted for 39% of community-wide emissions, with residential energy usage responsible for 14% of the City's overall emissions. In contract, the largest sector, transportation, was responsible for 58% of emissions. Waste and water were only responsible for the other 3% and 1%, respectively.



In considering the implications of greenhouse gas emissions by sector, it can be deduced that the most significant emissions reductions may be through the promotion of clean air vehicles and alternative commute options. Efforts such as "Electric Vehicle Ride-and-Drive" events help to encourage residents to lease or purchase clean air vehicles rather than convention vehicles for their daily commuting needs, and transit-oriented development policies paired with pedestrian and bicycle friendly infrastructure improvements encourage fewer vehicle trips. Regional efforts to extend the Bay Area Rapid Transit (BART) commuter train into the southern part of Fremont (Warm Springs, 2015)[4] and into Silicon Valley

[4] http://www.bart.gov/about/projects/wsx

(Berryessa, 2017)[5] as well as increasingly stringent fuel efficiency standards for both passenger and cargo vehicles at a federal level[6] will additionally support transportation emission reductions over the coming years.

While transportation may hold significant weight in Fremont's climate action mitigation strategies, energy programs can still carry significant greenhouse gas savings. On the energy generation side, in 2002, California established the Renewables Portfolio Standard (RPS)[7] with the goal of increasing the percentage of renewable energy in the state's electricity mix to 20% by 2017, which was later increased to 33% by 2020 under Executive Order S-14-08.[8] By March 2014, Pacific Gas and Electric Company (PG&E), announced that it had surpassed the 20% renewable milestone, with 22.5% of its energy coming from renewable sources in 2013. At the consumer level, regional and state rebates combined with federal tax credits can help residents and businesses save money on energy efficient appliance upgrades, building efficiency projects, and renewable energy installations. Furthermore, with the recent availability of CaliforniaFIRST Property Assessed Clean Energy Financing, energy upgrade projects are becoming much easier to implement for property owners that lack access to capital.

While the greenhouse gas reducing impact of water efficiency or waste reduction programs may be modest in comparison, they are not to be neglected. Water conservation measures often result in ancillary energy savings[9], not to mention that water conservation is of utmost concern in California during this period of extreme drought. Also, with the earliest recycling programs established in Fremont and the surrounding area more than 40 years ago[10], waste reduction and diversion programs are now institutionalized into local and regional policy, and have a far-reaching level of community engagement and impact.

With this in mind, Fremont's approach to sustainability includes a multi-sectoral approach. While the Georgetown University Energy Prize will only measure Fremont's Residential, Municipal, and Public School energy usage reductions, the City will utilize the GUEP competition as a means of catalyzing current and planned sustainability initiatives.

D. *Summary of Sustainability Achievements to Date*

GHG Emissions

- Community-wide GHG emissions dropped from an updated 2005 baseline of 1,698,000 MTCO2e to 1,516,500 MTCO2e in 2010, representing an 11% reduction.
- Municipal GHG emissions dropped from an updated 2005 baseline of 8,820 MTCO2e to 8,250 MTCO2e in 2010, representing a 6% reduction.

Municipal Operations

[5] http://www.vta.org/bart/
[6] http://www.nhtsa.gov/fuel-economy
[7] http://www.energy.ca.gov/portfolio/index.html
[8] http://gov38.ca.gov/index.php?/executive-order/11072/
[9] http://www.energy.gov/downloads/water-energy-nexus-challenges-and-opportunities
[10] http://www.tricityecology.org/about.html

- (2) EV fleet vehicles have been purchased to date. Pre-wiring for EV charging infrastructure is being incorporated into new design plans.
- Interior lighting retrofits upgrading T-12 fluorescent lighting to energy efficient T-8 lighting in Municipal buildings completed over the past 5-10 years.
- LED streetlight retrofits for approximately 2,000 streetlights complete.
- Comprehensive energy audit of City facilities & operations has been conducted recommending retrofit of remaining 14,000 streetlights to LEDs; upgrades to park, interior, and exterior lighting; weather-based irrigation controls; HVAC upgrades; water conservation measures; and a solar water heating system.
- Transit-Oriented Development focus in Downtown and Warm Springs Innovation District plans.
- Exploration of "last-mile" shuttle service for Warm Springs Innovation District employers in consideration of the new Warm Springs BART Station[11] opening in late 2015.
- EV charging, bicycle and pedestrian infrastructure updates, and bike-share programs being explored as local, regional, and state-level opportunities become available.
- City in the process of procuring solar PV for 4 public facilities, totaling 1.6 MW of energy generating capacity.

Community Energy Efficiency

- Promotion of East Bay Energy Watch / PG&E rebate programs, Energy Upgrade California Home Upgrade Program, on-bill energy efficiency financing options, and CaliforniaFIRST property assessed clean energy (PACE) financing.
- Implementation of the California Youth Energy Services Program[12] every summer (plus 1 fall) since 2009, resulting in 62 youth employed, 1,824 homes served, and 825,000 kWh, 14,000 therms, and 2,000 gallons of water saved.
- Pilot of the "Fremont Energy Challenge" in the summer 2014, resulting in 224 Home Energy Analyzer[13] sign ups and $1,120 donated to the Fremont libraries.
- Per person residential natural gas decreased 3.2% from 2005 to 2012
- Per person residential electricity usage decreased 8.5% from 2005 to 2012
- Total commercial natural gas usage decreased 30.1% from 2005 to 2012
- Total commercial electricity usage decreased 11.9% from 2005 to 2012

Solar PV

- 49 commercial PV installations 2001-2013, with 7,624 kW total power generating capacity
- 923 residential PV installations 2001-2013, with 3,842 kW total power generating capacity
- City working with DOE-funded "Solar Roadmap"[14] to reduce barriers to solar market penetration.

[11] http://www.bart.gov/about/projects/wsx
[12] http://www.risingsunenergy.org/content/cyes.html
[13] http://www.homeenergyanalyzer.org
[14] http://my.solarroadmap.com/ahj/city-of-fremont-ca/view

Electric Vehicles

- Fremont currently has 2,068 EVs that have been rebated, representing 31% of all the EVs that have been rebated in Alameda County (6,615)
- Fremont's 94539 zip code has been issued more EV rebates than any other zip code in California at 877 vehicles
- 8 publicly accessible EV charging stations being installed on City property under CA Energy Commission grant

Water Conservation

- Per capita water consumption decreased by ~15% (from 158.2 gallons pp in 2005 to 134.7 gallons pp in 2012)

Waste Reduction & Diversion

- Mandatory recycling service for both single- and multi-family customers since 1995
- 2011 waste diversion rate of 73%, 8% higher than the statewide average
- Residents diverted ~43,000 tons of recycling and organics in 2013

Green Certifications

- 24 Bay Area Green Business certified companies in Fremont
- 8 LEED Certified projects in Fremont since 2009, with another 9 registered for certification
- 34 ENERGY STAR Certified Buildings since 2003, including 22 K-12 public schools
- 3 Green Point Rated projects since 2008 totaling 163 residential units
- 3 National Wildlife Certified Habitats

I. PROGRAM MANAGEMENT & PARTNERS

A. *Program Leadership & Management*

1) Rachel DiFranco, Sustainability Coordinator (GUEP Project Lead)

Rachel DiFranco is the City of Fremont's first Sustainability Coordinator, a role dedicated to overseeing the direct implementation of Fremont's Climate Action Plan goals. Reporting to the Deputy Director of Community Development, Rachel identifies opportunities for emission reductions in City operations and in the community-at-large, educates and engages staff, residents, and businesses in resource conserving projects and initiatives, and provides assistance and oversight to the newly appointed Environmental Sustainability Commission.

Rachel is a Fremont, CA native with a dual M.A. in Natural Resources & Sustainable Development from American University in Washington, DC and the United Nations mandated University for Peace in Costa Rica, and a Leadership in Energy & Environmental Design Accredited Professional in Building Operations and Maintenance (LEED AP O+M). Prior to joining the City of Fremont, Rachel worked with the Northern California-based non-profit organizations of Community Energy Services Corporation in Berkeley as the SmartSolar Program Manager and Ecology Action in Santa Cruz as an Energy Upgrade CA Regional Program Manager. In these roles, she provided energy efficiency and renewable energy marketing, education, and outreach; conducted site assessments and produced energy savings reports; engaged with contractors, industry professionals, and community-based organizations; and offered free technical assistance and advising to residential, commercial, and municipal property owners and managers.

Due to the nature of her position and her extensive energy background, Rachel will serve as the project lead for Fremont's participation in GUEP, helping to direct relevant municipal and community-wide energy initiatives, collaborating with the Fremont Unified School District, engaging in marketing, education, and outreach activities, and tracking and reporting on implementation activities.

2) Dan Schoenholz, Deputy Director of Community Development (GUEP Project Oversight)

Dan Schoenholz has worked for the City of Fremont for the past 16 years in a variety of leadership roles in the City Manager's Office, the Human Services Department, and the Community Development Department. In his current role as Deputy Community Development Director, Dan oversees administrative functions of the Department ($12 million annual budget, 55 FTE), assists the Department Director in managing the operations of the Planning, Building & Safety, and Community Preservation divisions, directs programs to implement the City's Climate Action Plan, and represents the City on various regional bodies related to climate programs and energy management.

Previously, as the Special Projects Manager, Dan managed the first comprehensive update of the City's General Plan (the community's master land use plan) since 1991 and developed the City's first Climate Action Plan. He also managed a $1.9 million Energy Efficiency and Conservation Block Grant to fund a number of community conservation measures, including: the installation of a cool roof at the Fremont Main Library, the upgrade of municipal streetlights to LEDs, the replacement of boilers at the Fremont Main Library and Police Station, the purchase of six hybrid City fleet vehicles, the upgrade of parking lot lights to LEDs at Fremont Unified School District facilities, the upgrade of windows at a low-income housing project to dual pane, and the establishment of a youth residential energy audit program.

Dan will provide guidance and oversight to Rachel in her implementation of GUEP projects at both the municipal and community-wide levels.

3) Environmental Sustainability Commission (GUEP Steering Committee)

With the adoption of the Climate Action Plan in late 2012, Fremont City Council established an Environmental Sustainability Commission (ESC). The charge of the ESC is to advise Council on emerging sustainability issues and provide periodic updates on the Climate Action Plan. ESC meetings are held on a quarterly basis and are open to the public. One of the ESC's specific responsibilities is to assist the City with marketing, public education, outreach, and promotional activities in order to stimulate the greatest possible community participation in sustainability efforts.

The Environmental Sustainability Commission was established with following objectives:

- Advise the City Council on emerging policy issues related to environmental sustainability.
- Advise the City Council on updates to the Climate Action Plan, and receive periodic progress reports from staff on meeting climate action goals.
- Advise the City Council on policy for recycling, source reduction, and waste diversion.
- Assist the City with marketing, public education, outreach, and promotion activities in order to stimulate the greatest possible participation in sustainability efforts.
- Provide a forum to receive public comment on environmental sustainability.
- At the request of the City Council, the Environmental Sustainability Commission may perform other advisory functions not noted above

The current ESC members, their community affiliations, and their interests in sustainability are as follows:

Member	Representing	Affiliations	Interests/Projects
Richard Godfrey *Commission Chair*	*Environmental Organization*	Local Ecology & Agriculture Fremont (LEAF), Tri-City Ecology Center (TCEC), East Bay Regional Parks Advisory Committee	Solar, ZEVs, bicycling, community outreach, California Nursery Historic Park master planning
Shiva Swaminathan *Vice Chair*	*Public At Large*	City of Palo Alto Utilities, Fremont Friendly Visitor Program, Tamils of Northern California, Licensed Professional Engineer	Energy efficiency, solar, school-based energy conservation / behavior-change initiatives
Nina Moore	*Business Community*	Robson Homes, Fremont Rotary Club, Citizens for a Better Community, Fremont Education Foundation, Fremont Chamber of Commerce	Cost-benefit analysis of energy efficiency & sustainable design practices, alternative transportation
John Rennels	*Development/ Construction Industry*	San Francisco Bay Area Rapid Transit (BART), Antelope Hills Community Association, Bay Area Council Housing and Sustainable Development Committee, Urban Land Institute	Transit-oriented development, alternative transportation, urban planning, youth engagement

Carolyn Obata	*Public At Large*	Computer Software Professional, Stand Up 8 Foundation, Fremont Education Foundation	Sustainable living, healthy lifestyles, community service, energy efficiency
Daniel O'Donnell	*Public At Large*	Chrysalis Gardens, Tri-City Ecology Center (TCEC), Alameda County Source Reduction and Recycling Board, Master Composter	Sustainable landscaping, waste reduction & recycling, composting
Haroon Rasheed	*Student*	Mission San Jose High School Green Club, Boy Scouts of America National Youth Leadership Training, Eagle Scout, Earth Team Board Member	Campus-based and School District-wide sustainability initiatives

B. Program Staffing & Funding

1) Staffing

Sustainability Coordinator (1 FTE): The Sustainability Coordinator is a full-time, benefitted position budgeted under the City's General Fund dedicated exclusively to the implementation of community sustainability programs and meeting the 25% community-wide GHG reduction goal set forth in the City's Climate Action Plan. Seeing that the GUEP effort falls within the overall sustainability goals of the Climate Action Plan, and many of the current and future GHG reduction strategies involve energy efficiency and renewable energy implementation, the Sustainability Coordinator will dedicate her time over the next two years – either directly or indirectly – toward initiatives related to the GUEP effort, utilizing GUEP as a rallying cry for the City's broader Climate Action goals.

Leveraged Staff: Due to the nature of the GUEP challenge, other City of Fremont staff will be utilized on an as-needed basis. This could include, but is no limited to, time spent by the Communications Manager to draft social media posts, press releases, and news briefs on Fremont's participation in GUEP, by Economic Development staff to engage with business leaders in the cleantech sector, by Recreation Services staff to assist with outreach events and educational workshops, by Planning and Engineering staff to design and install energy saving technologies, by Permitting staff to fast-track energy efficiency and renewable energy projects, and by Environmental Services staff to include energy-conservation messaging into existing waste reduction and stormwater outreach and engagement efforts. A list of all relevant City staff was included as part of Fremont's GUEP Application Package.

2) Funding

The City of Fremont does not have a dedicated source of funds specifically for the Georgetown University Energy Prize effort. That said, however, there are a few direct sources of funding from both the City and PG&E (the local electric and gas investor-owned utility) that can be used for this effort. Furthermore, the City has identified a number of indirect funding sources through leveraged services as well as potential in-kind contributions or donations. Each of these is discussed in further detail below:

a) *Direct – City of Fremont:*

Beginning in Fiscal Year 2014/2015, the City of Fremont budgets $25,000 annually for Climate Action implementation activities. This money can be utilized for marketing, education, and outreach materials, for direct services conducted by staff or partner organizations, for monitoring and tracking tools, or for other items as staff sees fit.

b) *Direct – PG&E:*

Pacific Gas & Electric Company has announced that it will be offering a $20,000, one-time gift to each GUEP Semifinalist within its service territory. These funds must be used for one or a combination of the following efforts:

1. Marketing, education, and outreach
2. Hiring of an intern or other part-time assistant
3. Supplement to existing programs such as those offered through the local government partnerships

Fremont has identified a few different ways in which it would like to spend this money for either/both marketing, education, and outreach and supplementing existing residential energy programs, and has provided these ideas to PG&E for review. (See Section I.G.6 for examples.)

c) *Indirect – Leveraging of Other Services:*

A number of resources and services are available for Fremont residents through existing and upcoming energy programs administered by non-profit agencies, local government partnerships, energy and water utilities, and regional, state, and/or federal funding mechanisms detailed throughout this document. The dollar value of these various programs and services is nearly impossible to quantify because the more engaged the local community is in utilizing them, the more their value increases. Collectively, they could represent hundreds of thousands or even millions of dollars' worth of marketing and educational materials, staff time, rebates and financing, and goods and services.

d) *Indirect – Donations and In-Kind Contributions:*

The Environmental Sustainability Commission has expressed its interest in outreaching to major community players as a means of securing donations to aid the GUEP effort. Donations could be in the form of direct monetary contributions to fund a specific campaign or strategy, promotional items or energy-saving devices for free distribution, or in-kind contributions.

The ESC has identified five organizations that commonly donate to community efforts as primary targets for their solicitation: Kaiser Permanente, Washington Hospital Healthcare System, Palo Alto Medical Foundation, Fremont Bank, and Dale Hardware. In addition to these, the ESC plans to outreach to major cleantech firms such as electric vehicle manufacturer Tesla, whose Model S Factory is located in Fremont, and LED manufacturer Soraa, a Fremont-based company whose co-founder Shuji Nakamura was recently awarded a share of the Noble Prize in physics for

inventing the blue light emitting diode in the early 1990's[15]. The ESC also is very interested in engaging PetersenDean, a national roofing and solar company whose headquarters are in Fremont and whose owner, Jim Petersen, served as an FUSD Board Member from 1996-2000, donated a solar PV system to Hirsh Elementary School in 2012, and has a daughter who is now a senior at Mission San Jose High School.

C. *Engagement & Motivation of the Community-at-Large*

1) Community-Based Social Marketing

The community-based social marketing (CBSM) concept was developed by environmental psychologist Dr. Doug McKenzie-Mohr, who sees behavior change as the cornerstone of sustainability. CBSM is an alternative approach to simply providing information and education, which alone are often not enough to inspire actions that result in meaningful positive impact on society and the environment. The CBSM approach involves the following four steps:

1. Identifying benefits and barriers to an activity
2. Developing a strategy utilizing "tools" that have been shown effective in changing behavior
3. Piloting the strategy
4. Evaluating the strategy once it has been implemented across the community

While the Georgetown University Energy Prize is itself a large exercise in the CBSM approach, Fremont views its participation in GUEP as an opportunity to implement CBSM at a more micro-level. Some of the concepts and strategies listed below will prove integral to Fremont's community-based social marketing approach to the Georgetown University Energy Prize.

To identify the barriers and benefits of energy efficiency program implementation, it is important to take into consideration some of the successes and challenges in the field based on market research and in existing program implementation. Fremont therefore decided to conduct a survey through Fremont Open City Hall, an online forum for civic engagement, to determine some of the energy interests, goals, and challenges faced by the community. Open City Hall allows community members can read what others are saying about important Fremont topics, and then post their own statements. City officials read the statements and incorporate them into their decision process. Open City Hall is run by Peak Democracy, a non-partisan company whose mission is to broaden civic engagement and build public trust in government.

Fremont created an Open City hall topic entitled ***"How can the City of Fremont rethink our community-wide energy use and increase energy efficiency?"*** This topic was introduced to the community with the following statement:

> "The City of Fremont is among a select group of only 52 small and medium-sized cities and counties from across the country that have advanced to the quarterfinal round of the Georgetown University Energy Prize, a $5 million incentive competition to reduce America's energy consumption. You can learn more about the competition at www.guep.org.

[15] http://www.soraa.com/news/soraa-Oct-7-2014

To be considered for the full two-year competition that will begin in January 2015 and continue through December 2016, Fremont must develop a comprehensive Energy Efficiency Plan to detail specific strategies we will employ to reduce community-wide energy usage. The Plan is due on November 10, 2014.

Help us rethink our community-wide energy use and weigh in on how we can implement creative strategies to increase efficiency. Your feedback will assist the City as we develop an Energy Plan that will represent the needs, interests, and desires of the Fremont community as a whole."

Residents were asked the following questions:

1. What kind of actions are you personally willing to take to help Fremont win the competition?
2. What would motivate you to undertake any of the previous actions?
3. What would prevent you from undertaking any of the previous actions?
4. What types of initiatives would you like to see happen during the two year competition?
5. What should the City do with the $5M prize money if we were to win the competition?

It was noted on the forum that prize money must be used to promote and implement continued energy efficiency measures that benefit the community as a whole, including all demographic and economic sectors. Forum participants were also provided space for open-ended comments regarding additional thoughts on what the City of Fremont should do during the competition. The full forum can still be accessed directly at this link: www.peakdemocracy.com/portals/118/Forum_354/Issue_2222.

This Open City Hall topic was posted on October 6 and promoted on the City of Fremont's main webpage, through its Facebook and Twitter accounts, and in local newspapers. An image of the banner that circulated at the top of the City of Fremont's website is pasted below:

As of November 4, 2014 the forum had 117 attendees and 41 responses (18 on-forum and 23 off-forum). Based on both the multiple choice and open-ended responses, the Fremont captured the following results:

Community willingness

- Respondents are overwhelmingly (85%) willing to upgrade lighting, reduce plug load, and change their energy usage habits.
- Nearly 2/3 or respondents are generally interested in promoting energy efficiency at work or school.
- About 1/3 of respondents will consider major appliance upgrades, installing a solar electric system, and purchasing an electric vehicle.
- Less than 1/4 of respondents will consider a whole home upgrade.
- About 1/5 of respondents are interested in becoming dedicated volunteers and are willing to help organize workshops or home showcase events.

Community needs

- Over 3/4 of respondents said that discounts or rebates on products would assist them in completing upgrades.
- About half of respondents said that access to financing and educational resources were needed for them to undertake upgrades.
- Additional needs included proof of the financial benefits of upgrades, trust in the technology or brand, and technical assistance and advising.

Community challenges

- About 3/5 of respondents said that a lack of money prevented them from undertaking upgrades.
- Nearly half of the respondents said they did not have enough time to complete upgrades, or that they lacked the information and resources to do them.
- Over 1/3 of respondents said that the amount of effort required and the uncertainty of the benefits prevented them from completing upgrades.
- About 1/4 of respondents did not have the decision making authority to complete upgrades.
- Only 1/5 reported that other types of projects took precedence over energy efficiency work.

Triggers for energy efficiency

- Over 3/4 of respondents said that they would like the City to offer a community-wide group solar discount effort.
- Nearly 3/4 of respondents wanted the City to offer discounts on energy saving devices and access to financing options.
- Over half of respondents want the City to direct a school-based energy challenge.
- Over half of respondents felt that City-sponsored energy workshops, events, and other programming would increase community-wide energy efficiency.

GUEP prize money

- Most respondents (2/3) would like the City to put the prize money toward green infrastructure projects such as community solar, electric vehicle charging stations, and community solar installations.

- About 2/5 of respondents wanted the money to go into a City fund to be used for either residential energy rebates or for grants for local green projects.
- About 1/3 of respondents wanted the prize money to go to the schools for their own green infrastructure projects.

Other energy and sustainability interests

- There is interest from the community in gaining a better understanding of and access to both municipal and community-wide energy usage information.
- The community would like to see the City and the School District take initiative in energy efficiency by completing energy upgrade and renewable energy projects in facilities, parks, and other public spaces.
- The community would like the City to bolster other sustainability-related programs, such as bicycle and public transit infrastructure improvements, water-efficient/ drought-tolerant/ native plant landscaping, community gardening, and recycling.
- There is a desire that the City of Fremont collaborate with other communities both locally and globally for developing and implementing sustainability best practices.

2) Community Asset Mapping

Researching and mapping out community assets provides insights into the needs and interests of residents. A comprehensive identification of all community stakeholders will be done via *Community Asset Mapping*, a process based on the principles of Asset Based Community Development (ABCD) Institute[16]–founded by John McKnight and Jody Kretzmann at Northwestern University–to identify and connect the assets and capabilities of various community organizations and institutions. This will help Fremont to effectively market and promote energy programs in a meaningful manner.

While some primary stakeholders were identified through the gathering of Letters of Support (see Section I.H) and initial planning for the GUEP effort, Fremont will work to further identify and engage key stakeholders to gather additional qualitative information on what types of messaging and programming will work best to inspire behavior change in our community, especially in relation to the different geographic, demographic, economic, and functional groups of Fremont (see Section II.B).

Below is a list of various stakeholder sectors and a number of organizations that have already been identified as part of the community asset mapping process. Because community asset mapping is a continual process, however, additional stakeholder and affinity groups will be identified throughout the competition. Specific points of contact, ways in which individuals or organizations wish to be involved, and resources that they can contribute will be expanded upon as Fremont conducts outreach to these various groups.

[16] Asset Based Community Development Institute: http://www.abcdinstitute.org/

a) Fremont-based Environmental Organizations

- Tri-City Ecology Center
- Local Ecology & Agriculture Fremont
- Math-Science Nucleus

b) Education-Based Organizations

- Fremont Council PTA
- Fremont Education Foundation
- FUSD Parent Representative Advisory Assembly
- Ohlone College Sustainability Club
- FIERCE (Fremontians Enabling Real Change in the Environment) Youth Club
- Individual school "eco / green / environmental" clubs
    - Mission San Jose High School Green Club
    - American High School Science & Eco Club
    - Irvington High School Gardening Club
- Individual school PTAs and PTSAs
- California School for the Deaf
- California School for the Blind

c) Service Organizations and Clubs

- LIFE ElderCare
- Leadership Fremont
- Abode Services
- Rotary Club of Fremont
- Rotary Club of Niles
- Rotary Club of Mission San Jose
- Rotary Club of Fremont Warm Springs Sunrise
- Rotary Club of F.U.N. Sunset (Fremont, Newark, and Union City)
- Boy Scouts – San Francisco Bay Area Council: Mission Peak District
- Girl Scouts of Northern California: Coyote Hills Service Unit
- Bayside 4-H Club
- Fremont Garden Club
- Fremont Cultural Arts Council
- Fremont Mommies

d) Homeowners and Neighborhood Associations

- Andalusia Homeowners Association
- Antelope Hills Community Association
- Avalon Homeowners Association
- California Lakepoint of Fremont Homeowners Association
- Capriana Homeowners Association
- Fremont Roundtree Homeowners Association

- Glenmoor Gardens Homeowners
- Niles Community Unity
- Neighborhood Crime Watch groups
- National Night Out teams

e) Business Associations

- Fremont Chamber of Commerce
- Centerville Business & Community Association
- Irvington Business Association
- Niles Main Street Association
- Mission San Jose Chamber of Commerce
- Warm Springs Business & Community Association

f) Cultural & Faith-Based Groups:

- Hindu American Foundation
- Citizens for a Better Community
- Chinese Immersion Parents Council of Fremont
- Afghan Coalition
- Ohlone native community
- California Interfaith Power & Light
    - Christ the King Lutheran Church
    - Fremont Congregational Church
    - Holy Trinity Lutheran Church
    - Niles Discovery Church
    - St. Anne's Episcopal Church
- Gurdwara Sahib Fremont (Sikh Temple of Fremont)
- Temple Beth-Torah
- Mission Peak Unitarian Universalist Congregation

g) Regional Energy and Climate Oriented Organizations

- East Bay Energy Watch (PG&E Local Government Partnership)
- California Youth Energy Services Program (Rising Sun Energy Center)
- Green Point Rated Program (Build It Green)
- SmartSolar Program (Community Energy Services Corporation)
- Energy Council (StopWaste)
- Solar Roadmap (American Solar Transformation Initiative/Optony)
- Bay Area Climate Collaborative
- Bay Area Climate and Energy Resilience Project (Association of Bay Area Governments)
- Bay Area Regional Energy Network
- Public Sector Climate Action Task Force (Joint Venture: Silicon Valley)

3) Stakeholder Engagement

A stakeholder is defined as a group or organization that has a vested interest in the success of our participation in GUEP due to the alignment of the program's goals with their own mission, vision, and/or business model. Community stakeholders can both gain value from our energy savings efforts as well as help us engage the community and support us in GUEP planning, promotion, and implementation – making them key assets.

A key group of interested and active community members have already been engaged to help direct the GUEP planning and implementation process. The first meeting of this group was called by Sustainability Coordinator Rachel DiFranco on Tuesday, September 30 to talk through potential strategies for Fremont's participation in GUEP. The following list includes the 26 participants in that meeting with their respective role/title and representative organization:

FIRST	LAST	ROLE/TITLE	ORGANIZATION
Alex	Arteaga	Student	Ohlone Sustainability Club
Dylan	Brignon	Student	Ohlone Sustainability Club
Justine	Burt	Sustainability Consultant	Justine Burt + Associates
Jennifer	Chen	Economic Development Coordinator	City of Fremont
Kathy	Cote	Environmental Services Manager	City of Fremont
Amy	Dao	Sustainable Community Energy Manager	Pacific Gas & Electric Company
Rachel	DiFranco	Sustainability Coordinator; LEED A.P.	City of Fremont
Ron	Fong	LEED A.P.; Professional Engineer	RonFong.com
Ujjwala	Gadgil	PTA President, Parent	Fremont Council PTA
Richard	Godfrey	Env. Sustainability Commission (Chair)	Tri City Ecology Center
Paul	Kelley	Director of Biomedical Engineering	Washington Hospital
Jonathan	Kevles	Senior Director of PACE (CaliforniaFIRST)	Renewable Funding, LLC
Bubba	Manzo	Student	Ohlone Sustainability Club
Monica	Martinez	Student; Club President	Ohlone Sustainability Club
Kristi	Mikuni	Student; Parent	Ohlone Sustainability Club
Gus	Morrison	Former Mayor of Fremont; TCEC Chair	Tri City Ecology Center
Stephanie	Nevins	Water Conservation Supervisor	Alameda County Water District
Carolyn	Obata	Env. Sustainability Commission	Stand Up 8 Fremont
Donna	Olsen	President; Editor	Tri City Ecology Center
Bill	Palleshi	LEED General Associate	Home Energy Technology & Info
Raul	Parungao	Assistant Superintendent; Parent	Fremont Unified School District
Sushanth	Raman	Student	American High School
John	Rennels	Env. Sustainability Commission	Bay Area Rapid Transit
Ian	Scarbrough	Student	Ohlone Sustainability Club
Shiva	Swaminathan	Env. Sustainability Commission	City of Palo Alto Utilities
Jeff	Watanabe	Professor of Bio & Environmental Studies	Ohlone College

The group met for two hours, focusing on specific ways to engage the residential sector, schools, and the business sector, and identifying available resources in the community. Many of the strategies listed in Section II.A were conceived of and detailed out by the group during this meeting.

As a follow up to the meeting, Sustainability Coordinator Rachel DiFranco sent out a Doodle Poll to identify specific working groups focused around the five topic areas of:

- K-12 Public Schools
- Renewable Energy (Solar)
- Marketing & Community Engagement
- Business / Cleantech Engagement
- Net Zero Energy & Water

These working groups will be engaged as Fremont enters into the full competition to assist with strategy, marketing and outreach, and project implementation as relevant.

4) "Community Energy Champions"

The City of Fremont has remarkable ethnic and linguistic diversity. It is also a decentralized and suburban city with a relatively large population. Combined with the fact that there is only one staffmember solely dedicated to sustainability efforts and a meager budget for the GUEP effort, Fremont will develop a creative approach to community involvement through the use of "Community Energy Champions".

By engaging existing individuals and groups that have helped to inform the GUEP Planning Process, as well as reaching out to other potentially interested members of the community through schools, service based organizations, environmental non-profits, cultural and ethnic clubs, and faith-based organizations, Fremont will create a core group of "Community Energy Champions". Community Energy Champions will be recognized by the City of Fremont as purveyors of information and resources to the community-at-large, and will be given the training and resources necessary to do so through the Sustainability Coordinator.

Roles of Community Energy Champions could include leading community workshops, staffing tables and events, assisting with event set-up or take-down, setting up speaking arrangements for staff at local community meetings, developing and distributing outreach and marketing materials, assisting with translation and involvement of ethnic media, posting information on community forums and social media sites, and other activities as seen fit.

The City of Fremont will recognize Community Energy Champions regularly (weekly/monthly/quarterly) though online platforms, award ceremonies, and print publications (such as the City Newsletter) to give them a sense of accomplishment, encourage their continued participation, and generate new volunteer interest.

5) Education, Resources, and Motivation

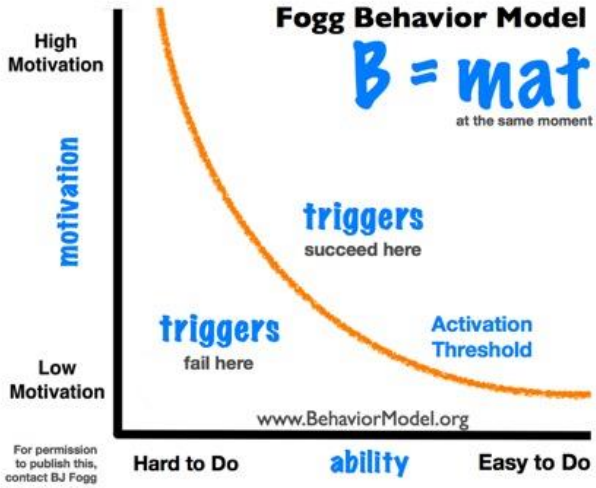
Information and resources for energy efficiency and renewable energy projects have become increasingly abundant at a local, regional, state, and national level. However, many Fremont residents are unaware that these resources exist, they do not know where to start, and/or energy-related projects are not currently a priority for them. The City, then, has a threefold challenge:

1. Distributing information to residents in a widespread and easily digestible format.
2. Providing them with access to the rebates, incentives, and financing that will assist them in completing projects.

3. Delivering energy efficiency and renewable energy messaging in a way that is fun and engaging and motivate them to take action.

Fortunately, the City of Fremont has a number of tools available to help disseminate information to the community-at-large regarding existing and upcoming rebates, incentives, and programs that might help to guide community members in completing energy efficiency or renewable energy projects. Such tools include a quarterly community newsletter that is mailed to each residential address, online City News articles and Press Releases, weekly press updates that go to 3 major news sources, 10 Facebook accounts, 5 Twitter accounts, 2 YouTube Channels, 3 Instagram accounts, a Google+ account, a LinkedIn account, the Open City Hall community forum, the Silicon Valley East Blog, and a Nixle community alert system (see Section VII.C). The City will utilize these tools to disseminate information about existing and planned future energy programs and their benefits to encourage residential participation.

In order to encourage residents to undertake energy conservation projects, the City must focus on what will trigger behavior change. Dr. BJ Fogg of Stanford University developed a behavioral model that demonstrates how three elements must converge at the same time in order for a desired behavior to occur. These three elements are Motivation, Ability, and Trigger (M.A.T.).[17] The higher the motivation or the easier the desired behavior is to implement, the more likely a specific trigger for behavior change is to succeed. Triggers to inspire change will likely fail in the cases of low motivation or difficulty of adoption. If motivation is very high, then a trigger may succeed even if the action is difficult to implement (i.e. timely, expensive, etc). Inversely, if something is easy to do, then a trigger may succeed even if the motivation to do it is lower. The Fogg Behavioral Model is represented by the curve below:



Simplicity/difficulty factors are time, money, physical effort, brain cycles, social deviance, and non-routine. Core motivators include pleasure/pain, hope/fear, and social acceptance/rejection. Triggers include spark, signal, and facilitator.

The City's marketing and outreach efforts will help to motivate behavior change by making it a part of the collective consciousness. The City will furthermore act as a facilitator to encourage adoption of energy saving habits and projects by offering education, resources, and assistance. The larger incentive

[17] Dr. BJ Fogg's Behavioral Model: http://www.behaviormodel.org/

of the $5M prize offered by Georgetown University will serve as an additional motivating factor to participate in these programs.

D. Local Government Commitment & Involvement

1) Municipal Operations

The City of Fremont is dedicated to sustainability, both within its own operations and in the community-at-large. The City's General Plan and Climate Action Plan as referenced above set the tone for Fremont's overall commitment to sustainable development. Additionally, the City is currently undertaking the following municipal energy projects:

a) Energy Efficiency

- Investment grade audit conducted by OpTerra Energy Services (formerly Chevron Energy Solutions) of municipal facilities and operations to consider upgrades to LED streetlighting, park lighting, interior/exterior facilities lighting, HVAC systems, water efficiency measures, and additional solar options. OpTerra estimates annual municipal savings of 5,291,000 kWh, 15,500 therms, and 54,246,000 gallons of water.

b) Solar PV

- Contract negotiations for solar PV at the City of Fremont's Police Complex (872 kW), Aqua Adventure Water Park (226 kW), Maintenance Center (440 kW), and Irvington Community Center (88 kW), totaling over 1.6 MW of solar saving 2,385,000 kWh annually.
- Consideration of a group solar purchase option for current and retired City employees

c) Electric Vehicles[18]

- Procurement of (2) EV municipal fleet vehicles through Alameda County GSA
- Procurement of (8) publicly accessible EV charging stations through the Bay Area Charge Ahead Project (BayCAP) – a partnership of Bay Area Climate Collaborative and the Electric Vehicle Alliance with funding from the California Energy Commission

The table below lists all of the measures that the City of Fremont plans to undertake in the near future. At the time of this submission, the only projects that have been approved by City Council and have executed contracts are the solar PV projects at the Police Complex, Aqua Adventure Water Park, and Irvington Community Center. The solar PV project for the City's Maintenance Center is scheduled to go before City Council in November 2014. These four systems are planned for installation beginning in the spring of 2015. The remaining energy projects found in the list are those proposed by OpTerra Energy Solutions and are currently undergoing the process of internal review. Measures proposed by OpTerra that are thought to be infeasible by City staff have not been included in this table.

[18] While electric vehicle projects will not result in energy savings, and will in fact add electricity usage to the grid, these projects will encourage non-greenhouse gas emitting forms of transportation. With 58% of community-wide GHG emissions resulting from the transportation sector, Fremont will promote electric vehicle adoption alongside energy efficiency and renewable energy programs, resulting in a much larger overall GHG emissions reduction.

Planned Municipal Energy & Water Savings Projects

Municipal Upgrade Measures	Measure Description	Annual projected energy/water savings									
		Existing kWh	kWh savings	Future kWh	Existing therms	therm savings	Future therms	*% kWh/therm reduction*	Existing gal H2O	gal H2O saved	Future gal H2O
Streetlights	Upgrade remaining 14,753 of 15,524 streetlights from HPS/MH/MV to LED	7,249,244	4,535,961	2,713,283				*62.6%*			
Water Conservation Measures	Upgrade (69) urinals from 1 gal to 1/8 gal per flush; (268) toilets from 1.6 to 1.28 gal per flush; (228) sinks from 2.2 to .5 gal/min; (46) showerheads from 2.5-3 to 1.5 gal/min.				21,037	13,302	7,735	*63.2%*	11,403,177	5,411,408	5,991,769
Weather-Based Irrigation Controls	Upgrade a total of (579) old irrigation control stations at a total of (36) park locations that are currently operated manually, on clock timers, or with localized control systems with the Calsense integrated and weather-based remote control system.							-	42,860,400	4,242,058	38,618,342
Park Lighting	Upgrade 700 lights in 24 City parks to LEDs, providing brighter, more uniform lighting with better security.	438,817	282,522	156,295				*64.4%*			
Facilities Lighting	Upgrade interior lighting with T-8 and LED retrofits and controls, and bring lighting power densities up to Title 24 standards; Upgrade exterior HID fixutres with new LED options, providing integrated adaptive controls as required by Title 24.	907,769	449,882	457,887				*49.6%*			
Solar PV - Maintenance Center	Install a 439.56 kW solar PV carport structure through a PPA with SunEdison	725,760	656,645	69,115				*90.5%*			
Solar PV - Police Complex	Install a 871.53 kW solar PV carport structure through a PPA with SunEdison	1,941,480	1,276,791	664,689				*65.8%*			
Solar PV - Irvington Community Center	Install a 83.25 kW solar PV carport structure through a PPA with SunEdison	136,880	124,292	12,588				*90.8%*			
Solar PV - Aqua Adventure Park	Install a 226.1 kW solar PV carport structure through a PPA with SunEdison	397,430	327,393	70,037				*82.4%*			
Pool Pumps - Aqua Adventure Park	Add filter pump VFD to (5) pump motors at Water Park.		22,967	-22,967				*5.8%*			
Solar Thermal - Aqua Adventure Park	Install a 41 flat panel Heliocol swimming pool solar thermal water heating system on 1,647 sq. ft. of roof space on the Water Park main buildings.				27,481	2,247		*8.2%*			

Between energy efficiency and renewable energy projects, the City of Fremont is poised to reduce overall energy consumption in municipal operations by 34.5%.

	kWh	therms	MMBTU
Overall Municipal Energy Usage	*15,894,841*	*262,307*	**80,466**
Savings from Planned Projects	*7,676,454*	*15,549*	**27,748**
% Reduction	*48.3%*	*5.9%*	**34.5%**

2) School District Facilities

FUSD has just hired an Energy Conservation Supervisor to work within the schools to improve operational efficiency. In particular, the Energy Conservation Supervisor's primary role will involve monitoring and evaluating District energy conservation methods, recommending installation of energy conservation projects, and developing a District-wide awareness and interest in energy conservation.

FUSD has appointed Matt McClain, a seasoned HVAC technician who has worked for FUSD for the last 18 years, as the new Energy Conservation Supervisor. Matt has extensive operational knowledge of school energy systems and will be working diligently to address energy concerns throughout FUSD's campuses.

The appointment of the Energy Conservation Supervisor position is timely as two significant sources of funding are now available to FUSD to implement facility upgrade projects.

a) Proposition 39 Funding

In November 2012, California voters approved Proposition 39, the California Clean Energy Jobs Act. Proposition 39 changed the corporate income tax code and allocates projected revenue to California's General Fund and the Clean Energy Job Creation Fund for five fiscal years, beginning with fiscal year 2013-14. Under the initiative, roughly up to $550 million annually is available for appropriation by the Legislature for eligible projects to improve energy efficiency and expand clean energy generation in schools.

Eligible local educational agencies (LEAs) — including county offices of education, school districts, charter schools and state special schools—can request funding by submitting an energy expenditure plan application to the California Energy Commission. For the first year, there is an option to receive part or all of a school's allocation for energy savings planning purposes. The Energy Commission approves plans and works with the California Department of Education, which subsequently distributes funds after plans have been approved.

Under Proposition 39, the Fremont Unified School District will have access to approximately $10 million in funding for energy projects. In order to access the funds, FUSD must develop an expenditure plan and receive approval from the California Energy Commission.

b) Measure E Bond funding

In November 2014, Fremont voters approved Measure E, authorizing the Fremont Unified School District to increase its debt by $650 million through issuing general obligation bonds in

that amount. This funding is to be utilized for upgrading /repairing neighborhood schools in the following ways:

- Update technology/aging classrooms, math, science/computer labs for 21st Century learning
- Upgrade electrical wiring to current safety codes
- Fix/replace leaky roofs, aging plumbing/restrooms
- Remove asbestos
- Repair, construct, acquire equipment, classrooms, sites, facilities

While the funding available to FUSD under Measure E is significantly greater than that under Proposition 39, the funds under Measure E are not earmarked for energy upgrade measures as they are under Proposition 39. However, because some of FUSD's facilities suffer from highly inefficient systems and catastrophic equipment failures, especially in relation to Heating, Ventilation, and Air Conditioning (HVAC) systems, some of the major improvements under Measure E will undoubtedly reduce energy usage.

FUSD has yet to develop a comprehensive plan for energy upgrades throughout its facilities, but the City of Fremont will work closely with FUSD's Energy Conservation Supervisor to help him identify and connect with the local resources and technical assistance programs available to schools on energy efficiency.

Based on initial conversations with the Energy Conservation Supervisor, the City is projecting that in the next two years, FUSD will be able to reduce its overall energy consumption by at least 5% through equipment upgrades and energy control systems. If FUSD is willing and able to consider renewable energy installations such as solar PV in addition to energy reduction strategies, then this percentage could significantly increase. Most likely, the energy savings captured throughout FUSD facilities over the next two years will only be the beginning of much deeper energy reductions that will be realized over the next 5+ years.

Other strategies for the Fremont Unified School District to achieve in deep energy savings include:

- Adopting a plan that requires the new elementary school to be established under the City's Warm Springs/South Fremont Community Plan area be a Zero-Net Energy (ZNE) facility and a BETA site for sustainability
- Set a goal of making ALL Fremont schools ZNE and applying for funding that would supplement Proposition 39 and Measure E funding to enable ZNE retrofits
- Consider crowd-funding of solar projects through programs like Solar Mosaic

E. Planned Municipal Incentives

While many of the local energy-related incentive programs are operated at a County, regional, or State level (see Section I.G), the City of Fremont has adopted a number of resolutions and ordinances providing for standardized solar permit costs, flexible and streamlined permitting for renewable energy systems, tax exemptions for clean tech businesses, and green building requirements for City facilities.

1) Removing Barriers for Renewable Energy Projects

- The Renewable Energy Ordinance[19] was incorporated into the City's Municipal Code in 2012, providing specific use allowances and flexibility in permitting for solar and wind energy systems and implementing policies of the Conservation Element of the City's updated General Plan.

2) Encouraging Green Technology Innovation

- In 2009, City Council adopted a Clean Technology Business Tax Exemption as an incentive to attract green employers into Fremont by providing both clean tech and biotech firms a payroll tax exemption. This was re-authorized in 2012, extending the exemption through 2019.

3) Streamlining Solar Permitting

- In 2006, City Council adopted resolutions to reduce solar permitting fees for residential installations to $236 per dwelling unit and non-residential installations to levels reflecting the actual cost to administer, as recommended by the Sierra Club.[20]
- A new standard plan for residential solar permitting (<10kW systems) was implemented in March, 2014 based on the recommendations of ASTI and the California Solar Permitting Guidebook, allowing designers of PV systems to complete two documents and submit them along with a completed permit application over-the-counter and obtain permits without submitting the plans for a formal review.

4) Municipal Green Building Requirements

- In 2006, City Council adopted the "Sustainability Policy", a resolution encouraging sustainable building and landscaping practices and establishing a policy to obtain LEED Certification at the Silver Level or higher for new City of Fremont buildings over 10,000 square feet.

F. Involvement of Business Community

1) Large Employers

Fremont's top employers (250 – 1,000+ employees) include a number of notable organizations, with Tesla electric vehicle manufacturer and Fremont Unified School District topping the charts, each with 3,000+ employees.

Some of these employers, such as the School District, Tesla, Washington Hospital, Kaiser Permanente, and the City of Fremont, have a significant level of public visibility due to both the nature of their work and the number of local residents they tend to employ. The City of Fremont will serve as a strong example to other large employers with the municipal upgrade projects is planning to undertake (see

[19] The Renewable Energy Ordinance is found in Chapter 18.185 of the Fremont Municipal Code and can be viewed online at http://www.codepublishing.com/CA/Fremont/?Fremont18/Fremont18185.html.

[20] See the Sierra Club Loma Prieta, San Francisco Bay, and Redwood Chapters' 2006 study "Solar Electric Permit Fees in Northern California": http://www.solarpermitfees.org/NorCalPVFeeReport.pdf (updated 2009).

Section I.D.1), and can provide guidance and technical resources to these businesses to assist them in undertaking projects.

The top ten employers are listed below:

Rank	Employer	Industry	# of Employees
1	Fremont Unified School District	Education	3,000
1	Tesla	Automotive / Cleantech	3,000
3	Washington Hospital	Healthcare	1,817
4	Lam Research Corporation	Semiconductor Equipment	1,500
5	Western Digital	Computer Storage	1,300
6	Boston Scientific / Target Therapeutics, Inc	Medical Equipment	1,200
7	Seagate Magnetics	Computer Storage	1,050
8	AXT Incorporated	Semiconductor Equipment	972
9	Kaiser Permanente	Healthcare	880
10	City of Fremont	Municipal	832

By engaging large employers like these in Fremont's energy conservation programs, the business sector will not only be able to demonstrate its commitment to sustainability through onsite energy saving projects, but also through employee education and incentive programs.

Furthermore, in addition to the two healthcare providers of Washington Hospital and Kaiser Permanente listed above, Fremont is also home to Palo Alto Medical Foundation. With over 2,000 combined employees and serving a large percentage of Fremont residents, these medical centers can help to distribute information to the community-at-large. They are also regular donors to philanthropic causes, and may want to lend additional support to Fremont's efforts through donations or other services. Dr Richard Godfrey, chair of the Environmental Sustainability Commission, will help to guide this targeted outreach to the healthcare providers.

Beyond assisting with outreach and implementing onsite programs to green their own operations, some large employers may be interested in collaborating with the City to promote energy efficiency & sustainability to their staff through a more defined program. This could work particularly well with employers who:

- Have Sustainability / Green Teams in place (see: "Green Teams: Engaging Employees in Sustainability" by Deborah Fleischer, President of Green Impact)
- Have a defined sustainability and/or environmental purchasing policy
- Have a mission/vision that incorporates environmental sustainability
- Are housed in a LEED/ Green Building
- Have done Bay-Friendly Landscaping
- Promote energy & water efficiency within the office space
- Organize employee volunteering / community engagement programs
- Have existing employee incentive/benefit programs (such as for using sustainable transportation, continuing education, or loan programs)
- Are focused on the health and happiness of their employees

There are many different ways that a large employer may want to implement such a program. Some examples follow:

a) *Targeted Outreach Campaign:*

At the simplest level, a large employer collaboration could involve a more targeted educational and outreach campaign that provides company-branded information regarding energy saving benefits. A company level campaign could include:

- Distribution of printed informational materials to all employees
- Brown-bag workshop for interested staff
- Periodic email updates regarding any specific program updates, as well as other energy-saving tricks & tips
- Overlap with employee service days dedicated to environmental causes
- Posting of energy-saving reminders throughout the office building

b) *Employer-sponsored incentives:*

A large employer dedicated to promoting energy programs may want to incentivize its employees to undergo whole home upgrades or install solar. An employer could do this by:

- Providing free or discounted energy saving devices for employees, such as CFL/LED light bulbs, smart power strips, energy usage metering devices (Kill A Watt™), water-efficient showerheads and faucet aerators, clotheslines, etc.
- Providing additional company incentives for energy upgrades
- Organizing a group solar purchasing effort for employees (see Section VII.B.2)

c) *Employee Challenges:*

Creating an Employee Challenge to see which home can save the most energy, which department can save the most energy, and/or how much energy overall the company can save through energy upgrades could add an element of fun and friendly competition to help jump start projects. Employee Challenges could be especially effective if the employer already is offering matched incentives or financing for projects, and should incorporate as many of the above-mentioned strategies as possible.

As these large employers complete sustainability projects and engage in their own marketing, education, and outreach activities to their staff and/or to their customer base, the City will help to showcase their efforts through recognition events, media coverage, and case studies. This will visibly demonstrate to the community-at-large the level of commitment to energy conservation and alternative energy technologies.

2) Bay Area Green Businesses

Fremont currently has 24 businesses that are certified under the Bay Area Green Business Program. The Bay Area Green Business Program distinguishes small businesses that protect, preserve and sustain the environment. Participating businesses are required to meet specific standards regarding conserving energy and water, minimizing waste, preventing pollution, and shrinking their carbon footprints.

Because these businesses have already taken a leading role in distinguishing themselves as green, the City will work to garner support from these businesses for its energy outreach efforts.

With the support of StopWaste, the Green Business Program is currently working to provide direct technical assistance to Fremont businesses in process of completing their certification checklists, as well as outreach to businesses identified by the City of Fremont as qualified leads. Activities are focusing on moving newly signed-up businesses and those that have started checklists through to checklist completion. As a supplement to this, the Green Business Program will also provide StopWaste with at least one Fremont green business case study that can be used by both Stopwaste and the City for additional outreach and engagement activities.

As Fremont progresses into the competition round of GUEP, the City will strategize with Stopwaste and the Green Business Program staff on ways to further promote Green Business engagement, especially in business sectors that have been traditionally underrepresented by the program, such as Fremont-based restaurants.

3) Green Business Challenges

A similar concept to the "Employee Challenge" example mentioned above is that of the "Green Business Challenge" sponsored by ICLEI (Local Governments for Sustainability, USA). The Green Business Challenge involves a toolkit and programmatic support for local governments (cities and counties) to engage local businesses and commercial property managers in a fun, friendly competition to save money, energy, water, and waste, improving their business's environmental performance.

The City of Fremont has done some initial exploration into ICLEI's Green Business Challenge and may consider adopting its model, or may leverage existing efforts of the Bay Area Green Business Program to encourage large employers to implement energy-saving and green business measures as part of a City-wide green business competition. The Sustainability Coordinator will coordinate with the City's Economic Development staff as well as the Fremont Chamber of Commerce (see below) to leverage their existing relationships and business engagement activities to explore the development of a green business challenge pilot program.

4) Local Business Associations

The Fremont Chamber of Commerce is Fremont's only community-wide business association. Its mission is to promote, support and enhance a positive business environment. The Fremont Chamber of Commerce is committed to making sustainable business practices the norm in Fremont. As stated on its website, "We want green business to become business as usual in Fremont. Sustainable business processes save money, period. Whether you call it clean, lean or green, efficiency and sustainability are values that help keep your company current, competitive and in environmental compliance. Business practices that reduce waste and save resources also improve employee morale, meet community expectations and increase your chances of attracting positive press coverage. Smart businesses in Fremont know that green business is good business."

To demonstrate its commitment to green, the Chamber is currently undergoing the process to become Bay Area Green Business certified. It has also recently secured grant funding from the CA Energy

Commission to provide workplace electric vehicle charging in the Bayside business park in Fremont's Warm Springs District, helping to promote clean and renewable commute options for local employees.

The Fremont Chamber works closely with the City's Economic Development Department as well as with the neighborhood business associations found in Centerville, Irvington, Niles, Mission San Jose, and Warm Springs to involve local businesses in local events and keep the business community abreast of local and regional activities that may be of interest. The Chamber has also hosted Green Business events in the past, and will work with the City to continue to promote green business opportunities to its membership, which includes nearly 1,000 businesses.

5) Cleantech Companies

Fremont is home to a total of 37 clean technology firms, including the notable manufacturers of Tesla (electric vehicles), Solaria (solar panels), and Soraa (LEDs). Fremont currently offers a business tax exemption for clean technology and biotechnology businesses through December 31, 2016. In its Municipal Code, Fremont provides the following definitions for "clean energy" and "clean technology":

> "Clean energy"
>
> Energy produced by wind, solar power, landfill gas, geothermal resources, ocean thermal energy conversion, quantifiable energy conservation measures, tidal energy, wave energy, biomass, biofuels, or hydrogen fuels derived from renewable sources. Clean energy does not include any fossil fuel-based energy production, including, but not limited to, clean coal, clean diesel, natural gas and hydrogen from natural gas, any nuclear-based energy production, waste-to-energy production via combustion or incineration, or other energy technologies derived from nonrenewable resources.
>
> "Clean technology business"
>
> A business in which at least 75 percent of all business activities carried on during the tax year are directly related to one or more of the following activities:
>
> – Research and development and/or associated manufacturing applying scientific advances to the production, distribution or storage of clean energy.
> – Research and development and/or associated manufacturing applying scientific advances to prototype or commercially viable materials and products powered by clean energy, including but not limited to single passenger vehicles and fueling infrastructure.
> – Research and development, and/or manufacture of solar panels.
> – Research and development and/or associated manufacturing applying scientific advances to prototype or commercially viable techniques, materials and products that materially improve energy efficiency, water conservation or air quality.
> – Research and development and/or associated manufacturing applying scientific advances to chemistry-based products and processes that use sustainable chemistry techniques to reduce or eliminate the use and generation of substances that are toxic to humans and the environment.

As discussed in Section I.2.5, the City's Environmental Sustainability Commission is driven by the idea of engaging key companies that have a strong community presence to provide support of Fremont's energy efforts, especially in the form of donations and in-kind contributions. This includes but is not limited to the cleantech firms of Tesla, Soraa, and PetersenDean. Support from these companies could attract not just widespread attention from the Fremont community, but also from the region and even the nation. This high level of visibility could have unprecedented effects on both consumers and the business community in terms of inspiring widespread adoption of energy efficient technologies.

A comprehensive list of Fremont's cleantech companies is included below for reference:

Fremont Based Cleantech Companies

#	Business	Address	Website	Description	Contact	Title	# Ees	Category
1	Alchemy Power	47835 Westinghouse Dr	www.alchemypower.com	Wind turbine parts	Percy Kawas	President	3	RE Generation
2	Amber Kinetics	47338 Fremont Blvd.	www.amberkinetics.com	Cleantech energy storage	Edward Chiao	President	0	Energy Storage
3	Applied Spectra	4661 Fremont Blvd.	www.appliedspectra.com	Laser ablation	Richard Russo	CEO	25	Undecided
4	Imergy (formerly Deeya Energy)	48611 Warm Springs Blvd.	www.deeyaenergy.com	GreenEnergy Storage Platform	J. Kelly Truman	President	40	Energy Storage
5	Delta Products	4405 Cushing Pkwy	www.deltaww.com	solar, LED, wind, EV charging	MS Huang	President	100	Undecided
6	Dragonfly Systems	Residential Location	dflystems.com	Solar			3	RE Generation
7	EchoFirst Inc.	34760 Campus Dr.	www.echofirst.com	Solar panels	Vikas Desai	CEO	0	RE Generation
8	Ecommunications	1045 Mission Ct.	-	Sensor technologies for green buildings	Bradley Kimura	CTO	7	SW & Comms
9	Enovix	3501 W Warren Ave.	enovix.com	R&D Optics	Harrold Rust	CEO	25	Undecided
10	Everbright Solar	44802 Osgood Rd.	www.everbrightsolar.com	Wholesaler of Solar Cells	Charles Liu	President	5	RE Generation
11	GenZe	2901 Bayview Address	www.genze.com	Electric Vehicle Scooters			10	Smart Transportation
12	GlassPoint Solar	46485 Landing Pkwy.	www.glasspoint.com	Green power generation	Rod MacGregor	President	7	RE Generation
13	Green Dot	670 Navajo Way	www.green-dot-charging.com	Charging Connector	Satyajit Patwardhan	CEO	3	Smart Transportation
14	Gridscape Solutions	46705 Fremont Blvd	grid-scape.com	Solar software	Vipul Gore	CEO		SW & Comms
15	IMI Energy Solutions	46453 Landing Pkwy	-	Solar R&D Startup	Arthur Tan	CEO		Undecided
16	Leyden Energy	off of Warren	-					
17	Intematix Corp.	46430 Fremont Blvd.	www.intematix.com	LED manufacturing	Mark Swoboda	CEO	60	Energy Efficiency & LEDs
18	Lumimax Optoelectric Technology	3167 Skyway Ct.	-	LED manufacturing	Tony Yang	CEO	0	Energy Efficiency & LEDs
19	NexTracker	6200 Paseo Padre Parkway	www.nextracker.com	horizontal tracking system	Dan Shugar	CEO		RE Generation
20	NovaTorque	3501 Gateway Blvd	www.novatorque.com	Magnet electric motors	Emily Liggett	CEO	40	RE Generation
21	Oorja Protonics Inc.	40923 Encyclopedia Ci.	www.oorjaportonics.com	Methanol Fuel Cells	Sanjiv Malhotra	CEO	40	RE Generation
22	Pacific Solar Tech	44843 Fremont Blvd.	www.pacificsolartech.com	Solar panels	George Huang	CEO	0	RE Generation
23	PetersenDean	39300 Civic Center Dr. #300	www.petersendean.com	Solar panels	James Petersen	CEO		RE Generation
24	PlasmaSi	3754 Spinnaker Ct.	www.plasmasi.com	Manufacturing	Adam Kabbnian	CEO	0	Undecided
25	Redwood Systems	3839 Spinnaker Court	www.redwoodsystems.com	LED, smart lighting, smart buildings	Dave Leonard	CEO	0	Energy Efficiency & LEDs
26	RETC	46457 Landing Pkwy.	www.retc-ca.com	Solar Testing Services	Alelie Funcell	CEO	15	Supporting EcoSystem
27	Sanmina-Sci	42735 Christy St.	www.sanmina-sci.com	LED manufacturing	Jure Sola	CEO	460	Supporting EcoSystem
28	Silevo	45645 Northport Loop E	www.silevo.com	R&D Solar cells	Xu Zheng	CEO	0	RE Generation
29	SolarEdge	3347 Gateway Blvd.	www.solaredge.us	Solar inverters	Guy Cella	CEO		RE Generation
30	Solaria Corporation	6200 Paseo Padre Pkwy	www.solaria.com	Solar panels	Daniel Shugar	CEO	65	RE Generation
31	Soleeva Solar	901 Laurelwood Rd.	www.soleeva.com	Solar panels	K. Ahmad Qazi	CEO		RE Generation
32	Soraa	6500 Kaiser Dr.	www.soraa.com	LED manufacturing	Eric Kim	CEO	0	Energy Efficiency & LEDs
33	Sun Hydrogen	39812 Mission Blvd. #202	-	Solar R&D Startup	Amjad Huda	CEO	0	RE Generation
34	Sun Innovations	43241 Osgood Rd.	www.sun-innovations.com	R&D Optics & photonics	Ted Sun	CEO	6	Undecided
35	Syserco	215 Fourier Ave 94539	www.syserco.com	Smart Lighting, building, energy management	Majol Khleif	CEO		
36	Thrive Solar Energy	Residential Location	thriveenergy.com	LED	Sohrab Kakalia	CEO	0	Energy Efficiency & LEDs
37	Tesla	3500 Deer Creek	www.teslamotors.com	Electric Vehicle Manufacturing	Diarmuid O'Connell	VP	4000	Smart Transportation
38	TUV SUD America	46457 Landing Pkwy.	www.tuvamerica.com	solar testing and certification			0	Supporting EcoSystem
39	Xcell Power	Residential Location					0	Undecided
	TOTAL= 40						**4911**	

G. Local Utility Programs & Incentives

1) PG&E / East Bay Energy Watch (EBEW)

The East Bay Energy Watch partnership is a collaboration between Pacific Gas and Electric Company and local governments, non-profit and for-profit energy service providers in the East Bay dedicated to providing innovative energy efficiency solutions for residents and businesses in communities throughout Alameda and Contra Costa Counties.

In the 2010 through 2012 program cycle, 930 residential and 199 non-residential PG&E customers in Fremont participated in PG&E's East Bay Energy Watch Programs. This resulted in 7,102,405 total kWh saved, with 6,545,000 kWh from lighting, 555,000 kWh from refrigeration, and 2,000 kWh from appliance upgrades, and 8,579 total therms saved, with 7,747 from appliance and 831 from boiler/steam system upgrades.

a) Municipal Implementation Team (MIT):

This program provides no-cost energy assessments for municipal buildings and implementation assistance of recommended energy efficiency measures. The program also ensures that all applicable cash incentives are obtained for municipal governments based on project qualifications. The MIT team furthermore provides technical assistance, training, and reporting services to local government staff on the use of ENERGY STAR Portfolio Manager by collecting operation and energy data, inputting it to Portfolio Manager, and interpreting benchmarking results to identify relatively efficient or inefficient buildings.

In the 2010-2012 program cycle, MIT conducted audits at five City community centers, examining HVAC and hot water systems, and other building equipment. MIT also prepared replacement specifications for chiller retrofits and chilled water flow rebalancing at the City's Maintenance Center, the AC unit at the City's Development Center, the boiler at the Fremont Main Library, and the boiler at the Police Department. The energy efficiency recommendations provided by MIT will be considered when the City of Fremont considers replacing these units as capital improvement projects as they near the end of their useful life.

b) Business Energy Solutions Team (BEST):

The BEST Program helps small to medium sized business owners lower energy costs and offset the high cost of energy efficiency upgrades. The BEST Program offers free facility energy audits and incentives for energy efficient lighting retrofits, select refrigeration equipment, controls, and other proven technologies. Additionally, the BEST Program offers incentive levels which typically cover 50%-70% of the project cost. This allows for short payback periods and low measure installation costs for customers.

In the current 2013-2014 program cycle, BEST has served 66 small to medium businesses, provided nearly $265,000 in rebates, and saved 1,715,630 kWh and 270 kW of electricity.

c) California Youth Energy Services (CYES):

For seven weeks each summer, young adults ages 15 to 22 are hired for the CYES Program. These youth are trained to serve communities across the Bay Area with no-cost Green House

Calls. At each Green House Call, youth check the home for efficiency, install energy and water-saving equipment like energy-efficient lighting, high-efficiency aerators for bath and kitchen, showerheads, clotheslines, powerstrips, and more – and provide personalized recommendations for further savings.

The CYES Program has served the City of Fremont every summer since 2009, with an additional fall-based program in 2011. Over the course of this period of time, it has employed 62 youth, served 1,824 homes, and saved 825,000 kWh, 14,000 therms, and 2,000 gallons of water.

d) SmartSolar:

This program offers free advice and guidance to East Bay home and business owners interested in installing solar, whether in the form of photovoltaic panels or a solar water heater. Services include a free solar assessment, an analysis of solar or energy efficiency project bids, educational materials and tools, and assistance on project proposal and installation.

Since 2011, the SmartSolar Program has offered independent and site-specific solar advising for 14 homes and 7 municipal facilities in Fremont.

2) Alameda County Water District (ACWD)

The Alameda County Water District is the oldest water district in California. It supplies fresh water to the residents and businesses of the southern Alameda County cities of Fremont, Newark, and Union City. ACWD offers a number of incentive programs to help its customers conserve water, indirectly reducing the energy usage embedded in water for water distribution, water heating, and wastewater treatment.

a) Water Conservation Kits:

These kits are offered at no cost to residents with older homes (built before 1994). Kits include a 1.5 gallon per minute (GPM) showerhead, 1.5 GPM kitchen faucet aerator, 1.5 GPM bathroom faucet aerator, leak detection tablets for checking for toilet leaks, a replacement toilet flapper and general water conservation tips and information.

By June 2014, ACWD had distributed a total of 1,108 Water Conservation Kits to its customers (Fremont, Newark, and Union City) since 2012, with 721 of those given out in 2014 alone.

b) Water Savings Assistance Program (WSAP):

ACWD's new WSAP provides income-qualified single-family homeowners with free water use efficiency upgrades to help reduce water use and save money on the water bill. Homeowners must meet certain income and household size requirements to qualify. Qualified homeowners participating in the Water Savings Assistance Program receive a free water use efficiency survey to help identify water saving opportunities and to identify any potential leaks. Some leaks, leaking flappers and overflow tube adjustments in toilets, may be fixed right on the spot.

By June of 2014, 44 customers had participated in the new Water Savings Assistance Program.

c) High Efficiency Clothes Washer Rebate Program:

High-efficiency clothes washers use up to 50% less energy and water than standard washers. Currently there are two different types of washer rebates available to ACWD customers. Since 2012, ACWD, in partnership with Union Sanitary District (USD) and Pacific Gas and Electric Company, has offered a combined $200 rebate toward the purchase of a qualifying Energy Star Most Efficient (ESME) model. In addition ACWD and USD are offering a rebate of $50 toward the purchase of a Consortium of Energy Efficiency (CEE) Tier 3 model (certain restrictions apply). Replacing a standard washer with a high-efficiency model can save an estimated 7,978 gallons per year.

By June of 2012, ACWD had issued a total of 6,035 high-efficiency clothes washer rebates.

d) Water-Efficient Landscape Rebate Program:

Low water use landscapes are beautiful and can save money on water bills, fertilizers, pesticides, and maintenance. Single family homeowners who convert their lawn to water-efficient plantings can get a rebate of up to $1,500. Commercial and Multi-family customers can get up to $20,000. The rebate is based on the number of square feet of lawn converted ($1 per sq. foot of turf replaced). Average estimated water saving for replacing turf with low water use plants is 21.6 gallons per square foot per year (savings based on average ET rates for water-efficient plants vs. turf, average drip irrigation efficiency and assumed plant density).

In 2012, the turf replacement program had 16 participants and converted approximately 20,000 sq. feet of turf. In 2013, that amount doubled, with 30 participants and approximately 55,000 sq. feet of turf converted. By June of 2014, there were 27 participants that have so far converted 42,000 sq. feet of turf.

3) Bay Area Regional Energy Network (BayREN)

BayREN is a collaboration of the 9 counties that make up the San Francisco Bay Area. Led by the Association of Bay Area Governments (ABAG), BayREN implements effective energy saving programs on a regional level and draws on the expertise, experience, and proven track record of Bay Area local governments to develop and administer successful climate, resource, and sustainability programs. BayREN provides an effective platform for local government energy programs to benefit from regional consistency and scale. One of only two Regional Energy Networks in the state, BayREN represents 20 percent of the state's population. Its energy savings programs complement and supplement established core programs of existing PG&E Energy Watch local government partnerships. BayREN is funded by California utility ratepayers under the auspices of the California Public Utilities Commission.

a) Energy Upgrade California: Home Upgrade & Advanced Home Upgrade:

Energy Upgrade California™ Home Upgrade provides assistance and incentives for home improvement projects that can reduce energy use and make homes more comfortable. Rebates currently range from $1,000 to $3,150 for a Home Upgrade (eligible projects must complete a

minimum of three upgrade measures including one base measure) or $1,000 to $4,500 plus a $300 Assessment Incentive for an Advanced Home Upgrade[21] (eligible projects must complete a whole house energy assessment demonstrating a minimum of 10% modeled savings).

Over the last 9 months, the 9 Bay Area counties have hosted over 120 events with over 400 Home Upgrade projects in progress or completed and over 425 assessment rebates reserved or paid to Advanced Home Upgrade projects. Since the launch of the Energy Upgrade California program in March 2011, at least 66[22] Fremont households have completed either a Home Upgrade or Advanced Home Upgrade project.

b) Home Upgrade Advisor:

The BayREN Home Upgrade Advisor is an independent resource offered to both homeowners and contractors interested in the Energy Upgrade California Home Upgrade and Advanced Home Upgrade rebate programs. Through phone- and field-based advising, Home Upgrade Advisor staff provide individualized and ongoing assistance to homeowners with relevant programs, energy efficiency benefits, contractor selection, assessment report and bid review, financing options, upgrade project support, and customer service. For residents that do not qualify for or determine that they are uninterested in a Home Upgrade, Home Upgrade Advisor staff refer them to relevant complementary programs in the region.

Between July 2013 and June 2014, the Home Upgrade Advisor has provided independent, no cost advising for 44 Fremont homes, with 14 of those homes considered to be qualified leads with Home Upgrade potential.

c) Bay Area Multifamily Building Enhancements:

Energy Upgrade California's Bay Area Multifamily Building Enhancements offers cash rebates and free energy consulting for multifamily properties that undertake energy upgrades. The program assists in planning energy saving improvements designed to save 10% or more of a building's energy usage and provides $750 per unit in rebates to help pay for the upgrade. The program is open to multifamily buildings with five or more attached dwelling units in the nine county Bay Area. The Bay Area Multifamily Capital Advance Program (BAMCAP) additionally provides loan capital at 0% interest to property owners, limited to no more than 50% of the cost of the approved scope of work minus any program incentives.

Since outreach began in the fall of 2013, the Bay Area Multifamily Building Enhancements program has reserved rebates for about 6,000 units throughout the 9-County region, with an additional 1,500 units ready for reservations. The reservations have exceeded the program's original goal, and BayREN has successfully requested additional funding to increase the program's capacity. The program anticipates incentivizing 7,400 units of completed multifamily retrofits by the end of 2014.

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[21] The Advanced Home Upgrade package is currently administered by PG&E, with the Assessment Incentive provided by BayREN.

[22] There have been 16 upgrade projects in Fremont under BayREN (9 Advanced Home Upgrade and 7 Home Upgrade projects), and 50+ projects under PG&E from the previous Energy Upgrade California program cycle.

In Fremont, the Bay Area Multifamily Building Enhancements has advised on 8 multifamily properties amounting to a total of 1,927 residential units. Of these, 1 property (332 units) has reserved its rebate and is currently undergoing the upgrade process, with an additional 5 properties (totaling 1,058 units) in the queue for rebate.

4) Alameda County Energy Council JPA (managed by StopWaste)

The Energy Council is a Joint Powers Authority created in 2013 to assist Alameda County member Agencies develop and implement sustainable energy initiatives that reduce energy demand, increase energy efficiency, and advance the use of clean, efficient, and renewable resources available in the region for the benefit of the Agencies and their constituents. The Energy Council's Technical Advisory Group (TAG) consists of Agency staff involved in energy and sustainability planning and implementation.

a) Fremont Energy Challenge / Home Energy Analyzer:

In partnership with the StopWaste Energy Council and the BayREN Energy Upgrade California Home Upgrade, the City of Fremont launched the Fremont Energy Challenge, a city-wide initiative encouraging residents to monitor and evaluate energy usage while giving back to the local community. From June through September 2014, Fremont residents who signed up for the free Home Energy Analyzer (www.homeenergyanalyzer.org) receive coupons for discounts on energy efficient products at local home improvement store Dale Hardware. Additionally, a $5 donation was made to the Fremont libraries. The Home Energy Analyzer uses PG&E smart meter data to evaluate energy usage. By pinpointing where energy is being used – and wasted – residents can determine the right energy-saving actions and improvements to suit their needs. The Home Energy Analyzer provides customized energy saving recommendations including conservation behaviors and do-it-yourself improvements. While the incentives offered in the Fremont Energy Challenge were only available during the summer months, the Home Energy Analyzer will be available for Alameda County residents to utilize free of charge at least through the end of 2015.

Local marketing, education, and outreach efforts to promote the Home Energy Analyzer tool and Fremont Energy Challenge included:

- Neighborhood canvassing of hundreds of homes through Green Pro Network
- November 5, 2013 Home Energy Efficiency Workshop
- June 3, 2014 Fremont Energy Challenge Kickoff Event
- Partnerships with Fremont libraries and Dale Hardware, promoting the Fremont Energy Challenge through print materials such as bookmarks, handouts, posters, and flyers
- Inclusion of Fremont Energy Challenge information on City of Fremont Website, City Newsletter (mailed out quarterly to all Fremont residential addresses), local newspapers, and online forums
- Tabling during the City of Fremont's Summer Concert Series

By October 2014, a total of 226 Fremont households have registered with the Home Energy Analyzer tool. At the County-wide level, there are 880 registered users who are reducing an average of 557 lbs of CO_2 and saving $45 on annual energy costs per person.

5) Possible Supplements to Services

a) Supplement Rising Sun's California Youth Energy Services

Fremont would add one or more of the following additional measures to the scope of work of Rising Sun Energy Center's California Youth Energy Services "Green House Call" offering:

Electric Savings

- Add (275) Smart Power Strips to Green House Calls at a cost of $16.99 in materials and $3.00 in labor each for a *total cost of $5,497.25*. Projected savings of 24 kWh per smart strip installed, based on PG&E SCE work paper.
- Add (550) 10W LED Flood Lamps to Green House Calls at a cost of $9.41 in materials and $4.00 in labor each for a *total cost of $7,375.50*. Use deemed savings.
- Provide LED Holiday light swap of (750) leading up to or as follow up to summer CYES program 2015 at a cost of $10.00 in materials and $4.00 in labor each for a *total cost of $10,500.00*. Projected savings of 6.9 kWh per string of lights, based on PG&E SCE work paper.

Natural Gas Savings

- Add (275) Draft Guard Door Snakes to Green House Calls at a cost of $5.98 in materials and $3.00 in labor each for a *total cost of $2,469.50*.

Water-Energy Savings

- Add (275) shower timers to Green House Calls at a cost of $2.81 in materials and $3.00 in labor each for a *total cost of $1,597.75*.
- Add (275) 5 gallon collapsible buckets for capturing water while shower is warming up to Green House Calls at a cost of $5.83 in materials and $3.00 in labor each for a *total cost of $2.428.25*.

Fremont will approach the Alameda County Water District to see if they can fund one or both of these water-energy offerings as a supplement to their existing co-pay of CYES.

b) Follow up on the Fremont Energy Challenge

Fremont would build upon the momentum of the "Fremont Energy Challenge" and supplement the BayREN Home Upgrade program offerings (managed StopWaste) by delivering one or more of the following in Fremont:

Plug Load Follow Up

- Target existing and new Fremont Home Energy Analyzer users with high electric loads to promote energy savings tactics and behaviors (e.g. strip power strips, timers, as well as turning things off, washing on cold etc.). This could either be an in-person direct install type of program (running in parallel with CYES or during CYES off-time), or a kit that gets mailed out or picked up at a workshop.

Home Energy Walk-Throughs

- Offer energy walk-throughs with Green Pro Network focusing on either plug load or upgrades, depending on the home.

Additional Outreach

- Offer a series of extra workshops, canvassing and partnerships with community organizations, and/or focus on Fremont-based contractor outreach and engagement.

Fremont would work with StopWaste to develop out this scope and determine any additional costs to the City once we are notified about advancing to the Semifinalist round of GUEP.

H. Involvement by Citizen Groups / Major Landlords

1) Citizen Groups

As already detailed in Section I.C, Fremont will coordinate with a variety of citizen groups at varying levels of engagement to promote its energy reduction goals. These include:

- Environmental Organizations
- Educational-based Organizations
- Service Organizations and Clubs
- Homeowners and Neighborhood Associations
- Business Associations
- Faith-based and Cultural Organizations
- Regional Energy and Sustainability Organizations

The "GUEP Steering Committee" (Environmental Sustainability Commission) and "Community Energy Champions" (dedicated volunteers), under the direction of the GUEP Project Lead (Fremont Sustainability Coordinator), will play a leadership role in engaging these other community groups in energy savings programs and initiatives.

2) Major Landlords, Realtors®, and Lenders

Residential property owners/managers, the real estate community, and lending institutions call all play integral roles in Fremont's energy reduction efforts due to their ability to facilitate upgrades. This is especially relevant when properties become vacant through a change in tenancy or ownership, allowing for comprehensive upgrades to be completed during turnover as they would most likely not be during occupancy.

a) Building Owners & Property Managers

Building owners and property managers are the primary means through which to conduct upgrades in multifamily residential properties. Multifamily building tenants may be engaged in energy reduction efforts through behavior change activities and plug load reduction strategies (see Section II.D.2), but deep energy savings will only be achieved through facility improvements involving the upgrading of major appliances and systems (refrigerators, hot water heaters,

furnaces, HVAS systems, boiler units) as well as building envelop improvements (insulation, weatherization, window replacement) and renewable energy installations (solar PV, solar water heating, small wind systems). Engaging building owners in any existing programs (see Bay Area Multifamily Building Enhancement Program in Section I.G.3) or new offerings (such as a group solar purchase) could result in significant community-wide energy reductions.

The following groups represent local building and apartment owners and managers:

- Rental Housing Association serving Southern Alameda County
- East Bay Rental Housing Association
- Apartment Owners Association of California
- California Apartment Association
- Building Owners and Managers Association Oakland/East Bay

b) Real Estate Community

Real estate professionals work with a large network of homeowners, and can help encourage program uptake by letting homeowners know about the incentives to improve distressed properties. Furthermore, they are dependent on the appearance, performance, comfort, and value of homes in order to make a home appraise at a higher value and be more marketable to sell. Real estate professionals willing to collaborate can educate homeowners on the rebates available to help with major renovations (or apply green building measures) that increase the value and durability of their homes. They can also help promote upcoming events and to former, current, and future clients. Examples of local real estate associations include:

- Bay East Association of Realtors®
- Silicon Valley Association of Realtors®
- Bay Area Association of Realtors®

c) Lending Institutions

Local lending institutions help alleviate a huge barrier for homeowners to participate in energy upgrades by providing the financing that can enable a homeowner to complete a project that could otherwise be too costly out-of-pocket. Once lending institutions are educated about local efforts and resources available to promote energy efficiency, they may be willing to come to local events and speak with homeowners about financing their home energy upgrades. By marketing their energy efficiency loan products to homeowners, lenders can help make the upgrades more affordable and increase the chances of homeowners scheduling an assessment.

In addition to major national banks like Bank of America, Bank of the West, Chase, Citibank, HSBC, U.S. Bank, and Wells Fargo, the following are some of the local lending institutions that serve Fremont residents:

- Fremont Bank
- Alliance Credit Union
- Patelco Credit Union
- 1st United Services Credit Union

– Technology Credit Union

A number of financing and lending products available to help homeowners complete energy upgrade projects are listed in Section II.C.2.

I. Involvement of other partnering organizations

In addition to the various stakeholder groups already identified through community asset mapping and initial stakeholder engagement activities, it is important to mention the organizations that provided the City of Fremont with letters of support for the GUEP effort during the Application Stage of the competition. These included not only the required letters of support electric and natural gas utility PG&E and the Mayor of Fremont, but also from a number of community organizations. All Letters of Support included in the initial application can be viewed in the following attachments:

Fremont GUEP Utility Letter of Support - PG

Fremont GUEP Municipal Letter of Su

Fremont GUEP Community Letters of

Below are brief descriptions of each community organization that offered its support of Fremont's participation in the competition:

1) Environmental Sustainability Commission

With the specific charge of assisting the City with marketing, public education, outreach, and promotional activities in order to stimulate the greatest possible community participation in sustainability efforts, the ESC is taking a leadership role in driving Fremont's participation in the GUEP effort, as detailed in Section I.A.3.

2) Alameda County Water District

Celebrating its centennial, the Alameda County Water District has this year been emphasizing the importance of stewardship and sustainability. With conservation a central strategy in maintaining a reliable water supply, ACWD currently offers a wide variety of rebates, incentives, and technical assistance to residential, commercial, industrial, institutional, and large landscape customers (see Section I.G.2 for details on ACWD residential offerings). ACWD is interested in water conservation strategies that also reduce energy consumption, and looks forward to working closely with the City to build upon successful programs.

3) Fremont Unified School District

The Fremont Unified School District has expressed its deep commitment to environmental protection. FUSD has worked closely with the City of Fremont, StopWaste (see Section I.G.4), and Allied Waste (local waste hauler) over the past decade to reduce the amount of waste going to the landfill by encouraging recycling and composting at each school site. With upcoming planned efforts focused around facility energy management systems and irrigation improvements to reduce energy and water consumption (aided by the availability of local and state funding sources and the hiring of an Energy Conservation Supervisor), FUSD has a demonstrated commitment to environmental sustainability (see Section I.D.2). Furthermore, FUSD has expressed its support of the City's vision for school-based energy engagement

activities, including incorporation into school curriculum and school-based energy challenges (see Section VII.A).

4) Fremont Council Parent-Teacher Association

The Fremont Council PTA coordinates PTA activities among 30 different schools in the School District and liaises with the Fremont Unified School District and the City of Fremont offices. During the past school year, the Fremont Council PTA added "Environmental Awareness" into their list of top priorities. With initial efforts during the 2013-14 school year to incorporate environmental sustainability concepts into school programs, the Fremont Council PTA looks forward to collaborating with the City of Fremont and local school site PTAs to further direct sustainability education and awareness over the GUEP competition period.

5) San Francisco Bay Area Rapid Transit District

The San Francisco Bay Area Rapid Transit District (BART) is the primary provider of heavy rail passenger transit within the San Francisco Bay Area, operating 110 miles of electrified double track with 44 stations and a daily ridership of over 400,000 patrons. Currently, the end of the BART line in the southern part of the Bay is the Fremont Station in central Fremont. BART is constructing a new station that will extend service to Fremont's Warm Springs District, slated to open in late 2015. This is the first phase of a planned extension that will link BART to the VTA and CalTrain systems in San Jose. To demonstrate its commitment to sustainability, BART will equip the new Warm Springs Station with approximately 700 kW of PV to offset the energy usage of the station as well as 36 electric vehicle charging stations for park and ride passengers. BART has expressed its interest in partnering with the City on other projects and programs that will further foster an energy-saving lifestyle for the Fremont community.

6) Fremont Libraries

The Fremont libraries of Alameda County consists of the Fremont Main Library and 3 small branches. The library is a rich repository of materials and services, including books, DVDs, information databases and public programming for those interested in energy conservation and sustainability. The Fremont libraries partnered with the City of Fremont and StopWaste this past summer on the "Fremont Energy Challenge", a pilot initiative encouraging Fremont residents to sign up with the free Home Energy Analyzer tool to evaluate their homes' energy usage and providing them with specific recommendations on energy usage habits and opportunities for upgrades. For every resident who registered for the tool through September 31, StopWaste donated $5 to the Fremont libraries. This resulted in 226 sign ups and $1,130 being raised for the Fremont libraries (see Section I.G.4 and visit the Fremont Energy Challenge webpage at www.fremont.gov/energychallenge). The Fremont libraries are excited to use the lessons learned from this summer's Energy Challenge to help the City develop and implement community-wide energy savings programs.

7) Tri-City Ecology Center

The Tri-City Ecology Center (TCEC) is a nonprofit organization that has led the local environmental movement since 1971 when it established a local recycling center and launched the Eco-Logic newsletter (still in publication today). Since then, TCEC has addressed additional environmental needs of the community with timely projects and donations focusing on environmental conservation, preservation, and education. TCEC's has advocated for transportation, curbside recycling, household hazardous

materials drop-off centers, and modern waste disposal technologies. TCEC also donates $1,000 worth of environmental books and videos to the Fremont, Newark, and Union City libraries and schools every year, and offers up to $1,200 in eco-grants for both youth- and adult-led environmental projects. TCEC's President Donna Olsen and Board Chair and former City of Fremont Mayor Gus Morrison have wholeheartedly supported the GUEP effort and pledge to support the City's efforts through their membership's energy and talents.

8) Local Ecology & Agriculture Fremont

Local Ecology & Agriculture Fremont, or LEAF, is a 501(c)3 non-profit committed to playing a vital leadership role in helping to facilitate change in the Fremont community through collaborative teaching, learning and community dialogue about growing healthy food and offering healthy alternatives to existing, non-sustainable practices. LEAF supports the first public community garden in Fremont, which just held its grand opening event on October 29 at the California Nursery Historic Park. This event was attended by a number of well-respected representatives of the community, including members of Fremont's City Council and State Senator Ellen Corbett and Assemblymember Bill Quirk. (Read New Community Garden Blooms in Fremont, San Jose Mercury News, November 6, 2014.) With this new headquarters, LEAF plans on offering a series of workshops, trainings, and other events on sustainable and ecological practices, including local food production and organic gardening, waste reduction, green building and resource conservation. With its current online membership base of over 700 local residents (visit http://fremontleaf.org/), LEAF has the ability to engage a large number of Fremont residents in the City's energy conservation efforts.

9) Additional organizations

Other groups that have expressed their strong support of Fremont's participation in GUEP but whom we did not solicit letters from during the Application Stage of the competition include the local organizations of the Fremont Chamber of Commerce (see Section I.F.4) and Washington Hospital and the regional organizations of StopWaste, East Bay Energy Watch Partnership, Rising Sun Energy Center, and Community Energy Services Corporation (see Section I.G.1 and Section I.G.4).

II. ENERGY SAVINGS PLAN

A. Program Summary

Fremont's overall program plan is summarized by the following ten strategies. These strategies have been detailed out further in other sections of this document as noted.

Strategy 1: Promote existing no- and low- cost residential energy and water saving devices and incentive programs.

- Fremont will leverage the programs offered by PG&E/East Bay Energy Watch Partnership, ACWD, BayREN, and Stopwaste to encourage basic energy upgrades and energy saving behavior changes. (See Section I.G)

Strategy 2: Scale up the "Fremont Energy Challenge" to get residents to use Home Energy Analyzer

- Fremont will continue to market and promote the Home Energy Analyzer tool that is available at no cost to all Fremont residents to assist them in identifying energy wasters in their homes and to guide them to plug load reductions and home upgrade projects that can help them save significantly on their energy bills. (See Section I.G.4 and Section VI.B.4)

Strategy 3: Promote residential and commercial energy & water conservation and clean energy financing products

- Fremont will work to encourage comprehensive energy and water conservation and renewable energy home upgrade projects through use of the new CaliforniaFIRST Residential PACE and other relevant financing products. (See Section II.C.2)

Strategy 4: Work with the Fremont Unified School District to promote energy literacy and develop school-based energy competitions

- Fremont will work to incorporate concepts of energy and sustainability into FUSD curriculum and will develop school based energy challenges that engage students in analyzing and rethinking both their classroom/school energy usage and their own household's energy usage. (See Section VII.A)

Strategy 5: Run a "Fremont Green Homes Challenge"

- Fremont will develop a community-wide Green Homes Challenge similar to the one offered in Frederick County, Maryland, encouraging community participation through three different tracks of energy efficiency upgrades, home "greening" projects, and renewable energy installations. (See Section VII.B.1)

Strategy 6: Train interested individuals and groups as volunteer "Community Energy Champions".

- Fremont will encourage interested individuals from local environmental, neighborhood, service-based, faith-based, cultural, educational institutions and the community-at-large to serve as "Community Energy Champions." These dedicated volunteers will educate, engage, and motivate the community-at-large in energy efficiency discussions and organize local events such as workshops, home showcases, and expos as part of the Fremont Green Homes Challenge. (See Section I.C.4)

Strategy 7: Develop a "Solarize Fremont" residential solar educational and group purchase campaign.

- Fremont will educate residents on the benefits of solar PV systems (and secondarily solar water heating systems) through a Solarize campaign, which will center around offering a 15-20% discount on the market price of systems through a SunShares residential group purchase effort. (See Section VII.B)

Strategy 8: Complete energy & water efficiency / renewable energy projects on Municipal facilities

- The City of Fremont is in the process of planning a number of Municipal upgrade projects involving the upgrading of streetlighting, park lighting, and facilities lighting to LEDs installing lighting controls where relevant, completing water conservation upgrades, installing weather-based irrigation controls system for all City park facilities, adding solar PV canopies to four municipal facilities, converting City fleet vehicles to electric vehicles, and installing publicly accessible electric vehicle charging stations. (See Section I.D.1)

Strategy 9: Collaborate with FUSD to encourage energy & water efficiency / renewable energy projects at public school sites.

- The City will collaborate with FUSD's new Energy Conservation Supervisor to assist the School District in utilizing State Proposition 39 funds and local Measure E bond funds to complete school site and District facility energy efficiency and renewable energy projects. (See Section I.D.2)

Strategy 10: Engage Fremont's cleantech companies in green energy demonstration projects.

- Fremont will develop an energy demonstration policy and work with local cleantech companies to utilize Fremont public facilities or other spaces as a testing ground for new and innovative clean technology deployments. Such demonstration projects will directly help reduce community energy consumption, provide the community with visible examples of the City's commitment to innovative approaches to energy savings, and offer local companies a form of economic assistance and promotion. (See Section IV.B)

B. Widespread Community Involvement

The energy demands of Fremont's residential community will be affected by the following:

- Age of home
- Type of home: single family detached, townhome, condo, apartment
- Size of home: square footage, number of stories, lot size, amount of conditioned space
- Style of home craftsmanship: timber frame, wood panel, stucco, brick, manufactured, concrete, metal siding
- Type and fuel source of major appliances/systems: electric vs. gas stove/oven, tank vs. tankless/on-demand water heater, central heating vs. wall/space heaters, forced air vs. hydronic vs. radiant heating
- Existing renewables: solar electric, solar water heating, small wind, geothermal, heat pump

- Additional energy demands: air conditioning, whole house fan, extra refrigerator/freezer unit home-based business, medical equipment, pool/hot tub, electric vehicle
- Home ownership
- Number of people living in the home
- Age of household members
- Employment status of household members
- Annual household income

Due to the many variables that can determine household energy consumption, it is essential that Fremont take into consideration the physical geography and demographic diversity of the population when considering its energy reduction strategies.

1) Geography

With its 90 square miles of land and its 28 neighborhoods, Fremont is a geographically spread out community. Fremont's neighborhoods are currently characterized by a combination of factors. Geographic identification can include one or more of the following:

a) By historic district:

- Mission San Jose, Centerville, Niles, Irvington, and Warm Springs.

b) By neighborhood:

- Lakes & Birds, Ardenwood, Northgate, Cabrillo, Brookvale, Niles, Canyon Heights/Vallejo Mills, Parkmont, Cherry/Guardino, Centerville, Glenmoor, 28 Palms, Sundale, South Sundale, Baylands, Blacow, Irvington, Grimmer, Central/Downtown, Kimber/Gomes, Mission Valley, Mission San Jose, Mission Hills, Cameron Hills, Weibel, East Industrial, Warm Springs, Vineyards/Avalon.

c) By elementary school attendance area:

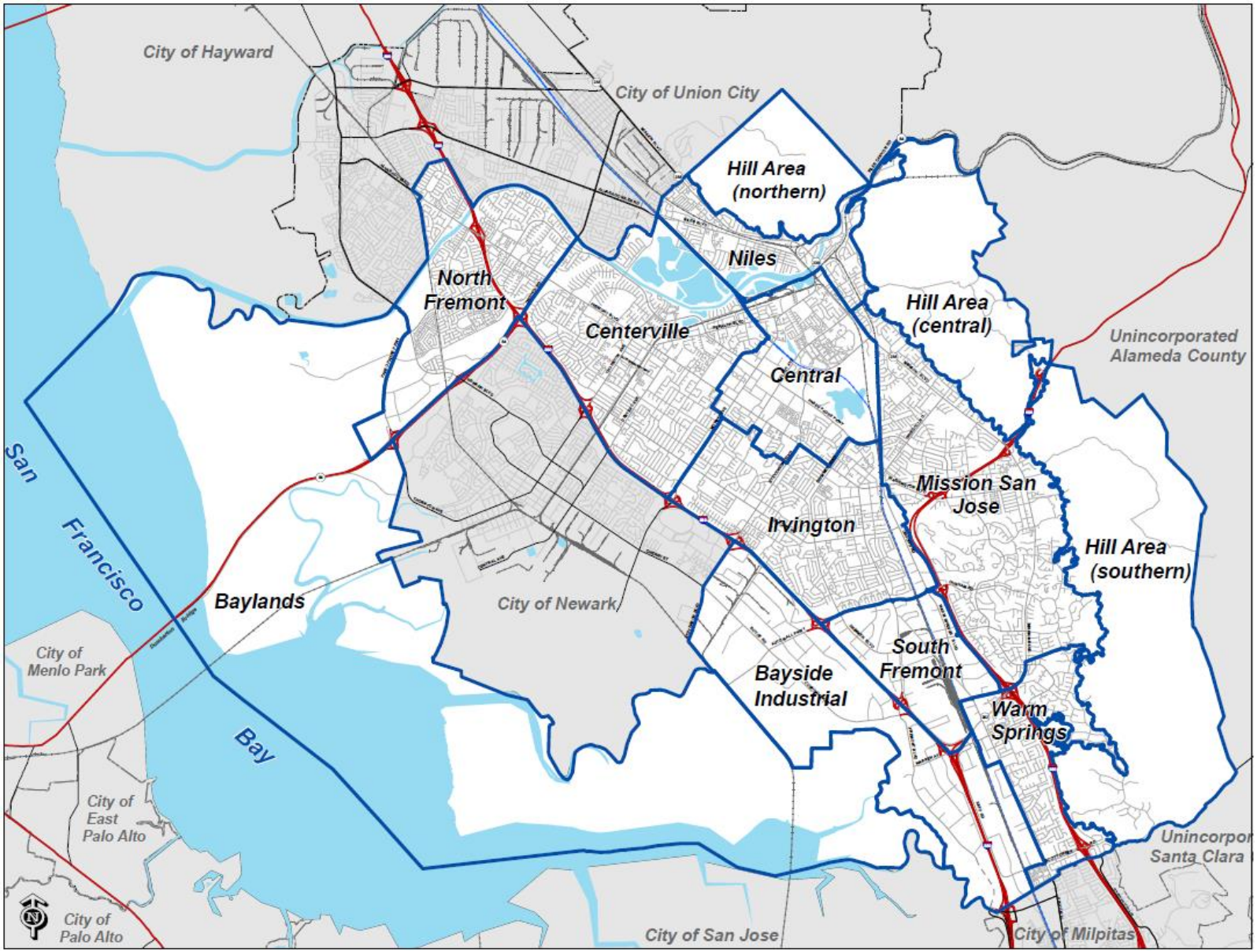
- Ardenwood, Forest Park, Patterson, Warwick, Oliveira, Brookvale, Cabrillo, Niles, Vallejo Mill, Parkmont, Maloney, Glenmoor, Mattos, Azevada, Brier, Durham, Blacow, Millard, Gomes, Chadbourne, Mission Valley, Mission San Jose, Green, Hirsch, Grimmer,Weibel, Leitch, Warm Springs

d) By high school attendance area:

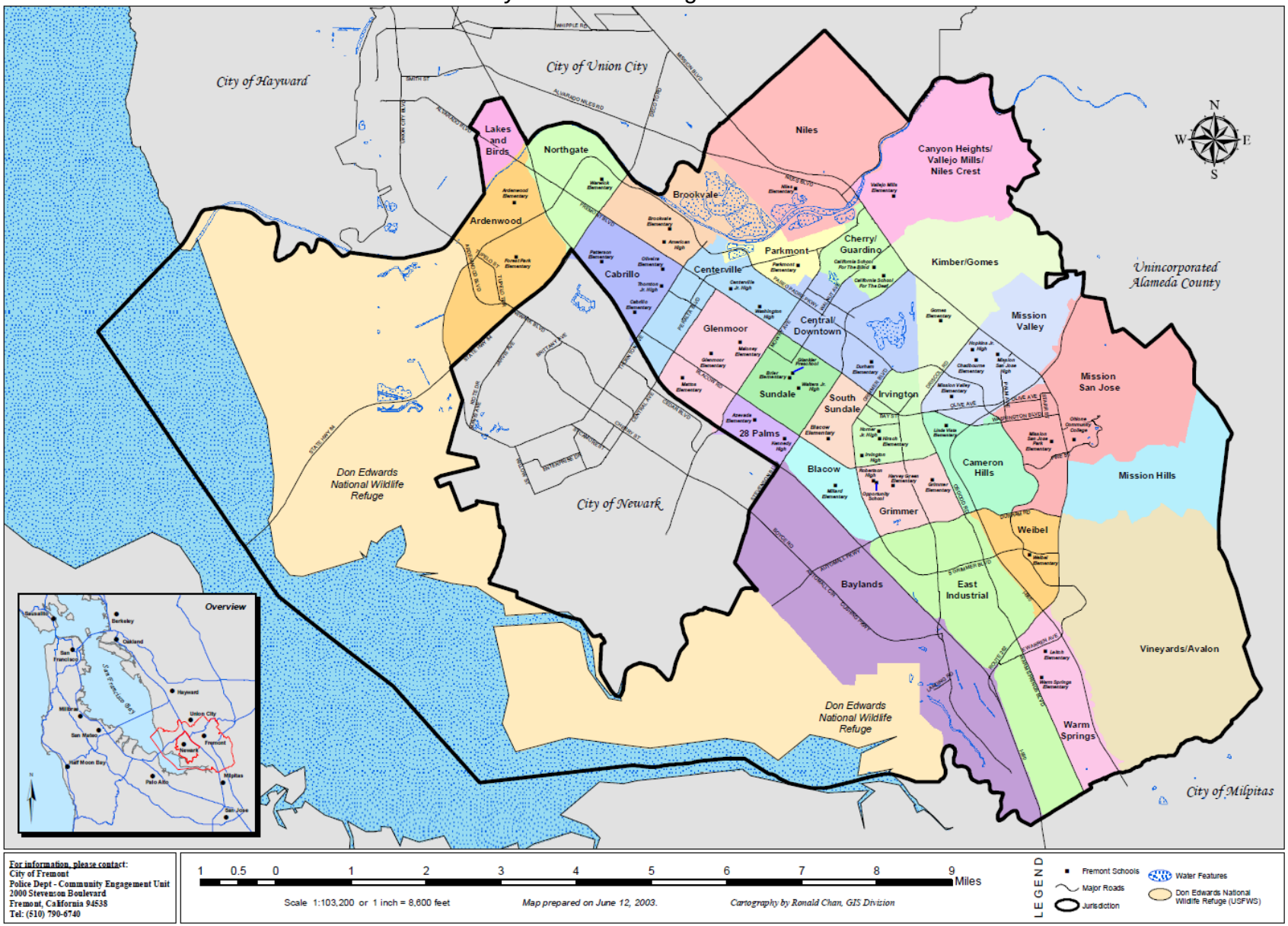
- American, Washington, Kennedy, Irvington, and Mission.

The following maps show Fremont's community plan areas (including the five historic districts), individual neighborhoods, and school attendance areas.

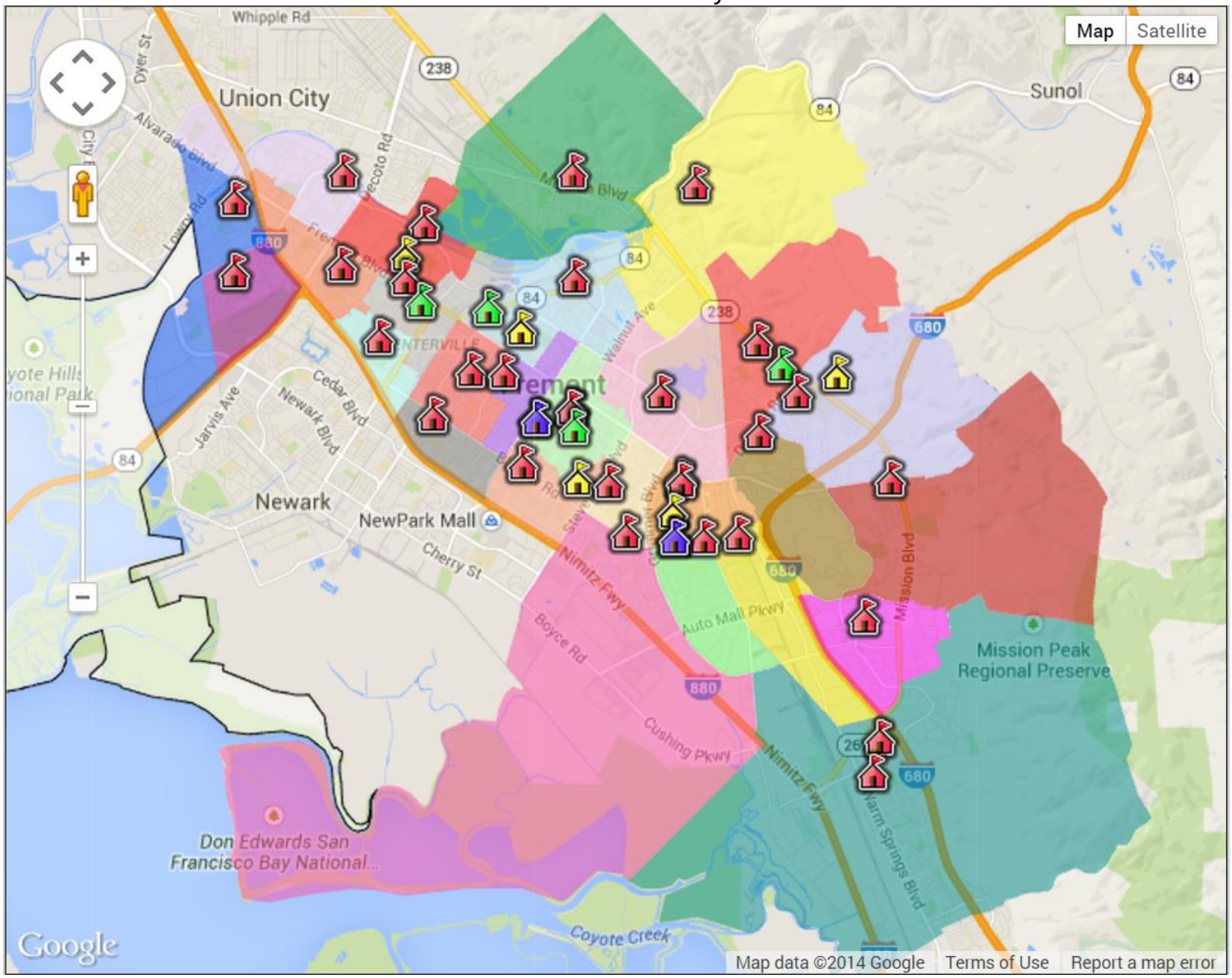
City of Fremont Community Plan Areas



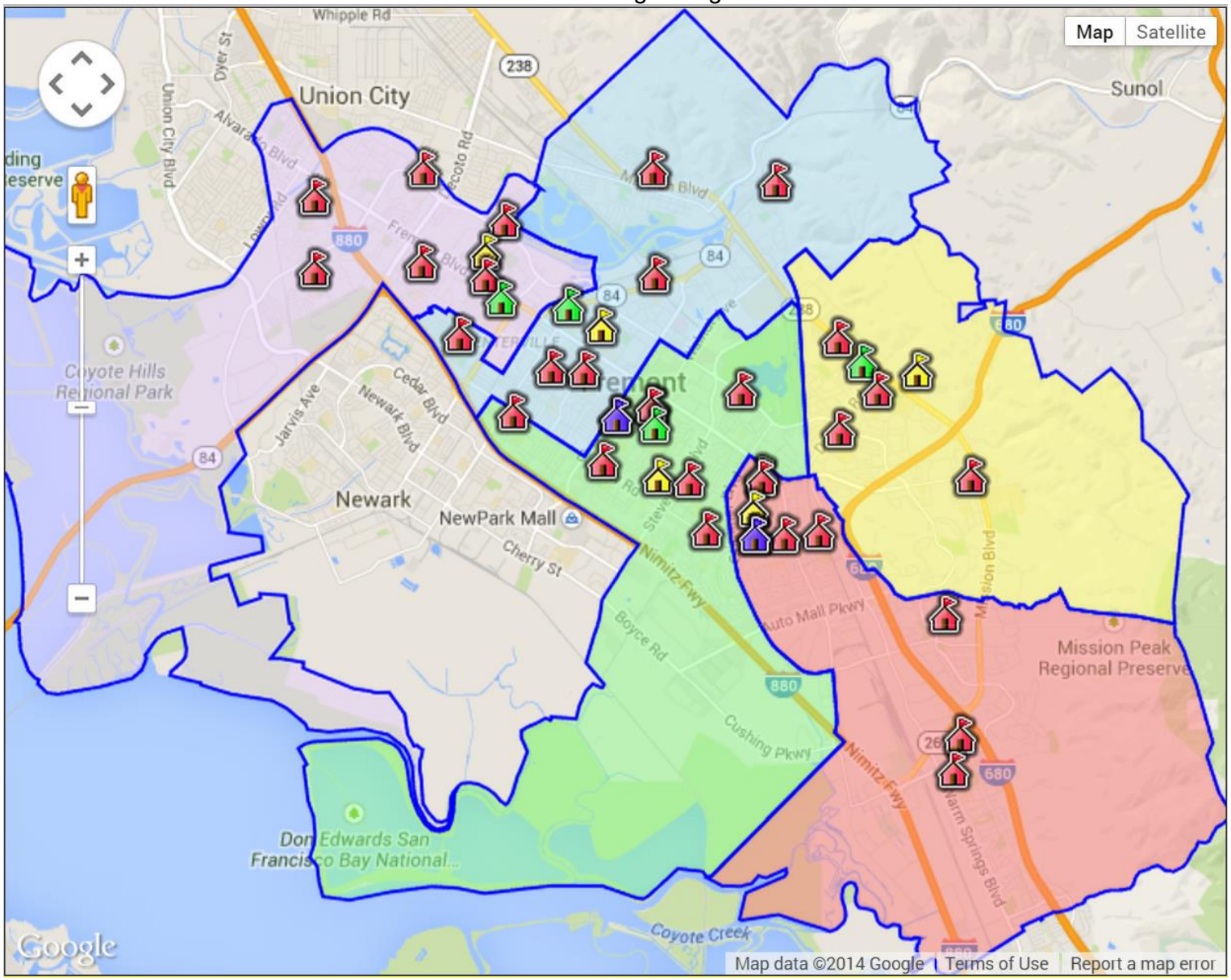
City of Fremont Neighborhoods



Fremont Unified School District – Elementary School Attendance Areas



Fremont Unified School District – Jr High / High School Attendance Areas



2) Demographics

The City of Fremont is a diverse community with a large number of foreign-born residents, a high median household income, a large number of households with families, and a high percentage of single-family housing units, the majority of which were built before 1980. The following demographic statistics[23] provide further detail into Fremont's overall community profile:

a) Population

- Fremont is home to a population of 224,922 residents
- The median age is 37.2 years
- 26.3% of the population is age 19 or younger
- 10.6% of the population is age 65 or older
- There are 69,940 households in Fremont

b) Households

- The average household size is 2.99 persons per home
- 16.3% of households consist of only one occupant
- 13.9% of households consist of 5 or more occupants

c) Family Size

- 78.3% of households are families
- The average family size is 3.36 persons per home
- 55.5% of households with families consist of related children under 18 years of age

d) Income

- The median household income is $99,169
- 7.9% of residents are unemployed
- 33.3% of residents are not in labor force
- 3.6% of families live below the poverty line

e) Housing

- There are 74,961 total housing units in Fremont:
- 43,500 (58%) are single family detached and 10,686 (14.3%) are single family attached
- 17,665 (23.6%) are multifamily [multifamily = 5 or more units]
- 13,707 (18.3%) are multifamily with 20+ units
- 11,961 (16%) were built in 1990 or later
- 47,795 (63.8%) were built 1979 or earlier
- 44,423 (59.5%) are owner-occupied
- 87.5% of housing units consist of 2 or more bedrooms
- 89.9% owner-occupied units have a value of over $300,000

[23] All demographic information extracted from the U.S. Census Bureau American Factfinder (http://factfinder2.census.gov/faces/nav/jsf/pages/community_facts.xhtml) using 2010 Census, 2012 American Community Survey, and 2013 Population Estimates Program data as available.

- 66.9% owner-occupied units have a value of over $500,000
- There are an average of 977 housing units per square mile (excludes the Baylands)

f) Ethnicity /Race & Country of Origin

- 53.7% of Fremont residents identify as “Asian”
- 36.3% of Fremont residents identify as “white”
- 11.6% of Fremont residents identify as “Hispanic or Latino”
- 4.6% of Fremont residents identify as “Black or African American”
- 1.3% of Fremont residents identify as “American Indian or Native”
- 0.9% of Fremont residents identify as “Native Hawaiian or Pacific Islander”
- 93,220 (41.4%) Fremont residents are foreign-born

g) Language

- 57.7% speak a language other than English at home
- 20.7% speak English less than “very well”
- 3.7% who speak Spanish at home speak English less than “very well”
- 12.7% who speak Asian / Pacific Islander languages at home speak English less than “very well”
- 3.9% who speak other Indo-European languages at home speak English less than “very well”

h) Source of Energy

- 78.7% of households use natural gas for heating
- 19.1% use electricity for heating
- 1.2% use bottled, tank, or liquid petroleum gas (i.e. propane)
- 0.4% use wood

i) Transportation & Commute

- 30.7% of Fremont’s working population work within Fremont
- 69.3% of Fremont’s working population work outside of Fremont
- 70.3% of households have two or more vehicles available for use
- 74.8% of the working population over age 16 drive alone to work
- 10.9% of the working population over age 16 carpool to work
- 7.4% of the working population over age 16 take public transportation to work
- 1.5% of the working population over age 16 walk to work
- 0.4% of the working population over age 16 bike to work
- 4% of the working population over age 16 work at home

Based on this profile, it is essential that Fremont develop and implement its community engagement activities in a way that can encompass the various age groups, household sizes, levels of income, home ownership levels, ethnic and cultural backgrounds, language diversity, home fuel usage types, and standard methods of transportation. Coming from various community-based organizations, Fremont’s “Community Energy Champions” will represent this diversity themselves, as well as receive training on the challenges faced by and the resources available to the different sectors of the population.

C. *Inclusion of Energy Retrofits and Other Capital Improvements*

1) Types of retrofits that will be encouraged

Existing local and regional energy programs available to Fremont residents range from low-cost, easy to implement "low-hanging fruit" measures like lighting upgrades to more expensive, more difficult to implement projects like whole home upgrades and the installation of renewable energy technologies. Because residents may fall anywhere on the spectrum regarding their interests, motivations, and abilities to undertake these various measures, it is important to stress proper loading order. This loading order, as follows, will be incorporated into the community-based social marketing of energy programs in Fremont in order to inspire real energy savings at a community wide level.

a) Low-Hanging Fruit & Behavioral Changes

Fremont will utilize programs such as the Fremont Energy Challenge, California Youth Energy Services free "Green House Calls", and other mechanisms to drive the replacement of incandescent lamps with CFLs and LEDs, installation of water conserving faucet and showerheads, utilization of powerstrips and timers, and other simple and inexpensive measures.

b) Longer payback, greater investment upgrades

Fremont encourage the use of ACWD, PG&E, and other relevant "widget-based" rebate programs to encourage the upgrade of more expensive, longer payback items such as refrigerators, water heaters, washing machines, and other major appliances.

c) House-as-a-system /whole building approach

Fremont will engage homeowners, property owners, and real estate professionals to consider major upgrades or renovations of their properties under the house-as-a-system/whole building approach, including upgrades to HVAC systems and ductwork, attic and wall insulation, and furnace/boiler replacement under the Energy Upgrade California Home Upgrade and Advanced Home Upgrade incentive programs as well as through direct rebates offered by PG&E and ACWD. Fremont will incorporate financing options into its outreach materials, particularly promoting CaliforniaFIRST PACE financing and On-Bill Financing as two key ways to upgrade buildings without having to pay any upfront costs. (See Section II.C.2)

d) Alternative / renewable energy installations

Fremont will create a "Solarize" campaign encourage homeowners, property owners, and real estate professionals to consider renewable energy technologies such as solar PV, solar thermal, and wind as an alternative to conventional energy from the grid. This will be particularly driven by the expiration of the Federal Renewable Energy Tax Credit at the end of 2016, as well as through a residential group purchasing program as detailed above.

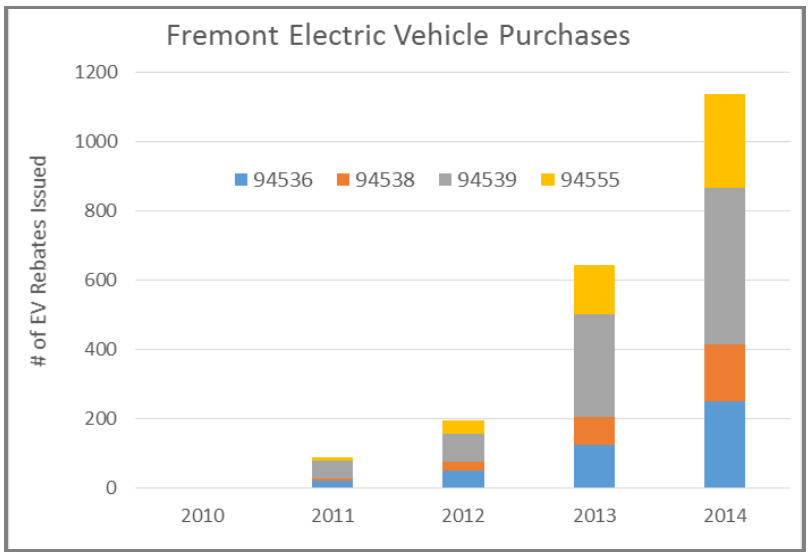
e) Electric vehicles

Fremont will encourage residents to consider the lease or purchase of electric vehicles either as a standalone measure or in combination with the installation of solar PV. Fremont will also encourage workplaces to install EV charging to encourage their staff to drive electric, as well as

work with large employers to encourage the electrification of their fleet vehicles. While this may have a negative effect on reducing aggregate energy usage from the grid, PG&E has expressed willingness to work with Fremont to determine mechanisms for excluding this energy usage from the competition if it becomes an issue. Furthermore, widespread EV usage will significantly reduce GHG emissions at a community-wide level, considering that transportation is responsible for 58% of Fremont's community wide emissions.

Finally, there is a strong connection between EV ownership and solar PV installations. The Center for Sustainable Energy, who manages the California Clean Vehicle Rebate Project (CVRP), conducts regular EV owner surveys and reports on its findings. In the February 2014 report, the Center for Sustainable Energy reported that 93% of customers who purchased electric vehicles owned their own home, and that 32% of those have installed solar on their homes, with another 16% planning to install solar.[24]

Fremont's EV adoption rates are depicted by the graph below:



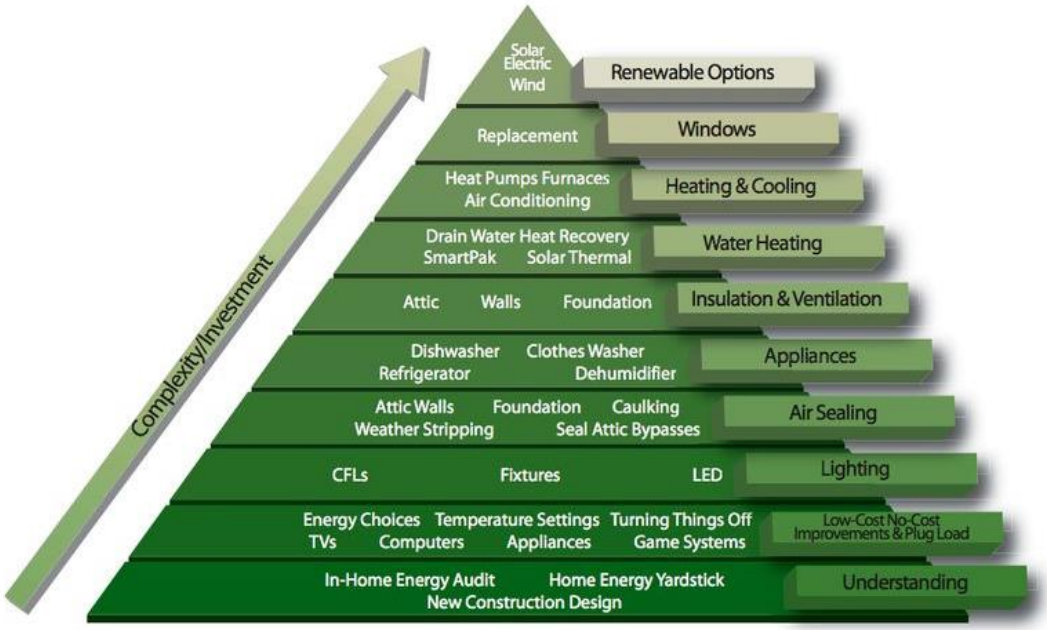
Using the percentages from the CVRP Survey, we can assume the following:

Total Fremont EV owners	*2,068*
EV owners who own their home	*1,903*
EV homeowners with solar PV	*609*
EV homeowners who plan to install PV	*304*
EV homeowners who do not yet have and are not yet planning to install PV	*989*

Due to the sheer number of EV owners who do not yet have solar and who could be encouraged to install solar PV, it is important for Fremont to pair solar outreach activities with conversations about electric vehicles. Fremont will target outreach for its Solarize effort (see Section VII.B) toward current and potential future EV owners.

[24] Center for Sustainable Energy – Clean Vehicle Rebate Project "Plug-in Electric Vehicle (PEV) Owner Survey," February 2014. http://energycenter.org/clean-vehicle-rebate-project/vehicle-owner-survey/feb-2014-survey

The following pyramid demonstrates proper energy loading order by starting with the least costly, easiest to implement measures such as low- and no-cost improvements, lighting, and airsealing and placing the higher investment, more complex projects such as window upgrades and renewables at the top.



2) Retrofit financing

Within the last few years, a number of financing products have become available for residents and businesses to assist them in paying for energy efficient and renewable energy projects. Of course, private loans are always an option, but may not be readily accessible to customers due to credit scores, lack of equity, or other reasons, or may carry excessively high interest rates. The following products are available to Fremont residents and businesses and have been specifically designed to fund energy efficiency and/or renewable energy projects with reduced participation barriers.

a) On-Bill Financing

PG&E offers a 0%, 60 month term energy efficient financing option for non-residential properties through its On-Bill Financing program. Qualifying projects must be valued at between $5,000 to $100,000 and have a simple payback of less than 5 years. Financing is available to fund many technologies, including lighting, HVAC, electric motors, LED street lights, refrigeration, food service equipment and water pumps. Eligible projects must qualify for rebates or incentives through a PG&E program, including Customized Retrofit Incentives, certain PG&E third-party programs, the LED Street Light Program or certain product rebate programs.

Government agencies can also qualify for On-Bill Financing loans between $5,000 and $250,000 per PG&E meter under this program, with loan periods of up to 120 months. PG&E has also discussed offering an On-Bill Financing option for residential properties as a pilot program as early as 2015.

b) CaliforniaFIRST PACE Financing

CaliforniaFIRST is an innovative clean energy financing program, offered through a partnership between California local government agencies and Renewable Funding, LLC under the auspices of the California Statewide Communities Development Authority (CSCDA).

Utilizing the concept of Property Assessed Clean Energy (PACE), CaliforniaFIRST allows property owners to receive upfront funding for energy efficiency, renewable energy and water efficiency improvements for their homes or businesses and to repay those loans through their property taxes. Originally piloted by the City of Berkeley under the BerkeleyFIRST Program in 2008, PACE was slated to be expanded throughout California, with hundreds of cities and counties passing resolutions allowing for PACE to be offered in their communities.

In 2010, however, Fannie Mae and Freddie Mac stated that they would no longer purchase mortgage loans secured by properties with outstanding PACE loans. While commercial PACE programs were able to move forward, residential PACE was effectively put on hold for a number of years. By 2013, the California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA) developed the PACE Loss Reserve Program to mitigate the potential risk to mortgage lenders associated with residential PACE financing. After a long wait, residential CaliforniaFIRST finally was rolled out beginning in August of 2014.

CaliforniaFIRST is now the nation's largest PACE program, available in 17 counties and 142 cities throughout the state. Both the City of Fremont and Alameda County have signed onto CaliforniaFIRST, allowing all property owners within the area the ability to utilize this form of financing. Loan can carry terms of 5, 10, 15, or 20 years, with interest rates starting at 6.75% and increasing to up to 8.75% by the end of the loan period.

Residential Properties:

Through CaliforniaFIRST, local homeowners can receive the necessary financing to install custom-tailored clean energy projects—such as the purchase and installation of efficient heating and cooling systems, solar panels, low-flow toilets, home insulation, or electric vehicle charging stations.

Commercial Properties:

CaliforniaFIRST gives commercial property owners the flexibility to choose a contractor and install a clean energy project through a special tax assessment levied on the property and repaid by the owner through the property tax bill. Potential commercial upgrade projects can include efficiency measures like attic insulation, furnace replacement, and HVAC upgrades, water conservation measures like toilet replacement and irrigation control systems, and renewable energy technologies like solar, wind, and fuel cells.

c) BayREN Pay As You Save (PAYS®)

The BayREN PAYS® (Pay As You Save®) program is a joint effort of Bay Area cities and counties and their water agencies to partner in the implementation of a unique on-bill program that allows municipal water utility customers to pay for efficiency improvements through a monthly

charge attached to their meter, with no up-front costs and the assurance that their utility bill savings will exceed the program charge.

Currently, only the Bay Area Cities of Windsor and Hayward have implemented PAYS® programs through their own municipal water districts. If Fremont were to have a PAYS® program, it would have to be implemented by the Alameda County Water District, serving the cities of Fremont, Newark, and Union City. ACWD Water Conservation Department has expressed initial interest in this program, but the challenges of implementation may prevent it from becoming available in the near future. The City will continue to have conversations with ACWD on this topic.

d) Other Loan and Financing Products

- California Home Finance Authority Residential Energy Retrofit Loan
- Electric and Gas Industries Association GEO*Smart* Financing
- FHA PowerSaver Loan
- FHA Energy Efficient Mortgage Loan
- Fannie Mae HomeStyle Renovation Mortgage

3) Retrofit business resources

Businesses have access to energy efficiency incentives through PG&E, the East Bay Energy Watch Partnership, and the Alameda County Water District (see Section I.G), to technical assistance through the Bay Area Green Business Program (see Section I.F.2), and to financing through On-Bill Financing and CaliforniaFIRST Commercial PACE (see Section II.C.2).

4) Retrofit marketing and sales strategies

Fremont will build off of the momentum of existing energy savings efforts in the community, including programs offered under the East Bay Energy Watch Partnership and Energy Upgrade California (see Section I.G), to drive interest in and adoption of conservation measures. This includes scaling up the "Fremont Energy Challenge" and leveraging the regional and statewide PG&E and Energy Upgrade California rebates, with additional energy and water efficiency, renewable energy, and electric vehicle efforts leveraged when appropriate. The following messages will serve as the basis for Fremont's marketing, education, and outreach efforts:

a) "Save on your energy bills"

Hot summers mean high electricity usage for air conditioning, and cold winters mean that the furnace is running more often. In a poorly insulated home, this means that excessive amounts of energy are being used to keep the home comfortable, resulting in high energy bills. A properly insulated and sealed home could mean significant bill savings.

b) "Improve home comfort / Increase indoor air quality / Enhance home value."

When energy savings are not as significant due to mild temperatures or lower average energy usage, it is important to focus on improved indoor air quality, mold remediation and durability resulting from a whole home upgrade. Modeled energy savings will not equate to as great of energy bill savings in the temperate Bay Area as they would in the Central Valley of California. Whole home performance can help to improve other issues such as draftiness, moisture, and

mildew through proper insulation and weather-sealing, with the added benefit that the home will require less energy for heating and cooling.

c) *"Reduce, then produce"*

Environmentally-motivated homeowners are often interested in reducing their ecological footprint as much as possible. For these consumers, it is important to stress the implementation of efficiency first before the installation of alternative or renewable technologies such as solar, which tends to be a popular consideration. By improving the performance of house as a system, one's energy bill can be reduced to as minimal amount as possible. This allows for the installation of a smaller and less expensive on-site renewable generation system. Such loading order is summarized with the adage "reduce, then produce".

5) Adoption goals

In order to predict adoption goals over the 2015-2016 period, it is important to consider the current energy profile for Fremont's Residential, Municipal, and Public School sectors. While the 2014 calendar year will serve as the actual baseline comparison year during the Semifinalist competition, that data is not yet available nor will it be made available until after the start of the competition. Therefore, Fremont has analyzed available data from the calendar year 2013 as the baseline to predict energy adoption goals for 2015 and 2016.

Fremont's energy consumption for 2013 in the Residential, Municipal, and Public School sectors is summarized as follows:

Sector	Total Energy Use in MMBTU (2013)	% Total
Municipal	80,466	1.8%
Public Schools	130,034	2.9%
Residential	4,343,018	95.4%
TOTAL	**4,553,518**	**100%**

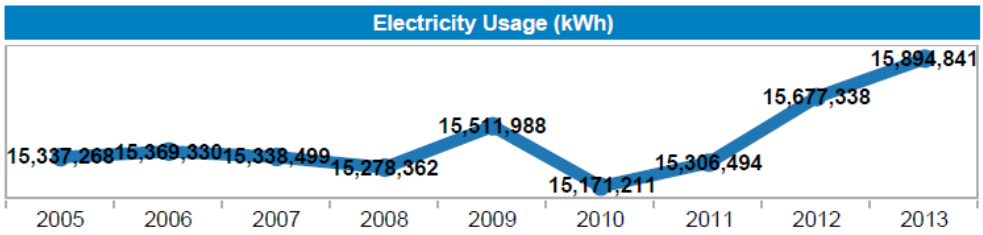
The following table provides additional details regarding electric and natural gas energy usage for each end usage sector, with relevant sub-categories highlighted.

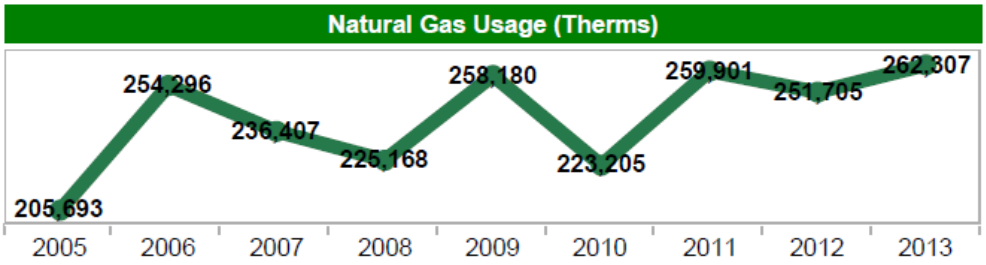
2013 Energy Usage						
Sector	Subcategories	*electric (kWh)*	*electric (MMBTU)*	*natural gas (therms)*	*natural gas (MMBTU)*	*TOTAL (MMBTU)*
Municipal	**TOTAL**	**15,894,841**	**54,235**	**262,307**	**26,231**	**80,466**
	Facilities	8,524,560	29,087	262,307	26,231	55,318
	Parking Lot Lights	3,978	14	0	0	14
	Streetlights	7,249,244	24,735	0	0	24,735
	Traffic signals	117,059	399	0	0	399

Residential	**TOTAL**	**407,868,511**	**1,391,705**	**29,513,130**	**2,951,313**	**4,343,018**
	Zip Code 94536	130,759,259	446,169	10,214,220	1,021,422	1,467,591
	Zip Code 94538	113,337,132	386,722	6,981,204	698,120	1,084,843
	Zip Code 94539	103,850,575	354,353	7,620,948	762,095	1,116,448
	Zip Code 94555	59,854,142	204,231	4,695,786	469,579	673,809
	Unknown Zip Code	67,403	230	972	97	327
Public Schools	**TOTAL**	**20,129,514**	**68,685**	**613,494**	**61,349**	**130,034**
	High Schools	8,018,791	27,361	354,138	35,414	62,775
	Junior High Schools	2,265,980	7,732	36,367	3,637	11,369
	Elementary Schools	7,492,833	25,567	155,832	15,583	41,150
	District Offices & Shared Facilities	2,351,910	8,025	67,157	6,716	14,741
GRAND TOTAL		**443,892,866**	**1,514,625**	**30,388,931**	**3,038,893**	**4,553,518**

When aggregate energy usage is looked at over time in each of these sectors, the following trends have been observed:

a) Municipal Energy Usage



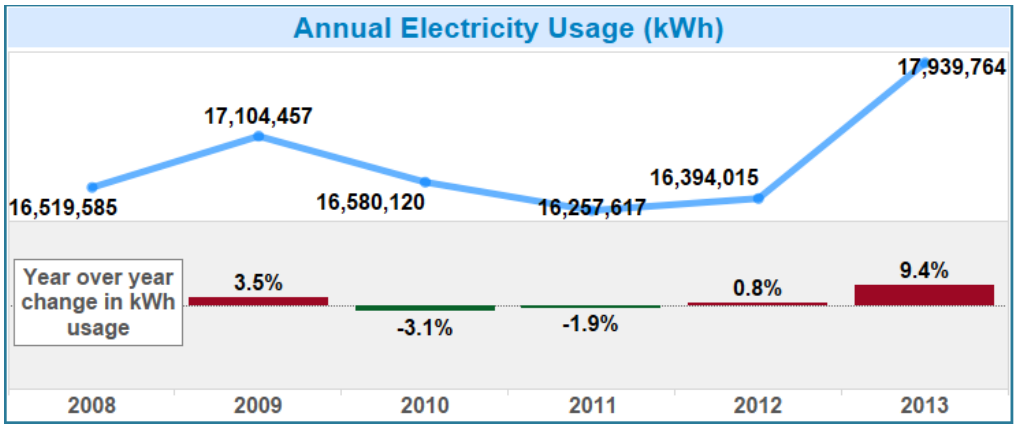


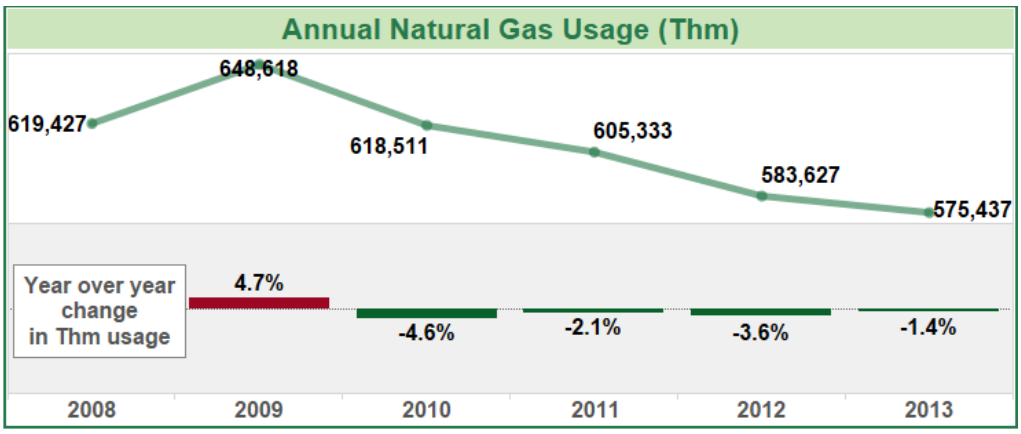
Since a low in 2010, both Municipal electric and natural gas consumption has increased over the past few years. This is most likely a function of an improved economy as the City is no longer on a hiring freeze and staff have resumed regular work schedules.

As the City's normal operations stabilize, we should see a leveling off of energy usage. Furthermore, with the planned facility upgrades detailed in Section I.D.1, Fremont should see a dramatic decrease in both electric and natural gas consumption beginning in mid to late 2015.

Based on planned energy efficiency and renewable energy projects, the overall Municipal reduction goal is 34.5%.

b) *Public School Energy Usage (excluding District offices)*

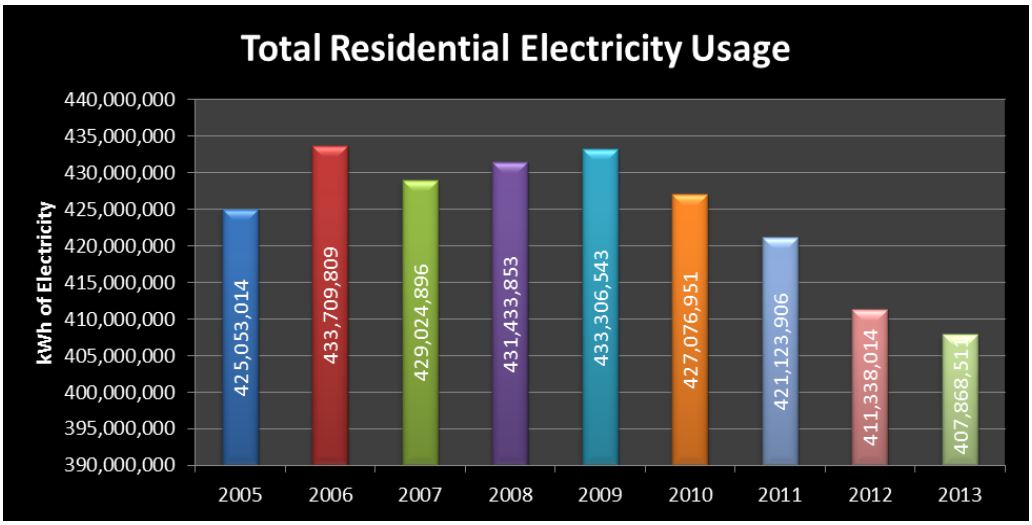


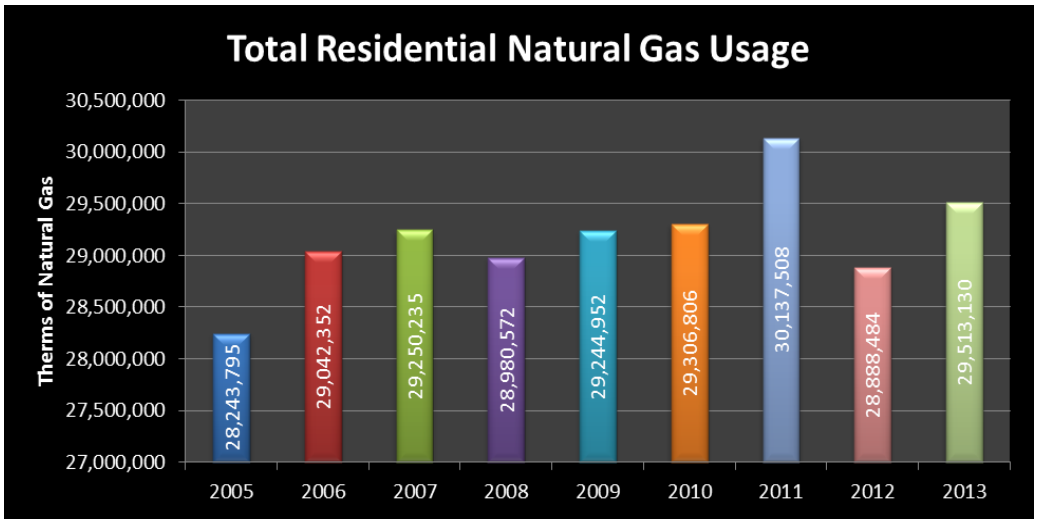


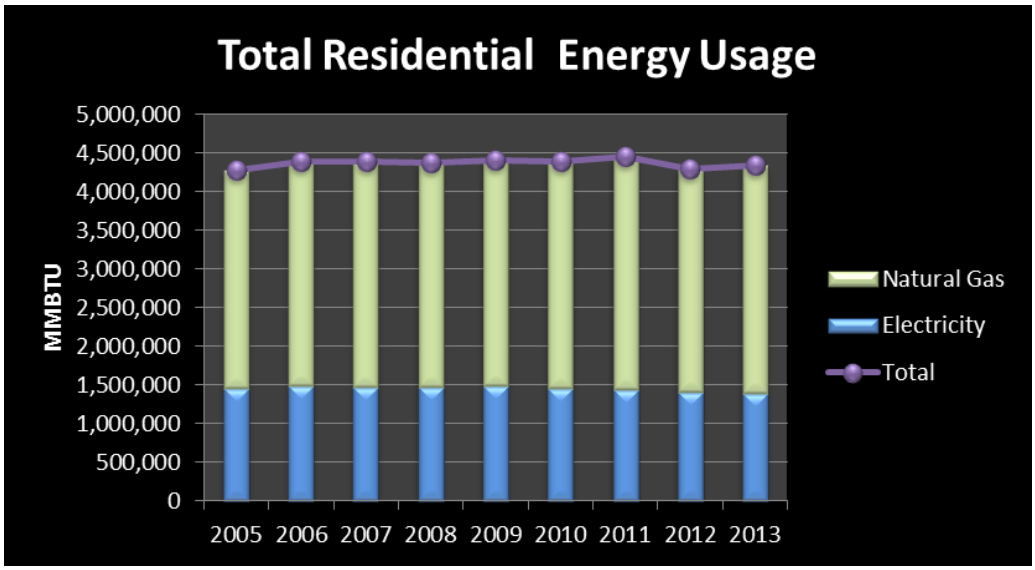
Public school natural gas consumption has steadily decreased over the last few years, primarily due to regular and continued HVAC improvements. Electricity consumption, on the other hand, has seen a dramatic increase in the last year. This could be due to an average increased consumption per student due to the use of electronic devices, or it could be the result of equipment failures or misuse. As FUSD begins to undertake facility upgrades such as HVAC replacement, lighting retrofits, and energy controls systems as detailed in Section I.D.2, it should see both a leveling off and a decrease in school site energy consumption.

Based on plans for short term energy upgrade projects and longer term energy reduction strategies, the overall Public School reduction goal is 5%.

c) Residential Energy Usage

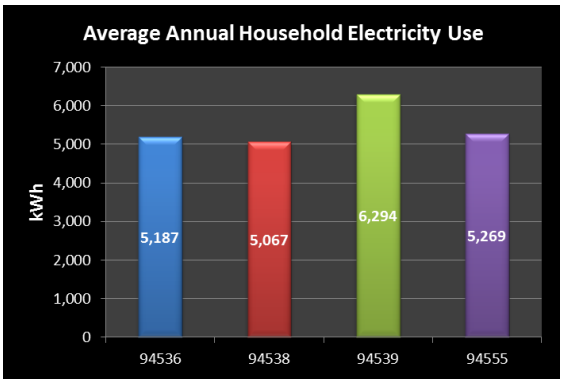


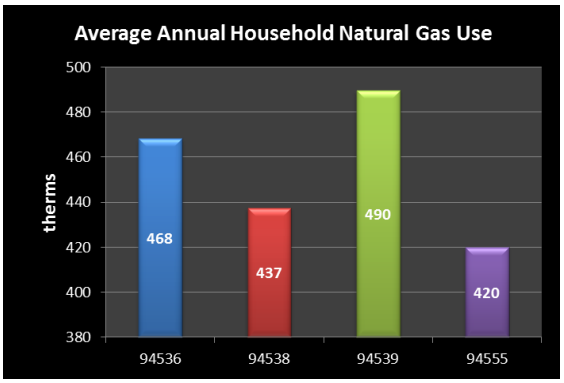




While residential electricity consumption has decreased steadily since 2009, natural gas consumption has suffered an increase. Efforts promoting plug load savings, appliance upgrades, and solar electric installations will help to continue the downward trend in electric consumption, and efforts promoting weatherization, programmable thermostats, whole home upgrades, and solar water heating systems will help to curb natural gas consumption.

When electricity and natural gas usage are observed at an average household level by zip code, it becomes apparent that the 94539 zip code is highest overall user of energy, and that the 94536 and 94539 zip codes might be the best targets for natural gas reductions:





As a result of community-wide energy initiatives such as the Green Homes Challenge, Solarize campaign, and School-based outreach programs, the overall Residential energy reduction goal is 5%.

Taking into consideration energy upgrade projects that both the City of Fremont and the Fremont Unified School District are planning to undertake (see Section I.D), combined with the assumed savings from residential energy efficiency and renewable energy marketing, education, and outreach efforts (see Section VII), Fremont anticipates the following total energy savings during the GUEP competition:

Sector	Total Energy Use in MMBTU (2013)	% Reduction during GUEP	Future Energy Use in MMBTU (2016)
Municipal	80,466	34.5%	52,718
Public Schools	130,034	5%	123,532
Residential	4,343,018	5%	4,125,867
TOTAL	**4,553,518**	**5.5%**	**4,302,117**

D. *High-Return vs. Hard-to-Reach Markets*

With a relatively large number of single family homes that are owner-occupied, strategies that target homeowners to complete energy upgrades and install renewable energy projects will have the overall highest return in terms of energy reduction per capita. Primary energy reduction retrofits are identified in Section II.C.1, and specific marketing, education, and outreach strategies for achieving these reductions are detailed in Section VII.

That said, strategies focusing on affordable housing and rental properties can help to retrofit markets that are traditionally considered hard-to-reach. The following are target markets could also be considered high-return opportunities. Fremont will leverage existing programs and policies to promote adoption in these types of households.

1) Affordable housing

a) Low-income Residents

PG&E's Energy Savings Assistance Program (ESAP) offers free energy upgrade services to low-income residents throughout its service territory. ESAP measures can include repairing or replacing your refrigerator, furnace or water heater and installing insulation, weatherproofing, energy-efficient light bulbs, caulking, low-flow showerheads and more. ESAP requires that participants live in a house, mobile home or apartment that is at least five years old and meet the following income guidelines, which are the same as those for CARE, the California Alternative Rates for Energy Program.

# of Persons in Household	Total Gross Annual Household Income
1-2	$31,460 or less
3	$39,580 or less
4	$47,700 or less
5	$55,820 or less
6	$63,940 or less
7	$72,060 or less
8	$80,180 or less
Each additional person, add $8,120	

Fremont will actively work with programs serving low income community members and seniors to promote PG&E's Energy Savings Assistance Program as well as ACWD's Water Savings Assistance Program (see Section I.G.2).

b) Affordable Housing Developers

In 2010, Fremont City Council adopted an ordinance requiring that new residential buildings six stories or less in height to be designed and constructed so that they consume 15% less energy than would otherwise be permitted by the California Energy Code contained in Title 24, Part 6 of the California Building Standards Code. Since that time, the California Energy Code has been updated to be much more stringent, so that Fremont's Municipal Code now matches the State Code. Fremont adopted without amendments as the City's green building code the 2013 Edition of the California Green Building Code (CalGreen) found in Title 24, Part 11 of the California Building Standards Code, and ensures that developers submit proof of compliance with the mandatory measures of CalGreen in their building plans.[25]

[25] See http://www.fremont.gov/2173/Green-Building for more on Fremont's green building requirements.

Fremont will continue to require residential developers to comply with the statewide green building and energy codes. The City will encourage affordable housing developers in particular to consider additional measures that will further reduce energy usage and improve sustainability, especially renewable energy installations and zero net energy (ZNE) construction.

2) Residential rentals

While renters have little incentive or ability to do large scale building improvements and energy installations, there are many ways in which the City can nevertheless engage the rental population in energy efficiency. Renters will generally not be able to participate in activities such as a group solar purchase, a whole home upgrade, or residential PACE financing, but they can be engaged in efforts that focus on energy usage habits, plug load, lighting, and small appliance energy efficiency. Based on existing and planned future energy programs, Fremont will develop resources such as handouts and workshop presentations that specifically engage the rental community in energy efficiency.

Furthermore, multifamily property owners such as those listed under Section I.H will be engaged in energy efficiency programs like the Bay Area Multifamily Building Enhancement program discussed in Section I.G.3.

E. Measurement & Evaluation of Program Success

Using the available tools listed in Section VI.B, Fremont will regularly track, monitor, update, and forecast progress for aggregate residential energy reductions and specific Municipal and School accounts. Residents will also have the opportunity to measure their own progress through use of the Home Energy Analyzer tool if they sign up for it.

Through the tools available to track Municipal, Public School, and Residential energy usage, Fremont will not only track and monitor progress, but will also publish the results through its own marketing outlets. This includes the City of Fremont's Sustainability section of its website (www.Fremont.Gov/Sutainability) as well as in the City Newsletter, social media accounts, and other outlets as listed in Section VII.C. One particular new strategy for tracking and evaluating success of residential energy reductions is the concept of "Community Energy Maps" detailed in Section VII.C.3. Residents would go to an online platform to compare average energy usage in their neighborhood with that of other neighborhoods, and be able to track changes over time on a monthly or quarterly basis. This can currently be done at a zip code level with the residential aggregate energy usage data provided by PG&E, but would be more effective if Fremont could access smaller aggregate data sets such as zip code plus two or census block level data.

Another tool for tracking progress is online platform used by the Frederick County, Maryland Green Homes Challenge (see Section VII.B.1) through which community members can track not only their own progress but the progress of the community as a whole. This platform can be customized for other communities at a relatively low cost, and the City of Fremont is exploring the possibility of adapting the Green Homes Challenge webpage as its GUEP community platform. (See Section VII.C.3.)

An additional example of a comprehensive community tracking tool is the City of Oberlin's Environmental Dashboard (www.oberlindashboard.org). While Fremont may not have the resources to

develop a tool like this in time for the GUEP competition, this may be something that it considers as a component for future Climate Action Plan implementation.

While the only specific measurements of success for the GUEP competition prior to the Finalist Stage will be electric and natural gas consumption, Fremont will also measure its success in other formats. This will include, but is not limited to, the following:

- Total levels of participation and energy savings achieved through PG&E, ACWD, and Energy Upgrade California rebate programs
- Total levels of participation and energy savings achieved through East Bay Energy Watch Partnership direct install programs
- Site-level water savings at City and Public School sites, and per capita average gallons per day consumption
- Expansion and improvement of recycling, composting, water conservation, and efficient landscaping programs and services
- Total number of residential and commercial solar installations, and total electric generating capacity
- Total number of electric vehicle purchases and total number of publicly accessible electric vehicle charging stations
- Number of Community Energy Champion volunteers and depth of participation
- Attendance at and success of energy and sustainability related community events
- Participation from large employers, green businesses, and cleantech companies to support Fremont's efforts
- Participation by City of Fremont employees in energy initiatives and events
- Level of community-wide recognition of and interest in Fremont's participation in the GUEP effort
- Amount of media coverage of Fremont's efforts
- Level of interest and participation from the residential construction and solar industries, real estate professionals, building owners and managers, and lending institutions
- Amount of support offered by utilities, service providers, community-based organizations, and key community leaders

F. Long Term Program Components

While the two year competition timeframe does offer a significant amount of time to build upon existing programs and generate momentum to drive community-wide energy reductions, it is nevertheless is a relatively short window of time to capture the savings that will be generated by longer-term strategies and planning efforts. Accordingly, some of the strategies that Fremont employs during the GUEP competition to reduce community-wide energy consumption may not produce results until long after the competition concludes. The following are potential areas where the City anticipates energy savings will not be captured in the 2015-2016 time period:

1) Municipal Projects

While Fremont is already in the process of procuring solar for four of its facilities and anticipates these to be installed starting in mid-2015, the City is still in review of the other proposed energy upgrade measures discussed in depth in Section I.D.1. Fremont anticipates being in contract by mid to late 2015 for these upgrades, but the inclusion or exclusion of specific measures is still up to debate and the exact timeline for project installation has yet to be determined. With the GUEP competition period concluding at the end of 2016, staff will work hard to encourage a speedy process while at the same time allowing enough time for careful review and evaluation of all possibilities.

Furthermore, as part of its future vision, the City of Fremont plans to build a new City Hall in Downtown Fremont that will house City staff currently located in both City Hall buildings A and B as well as the City's Development Services Center. According to the City's Sustainability Policy, this new building will need to achieve at least LEED Silver status, and the City will work diligently to meet and exceed these standards as well as consider making the facility a Zero Net Energy building. By consolidating staff from three distinct buildings into one and by designing sustainability into the new facility, the City anticipates deep energy reductions. Over the next two years, the City will begin strategizing ways in which it can be innovative and forward-thinking in the design of this new facility. The actual project, however, will not be undertaken for approximately five years.

2) FUSD Upgrades

As discussed in Section I.D.2, the Fremont Unified School District is planning on a number of facility upgrades through utilization of its Proposition 39 and Measure E Bond funding. Because securing these funds and developing a comprehensive plan for these upgrades will require significant time and staff resources, it is difficult to determine to what extent energy upgrades will be completed over the next two years. Fremont anticipates that some of the more pressing concerns, such as upgrades of failing HVAC equipment, will take precedence and that the savings from those upgrades will in fact be captured during the GUEP competition. Longer term energy reduction strategies such as classroom energy control systems and renewable energy installations, may not be undertaken until after the end of the competition period.

3) New construction & ZNE

California's stringent energy standards for residential and non-residential new construction and major renovations under the California Energy Code contained in Title 24, Part 6 of the California Building Standards Code ensure that all new developments will achieve high levels of energy efficiency. As the economy recovers from an economic recession and development projects begin to resurge, California Energy Code standards are becoming increasingly relevant. Add to this the fact that the State of California has established a goal of requiring all new residential construction to be Zero Net Energy by 2020 and all new commercial construction to be Zero Net Energy by 2030, Fremont will see increasing efficiency in all new development projects. While a handful of new development projects may in fact be completed by the end of 2016, most of the projects that will be affected by these standards will not be undertaken until after the end of the GUEP competition period.

4) Cleantech demonstrations

As discussed in Section IV.B, Fremont has recently begun the process of developing a Cleantech Demonstration Policy that will allow for local clean technology startup firms to deploy energy demonstration projects within the Fremont community. Because this process will take a concerted amount of staff time and energy as well as coordination with the industry, it may take the next year or two to fully develop and pilot this policy, with the result that perhaps only a few, if any, demonstration projects will be deployed before the end of the competition phase. Seeing that to our best knowledge, only one other city — San Jose, California — has developed such a policy to date, Fremont intends to use the development and implementation of this policy to come up with best practices that can be replicated in other communities. Therefore, while actual energy savings resulting from cleantech demonstration projects may not be captured during the GUEP competition period, the development of this policy will allow for future innovative energy project deployments in the Fremont community.

5) Community Solar

On September 28, 2013, Governor Brown approved SB 43, establishing the Green Tariff Shared Renewables Program. The Green Tariff Shared Renewables Program, or "Green Option", is a 600 Megawatt statewide program that will allow customers of each investor-owned utility to purchase up to 100 percent of their electricity from new small and mid-sized solar projects located within the utility's service areas. Local governments, businesses, schools, homeowners, municipal customers, and renters will all have the ability to select this "Green Option".

On February 21st, 2014, PG&E filed a proposal for an "Enhanced Community Renewable" option with the CPUC. This option would supplement PG&E's prior voluntary green power option. Under PG&E's new proposal, customers would have two ways to participate:

- Customers could pay for the output from a pool of small to mid-sized solar projects within PG&E's service territory.
- Customers could pay for the output from a solar project near them of their choosing.

Currently, the investor owned utilities are in negotiation with California Public Utilities Commission to receive approval for their proposed Green Tariff offerings. While a decision from the CPUC was anticipated by in mid-2014 that would make this option available to customers by mid-2015, no proposed decision has yet to emerge from the CPUC. If and when this decision is approved, Fremont may see the development of new community solar projects that would provide shared renewable energy to local residents and businesses that choose the Green Option tariff.

6) Community Choice Aggregation

In June 2014, the Alameda County Board of Supervisors approved funds to conduct a feasibility study for establishing a Community Choice Aggregation (CCA) program in Alameda County. Community Choice Aggregation, or Municipal Aggregation, allows cities and counties to aggregate the buying power of individual customers within a defined jurisdiction to secure alternative energy supply contracts on a community-wide basis. Should Alameda County find a CCA option feasible and decide to pursue this option, individual Cities within the County would then vote on whether or not to participate. Should Alameda County select to go CCA and should the City of Fremont participate, ratepayers in Fremont

would automatically become customers of that CCA, but would have the ability to opt-out and maintain PG&E as their utility provider.

This process is only in its initial stages and will play out over the next handful of years. Accordingly, it will most likely not affect any of Fremont's planned strategies for the GUEP competition. However, the CCA option is hereby discussed because it may have long term implications for the overall "greening" of the grid, as CCAs provide a much cleaner energy mix to their customers than is available through the investor owned utilities, often offering a 100% renewable option. Should Alameda County go CCA, the existing rebate and incentive programs for ratepayers that are currently offered by PG&E would undergo a shift. Currently, the funding for energy efficiency programs, provided through the CPUC's Public Goods Surcharge, is managed by PG&E. Under a CCA, the funding designated for these customers would be redirected to a different institution (such as a Joint Powers Authority) for local implementation and distribution. Furthermore, the way in which customers are compensated for grid-tied renewable projects would likely change from its current Net Energy Metering format, perhaps becoming a feed-in tariff.

While all of these changes are highly speculative, the possibility of a CCA makes current customer projections of energy bill savings from energy efficiency and renewable energy projects less certain. Opportunities that today may appear to have a poor payback may in the future become economically feasible, or vice versa. However, because it is impossible to predict what changes may in fact occur in the future, the current messaging and approach to energy savings will remain consistent with the strategies put forth in this plan.

III. UTILITY DATA REPORTING

A. Collaboration with PG&E

PG&E, the electric and gas utility serving the community of Fremont, will provide the city with monthly usage data on a quarterly basis.

PG&E administers several energy efficiency programs in the community serving the municipal, school and residential segments; Fremont community campaigns targeting energy efficiency and reduction measures will educate the community about applicable programs.

B. Classification of Residential Energy Consumers

Residential energy consumers can be identified according to rate schedule; PG&E data aggregated and shared with the city and with GUEP will come from billing data, and pull out customer usage based on residential rate schedules.

C. Exclusion of Multi-Unit Residential Common Area Accounts

Energy usage for common areas in multifamily properties is often on a commercial rate schedule rather than a residential rate schedule. As such, it is nearly impossible to disaggregate it from other commercial accounts for inclusion in residential aggregated energy usage data. This will not exclude any actual residential dwelling units, but will exclude any common area lighting used in hallways, building exterior, etc, as well as common use spaces such as laundry rooms, gyms, recreation rooms, and pools. If there is a central heating and cooling system or a central water heating system for building occupants, this energy may also fall onto a commercial common area account and would thus be excluded.

Due to the constraints of PG&E's data reporting and the inability of the City to secure Data Release Authorization forms for all multifamily properties within the City's jurisdiction, Fremont requests that common area energy usage for multifamily residential dwellings be excluded from the aggregated residential energy usage under GUEP.

D. Classification of Municipal Accounts

Municipal accounts are identified by customer type or account numbers within the city boundaries. PG&E has shared annual municipal usage with the city, by Account ID; Service Agreement ID; Business Activity where available (e.g. street light versus waste water treatment plant); and Service Address for four years.

The City has reviewed the list of Municipal accounts and agrees to the accuracy and completeness of accounts included and listed.

E. Exclusion of Non-FUSD School Accounts

There are 44 public schools in Fremont and approximately 29 private schools. Of the 44 public schools, 41 of those belong to the Fremont Unified School District (see Section I.D.2 and Section VII.A), with a total enrollment of 33,887 students. The other 3 public school districts within Fremont are regional in nature. They include two State Special Schools — The California School for the Blind and The California School for the Deaf — which are attended by students from across the State, including many from rural districts where there are insufficient resources to provide adequate services to deaf and blind students. The other public school program is the Mission Valley Regional Occupation Program, which offers technical training to 4,000 high school students and adults from the public school districts in Fremont, Newark, and Union City.

1) California School for the Blind & California School for the Deaf

California School for the Blind (CSB) serves 66 Blind students ages 6 through 21. CSB offers both K-12 educational and functional programs, including functional academics, daily living skills, social skills, communication skills and adaptive technology skills with a combination of classroom and community-based instruction.

The California School for the Deaf (CSD) in Fremont serves 438 Deaf students from pre-kindergarten through high school from all over Northern California. About two-thirds of the students who attend CSD live in on-campus housing.

As the California School for the Blind and the California School for the Deaf serve as not just an institutions of academic instruction but also a functional training programs and residential campuses for students across the State, Fremont requests that CSB and CSD energy usage be excluded from the school energy usage reported to GUEP.

2) Mission Valley ROP

Mission Valley ROP (MVROP) is the regional occupational program for the Tri-City (Fremont, Union City, and Newark) area. Through a partnership with Fremont Unified School District, New Haven Unified School District, and Newark Unified School District, MVROP offers career technical education to nearly 4,000 students (adults and high school) each year. This student enrollment figure is redundant in that it includes students already enrolled in public High Schools in Fremont, Newark, and Union City. Also, a portion of Mission Valley ROP's energy usage falls under the jurisdiction of the Fremont Unified School District and will therefore be considered part of FUSD's energy usage under GUEP.

As MVROP serves both K-12 and adult age students from three different cities, Fremont requests that MVROP energy usage <u>other than that already included under the energy from FUSD</u> be excluded from the school energy usage reported to GUEP.

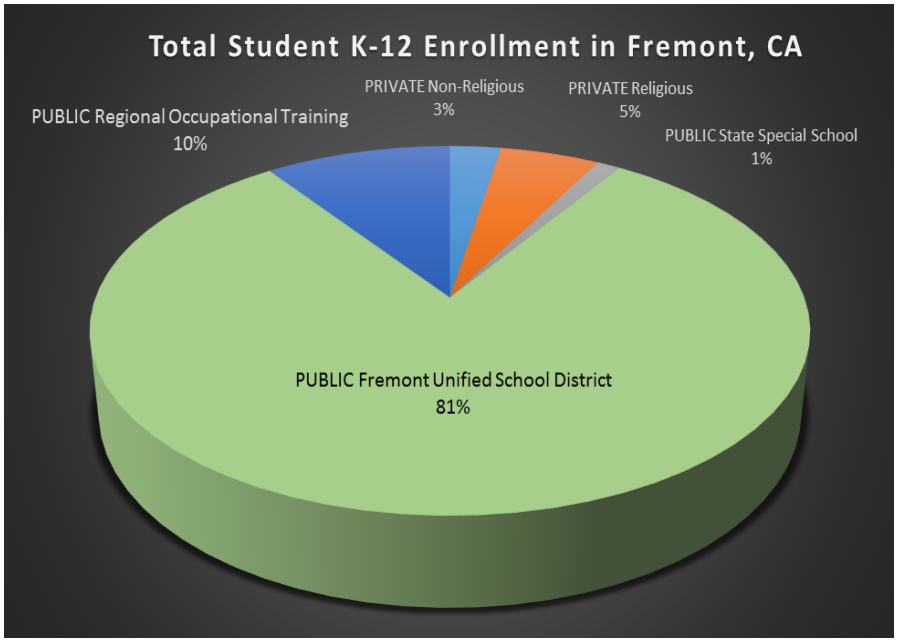
3) Private Schools

Of the approximately 29 private schools in Fremont, 16 of them serve K-8 Students and only 3 of them serve high school age students (there is some overlap in age range served). Among the private schools serving students above the Kindergarten level, the total enrollment is 2,771 students. 11 of the private schools only serve pre-kindergarten / kindergarten, with an attendance of 470 students. This makes the

total private school enrollment 3,241 students. Therefore, total private school enrollment accounts for less than one tenth of the total K-12 student enrollment, even when the enrollment of Mission Valley ROP is excluded from the total enrollment figures.

With almost one-third of the private schools in Fremont only providing Kindergarten instruction, these facilities are negligible in terms of both the total student enrollment as well as facility energy usage. Furthermore, about two-thirds of the private schools attended by Fremont students are religiously-affiliated. As such, many of these schools are housed within places of worship. The energy usage of these schools would be therefore be aggregated in the overall energy usage of the facilities of worship, making it nearly impossible to determine the energy used specifically for school operations.

The graph below depicts the breakdown of student enrollment figures in Fremont's schools:



A comprehensive list of all identified public and private schools with estimated enrollment levels is included here:

Fremont Public and Private Schools.xls

Assuming that the percentage of overall school energy usage used by private schools is relatively proportionate with enrollment levels, it can be assumed that private schools would account for less than 10% of Fremont's total school facility energy usage. Accordingly, Fremont requests that private school energy usage be excluded from the school energy usage reported to GUEP.

F. Exclusion of Energy Usage associated with Electric Vehicle Charging

Due to its high commuter population, proximity to Silicon Valley, affiliation with the industry (Fremont is home to Tesla) and generally tech-savvy population, Fremont has a very high level of electric vehicle ownership (see Section II.C.1). With a current total of 2,068 electric vehicles that have been rebated, Fremont represents 31% of the total EVs in all of Alameda County. Furthermore, Fremont's 94539 zip code has received more rebates for electric vehicles than any other zip code in California. With EV ownership rates more than doubling on an annual basis since 2011, it is safe to assume that thousands of Fremont residents will purchase electric vehicles in the next few years. Furthermore, the adoption of electric vehicles will help to reduce community-wide greenhouse gas emissions resulting from the transportation sector, which currently accounts for 58% of Fremont's overall emissions.

While adding more electric vehicles will may have a negative effect on reducing overall energy usage from the grid, PG&E has already told Fremont that it will work to identify all EV meters currently aggregated in Fremont's residential energy consumption and subtract it from totals in the case that Fremont advances into the Finalist Stage.

As the inclusion of the energy used for electric vehicle charging would unfairly penalize the community, Fremont requests that GUEP allow residential energy consumption used for electric vehicle charging to be omitted from Fremont's final energy reporting.

G. List of Municipal and Public School Accounts

See attached spreadsheets:

City of Fremont Municipal PG&E Accou

Fremont Unified School District PG&E A

Additional data reporting information:

Fremont Utility Data Collection Details.pdf

IV. PROGRAM INNOVATION

The City of Fremont's primary approach in this Energy Plan involves leveraging existing resources, strategies, programs, and trends to generate momentum and increase participation from the community at large in the City's sustainability vision. New energy programs implemented within the next two years in Fremont will certainly take on their own community character, but they will nevertheless utilize models that have been piloted and honed elsewhere (see Section VII for details).

That said, however, Fremont's geographic, demographic, and economic profile do make it an intriguing location for innovation in a number of ways. As fourth largest community participating in the Georgetown University Energy Prize, the 16th largest city in California, and the 97th largest city in the United States, Fremont can serve as a model to some of the bigger communities across the nation on how to implement energy programs. Furthermore, as a suburban community with a number of single family housing subdivisions and an infrastructure built around the auto, Fremont will face different challenges than those faced by more urban areas that traditionally have higher levels of housing density and lower per person energy and transportation footprints. Due to these factors, Fremont has the opportunity to develop a new model of *suburban sustainability* that communities across the country can emulate.

Finally, Fremont is geographically located between the urban centers of San Jose, Oakland, and San Francisco, California, which means that it has access to the social capital and technological innovations of the region. With a strong cleantech sector including notable manufacturers like Tesla (EVs), Soraa (LEDs), and Solaria (PV), Fremont is home to many of the cutting edge energy innovations (see Section I.F.5).

The following sections detail out specific ways that Fremont will approach the GUEP challenge in an innovative manner.

A. *Embracing the "Strategically Urban" Future Vision*

1) Downtown Fremont

With its five distinct districts of Mission San Jose, Centerville, Niles, Irvington, and Warm Springs, the City of Fremont has lacked a common center to provide a sense of identity for the community—a Downtown of its own. To further that vision, the Fremont City Council unanimously approved the Downtown Community Plan last fall. The Plan is focused on meeting the City's General Plan goals of redefining Fremont from an auto-oriented suburban environment to a strategically urban community.

The Fremont Downtown Community Plan is focused on a core area within the City Center encompassing approximately 110 acres. The area is centrally located within Fremont and is bounded by the arterial roadways of Fremont Boulevard, Mowry Avenue, Paseo Padre Parkway, and Walnut Avenue. It is the City's desire to redevelop this underutilized area into a sustainable, vibrant pedestrian-oriented mixed use destination for Fremont and the region.

The Plan includes many exciting elements such as new mixed use projects, civic center and park space, and a new streetscape along the extension of Capitol Avenue, which will connect to Fremont Boulevard

as soon as next year. Already the private sector is investing in the Downtown as witnessed by the new Paragon Housing project, and the construction of Whole Foods at the gateway to the Downtown.

Yet in order for a Downtown to function as a community gathering place, it requires more than bricks and mortar. Vibrancy comes from regular events, cultural activities, and the spontaneity of new and exciting discoveries. The City has been working closely with the Fremont Chamber of Commerce, who has been a strong partner in the evolution of Fremont's emerging Downtown. Most notably, the Chamber of Commerce is the sponsor of the Fremont Festival of the Arts since 1983, an event which now takes place along key Downtown streets every summer. The exposure to the Downtown at this event is immeasurable as it is the largest two-day street festival west of the Mississippi, and draws crowds of up to 400,000 visitors.

Ultimately, the Fremont Festival of the Arts, the patriotic Fremont Fourth of July parade, and community events like these, help to create "place" and serve as a catalyst for future Downtown events that will provide important points of connection. Another event that has recently made Downtown its new home is "Fremont Street Eats," the popular culinary event produced by the Fremont Chamber of Commerce and Food Truck Mafia taking place every Friday evening from April through October. In addition, the City of Fremont has launched FREMONT UNDERGROUND (FUSE), a new series of events held monthly from May through October to bring artists, performers and indie retailers together to showcase, exhibit and make their art and creative products more accessible above ground in downtown Fremont.

With the public's support and attendance, these community events are opportunities for Fremont residents to contribute toward shaping the "place" that will be Downtown Fremont. The City is working to identify more ways to engage the public as infrastructure improvements and private development begin to shape Downtown's physical appearance.

2) Warm Springs Community Plan

The Warm Springs/South Fremont Community Plan covers the ±879 acres generally bounded by I-880 on the west, I-680 on the east, Auto Mall Parkway on the north, and Mission Boulevard on the south. The Plan sets the framework for a transformation of the area into an Innovation District and employment center accommodating a mix of compatible uses focused around the synergy of the new BART station and adjacent undeveloped land.

Following the New United Motor Manufacturing, Inc. (NUMMI) automobile plant closure in 2010, the City completed a Jobs Recovery Strategy, funded by the U.S. Economic Development Administration (EDA), addressing the reuse and revitalization of South Fremont/Warm Springs. This area is critically important to the City and the region and represents a unique convergence of forces, as summarized below:

- Electric car manufacturer Tesla Motors now anchors this district in the former NUMMI plant.
- There is an abundance of industrial space and vacant land, including 160 acres owned by Union Pacific Railroad (UPRR) that is currently being marketed to significant employment and residential developers.
- In late 2015, a new BART station will open within walking distance of Tesla Motors and the UPRR property.

With the adoption of the General Plan (December 2011) and the Downtown Community Plan (August 2012) and pending City Center Plan, completion of the Warm Springs Community Plan will further the City's vision for a sustainable, strategically urban modern city. In the near term, the urban residential communities, an elementary school and an urban park will be completed, forming the base of the urban vision for Warm Springs. An iconic bridge is expected to be in place, connecting the east and west of the Community Plan for pedestrians and bicyclists, and much of the planned public infrastructure will be in place, including the new *Innovation Way*. The BART line is also scheduled to be fully extended and operational to Milpitas and Berryessa in San Jose, making BART a two-way system morning and night.

The plan's goals are geared toward:

- Increasing jobs and housing supply, including affordable housing.
- Increasing land-use intensities, thereby boosting transit ridership.
- Increasing walking, bicycling, carpooling and car sharing by promoting multi-modal connections.
- Locating key services and retail in the planning area to reduce auto trips.

The City and the region are heavily invested in ensuring the area is developed strategically and takes advantage of the huge public support and regional access provided by the new Warm Springs BART station. The Warm Springs Community Plan is unique in that it builds upon and integrates many sustainable urban development and innovation cluster concepts, well known in academia, onto underutilized land near existing clusters of Cleantech companies, anchored by Tesla Motors, to form Fremont's unique version of an *Innovation District*. This Innovation District will be unique in that a significant portion is new construction, not redevelopment, incorporating an already established Cleantech sector.

With a 48% increase in local demand for jobs by 2035, Fremont has the unique opportunity to "do it right" from the ground up. The Fremont Warm Springs Innovation District is an evolutionary expansion on existing Cleantech successes. The Bay Area is home to many great ideas and projects, and two similar projects are under development: Mission Bay, San Francisco and Moffett Field, Mountain View. However, the Fremont Warm Springs *Innovation District* will be 2.5 times the size of either of those projects.

The success of this plan is based on the greater Fremont community with an existing solid foundation:

- No. 1 in the nation for patents per capita (1 patent per 100 residents) – SizeUp.com 2012
- No. 1 in the nation for tech startups per capita – SizeUp.com 2012 (twice the startups per capita as the No. 2 city of San Jose)
- No. 2 for Best American City for Innovation – Newsweek 2010
- No. 2 for Best Run Cities in the Nation – 24/7 Wall Street 2014 (soaring from No. 5 in 2013)
- No. 2 for Safest City in America – Business Insider 2013 and 2012
- No. 3 for Sharpest, Smartest City in America – Readers Digest 2012

In ten years the Warm Springs *Innovation District* will be a model of a sustainable urban lifestyle centered on the Cleantech industry–with supportive retail and hotel uses in place and the re-establishment of the older industrial areas with renovated, expanded or new buildings. New

infrastructure would include sidewalks and walkable paths, bike lanes, street trees, and other transportation improvements. Fremont's Warm Springs *Innovation District* will enable Fremont to be a major player in the Cleantech sector which is expected to be $100 billion by 2020.

Finally, when the Warm Springs *Innovation District* is fully urbanized with new office buildings and users, new advanced manufacturing buildings and R&D businesses, and a substantial portion of the older industrial areas rejuvenated, it will be a model based on sustainable urban planning and innovation cluster principles.

B. Cleantech Energy Demonstration Policy

Fremont is blessed with many locational, physical and environment assets that make it an ideal location for clean technology demonstration projects. Therefore, in concert with its *Innovation District* initiative, Fremont has recently begun to develop a clean technology demonstration strategy. Such a strategy will serve both the Fremont community needs to develop and promote a sustainable community; and the external needs to support nascent clean technology startups become competitive in the market.

A proactive demonstration strategy offers several benefits to multiple stakeholders and constituents:

- Serve as a visible indication to community residents of Fremont's commitment to sustainable communities.
- Enable City staff to keep up to date on the latest technology trends, and help staff determine the criteria that best serves a formal purchase and implementation for long term application.
- Serve as an instructional tool for community residents to see first-hand and understand what may be appropriate and applicable in a residential or commercial setting.
- Offer the City a low-risk investment in new technologies while at the same time helping local startups demonstrate their products or gather the kind of real world data they need for the financial community or regulators.
- Demonstrate to the region that Fremont is a cleantech friendly community, attracting prospective new startups.

The range of what is defined as a cleantech project is very broad. Demonstration project technologies could encompass, but are not limited to:

- Smart traffic controls
- High efficiency lighting of various forms
- Building energy management and controls
- Both clean and waste water, and environmental friendly waste treatment systems in general
- Charging stations, EVs and other battery-backed systems
- Microgrids and utility-scale power systems
- Renewable energy generation of all forms and not just solar PV arrays in brownfields

Fremont is in the early stages of developing a strategy and policy details. Over the next few months, City sustainability and economic development staff will work to draft a policy that can eventually go forth to

City Council for approval. If successful, this "Cleantech Demonstration Policy" will then be incorporated into the Warm Springs Innovation District plan and promoted to local companies as an offering for product testing and deployment as well as an energy reduction / alternative energy strategy for the area of new development.

C. *Move Toward "Zero Net Energy"*

In 2007, both the California Public Utilities Commission (CPUC) and the California Energy Commission (CEC) adopted statewide goals requiring that

1. All new residential construction be Nero Net Energy (ZNE) by 2020,
2. All new commercial construction be ZNE by 2030, and
3. 50% of existing buildings be retrofit to ZNE by 2030

The Zero Net Energy Building goals have also been supported in the California Energy Action Plan, the AB 32 Scoping Plan, the Governor's Clean Energy Jobs Plan, and the Clean Energy Futures Vision.

At a national level, California is leading the way with one-third of the nation's ZNE commercial buildings. With a current total of 37 ZNE buildings, however, the State has a long way to go in reaching its goal. As California ramps up its efforts around ZNE, many new resources are becoming available at the regional and State level to assist ZNE advocates as well as interested property owners. Among these resources, there are a few that the City of Fremont has identified as useful for promoting ZNE to its residents, businesses, and schools. Fremont will utilize these resources to develop its own ZNE pilot campaign, encouraging homeowners participating in the Green Homes Challenge to consider ZNE as their ultimate goal. The City will also leverage resources as they become available from the Bay Area Climate Collaborative ZNE Schools campaign that will begin in 2015 to help the School District consider ZNE for their new elementary facility as well as for existing school retrofits.

1) PG&E Zero Net Energy Pilot Program

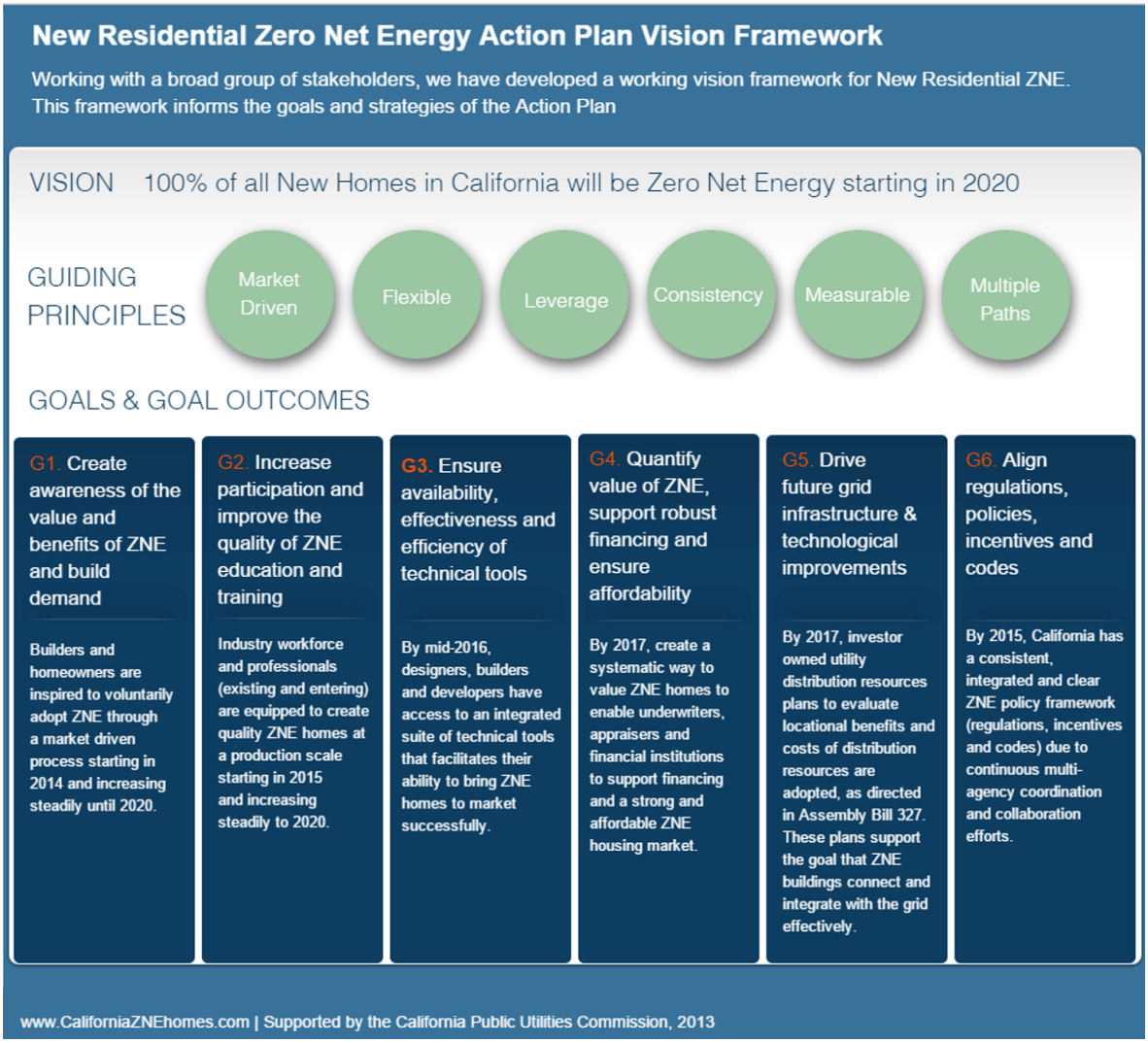
PG&E's ZNE Pilot Program promotes California's long term energy goals through a portfolio of research, development, and demonstration projects around ZNE buildings together with complementary education, outreach and information activities. The PG&E ZNE Pilot Program is focused on achieving maximal energy efficiency and load reduction by leveraging advanced design, construction and building operations before the addition of on-site renewable energy generation, such as solar PV.

In collaboration with the San Francisco Chapter of the American Institute of Architects, PG&E's ZNE Pilot Program has developed an annual zero net energy design competition, Architecture at Zero. The competition solicits state of the art design concepts for Zero Net Energy building and is open to a wide range of building and environmental professionals, as well as students.

2) Energy Upgrade California's Residential ZNE Action Plan Website

The Residential ZNE Action Plan Website (www.californiaznehomes.com/) is designed to facilitate stakeholder involvement in the CPUC's ZNE Residential 2020 Vision Framework and the state's ZNE building goals more broadly. The website serves as a clearinghouse for stakeholders in terms of information, resources, and emerging topics regarding Residential ZNE. It displays case studies as well

as covers frequently asked questions for residential ZNE construction, and displays a working vision framework for New Residential ZNE. This Framework is summarized by the following graphic:



3) New Building Institute's ZNE Communications Toolkit

The New Buildings Institute has developed a portfolio of materials designed to help address commonly asked questions about ZNE, provide messaging for consistent communications, and support advocates in advancing the Path to Zero Campaign for achieving the state of California's goals for achieving ZNE.

The Toolkit was designed with all audiences in the building sector in mind. Specific audiences are addressed with targeted information in the materials, including designers, architects and engineers, building owners and operators, policy makers and local governments, and those involved in schools and other public buildings. These toolkit pieces will give those interested in ZNE building and operations a common language to discuss this growing trend and resources to help project pursue ZNE performance goals. Toolkit resources such as factsheets and case studies are available at no cost and can be co-branded with the logo of the stakeholder group.

V. POTENTIAL FOR REPLICATION

The City of Fremont plans to develop a model that can be easily replicated by other communities. This model will involve the "Green Homes Challenge" with the three levels of participation of energy efficiency, home greening projects, and renewable energy systems. Fremont will utilize trained and dedicated "Community Energy Champion" volunteers to engage residents in the Green Homes Challenge and help encourage deep energy reductions. As part of its overall marketing, education, and outreach strategy, it will employ a community-based social marketing approach that will engage local community-based organizations, neighborhood associations, schools, and the business community in educational events and initiatives. It will furthermore run a school engagement campaign that focuses on promoting energy literacy as well as directly involving students in energy reduction challenges. Finally, as part of the third tier of the Green Homes Challenge, Fremont will run a community-wide Solarize campaign to encourage widespread deployment of residential solar PV.

Additional innovative elements of Fremont's plan involve embracing Fremont's "strategically urban"' future vision in development projects, engaging local cleantech firms in community cleantechology demonstrations, and promoting Zero Net Energy as the proverbial "Holy Grail" of energy efficiency.

A. Planned Model Resources

As part of these efforts, Fremont will develop a number of resources that can be packaged as a toolkit for other communities to use as a model. These resources may include, but are not limited to:

- Green Homes Challenge Website
- Residential materials on plug load reduction strategies
- Residential materials on energy upgrade best practices
- Residential "Green Homes" guidebooks
- Case studies highlighting exceptional energy, water, and resource conserving projects
- Training manual for Community Energy Champions
- Solarize Fremont case study
- School energy and sustainability curriculum components and

A discussion regarding the various marketing, education, and outreach activities is found in Section VII.

B. Replicable Procedural Program Aspects

In addition to the resources listed above, Fremont will work develop innovative procedural program elements that can be replicated in other communities. These may include, but are not limited to:

- Best practices for school-based energy education and engagement
- Cleantech demonstration policy
- Residential on-bill financing program (assuming that PG&E rolls out their pilot program during the two year competition and that Fremont is selected as a pilot community)

VI. LIKELY FUTURE PERFORMANCE

Fremont's participation in the Georgetown University Energy Prize will build off of existing sustainability efforts and Climate Action Plan implementation activities to particularly focus on energy reductions in the Residential, Municipal, and Public School sectors. The momentum generated through community engagement activities will foster and strengthen a community-wide sense of commitment to and pride in Fremont's sustainability vision. The direct actions undertaken by the City and the School District will furthermore set a precedent for their own future facility upgrades and maintenance, as well as serve as a symbol to the Fremont's residents and business community that the City is dedicated to long term energy reductions and sustainability strategies. Accordingly, the energy reductions achieved during Fremont's participation in the two year Georgetown University Energy Prize completion will only be the beginning of Fremont's path toward deep energy reductions.

A. Continual & Lasting Energy Savings

In particular, Fremont will build capacity for continual and lasting energy savings in the following ways:

- Develop and strengthen relationships with parents, teachers, students and School District staff around energy and sustainability curriculum and energy engagement activities
- Develop and strengthen relationships with local environmental organizations, service clubs, neighborhood associations, faith-based organizations, and the business community through community education and outreach activities
- Build a model for training and continually engaging community volunteers in City sustainability initiatives
- Foster an open-door policy with large employers to use the City as a resource for helping them develop and hone their own sustainability plans, initiaties, and employee engagement activities
- Create a mechanism for local cleantech companies to demonstrate their technological advancements within Fremont's borders

B. Collection, Management, Utilization of Relevant Data

Since the development and adoption of its Climate Action Plan, The City of Fremont has been utilizing available tools to collect, manage, and utilize relevant data for its sustainability initiatives. Primary tools include the following:

1) SEEC-ClearPath California

The SEEC-ClearPath California tool is used for conducting the City's Greenhouse Gas Inventory. The City's initial 2005 baseline inventory and 2010 inventory update were both conducted with the help of StopWaste using ICLEI-Local Governments for sustainability standard protocol. Recently, ICLEI, in partnership with California's Local Government Commission, has developed the Statewide Energy Efficiency Collaborative (SEEC) ClearPath California online GHG inventory platform. Through the Energy Council, StopWaste has provided training to local Bay Area municipalities and helped the City of

Fremont to migrate its baseline and GHG inventory update data into this online platform. Benefits of the online platform are that it offers forecasting, planning, and monitoring modules in addition to a mode dynamic inventory tool (the previous tool was but in an excel spreadsheet). Fremont is currently exploring how the forecasting, planning, and monitoring modules might be able to be utilized for predicting potential energy savings during the GUEP competition and tracking overall progress in terms of energy usage reduction and its relationship to greenhouse gas emissions.

2) PG&E Green Communities

PG&E's Green Communities is an online portal for municipal governments within the PG&E service territory to request and download data usage within its boundaries. The portal gives Fremont access to Community-wide and Municipal Greenhouse Gas Emissions Inventories data sets, aggregating electric and natural gas usage and providing GHG emissions factors that designed to integrate with tools and guidance available through ICLEI for local government municipal and community-wide GHG inventories. The portal also offers Climate Action Planning reports in Tableau format that provide a more detailed understanding of community and municipal energy usage. These include Community-Wide, Residential, Non-Residential, Municipal, and County Overviews, as well as a PV Interconnection report.

3) EPA Portfolio Manager

With the assistance of the East Bay Energy Watch, the City of Fremont has entered 27 of its municipal facilities into EPA Portfolio Manager for building benchmarking. Using the Green Button connect, Portfolio Manager automatically accesses these facilities' energy usage from PG&E, so that month energy changes are easily tracked in one place. Many of these facilities have historical electric and natural gas usage dating back to 2006 captured in the tool, allowing for Fremont to track changes over time and pinpoint when specific spikes or reductions may have occurred. While Fremont has not yet pursued Energy Star certification of many of its facilities through Portfolio Manager, it plans on using this tool during the GUEP competition to better track energy reduction progress at specific facilities and observe the changes as upgrades are made.

4) Home Energy Analyzer

The Home Energy Analyzer tool, developed by Home Energy Analytics in Mountain View, California, uses PG&E smart meter data to evaluate home energy usage. The Home Energy Analyzer tool has been made available by StopWaste to all Alameda County residents beginning in 2013 through a PG&E Innovator Pilot grant and recently refunded through Energy Upgrade California - Energy Management Education Programs. The Home Energy Analyzer disaggregates energy usage data based on a combination of the 15-minute interval data provided by PG&E as well as through a series of questions posed to the ratepayer regarding home energy usage habits and appliances. By pinpointing where energy is being used – and wasted – residents are able to determine the right energy-saving actions and improvements to suit their needs. The Home Energy Analyzer provides customized energy saving recommendations including conservation behaviors and do-it-yourself improvements. The Home Energy Analyzer tool is one of two tools currently being evaluated under Energy Upgrade California for a statewide rollout to all residential customers of investor-owned utilities. This rollout is scheduled to happen sometime in 2015.

VII. MARKETING, EDUCATION & OUTREACH

A. Involvement of Local K-12 Public School System

The Fremont Unified School District (FUSD) – tied with Tesla as the City's top employer – is made up of a total of 5 high schools, 5 junior high schools, and 28 elementary schools as follows:

High School	American	Washington	Kennedy	Mission	Irvington
Jr High	Thornton	Centerville	Walters	Hopkins	Horner
Elementary	Ardenwood Brookvale Forest Park Oliveira Patterson Warwick	Cabrillo Glenmoor Maloney Niles Parkmont Vallejo Mill	Azevada Blacow Brier Durham Mattos Millard	Chadbourne Gomes Mission San Jose Mission Valley	Green Grimmer Hirsch Leitch Warm Springs Weibel

In addition to the schools listed above, FUSD hosts an alternative school campus made up of Robertson High School and VISTA Alternative High School. There is also the Circle of Independent Learning (COIL) Charter School, a homeschooling program.[26] This means that FUSD has a total of 39 K-12 school campuses and 41 schools with a total student enrollment of 33,887, making it the third largest school district in the San Francisco Bay Area (after San Francisco Unified and Oakland Unified) and the 23rd largest in the State of California.

FUSD has already expressed initial support of Fremont's participation in GUEP, with School Superintendent Jim Morris signing a letter of support for inclusion in the GUEP Application in June and Assistant Superintendent of Business Services Raul Parungao attending a stakeholder meeting in September to brainstorm ways in which FUSD can contribute to the effort. Furthermore, FUSD has recently appointed Matt McClain to fill the newly created position of Energy Conservation Supervisor, whose primary role will involve monitoring and evaluating District energy conservation methods, recommending installation of energy conservation projects, and developing a District-wide awareness and interest in energy conservation.

Matt will be the primary point person within the School District focusing on facility upgrade measures (see Section I.D.2), but will also serve as a liaison between the City and the School District for all energy-related activities.

Seeing that the School District is a top employer in the City of Fremont, that engages directly with almost every school-age resident (representing 15% of Fremont's total population), and that it can target over half of Fremont's households (56% of Fremont households include someone under the age of 18), the Fremont Unified School District is the primary target audience for energy outreach and engagement.

[26] FUSD also supports the campuses of the Mission Valley Regional Occupation Center (ROP) and Fremont Adult and Continuing Education (FACE), which are not included in the total K-12 school count, but do count toward FUSD's total facilities' energy usage.

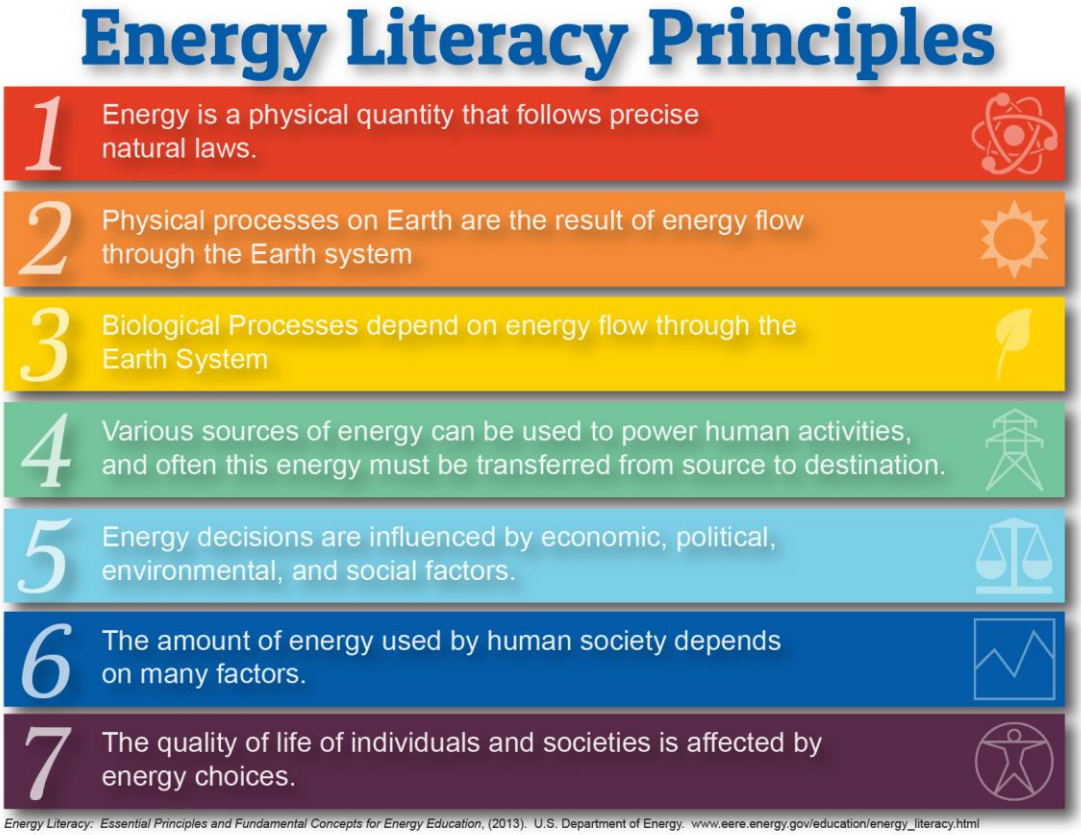
Based on initial conversations with Raul Parungao and Matt McClain, the City of Fremont has been able to secure commitment that FUSD can support school-based energy outreach and education through the following mechanisms:

- Incorporate energy and sustainability concepts and local initiatives into the school curriculum through collaboration with
- Disseminate regular messaging to FUSD staff, teachers, parents and students through the Public Information Officer
- Provide District funding/incentives to classrooms and schools encourage students to achieve energy savings at school and at home

By leveraging the resources offered by FUSD, the City of Fremont has identified two primary strategies for engaging the local schools – energy education and energy competitions.

1) Energy & Sustainability Curriculum

Energy education and outreach through the local schools would be based around the idea of promoting *Energy Literacy*, or the "understanding of the nature and role of energy in the world and daily lives accompanied by the ability to apply this understanding to answer questions and solve problems."[27] The U.S. Department of Energy has developed a framework of energy literacy covering the following seven principles:



[27] Definition provided by U.S. Department of Energy: http://energy.gov/eere/education/energy-literacy-essential-principles-and-fundamental-concepts-energy-education.

In addition to the Energy Literacy Framework available through the Department of Energy, the U.S. Green Building Council's Center for Green Schools has put together a National Action Plan for Educating for Sustainability. The Center for Green Schools was established to drive the transformation of all schools into sustainable and healthy places to live, learn, work and play. Its National Action Plan for Educating for Sustainability offers recommendations for enhancing formal education in the U.S. to ensure that by 2040, every student graduating from a U.S. K-12 school will be equipped to shape a more sustainable future. The Plan recommends that Education for Sustainability content be aligned with Common Core and Next Generation Science Standards, and that students be educated in global and ecological citizenship skills. The Center for Green Schools has also put together Powering Down: A Toolkit for Behavior-Based Energy Conservation in K-12 Schools, which highlights the many ways that a School District can involve students in campus energy savings strategies and upgrade projects. The research, leadership, and resources offered by the Center for Green Schools will help to inform and direct the City of Fremont as it coordinates with the Fremont Unified School District on ways to integrate Energy Literacy into school curriculum.

Furthermore, local resources for energy and climate education have recently been made available by the Bay Area Climate Collaborative (BACC). In partnership with Strategic Energy Innovations (SEI), PECI (recently acquired by CLEAResult), and Ecology Action of Santa Cruz, BACC has developed an Energize Schools Program to assist local school districts in planning for the use of their Proposition 39 funding (see Section I.D.2). Part of the Energize Schools Program offerings are free curriculum guides for teachers within PG&E territory, which include a "Sustainability" guide for grades K-1, a "Protect Your Climate" guide for grades 4-5, and a "School Energy Audit" guide for grades 4-8.[28] The Energize Schools curriculum also offers high school sustainability certificate programs in Energy Auditing, Sustainable Enterprise, Energy, Green Building, and Green Transportation. There are additionally project-based learning activity guides for home, school, and business energy, water, and solar assessments.

Through coordination with the Fremont Unified School District's Curriculum Instructor, the City will leverage these and other resources to help inspire energy and sustainability literacy within the public school system.

2) School-Based Energy Competitions

Energy literacy will be put into practical application through school based energy challenges, requiring students to actively participate in energy awareness and efficiency. Fremont has strategized specific campaigns that would engage public schools and students in community-wide energy efficiency efforts, detailed below:

a) Energy Scavenger Hunt Competition

Fremont would utilize "Community Energy Champions" to work with specific elementary schools and classrooms to get students to do basic energy assessments of their own homes with a checklist of potential opportunities as a classroom assignment. Teachers would incorporate curriculum around energy to discuss savings of various measures/habit changes, and have students conduct a follow up assessment weeks or months later to determine potential changes made.

[28] See http://www.energizeschools.org/curriculum-resources.html for details.

b) Household Green Home Pledge Drive

"Community Energy Champions" would coordinate with schools to develop a program in which students get their parents, friends, neighbors, family members, etc. to take a "green home" pledge. The pledge would utilize an online platform to get Fremont residents to commit to specific actions such as changes in energy usage habits, reducing plug load, upgrading appliances, completing weatherization projects, or installing renewable energy systems. Registration with the Home Energy Analyzer would be a key component of this strategy.

c) Student Eco-Innovation Competition

Fremont is home to a number of award-winning youth who have dedicated themselves to addressing environmental concerns. One youth is Pavan Raj Gowda, founder of Green Kids Now, Inc., who will graduate from Washington High School in 2018. Another is Irvington High alumni and Stanford graduate student Jasper Lin, who helped Irvington win the title of "America's Greenest School" in 2009. By tapping into the creativity and ingenuity of students like these, Fremont could create student energy competitions within the five high schools to inspire innovative ideas for school and/or home energy savings.

As part of these strategies, cash or sustainability-related prizes (such as an upgrade project) would be provided to the classroom(s) or school(s) that generate the most "pledges", complete the most assessments, identify the greatest potential savings, and/or achieve the best savings. This type of marketing, education, and outreach effort would generate momentum for a community wide "Green Homes Challenge" and promote resources such as the Home Energy Analyzer, CYES Green House Calls, and SmartSolar free solar assessment to interested parents.

B. Community-wide Educational Programs

1) Fremont Green Homes Challenge

Using the "Green Homes Challenge" model developed by Frederick County, Maryland[29], Fremont will develop its own Green Homes Challenge to encourage multiple levels of engagement in Fremont's energy reduction strategies.

The Frederick Green Homes Challenge (GHC) offers 3 tracks for becoming green involving energy efficiency measures, non-energy sustainability projects, and renewable energy installations. The Frederick GHC has branded these three tracks as follows:

1. **"Be a Power Saver"** - Home energy saving through energy saving habits and basic upgrades, as well as home energy audits,
2. **"Be a Green Leader"** - Neighborhood greening efforts like water conservation measures, tree plantings, and landscaping, and
3. **"Be a Renewable Star"** - Renewable energy through a solarize effort, focusing on both solar PV and solar water heating.

[29] See http://www.frederickcountymd.gov/GreenHomes and https://www.frederickgreenchallenge.org/ for more details.

By offering three similar platforms for engagement with different entry points, the Fremont Green Homes Challenge will allow for households to participate in as minimal or as comprehensive of a manner as they so choose. Fremont's GHC will work to rebrand these three levels of engagement for our own community, with the biggest difference being that we will add in electric vehicle purchases as part of the third "alternative energy" strategy.

For energy saving behavioral changes, basic energy efficiency upgrades, and whole house upgrades, Fremont has the following tools and programs available:

- Home Energy Analyzer online tool (see Section I.G.4)
- Green House Calls offered by Rising Sun's CYES Program (see Section I.G.1)
- Energy Upgrade California Home Upgrade Program (see Section I.G.3)
- CaliforniaFIRST Property Assessed Clean Energy Financing (see Section II.C.2)
- "Home Energy Score" for home energy performance created by the U.S. Department of Energy and offered locally by StopWaste (www.energy.gov/eere/buildings/home-energy-score)

For other green home offerings, Fremont will focus heavily on measures that deal with water conservation, leveraging the following resources:

- Water conservation and water efficient landscaping rebates offered by the Alameda County Water District (Section I.G.2)
- "Green Point Rated" Program offered by Build it Green, providing a home "report card" in five categories: energy and water conservation, indoor air quality, sustainable building materials, and community benefits such as proximity to public transit. (www.greenpointrated.com)
- Bay Friendly Gardening resources encouraging waste reduction and pollution prevention, natural resource conservation, and promote biodiversity. (www.bayfriendlycoalition.org)

For renewable energy and clean technology applications, Fremont will promote solar electric, solar water heating, electric vehicles, and other technologies (small wind, geothermal, energy storage) where appropriate through the following activities:

- City of Fremont employee group solar purchase through the Vote Solar Initiative's GroupEnergy "CAFIRST SunShares" Program
- "Solarize Fremont" community-wide group solar purchase
- Marketing outreach, and education efforts on energy efficiency, solar, and electric vehicles, leveraging the SmartSolar Program

Using this tiered model allows Fremont's marketing, education, and outreach efforts to be inclusive of households with varying levels of motivation and ability (see the discussion on Community Based Social Marketing in Section I.C.1 and Fogg's Behavioral Model in Section I.C.5), accounts for the "reduce, then produce" proper energy retrofit loading order (see Section II.C.1), and incorporates other greenhouse gas reduction strategies involving transportation, waste and water that are not directly accounted for under the GUEP effort but are an important part of Fremont's sustainability vision.

Another element of the Green Homes Challenge model is the use of committed volunteers as trusted messengers. In Frederick County, these have been branded "Green Ambassadors". In Section I.C.4, Fremont has already discussed its plan for engaging "Community Energy Champions" to engage businesses, schools, community-based organizations, and the community-at-large in our energy efforts.

Other Frederick GHC strategies include:

- Organizing "Energyware" house parties for neighborhood engagement on home greening projects;
- Develop residential guidebooks on how to get started;
- Drive residents to an online platform to pledge their individual commitments and track their progress;
- Provide a map of participants and progress in the community; and
- Regularly recognize volunteers and challengers through public events, online platforms and marketing/outreach materials.

For whole home upgrade projects, average household energy saving in California are about 19% per home, or 17 MMBTU annually. This is broken down by an average electric savings of 9% or 1,117 kWh and natural gas savings of 23% or 132 therms annually per home.[30] With a historic participation rate in the Energy Upgrade California Home Upgrade Program of 66 homes total upgraded since 2011, Fremont anticipates that a Green Homes Challenge will significantly increase participation in this program. Assuming that 100 homes are able to complete home upgrades in the year 2015 and 200 in the year 2016, the following savings can be predicted:

Year	# of Home Upgrades	Total therm savings	Total kWh savings	Total MMBTU savings
2015	100	13,200	111,700	1,700
2016	200	26,400	223,200	3,400
TOTAL	**300**	**39,600**	**335,100**	**5,100**

While a 5,100 MMBTU reduction represents only a .12% reduction of Fremont's total residential energy consumption, it is likely that a much greater amount of energy savings will be achieved through energy education and outreach activities that encourage behavior changes, plug load reductions, and basic upgrade measures such as lighting retrofits, weatherization measures, and major appliance replacement. With a total County-wide population similar in size to the City of Fremont's population, Frederick County's Green Homes Challenge has registered 345 "Power Savers", 194 "Green Leaders", and 102 "Renewable Stars", who together have saved an estimated 5.2 million kWh of electricity[31]. With Fremont's 408 million kWh total residential electricity consumption in 2013, a similar amount of kWh savings would result in a more substantial 1.3% electricity usage reduction.

[30] See 2012 BKi working paper "Modeled vs. Actual Savings for Energy Upgrade California Homes Retrofits," found online at http://www.bki.com/documents/Utility_bill_analysis_report_FinalReviewDraft.docx.

[31] See Frederick Green Homes Challenge – Certified Households webpage at https://www.frederickgreenchallenge.org/certified-households

2) Solarize Fremont Campaign

Using the best practices and lessons learned from the CAFIRST SunShares employee group purchasing program, Fremont will organize a Solarize effort based around a community-wide group solar purchase. Fremont has been encouraged to implement this type of program through its participation in the American Solar Transformation Initiative's Solar Roadmap as one way of educating the community-at-large as well as inspiring widespread solar adoption[32]. Furthermore, some key community members have expressed significant interest in this strategy, including Environmental Sustainability Commission Chair Richard Godfrey (see Section I.A.3) and local solar advocate Bill Palleschi.

At the State level, the California Solar Initiative (CSI) has a goal that Californians install 3,000 megawatts of solar energy systems on homes and businesses by the end of 2016, making renewable energy an everyday reality. While the rebate for solar PV systems in PG&E territory has now been exhausted, there is still the Residential Renewable Energy Tax Credit and the Business Energy Investment Tax Credit of 30% for solar photovoltaic and solar thermal systems, wind turbines, and fuel cells through December 31, 2016. A Solarize Fremont effort aims to educate residents about the benefits of solar PV and solar thermal installations and will encourage them to take advantage of the availability of this tax credit before it expires.

A Solarize Fremont effort will be centered around the concept of a group purchase of solar photovoltaic systems to drive down the cost per watt of solar First, Fremont will organize a group solar purchase for its own employees. It will use best practices and lessons learned to encourage employee group purchases at other large Fremont employers as well as organize a community-wide Solarize group purchase effort.

a) CAFIRST SunShares City Employee Group Purchase

Renewable Funding, LLC has developed a new group solar discount program called "SunShares" for cities and counties participating in CaliforniaFIRST (see Section II.C.2) as a way to jumpstart interest in residential PACE.[33] SunShares, implemented jointly with the Vote Solar Initiative through its GroupEnergy Program, is a limited-time employee solar education and discount program for homeowners throughout the greater Bay Area.

As a CaliforniaFIRST participating community, Fremont is planning on offering employees & retirees (and their friends, family and neighbors) the opportunity to take part in SunShares to help pool their buying power, securing discounts of ~15% off the average installation cost.

By engaging employees directly through an approved communication channel (internal email, employer intranet, newsletters, on-site workshops), the CAFIRST SunShares program will reach homeowners in the greater Bay Area more quickly and at lower expense than standard marketing efforts commonly implemented by solar contractors[34]. Participants will benefit by

[32] http://my.solarroadmap.com/ahj/city-of-fremont-ca/view

[33] For more details, see the CAFIRST SunShares Program: http://www.mygroupenergy.com/group/cafirstsunshares

[34] Customer acquisition remains a large portion of residential solar installation costs, as solar contractors spend time and resources finding customers one-by-one. As a result, customer acquisition is estimated at 10% of a typical residential solar installation's cost, which amounts to $0.67/watt for an average (5 kilowatt) residential system in

pooling their collective power to secure either lower up-front purchase pricing or highly attractive long-term solar lease payments for their solar electricity systems. Both of these options – buy or lease – can be financed through CAFIRST.

The program's affinity group approach is also supported by behavioral research; the simplified process of researching and choosing a solar provider as part of a group that includes trusted friends and colleagues makes it easier for participants to learn about solar, and ultimately to make a decision on whether solar is a good fit for their home – and their finances.

The CAFIRST SunShares program differs from other solar group discount models that have been implemented in some communities and states in a number of key ways. First, the program targets outreach to employees of local government organizations participating in CAFIRST, utilizing existing communication networks within participating local government employer organizations to connect with participants. This outreach strategy leads to significant program exposure at minimal cost. Also, by limiting participation to local government employees and their community of friends and neighbors, the program provides a sense of trust, unity, and a positive "we're in this together" attitude among participants. And though this group is large in absolute numbers, it is still small enough relative to the total number of households in the region that this approach does not crowd out of the regional market the many contractors who do not get selected through the program's RFP process; a diverse and competitive solar market continues, as contractors continue conducting business as usual throughout their community.

On behalf of Renewable Funding and the CaliforniaFIRST program, Vote Solar (SunShares administrator) issued a RFP to the solar installation community the week of 8/18/14. Two contractors were selected — Sunrun and SkyTech solar — offering pricing 15% below standard Bay Area prices. Employees who decide to register for the program must sign up to receive a no cost/obligation site evaluation & proposal from the contractor(s) by December 12, and may live anywhere in the Bay Area. The Vote Solar Initiative will administer the program website, provide all collateral materials to participating municipalities, coordinate with program contractor(s) and serve as technical support to participants should they have questions or concerns about their proposals.

With 585 City employees reporting home addresses in Fremont, participation in this Bay Area wide group purchase could contribute to a significant number of local solar installations. Based on the success of this program among City of Fremont employees, Fremont will develop a case study and offer resources and technical assistance to large Fremont employers to assist them with their own employee group solar effort. (See Section I.F.1)

b) Community-Wide Group Solar Purchase

For a community-wide group solar purchase, Fremont will utilize the lessons learned from the CAFIRST SunShares initiative as well as rely on the Solarize Guidebook (developed for the National Renewable Energy Laboratory and the City of Portland as part of the Department of

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the U.S., of which $0.33/watt is for marketing and advertising. Please see articles on customer acquisition costs at the following links: Lawrence Berkeley National Laboratory and the National Renewable Energy Laboratory.

Energy's SunShot Initiative) as a guiding document to drive this effort. According to the Solarize Guidebook, an effective solarize initiative must include the following elements:

Competitive Contractor Selection:

Through a competitive solicitation process, one or a few contractors are selected to deliver a pre-negotiated price on solar systems. This not only simplifies the contractor selection process for the customer, but also creates trust that the contractor(s) were selected based on criteria that met the City's specifications.

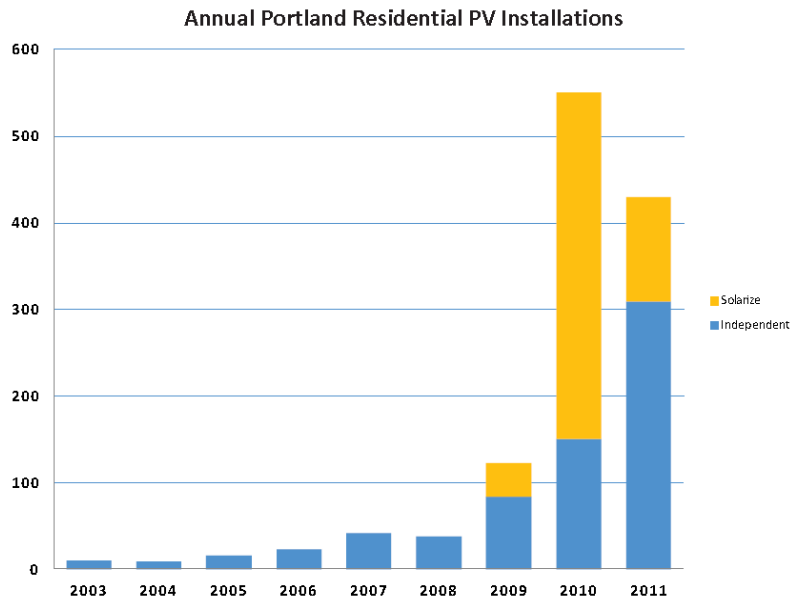
Community-Led Outreach and Education

Marketing, education, and outreach efforts that are delivered by a trusted messenger are more effective than from an outside source. Using local community-based organizations and community volunteers (like "Community Energy Champions") to deliver messaging creates a sense of community investment in the project. This also helps to drive down the overall cost of solar by reducing the time and effort a contractor has to spend on marketing and lead generation.

Limited Time Offer

While many residents may have considered installing solar at some point in the future, a sense of a deadline gives them the motivation to act now rather than wait. Residents will see the Solarize effort as a way that they can get a deal on a solar system, and will also feel the pressure from their neighbors and peers who are participating to also be a part of the effort rather than be left out.

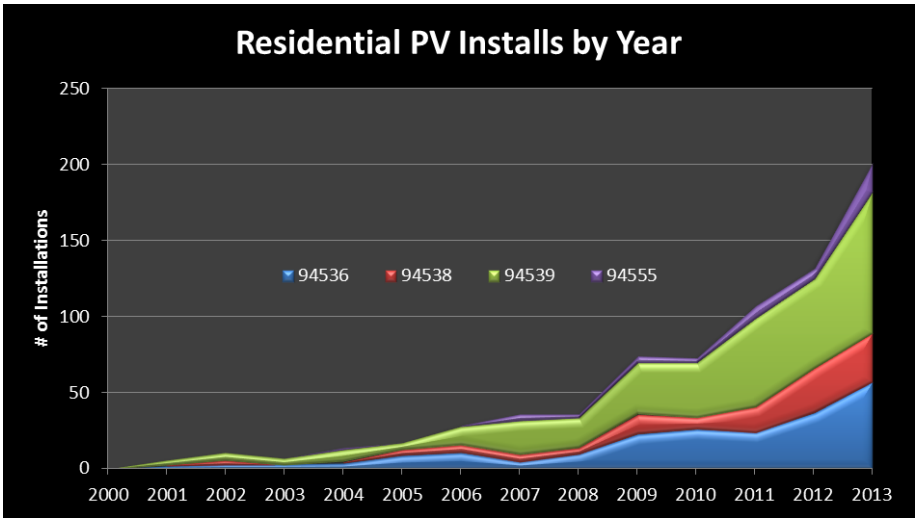
A Solarize campaign can therefore effectively increase the number of solar installations in a community that may not otherwise happen. In the case of Portland, Oregon, its Solarize campaign catalyzed the installation of about 450 residential PV systems, nearly doubling the amount that were installed independently of the effort.



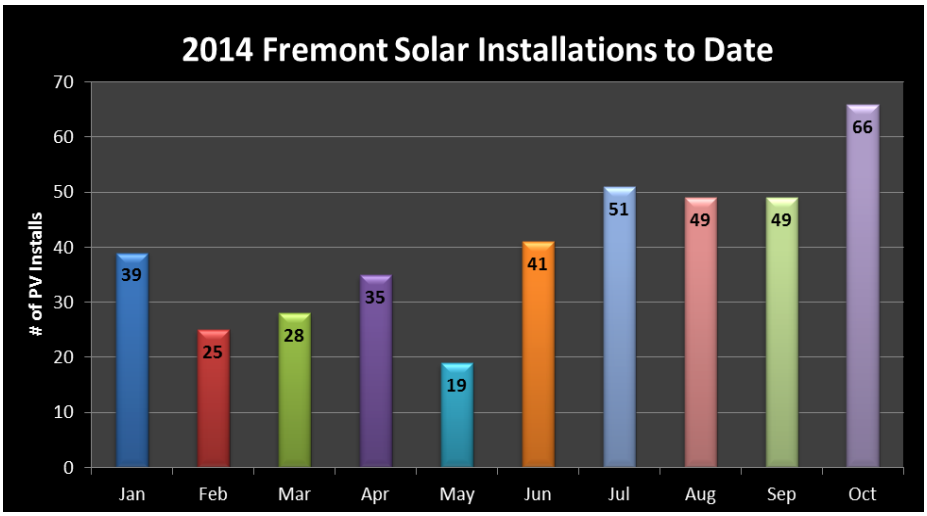
In order to generate the local momentum around this initiative, Fremont will work with the SmartSolar Program (see Section I.G.1) and the CaliforniaFIRST Program (see Section II.C.2) to develop marketing, education, and outreach materials and conduct workshops discussing the benefits of solar, relevant technologies, options for financing, and considerations for including other energy efficiency upgrades alongside the installation of solar as part of a bigger home greening project. These efforts will also particularly encourage residents to take advantage of the 30% Federal Tax Credit while it is still available to install solar water heating systems alongside their solar electric systems.

Solar Electric (PV)

Fremont's historical solar PV adoption rates in the residential sector have increased steadily since the first installations beginning 2001, as seen in the graph below:

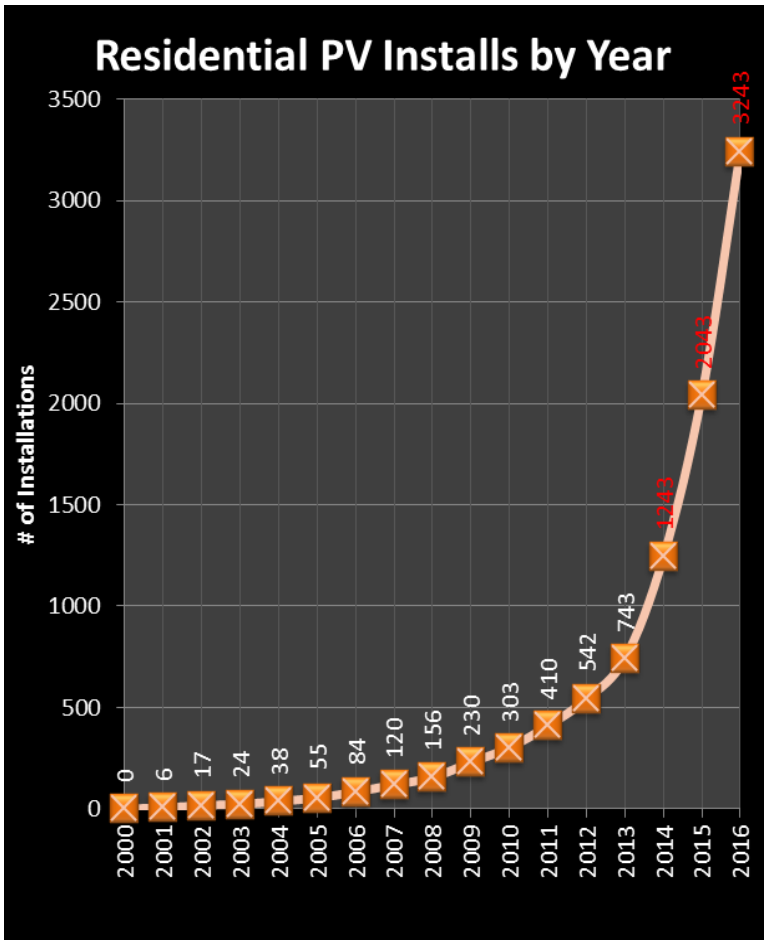


By 2013, the total number of residential PV installations had more than doubled the total amount in 2010. In 2014 to date (through the end of October), Fremont has seen the annual total number of solar installs nearly double from the total annual installs in 2013, with 402 total solar permits issued to date (compared to 201 residential and 9 non-residential systems in 2013). The following graph shows the number of solar PV installations by month in 2014.

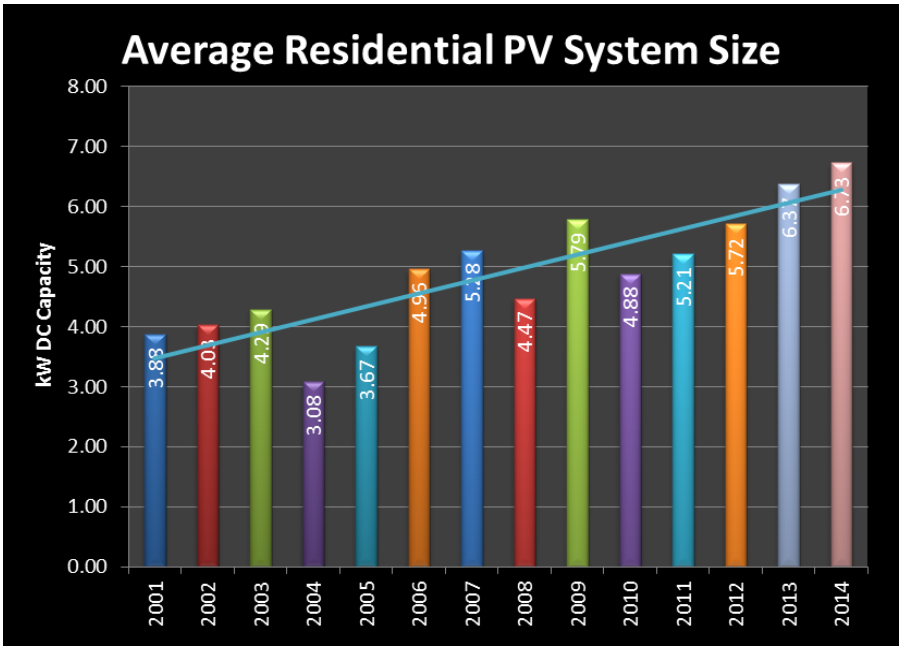


Note: This graph is based on data from the City of Fremont Permit Center and includes nonresidential systems, which account for ~15-18 of the total installs. The systems captured by the Permit Center may not all be completed and be connected to the grid by the end of 2014, so final 2014 PG&E interconnection figures may end up looking slightly different.

Assuming that November and December bring in similar numbers of installations as the months of July through October, Fremont can anticipate nearly 500 residential solar installations by the end of the 2014 calendar year. With a 2015 starting total of over 1,200 residential PV systems, Fremont will anticipate dramatically increasing the number of installations over the next two years. Assuming the rate of installations will continue on its current growth path and that Fremont will initiate a "Solarize" that will further encourage adoption, Fremont predicts 1,000 installations a year over the next two years.



The average residential system size has also increased over the years, with systems installed in the last two years nearly twice the size of those installed in 2001. This is likely a function of the fact that overall system cost has decreased, making a larger system more affordable, plus an increased plug load due to electric vehicle charging. Annual average residential system sizes are seen below:



Projecting the average kW system size of 6.5kW in 2015 and 7 kW in 2016 and a year 1 annual production of 1,643 kWh per kW DC[35], Fremont assumes the following annual savings could be achieved from the installation of residential solar PV systems, catalyzed by a Solarize Fremont campaign:

Year	# of Residential Installs	Ave kW DC	Total kWh savings	MMBTU
2015	1,000	6.7	11,008,100	37,561
2016	1,000	7	11,501,000	39,243
TOTAL	**2,000**	**6.85**	**22,509,100**	**76,804**

Solar Water Heating

Under the California Solar Initiative (CSI) effort managed jointly by the California Energy Commission and the California Public Utilities Commission, California has a goal of installing 585 million therms of gas-displacing solar hot water systems by the end of 2017. Solar water heating systems have traditionally not enjoyed anywhere near the level of adoption of solar PV. Nevertheless, the CSI-Thermal Program offers cash rebates of up to $2,719 for solar water heating systems on single-family homes, and residents are able to take advantage of the same 30% federal tax credit available for solar PV systems.

A Solarize effort in Fremont will not only promote solar PV, then, but will also incorporate education, information, and resources on residential solar water heating systems. Because estimates for rates of adoption of solar water heating systems are assumed to be much lower than for solar PV, Fremont predicts the following number of installs and annual savings from solar thermal.

[35] Bay Area average taken from https://s3.amazonaws.com/CEMS_Docs/Solar+Generation+Potential.pdf.

Year	# of Residential Installs	Ave. therm offset	Total therm savings	MMBTU
2015	75	120	9,000	900
2016	225	120	27,000	2,700
TOTAL	**300**	**120**	**36,000**	**3,600**

Between solar PV and solar water heating systems, then, the City of Fremont predicts that the following overall energy reductions could result from a Solarize Fremont community-wide solar education and residential solar group purchase effort.

	kWh	therms	MMBTU
Overall Residential Energy Usage	*407,868,511*	*29,513,130*	**4,343,018**
Savings from Solar installations	*22,509,100*	*36,000*	**80,404**
% Reduction	*5.52%*	*.12%*	**1.85%**

C. *Marketing Tools*

The City of Fremont has a number of marketing and outreach tools at its disposal, some of which (such as Open City Hall) have already been highlighted. A comprehensive list of the various tools available follows:

1) Internal: Communications Toolkit

- All User Emails
- City Websites
- Citywide Employee Newsletter and Department Newsletters
- Communications Roundtable Notes
- Community Alert/Notification System (Reverse 911 System)
- Department Staff Meetings
- Direct Mail (Letters And/Or Memos)
- Employee Events (Citywide and Department Events)
- Fliers, Brochures, and/or Other Handouts
- Intranet Sites
- Posted Employee Notices in Break Rooms
- Quarterly Management Meetings
- Social Media (Facebook, Twitter, YouTube, Google+, Linkedin, Instagram, Nixle, Blogs, etc.)
- Targeted Emails
- Websites (Public)
- Workshops/Trainings

2) External: Communications Toolkit

- Boards, Committees, Commissions
- City Websites (Fremont.gov/Sustainability; ThinkSiliconValley.com; FremontPolice.org)
- Community Alert/Notification System (Reverse 911 System)

- Community Networks (Listserves, Yahoo Groups)
- Fremont Open City Hall (Hosted by Peak Democracy)
- Government Cable TV Channel 27
- Media (Press Releases, Press Briefings, , News Briefs, Advertisements)
- Mobile Apps
- Newsletters (Print and Electronic), including City News (mailed to all Fremont households), Human Services e-newsletter, and Parks and Recreation e-newsletter
- Postcards, Brochures, Fliers
- Surveys (Print, Electronic, and Telephone)
- Social Media (Facebook, Twitter, YouTube, Google+, Linkedin, Instagram, Nixle, Blogs, etc.)
- Volunteers (Neighborhood Watch, CERT, Others)
- Workshops (for Specific Topics)

3) Potential New Marketing Activities

a) Community Energy Maps

Fremont is currently working with PG&E to determine if there are ways the City can access average household energy usage data aggregated at a level lower than zip code (i.e. zip code plus 2 or census block level) to create a map that overlays with Fremont neighborhoods and school attendance areas displaying energy usage profiles for the different neighborhoods. Such a map could help to drive localized energy reduction competitions.

b) TV / Radio Advertisements

Fremont is looking into the costs and benefits of developing a targeted television and/or radio advertisement based around community energy usage. This could involve audio clips that are played on Ohlone College's local 89.3 KOHL radio station and/or a promotional video that is shown at schools, community events, on Channel 27 local access stations, and during local movie previews.

c) Green Homes Challenge Online Pledge

Fremont has begun preliminary discussions with the software developer Strativia who created the Frederick County, Maryland Green Homes Challenge online platform (https://www.frederickgreenchallenge.org/) to discuss how this tool could be customized for Fremont's planned energy challenge under GUEP. The tool would not only offer residents to take a pledge committing to specific green efforts, but would also offer an online forum for program highlights, best practices, case studies, Q&A, and other resources.

Another simpler option is to utilize the City of Fremont's website built within CivicPlus and use an existing or beta module to create an online pledge form within the Sustainability section of the City website.

VIII. PRIZE PURSE

A. Preliminary Plan for Prize Purse

The City of Fremont would like the community-at-large to direct how we would use the prize money for future energy programming. Based on both initial stakeholder meetings and the Open City Hall energy forum that the City of Fremont recently conducted, the City has determined the following interests from the community:

1. Use it as prize money for energy projects in the schools or neighborhoods that significantly reduce energy usage
2. Create a grant fund for local energy saving projects designed/administered by students, nonprofits, or local green/cleantech companies
3. Provide direct rebates/discounts for home energy efficiency / renewable energy projects
4. Put it toward "green infrastructure" projects such as community solar, electric vehicle charging stations, bicycle infrastructure, etc.

Should the City of Fremont be selected to participate as a semifinalist in the GUEP competition, the City will work with the Environmental Sustainability Commission, interested stakeholders, and the community-at-large to further strategize around these ideas.