BAY AREA MONITOR

A Publication of the League of Women Voters of the Bay Area

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Rising from the Ashes

Talking Taxes

Eyeing Erosion

Pumping Heat

Election Day Is November 6 - Remember to Vote!

Stay Informed and Engaged, in Election Season and Beyond

With the November 6 election right around the corner, the Bay Area's 20 local Leagues are busy putting on ballot measure presentations, organizing candidate forums, and registering residents to vote. (Friendly reminder: If you aren't registered, the deadline to do so is October 22.) We encourage you to contact your local League if you have any voter service needs they can help you with — or conversely, if you would like to help them during this pivotal time. Volunteering with the League is an excellent way to get involved in the democratic process.

We join the election excitement in this edition of the *Monitor* by examining Proposition 6, which could have major implications for transportation here in the Bay Area and across California. Cecily O'Connor reports on this weighty state initiative starting on the next page.

Then on page 5, Aleta George looks to the future from a different vantage, anticipating the seasonal rains that we depend on to replenish our reservoirs, but that also pose an unexpected problem for those same reservoirs in places affected by wildfires. Robin Meadows follows with additional wildfire coverage, but from a more uplifting angle. For a fun change of pace this edition, our writers have swapped their regular beats; while Aleta is writing about water this time around, Robin is exploring open space, quite literally. For her article on page 8, she embedded on a Rare Plant Treasure Hunt with the California Native Plant Society, venturing into the charred hillsides of Napa County in search of "fire followers" — such as the Napa checkerbloom on our cover, photographed by Mike Palladini — that germinate after the land has been scorched by flames.

Finally, Leslie Stewart continues to bring the heat, but in a much safer and climate-friendly sense. Her article about heat pumps on page 10 reveals how this innovative technology is poised to bring greater energy efficiency to homes across the Bay Area.

Volunteers for the League of Women Voters of Fremont, Newark, and Union City have been working especially hard to register youth voters this election year. photo courtesy LWV FNUC

That's all for this edition of the *Monitor*, but you don't have to wait until December to hear from us again. You can stay apprised of the latest regional news by signing up for our weekly email bulletin, *Monitor Notes*, which Cecily sends out every Wednesday. Visit bayareamonitor.org/subscribe to sign up. We'll keep you informed and engaged, during election season and beyond.

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Proposition 6 Versus Senate Bill 1: Gas Tax Faces Fork in the Road

By Cecily O'Connor

Last year, the California legislature enacted Senate Bill 1 (Beall), which increased the state's base gasoline tax by 12 cents. The law also hiked diesel taxes, implemented a vehicle transportation fee, and established a $100 annual payment on zero-emission cars, all with the promise of raising more than $5 billion annually for tackling a backlog of state and local transportation projects.

This plan to repair our crumbling roadways may prove short lived, however. Voters can repeal SB 1 if they pass Proposition 6 in the upcoming election. The ballot measure would not only eliminate the new taxes and fees, but also require that any future transportation tax and fee proposals be subject to voter approval.

Which way will voters turn this November — toward SB 1 or Prop 6? The outcome could be fueled, in part, by voter perceptions about who benefits from gas tax revenue, based on analysis of two separate studies. Also important are beliefs about how the state and local jurisdictions should collect, manage, and spend transportation funding.

On November 6, California voters will weigh in on Proposition 6 to determine if Senate Bill 1's gas tax increase will be repealed. photo by Alec MacDonald

The "Yes on 6" campaign, led by some lawmakers and taxpayer watchdog groups, wants to nix the SB 1 increases. They believe the money that would be generated won't fix roads because it is a "blank check tax hike that has already been diverted away from road repairs," according to the GasTaxRepeal.org website. The increase also hurts California's working families, raising cost-of-living expenses for a typical four-person household by $800 per year, said Carl DeMaio, chairperson of Reform California and a leader of the Gas Tax Repeal campaign, in an August 10 *San Francisco Chronicle* opinion piece.

Forthcoming Bay Area bridge toll increases, greenlighted via Regional Measure 3's June passage, compound the situation locally, said Ourania Riddle, secretary of the Solano County Taxpayers Association. Riddle lives in Dixon, where a half-cent sales tax measure for street maintenance also goes before voters in November.

"We need some accountability," Riddle told the *Monitor*. "A lot of times during elections we hear promises … and people get elected and they forget all the promises."

Instead, the Prop 6 campaign proposes the "Road Repair Accountability Initiative" to spend 100 percent of gas tax revenue on roads, use auto sales tax for voter-approved intermodal transportation projects, and establish efficiency reforms like competitive bidding.

For their part, Prop 6 opponents point out that SB 1 marked the first increase in the state's base gas tax since 1994. They assert that the law is generating necessary proceeds for maintenance, repair, and safety improvements on state highways, local streets and roads, bridges, tunnels, and overpasses. Funding also extends to public transit, goods movement, and traffic congestion.

There's lots of evidence that persistent potholes and other significant repair and maintenance issues need attention. The region-wide pavement condition index (PCI) is 67, which is considered "fair" for now but at risk of worsening if not addressed, according to Metropolitan Transportation Commission (MTC) data. Local road conditions in certain counties like Napa and Sonoma are further diminished, with some marked as "failed."

Bay Area cities and counties are expected to receive $208 million from SB 1 in the current fiscal year, a 74 percent increase in their baseline state gas tax funding, according to materials from MTC's July 13 legislative committee meeting.

The additional gas tax revenue, for which collection began last November, is already going to use. And Proposition 69, passed earlier this year, created lockbox protections to prevent state borrowing or raiding of that revenue for other non-transportation purposes.

"We've got a couple cities who have established this as the

continued on page 4

Proposition 6 Versus Senate Bill 1 (from page 3)

summer of paving," said Tess Lengyel, deputy director of planning and policy for the Alameda County Transportation Commission during an August 31 interview. "Oakland is using SB 1 and Measure K and Measure BB funds to address an 80-year backlog of bad roads."

Voting with Values

Research from the Mineta Transportation Institute (MTI) points to maintenance and safety as the most widely shared voter priorities, based on a summer survey asking Americans' opinions about federal tax options to support transportation. It discovered the majority of respondents in favor of higher taxes, albeit under certain conditions. For example, 72 percent said they support a 10-cent-per-gallon gas tax increase to improve road maintenance. Support dwindled to 34 percent if the revenues were to be used more generally with "no additional detail."

A work crew kicked off the City of Oakland's summer of paving on June 28.

photo courtesy the City of Oakland

"Strong majorities of people are willing to pay more for transportation, including higher gas tax, if they believe money is spent for purposes they value," said Dr. Asha Weinstein Agrawal, MTI's director of education.

Also worth noting is that in the survey's last eight years, gas tax support has been ticking upward for scenarios in which revenue is spent on the environment, whether to reduce air pollution or global warming.

Still, there are limits on voters' willingness to open their wallets, especially when they have misconceptions about the cost of fuel tax. That's according to a 2015 survey of California and Michigan voters who responded to questions about the cost of the gas tax in their state and if they'd support an increase to pay for road maintenance and improvements.

In general, people overestimate how much gas tax they pay, fueling misperceptions that sap tax support, said Professor Rob Wassmer, co-author of the survey and acting chair in the department of public policy and administration at California State University, Sacramento. Embedded in these findings are policy implications that suggest funding support is more likely when accompanied by education about gas tax rates and average payment amounts.

"The way to sell it to people is to tell them what they are spending," Wassmer said.

Before SB 1's 12-cent-per-gallon increase went into effect, California's base excise tax was 18 cents a gallon. The Department of Motor Vehicle's new vehicle transportation improvement fee now ranges from $25 to $175, depending on a car's value. That's up from the previous $53 base registration.

So, if a California driver consumes an average of 585 gallons of gas each year, then they are paying $70.20 more in gas tax when multiplied by 12 cents per gallon, according to calculations from Steve Wells, principal budget analyst at the California Department of Finance. Add to that the average transportation improvement fee of $47.85, and a California driver pays $118.05 more a year in gas taxes and fees. That works out to $9.83 a month, $2.27 a week, or 32 cents a day.

Wells estimated the average California driver paid roughly $350 a year in gas tax before SB 1, an amount that includes the state tax, local sales taxes and measures, and a two-cent underground storage maintenance fee. Also, part of the tab is the federal tax on gasoline. It's 18.4 cents a gallon and hasn't changed since it was last raised in 1993.

Drivers will see additional increases this July when the price-based excise gas tax resets to 17.3 cents a gallon, up from the current 9.8 cents a gallon. Combined base and price-based excise taxes will later be adjusted for inflation. Lastly, the annual $100 zero emission vehicle fee will begin in July of 2020.

With funding on the line, transit officials are stepping up with online pictures, videos, maps, and fact sheets to provide a clear picture of where projects aided by SB 1 are underway

or complete. Rebuildingca.ca.gov was created last year by the California State Transportation Agency. The home page offers links to projects like one in Solano County, an area with PCI's in the "worn to the point of repair" category, where chip seal repair on State Routes 84 and 220 is now complete.

MTC has introduced "Street Stories" to show cities like Fremont where the number of repaved miles has doubled and deferred maintenance projects in San Jose are no longer on the backburner.

"We are trying to do our best to get the word out about why we are opposed to [Prop 6] and the risk on the line with potential passage," said MTC's Rebecca Long.

While the state has explored alternatives, including road charges for miles traveled, the gas tax remains its best source of funding in the near term, transit officials said. The California Road Charge Pilot drew in 5,000 participants last year and proved successful. About 73 percent of participants said they felt a road charge was a more equitable transportation funding solution than the gas tax. But the idea still has kinks to work through related to privacy and system technology, as well as dealing with the trend toward fuel-efficient cars.

Said Wassmer: "At some point, when 50 percent of the street becomes electric, where's the money going to come from to fund our roads?"

Cecily O'Connor covers transportation for the Monitor.

Fire and Rain: The Perils of an Unbalanced Watershed

The Tubbs Fire inflicted catastrophic damage in the North Bay, including the Fountaingrove neighborhood of Santa Rosa, shown here on October 14, 2017.

photo courtesy Santa Rosa Fires / Flickr.com

By Aleta George

We've seen fire aplenty this year. The California wildfire season got off to an early, rip-roaring start and continues apace, stretching budgets and firefighters. The Mendocino Complex Fire crossed four county lines and is the largest California wildfire in history. It is also the nation's largest wildfire this year so far, with 459,123 acres burned at 98 percent containment in early September. The most destructive wildfire in California history was the Tubbs Fire last year with 5,636 structures burned, 36,807 acres burned, and 22 deaths.

Soon we're going to see rain, which we need, but which is also an ironic cause for concern for those who protect California's water quality for people and the environment. Their main worry is the extra sediment carried in runoff through fire-damaged watersheds that drain into water-holding basins.

US Forest Service research hydrologist Joe Wagenbrenner explained how the system works in a balanced, unburned watershed. When it rains, as much as ninety percent of

continued on page 6

Fire and Rain: The Perils of an Unbalanced Watershed (from page 5)

rainfall is absorbed by the soil. The rest evaporates or is used by plants. The water in the soil percolates down to recharge groundwater and move through the substrate into streams. "It takes a long time for a drop of water to move through the soil and reach a stream," said Wagenbrenner. "As a benefit, the soil acts as a filter and the water comes out clean." In a balanced system, sediment in water is good. It provides habitat for fish and carries with it soil nutrients such as organic carbon, phosphorus, potassium, and nitrogen. These nutrients provide food for fish and micro-invertebrates while replenishing floodplains and riverbanks.

In an unbalanced system such as a high-intensity burn area, there is too much sediment and a bloom of nutrients that are not good for water quality, said Wagenbrenner. In a burned area there is likely no vegetation to absorb some of the rainfall, and in some cases, waxy vegetation burns, melts, and forms a coat on the soil that repels water. A fire can also burn the organic matter in soil itself. Organic matter helps to hold soil together, and when it burns, it becomes more friable and won't clump, making it more susceptible to erosion. With less water being absorbed by the soil, there is more runoff and more sediment on the move. As a result, the water is less clean because it hasn't gone through the natural filtration of soil.

How water managers respond after a fire depends on the severity of the burn, said Sheri Miller, a senior sanitary engineer for the State Water Resources Control Board, which is responsible for protecting California's water quality. "Each fire presents its unique set of circumstances," she said, which leads her to look at how hot a fire burns, its damage to the watershed, and if water system facilities were harmed, either above or below ground. Maps of burn areas are generated and studied for the degree of burns. A high-severity burn creates greater impacts.

"There are things we can do to mitigate for fire impacts once the fire has happened," said the Forest Service's Wagenbrenner. To reduce erosion, they might apply seed or mulch before it rains. To slow down or trap moving water that carries sediment and ash, they can use straw wattles (straw-filled tubes bound by natural fiber) and log erosion barriers, or build check dams.

After the 2017 Tubbs Fire burned one side of Kimball Reservoir, a source of Calistoga's drinking water supply, the city laid 7,000 linear feet of straw wattles around the reservoir. It helped. Water managers did additional water monitoring and didn't see elevated levels of nutrients, said Miller.

Once runoff and sediment reach a municipal water supply, additional treatment may be necessary because sediment can change the pH of water. "Almost every contaminant can be removed, but the removal can be expensive," said Wagenbrenner. Sediment does more than affect water quality and treatment approaches; it hastens the lifespan of a reservoir, which loses capacity as it ages and collects sediment.

"Fires have been here long before humans," said Wagenbrenner, pointing out how the natural cycle of wildfires has historically served to benefit ecosystems. Medium- and low-intensity fires can benefit a watershed ecosystem by removing small trees, allowing mature trees to receive more nutrients and water, making them stronger to resist fire and disease. Also, removing fuel from a forest renders a fire less hot.

While it may seem that there are more reported fires each year, the number is relatively constant over time according to data from the California Department of Forestry and Fire Protection (CAL FIRE). What has increased exponentially over the last decade is the amount of acreage that burns. Three things control the size and sizzle of a fire, says Wagenbrenner. The biggest factor is local weather, which is growing more extreme due to climate change. "If it's hot and dry, fuel will burn hotter and faster," he said, "and if it's windy all bets are off." In wind, fires can jump barriers such as roads and streams, and spread the fire by "spotting" other fires downwind. Variables in firefighting efficacy due to the size of the fire, resources, and wind condition can also affect the size and intensity of a fire.

Fuel conditions on the ground are another important

factor. Most fires spread on the ground, not from tree canopy to canopy, so what is on the ground matters. That's where forest management comes in. "Maintaining a healthy forest is one way to help prevent large fires," said CAL FIRE's Dennis Hall. "And preventing large wildfires is one way to protect water supplies in the future." Healthy forest management reduces fuel for fires by harvesting trees, thinning and removing other vegetation, and by conducting prescribed burns.

Urban fires and wildland-urban interface fires add another level of concern for water quality. After the Tubbs Fire, the North Coast Regional Water Quality Control Board was concerned that hazardous waste from over 5,000 burned structures would enter waterways. Working with CAL FIRE and other agencies, the Regional Water Board identified high risk areas in need of protection within the Russian River watershed. The data was used to mitigate post-fire runoff and erosion, including the use of straw wattles to keep soil and structure material onsite and not in creeks. After a post-fire monitoring, they found that their efforts were successful.

In an urban fire, the burning of water delivery pipes can also be a problem. KQED reported that pipes made of high-density polyethylene that burned in Santa Rosa's Fountaingrove neighborhood delivered toxins to the water mains.

A disaster like a fire can bring communities together, and those in Lake County are a good example. These communities have a history of fire and are accustomed to dealing with sediment from Clear Lake, the oldest lake in America. (Old lakes are full of sediment.) "In Lake County, there are emergency protocol systems in place and the communities have learned to network with each other," said Miller, who added, "We were lucky with the Mendocino Complex Fire. There are 50 water systems we have control of on the lake and only one sustained damage."

The State Water Board encourages small and large water entities to plan by protecting water treatment plants and storage tanks with defensible space. Smaller water delivery services, such as those serving homeowner associations, should know in advance if insurance covers fire events, and consider lining up adequate administrative support for needed paperwork.

Fires are here to stay. They can't always be controlled, but there is much we can do through smart planning to lessen their intensity and mitigate their impact so that rain is always welcome.

Aleta George (usually) covers open space for the Monitor.

This photo from February 18, 2018 shows the lingering destruction from the 2017 Tubbs Fire in Sonoma County.

photo courtesy Derrick Story/Flickr.com

Rising from the Ashes: Finding Fire-Following Flowers

By Robin Meadows

On a beautiful morning early this summer, Amy Patten led a team of native plant enthusiasts on a quest. They explored a 45-acre property, owned by Paul and Donna Woodward, in the hills west of Napa Valley. The land was scorched in the Atlas Fire last October, and the team had a mission to search for fire followers — rare plants that bloom only after a burn.

A team of native plant enthusiasts went searching for fire followers in Napa County this summer. photo by Paul Woodward

"One of the species I'm most excited to look for is the Napa Checkerbloom, a fire follower known from very few records," Patten said. She had just seen this delicate pale pink flower in the Foote Botanical Preserve on Mount George, which is across the valley from the Woodwards' land. The preserve, which also burned in the Atlas Fire, is one of the handful of places where the Napa Checkerbloom has been documented.

Patten manages the California Native Plant Society's Rare Plant Treasure Hunt program, a citizen science effort to monitor rare plants statewide. California has about 6,500 varieties of native plants — the most of any state in the country — and about one third are found nowhere else in the world. Current priorities for CNPS's Rare Plant Treasure Hunts include burn areas in the North Bay wine country.

"Fire followers have fleeting abundance," said Heath Bartosh, a botanist at the Martinez-based consulting firm Nomad Ecology who studies fire followers in northern California. "There's a big show for a couple of years and then they're gone," he added, explaining that their germination can be triggered by smoke and heat, as well as burn chemicals that wash into the soil during the first few rainy seasons after a fire.

After that, the seeds can lie under the soil surface for decades waiting for another fire to blaze through. This long dormancy is a perfect fit with the natural burn rhythm in the Bay Area, which is likewise slow. "The fire frequency here can be 30 to 120 years," Bartosh said.

Patten's expedition was the first time the Woodward's property had been surveyed for fire followers, and no one knew if the Napa Checkerbloom grew there. If it did, Patten thought the ridge top would be the most likely spot, so that's where the team headed. "It likes sunny, open areas," she explained.

The ridge isn't all that far from the Woodward's house, which survived the fire, but the team took its time making the climb. They had too much to enjoy along the way. "We're never a fast-moving group," commented Wendy Born of Sebastopol.

The plant hunt began in the forest behind the Woodwards' house. "Before the rains, this was charcoal," said Paul Woodward. "It was all black." The ground was still charred and crunched underfoot, but the forest understory was also alive with splashes of color.

The team fanned out from the trail, calling out their finds. They spotted the pink of wild roses; the bright yellow of fairy lanterns, which belong to the lily family; and the deep purple of another lily family member called Ithuriel's spear. None of these are fire followers or even rare. But each is beautiful, and

Thank You for Your Support

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The Napa Checkerbloom represents a prized find for rare plant hunters. photo by Jake Ruygt

offered a sign of recovery from the burn that had blackened the land.

Further up the trail, the forest opened to a warm, sunny meadow with a spring-fed pond. Birds sang, cicadas buzzed, and a tiny frog hopped near the water's edge. The pond was ringed first by cattails, then tiny pink flowers that looked like a sprinkling of stars, and finally daisy-like yellow flowers.

JoeJoe Clark of Calistoga identified the yellow flowers as sneezeweed, but the pink flowers sent the team to wildflower apps. Heads bent over their smartphones, they murmured over possibilities until settling on a likely match. Patten documented the find with photos and tucked a sprig into her backpack for formal identification later.

Verified field sightings help the California Department of Fish and Wildlife (CDFW) inventory more than 2,300 species of rare plants. "CNPS takes the lead on tracking the plants, and we take the lead on mapping them and managing their data," said Kristi Lazar, lead botanist for the CDFW's California Natural Diversity Data Base. Knowing the locations and abundance of rare plants can inform conservation efforts and land use decisions.

Lazar also values the citizen science aspect of CNPS Rare Plant Treasure Hunts. Our smoky mid-summer skies were a sobering reminder of the perils of wildfires. But from an ecological perspective, there can be a silver lining. "Including the public in surveys for fire followers can help educate people that fire is not always a devastating event, that some California native species thrive after a fire," she said.

Back on the far side of the meadow, Patten and her team of plant hunters returned to the cool of the forest, making their way to the open ridge. They broke for lunch near the top, in the shade of a spreading oak that survived the fire. Donna Woodward shared photos of the burn and of the gradual recovery of the land, beginning with bright green sprigs poking through the black ground. The ridge was full of flowers, included a stunning stand of yellow mariposa lilies. The Woodwards hadn't seen this many flowers here in years, if ever.

The ridge overlooked the Napa Valley, so Patten pointed out Mount George, where she saw the pink-flowered Napa Checkerbloom just the week before, on the eastern side. Inspired, the team started searching for this rare fire follower. Once again they fanned out from the trail, and once again their search turned up many flowers to name and enjoy. But not the Napa Checkerbloom.

Even so, spirits were high with camaraderie and the thrill of the hunt. "This is unsurveyed territory," said Wendy Smit of Healdsburg. "If you don't look, you won't find rare flowers in new places."

And Patten was just getting started. "We'll have a lot more fire follower outings in Napa and Sonoma next spring," she said.

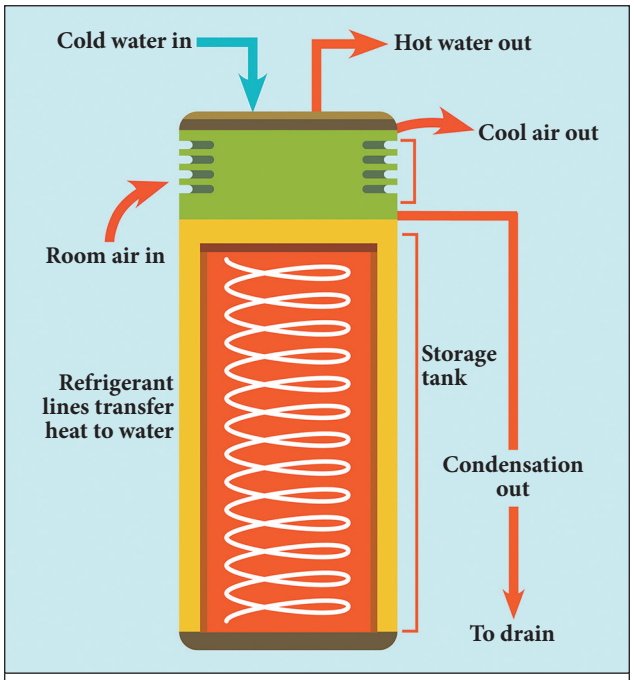
Robin Meadows (usually) covers water for the Monitor.

Pumping Heat: Grants Awarded to Increase Home Energy Efficiency

By Leslie Stewart

The contractor remodeling James Tuleya's house on the Peninsula a few years ago was surprised to find an uncommon type of water heater awaiting installation. Tuleya had taken advantage of a PG&E rebate program to purchase an electric heat pump water heater instead of a gas-fueled one. An energy efficiency expert and board chair of Carbon Free Silicon Valley, Tuleya was a pioneer in a shift which is about to change homes throughout the region, boosted by recent climate protection grants from the Bay Area Air Quality Management District.

This summer, the Air District awarded a total of $4.5 million to public agencies across the region for projects that reduce greenhouse gas emissions. According to Abby Young, planning and climate protection manager at the Air District, the aim of the grants is to create models that can be scaled. "The biggest contribution the district can make is creating the examples that can be exported outside the Bay Area. We are looking for replicability and scalability," she commented.



A heat pump water heater works by pulling heat from the surrounding air and transferring it to the water in its storage tank.

source: Portland General Electric (portlandgeneral.com)

Carbon Free Silicon Valley strongly encouraged community choice aggregator Silicon Valley Clean Energy (SVCE) to apply for a climate protection grant to fund a heat pump water heater incentive program. Carbon Free Silicon Valley is a climate advocacy umbrella organization for multiple Carbon Free groups in Santa Clara and San Mateo counties. These groups supported formation of the community choice aggregators which now supply clean energy to the Peninsula and San Jose. Once the aggregators went online, the Carbon Free groups turned to the next step: how to use the clean energy more effectively. They found inspiration in a presentation by Pierre Delforge of the Natural Resources Defense Council, who showed them the results of a 2016 study for UC Berkeley's CoolClimate Network on residential sources of greenhouse gas in the Bay Area. Evaluating energy use in homes across the region, and factoring in progress in reducing the carbon footprint of electricity by methods such as community choice, the study suggested that reducing natural gas use in buildings was the next problem to solve.

About 85 percent of natural gas in Bay Area homes is used to heat water or heat living spaces. Not only is electric heat pump technology available to perform both of those functions, it can do them more efficiently. Using the same technique that moves warm air from inside a refrigerator to the outside, heat pumps can move warmer air from outside a water heater to heat the water stored inside. Because the pump is just moving heat, not creating it, the appliance can be exceptionally more energy-efficient than burning natural gas to get the heat.

Heat pumps are more widely used in other parts of the country than in California, for several reasons. One is that natural gas was historically cheaper here than electricity, although rates are beginning to change. Also, a more temperate climate means less demand for energy-saving ways to heat water or rooms, or for air conditioning, another heat pump application. However, less extreme temperatures mean heat pumps don't work as hard to get results. Jennifer West, program manager at Alameda County's StopWaste, noted, "With our climate, this is a technology that should be used more."

Unfamiliarity with heat pump appliances other than refrigerators and air conditioners has also been a barrier. As John Supp, account services manager at SVCE, explained, "If the buyer doesn't know about it, they won't demand it. If the supplier doesn't know about it or have it in stock, that makes it harder for the buyer. And it's been much harder for a developer to do this, because it's something unusual for permitting agencies, and that means it takes more attention and therefore more time to process the permit."

Of the 17 climate protection grant applications that the Air District funded, the three largest were for projects to support expanded use of heat pump water heaters. "These were larger because [the recipients] are all coordinating and working

together on incentives," Young noted. The largest grant, in the amount of $400,000, went to BayREN, a regional energy efficiency group, and will be administered by StopWaste. The agencies will collaborate to address the market supply piece of the heat pump water heater problem.

"We're working on incentives for the distributor network, influencing the people who will be trusted to make recommendations to a buyer on what to get," commented West. "We aren't giving out money," she added. The community aggregators, and municipal and local power companies, will be providing the funding. BayREN is also planning contractor trainings, with the goal of increasing both the numbers and geographical spread of knowledgeable installers, and will distribute information on heat pump water heaters to industries that provide solar installations and electric vehicles to help reach consumers interested in further electrification of their homes.

The Air District awarded $325,000 to SVCE; the aggregator will match that for a total of $650,000 for its program. It plans to take the heat pump water heater message to consumer groups that may be particularly receptive, such as Tuleya's Carbon Free group and residents already considering remodeling.

Both Tuleya and Supp described some of the barriers to adopting the new technology, and SVCE is earmarking approximately $5,000 per home to overcome these and move a consumer closer to total electrification. To start with, electric heat pump water heaters are more expensive than gas water heaters. In addition, gas water heaters are often installed in a small space; to gather enough warmer air to efficiently function, heat pumps need either more space, such as a garage, or more ventilation. Finally, electric heat pump water heaters need a 220-volt outlet, and this may involve upgrading a home's electrical panel and running additional conduit and wiring.

SVCE's financial incentives will make the cost to the consumer a few hundred dollars less than putting in a new gas water heater, and they will have an upgraded electrical panel that will support further electrification of their home with an electric vehicle charger or an induction stove. Tuleya strongly supports this approach; although he upgraded his water heater, he still doesn't have the circuits he would need for an all-electric home. His advice? "Don't think of just one device at a time — for some people, even with a higher up-front cost, heat pump water heaters will pay off over time, but in combination with electric vehicles and solar panels, the cost easily evens out, because an electric vehicle can save $20,000 over 20 years."

Supp mentioned that SVCE will acquire data from monitoring actual usage patterns of electricity by homes with the new water heaters. This will enable them to design programs for better time-of-use charges to lower consumer costs. "Maybe after you take your hot shower early in the morning, you can wait to heat more water until there's plentiful solar energy later in the day," Supp suggested. SVCE also expects to contribute anonymized data to regional and state partners for large-scale energy efficiency planning.

The City of San Jose, which operates the San Jose Clean Energy aggregator, also received a $325,000 award. San Jose spokesperson Jennie Loft wrote, "We will be leveraging this award with the same amount by providing outreach and education, including to low-income households in San Jose. Nearly all of the funds are slated to go towards ... financial incentives for San Jose residents to change out their natural gas water heater for a heat pump water heater." San Jose recently adopted a climate action plan, and has a zero-net-carbon demonstration that will tour the city to let residents try out electrification.

Other climate protection grants included $296,997 to Marin County for decarbonizing buildings, including adoption of heat pump technology, and $296,220 for the City of Palo Alto Utilities' efforts to replace gas wall furnaces in multifamily buildings with heat pumps. Although new construction will be required to accommodate heat pump appliances starting in 2019, Young stressed, "The goal is getting natural gas out of our buildings, and the challenge is with the buildings we've already built."

Leslie Stewart covers air quality and energy for the Monitor.

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