

# MEMORANDUM

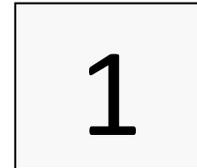
**TO:** UTILITIES ADVISORY COMMISSION

**FROM:** UTILITIES DEPARTMENT

**DATE:** April 5, 2017

**SUBJECT:** Discussion of Three Utility-Related Sustainability/Climate Action Plan Implementation Plan Components: Mobility, Efficiency and Electrification, and Water Management

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## **RECOMMENDATION**

Staff requests that the Utilities Advisory Commission (UAC) discuss and provide feedback on three Utility-related Sustainability/Climate Action Plan (S/CAP) Implementation Plan components related to Mobility, Efficiency and Electrification, and Water Management.

## **EXECUTIVE SUMMARY**

On April 17, 2017 the Council is scheduled to discuss a proposed implementation plan draft staff is working to prepare as a follow up to the S/CAP Framework adopted on November 28, 2016.<sup>1</sup> At its November meeting the Council directed staff to return with a detailed Sustainability Implementation Plan (SIP) for various items identified in the S/CAP Framework. The SIP components most relevant to the City's utility operations (Mobility, Efficiency and Electrification, and Water Management) are the focus of this report.

## **BACKGROUND**

On April 18, 2016 the Council first received and discussed the draft S/CAP and unanimously (8-0) approved the following motions:

- A. Adopt a goal of 80% greenhouse gas (GHG) reduction by 2030, calculated utilizing the 1990 baseline;
- B. Direct staff to return within two months with a process for integration of the S/CAP with the Comprehensive Plan Update;
- C. Support the general framework of the S/CAP;
- D. Support the S/CAP Guiding Principles, which are to be reviewed and formally adopted within six months.

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<sup>1</sup> Staff Report 7304 (Discuss and Approve Sustainability and Climate Action Plan (S/CAP) Framework, Principles & Guidelines), November 28, 2016

On November 28, 2016 the Council discussed the S/CAP Framework and unanimously (9-0) approved the following motions

- A. Adopt the draft Sustainability/Climate Action Plan (S/CAP) Framework, including its Guiding Principles, Decision Criteria and Design Principles as the road map for development of a subsequent Sustainability Implementation Plan (SIP); and
- B. Direct Staff to return to Council with a Sustainability Implementation Plan; and
- C. Direct Staff to make its best effort to incorporate Council Member comments.

In response to these directives, Staff formed seven inter-departmental teams to jointly develop a “Sustainability Implementation Plan” covering key S/CAP sections: Mobility, Energy, Water, Zero Waste, Municipal Operations, Adapting to Climate Change and Sea Level Rise, and Natural Environment.

**DISCUSSION**

Excerpts from three of the SIP components are included in Attachment A for UAC review: Mobility, Energy, and Water Management. These proposed SIP components, once finalized and adopted (including performance of all necessary environmental reviews) are intended to guide City actions **through 2020**, at which point new goals would be established. Programs with a “P” listed next to them will require further program or policy approvals, and those with a “\$” next to them have new funding proposed in the FY 2018 budget. Sustainability office staff intends to bring summary drafts of the proposed SIPs to Council for discussion and feedback at Council’s Earth Day meeting. Proposed SIPs will also need to undergo the requisite environmental review prior to any Council action.

**Mobility**

As discussed in the S/CAP, 61% of Palo Alto’s emissions come from road travel. As a result, reducing road travel is a major component of the S/CAP. The S/CAP framework anticipates achieving reductions through reducing the number of vehicle trips taken in Palo Alto and decarbonizing the vehicles themselves by encouraging electric vehicle adoption. The mobility SIP focuses on both types of strategies, but staff is only requesting UAC comment on the utility-related SIP key actions associated with electric vehicles (EVs):

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|---|
| <p><b>Mobility SIP Component – Key Actions related to Electric Vehicles</b></p> <ul style="list-style-type: none"><li>• Promote EV charger installation.</li><li>• Evaluate incentives, policies and funding sources to stimulate ownership/use of EVs.</li><li>• Encourage local ownership of 3-5,000 EVs by 2020 through programs such as group buys. Explore ways to reduce process and other barriers (such as fee- and rate-related barriers).</li></ul> |
|---|

Electric vehicle adoption in Palo Alto has increased substantially in recent years, with an estimated 2,000 electric vehicles registered in Palo Alto by the end of the 2016. It is estimated that about 4% of the passenger vehicles registered in Palo Alto are electric vehicles (as compared to 2% statewide). Though the early adoption lead compared to the state is expected

to decline, the overall adoption rate is currently projected to continue to increase substantially to between 3,000 and 5,000 EVs by 2020 as the market matures.

A number of efforts are already in place or are on the Utilities Department's list of initiatives to explore, to meet the goal of stimulating EV conversion among Palo Alto residents and visitors. These efforts include:

- Permit process streamlining for Electric Vehicle Supply Equipment (EVSE).
- Ordinances requiring installation of EVSE in all new single-family homes, installation of one EVSE outlet for every new multi-family residential unit built as well as EVSE in 25% of guest parking spaces, and requiring that at least 25% of parking spaces for new non-residential construction be EVSE-ready (conduit installed), with at least 5% of spaces containing EVSE outlets, and higher requirements for hotels.
- Palo Alto's partnership with other Bay Area communities to 'bulk buy' EVs at discounted prices.

Staff has implemented or is in the process of implementing a number of additional programs using resources that are already covered in the current budget and under existing Council authority, including:

- A pilot Time of Use (TOU) electric rate that encouraged off-peak EV charging that was coordinated with the Residential CustomerConnect Smart Meter Pilot Program.
- Using Low-Carbon Fuel Standard (LCFS) funds to provide rebates for EV charger installation in multi-family and non-residential buildings, reduce the impact of interconnection charges, and fund education, outreach, and pilot programs.<sup>2</sup>
- Examining ways to reduce fee- and rate-related disincentives to electric vehicle adoption while ensuring alignment with cost of service principles.
- Working to install City-owned EVSE on four City-owned parking structures in conjunction with PaloAltoCLEAN solar projects on those structures.<sup>3</sup>

Other potential programs under consideration would require additional Council approvals, which may potentially require approval of contracts, budgets, and/or policy. Programs that staff may consider prior to 2020 include:

- Exploring additional ways, over and above LCFS rebates, to increase the supply of public charging facilities and overcome hurdles to installing chargers at multi-family dwellings in Palo Alto.
- Design and implement pricing policies for public EV charging stations.

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<sup>2</sup> Program adopted March 14, 2016. See Staff Report 6489, *Approval of Master Agreement to Sell Low Carbon Fuel Standards Credits and Utilize the Revenue for the Benefit of Current or Future Electric Vehicle Customers*

<sup>3</sup> See Staff Report 6535 (Lease Agreement with Komuna Energy), January 25, 2016

- Explore expanding the current TOU rates to all residential customers, including EV customers, subject to cost of service principles and availability of staffing and infrastructure to support such an effort.

Existing and planned initiatives identified above were initiated by Utilities based on direction provided in the Council-adopted electrification work plan, which staff plans to integrate into the SIPs at the appropriate point in the process.<sup>4</sup>

Energy

The SIP Energy component covers building efficiency, building electrification, and facilitating the adoption and integration of distributed generation and other grid-interactive devices (commonly referred to under the broad term “Distributed Energy Resources” or “DERs”).

Building efficiency and electrification need to be a significant part of achieving carbon emissions levels 80% lower than 1990 levels. After transportation, which represents 61% of 2015 emissions, the second largest source of emissions in Palo Alto is natural gas use, at 27% of 2015 emissions. This is primarily related to natural gas use in buildings. GHG emission reduction in this area can be achieved both through more energy efficient buildings and through electrifying buildings to take advantage of low carbon electricity sources. The pace and timing of electrification efforts require consideration of the carbon content of the electricity source, customer impacts and preferences, and market readiness. Through 2020, the City will focus primarily on building efficiency, while continuing to reduce barriers for voluntary building electrification.

The focus on building efficiency is primarily reflected in the following SIP measures, though other SIP measures support efficiency:

| <b>Energy SIP Component – Key Actions related to Building Efficiency</b>   |
|--|
| <ul style="list-style-type: none"> <li>• Develop higher local energy efficiency (&amp; Net Zero) standards for new &amp; existing buildings through codes &amp; standards.</li> <li>• Develop a post-occupancy regulatory process for commissioning/retro-commissioning, and energy benchmarking to improve building design, construction, and performance.</li> <li>• Explore options for using performance requirements and transparency to increase learning and accountability of building operators; use data driven decision criteria to improve building performance.</li> <li>• Develop a Zero Net Energy (ZNE) Roadmap and baseline energy study for existing buildings.</li> <li>• Implement utility energy efficiency (EE) programs to achieve cumulative electric and gas EE savings of 2% by 2020.</li> </ul> |

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<sup>4</sup> Staff Report 5961, *Utilities Advisory Commission Recommendation to Approve Work Plan to Evaluate and Implement Greenhouse Gas Reduction Strategies by Reducing Natural Gas and Gasoline use Through Electrification*, approved by Council August 17, 2015

These proposed SIP measures are consistent with a variety of programs already being implemented under existing Council direction:

- The City has adopted local amendments to the Green Building Ordinance and Energy Code to mandate higher energy efficiency and solar-ready construction for new construction.
- Utilities staff continues to implement existing gas and electric efficiency programs and is adding new programs, such as training of building operators.

Staff is exploring additional efficiency programs that will require additional approvals from Council. For example, Development Services staff is exploring measures to achieve deep efficiency savings in existing buildings and move toward net-zero-energy building standards. Utilities Department staff continues to explore new methods of achieving electric and gas energy efficiency.

To date, the City’s work on electrification has been driven by a Council-adopted work plan<sup>5</sup> developed in response to a Council Colleagues Memo.<sup>6</sup> Updates on this work plan have been provided as part of the City’s annual Earth Day report and at other times for specific issues. The proposed Energy SIP component is consistent with and may eventually subsume elements of this work plan. SIP items relevant to building electrification include:

| <b>Energy SIP Component – Key Actions related to Building Electrification</b>   |
|---|
| <ul style="list-style-type: none"><li>• Encourage voluntary electrification of natural gas appliances by reducing barriers where legally and practically possible (processes, fees, financing, regulation, supply chain, and other costs or secondary disincentives where legally and practically feasible), educate consumers and contractors, and implementing utility pilot programs (e.g. heat pump water heaters and space heaters).</li></ul> |

So far, the following efforts have been completed or are in progress to implement the electrification work plan:

- Utilities and Development Services staff worked with the California Energy Commission (CEC) to reduce or eliminate barriers in the state’s Building Energy Code to installing heat pump water heaters.
- Development Services staff analyzed the feasibility of mandating electrification in buildings through local amendments to the Energy Code. Staff found that most potential electrification measures were not cost-effective using the CEC assessment methodology

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<sup>5</sup> Staff Report 5961, *Utilities Advisory Commission Recommendation to Approve Work Plan to Evaluate and Implement Greenhouse Gas Reduction Strategies by Reducing Natural Gas and Gasoline use Through Electrification*, approved by Council August 17, 2015

<sup>6</sup> December 15, 2014 Colleagues Memo From Council Members Berman, Burt, and Klein Regarding Climate Action Plan Implementation Strategy to Reduce Use of Natural Gas and Gasoline Through “Fuel Switching” to Carbon-free Electricity

required for such mandates, and that there were significant market barriers that made mandates imprudent even for cost-effective measures.<sup>7</sup>

- Utilities staff launched a pilot program to gain experience with heat pump water heaters and is working to develop a heat pump space heating pilot program. Public outreach and training workshops are also being planned.
- Utilities staff is collaborating with other groups to advocate before the CEC and the Air Resource Board for voluntary building electrification as a strategy to meet the state's GHG emissions and energy efficiency goals.

Staff intends to explore the following programs, which would require additional Council approvals, which may potentially require approval of contracts, budgets, and/or policy:

- Try to identify possible funding sources for electrification incentive programs by exploring the legal and practical aspects of various possible sources. Many available funding sources are legally restricted in the way they can be used, while others may face practical barriers.
- Explore further educational and outreach programs to help develop the market for electrification, and identify effective intervention times (e.g. water heater end of life) for informational programs.
- Explore ways to reduce fee- and rate-related disincentives to electrification while ensuring alignment with cost of service principles.
- Explore the feasibility of district heating.

Another component of the efficiency and electrification SIP relates to DERs. The SIP reflects current and future utility efforts to encourage DERs and configure the distribution system to enable their integration. Relevant SIP actions include:

| <b>Energy SIP Component – Key Actions related to Distributed Energy Resources</b>   |
|---|
| <ul style="list-style-type: none"><li>• Facilitate the adoption of local distributed energy resources such as PVs, EVs, and storage and achieve the Local Solar Plan goal of generating 2% of electricity needs locally by 2020 (and 4% by 2023).</li><li>• Ensure Utilities Strategic Plan addresses resource needs and business model changes to implement sustainability initiatives, including adapting to impacts of distributed energy resources, new technologies, and other changes to the utility service model.</li><li>• Complete assessment of smart grid investment merits and long term electric distribution system investment needs by 2019 to enable energy and electrification goals.</li></ul> |

Activities supporting these SIPs will require additional Council approvals, which may potentially require approval of contracts, budgets, and/or policy. Work efforts in progress include:

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<sup>7</sup> See March 1, 2017 Utilities Advisory Commission staff report titled *Discussion of Staff Plans to: (1) Suspend Additional Work on Evaluating the Feasibility of Implementing Local Building Code Amendments to Mandate Heat Pump Water Heaters and Space Heaters ; (2) Continue to Implement Pilot Scale Customer Programs for Heat Pump Water Heaters and Initiate a Pilot Program for Space Heaters*

- Developing a work plan to reassess the merits of smart grid investment.
- Developing a work plan to assess DER potential and to integrate DERs.
- Taking into account the impacts of DERs, new technologies, and other utility services in the Utilities Strategic Plan.
- Continuing to implement the Local Solar Plan, including exploring potential projects and programs like community solar and group buys and taking them for Council approval.

### Water Management

While managing water resources has been an important part of resource planning in California for decades, the past several years of severe drought conditions and this year's flooding have highlighted the need to actively engage in water supply reliability projects as well as watershed protection.

The S/CAP Framework includes goals to reduce water consumption and, as much as possible, match the right quality of water to the use of that water through a diversified supply portfolio that includes water reuse. The Framework also recognizes the need to protect our local watershed including our groundwater aquifer, the bay, marshlands, salt ponds, sloughs and creeks. Of course, maintaining the City's urban canopy is also very important.

Palo Alto is already engaged in a variety of valuable water-related initiatives such as water conservation and education programs, initiatives to reduce the salinity of the City's recycled water, source control efforts to reduce storm water pollution, and a comprehensive Recycled Water Strategic Plan. The [2015 Urban Water Management Plan](#) was approved by City Council in May 2016 and includes a per capita water use reduction goal of 20% by 2020 from a historical benchmark period (average use between years 1995 and 2004). The Water Integrated Resources Plan (WIRP) was recently approved by Council (Staff Report #7634) and provides a comparative analysis of potable water supply alternatives, including demand side management, available to the City. Once the Recycled Water Strategic Plan is complete, the WIRP will be updated with a comprehensive plan for a combined potable and non-potable water supply portfolio.

The proposed SIP actions also contemplate more work with regard to water. UAC feedback is requested on several potential new initiatives including:

- Developing programs and a local ordinance (similar to San Francisco's) that facilitates the use of non-traditional non-potable water sources (grey, black and storm water) and another for net zero water construction;
- Developing a Green Storm Water Infrastructure Plan to better capture and infiltrate storm water back into the hydrologic cycle and integrate with Urban Forestry Plan;
- Investigating innovative ways to increase recycled water use in and outside of Palo Alto; and
- Evaluating additional replacement of ornamental turf on public right of ways.

Staff plans to request a one-time expense of \$140K in the FY2018 budget for consulting costs to develop programs to encourage the use of non-traditional water supplies. Some of the other initiatives highlighted as potential actions here will be proposed in the next 3 years and may require Council approval of additional funds.

### **NEXT STEPS**

The Council is scheduled to review the proposed S/CAP SIPs on April 17, 2017 and provide comments and feedback. The UAC's feedback will be provided to Council for that meeting. Proposed SIPs will also need to undergo the requisite environmental review prior to any Council action. Staff will continue to implement existing programs and launch new programs described in the SIP to the extent there is existing authority to implement and no additional contracts, budget approvals or environmental review is required. Where new authority is needed, staff will return to the UAC, as appropriate, and to Council for further action. Necessary environmental review will be completed, as needed prior to any Council action.

### **RESOURCE IMPACT**

The utility-related portions of the proposed SIPs through 2020 will largely be accomplished by Staff as part of their ongoing job assignments. Where that is not the case, special requests will be included in budget requests for FYs 2018, 2019 and 2020. A rough representation of budgeted Utilities staff efforts towards the building efficiency, building electrification, and vehicle electrification aspects of these SIPs is reflected in Attachment B.

### **POLICY IMPLICATIONS**

The goal of the proposed draft SIP is to implement the policy goals of the previously approved S/CAP Framework. Projects and goals initiated under a wide variety of other Council-approved policies or work plans, as well as under State mandates, are, or will eventually be reflected in the SIP.

### **ENVIRONMENTAL REVIEW**

The UAC's discussion of the proposed utility-related S/CAP SIP components does not meet the California Environmental Quality Act's definition of a project, pursuant to Public Resources Code Section 21065, thus no environmental review is required. Numerous aspects of the proposed SIPs will require and undergo environmental review prior to any Council action on them.

### **ATTACHMENTS**

- A. Sustainability Implementation Plans for Mobility, Efficiency and Electrification, and Water Management
- B. Current Utilities Department Salary and Non-Salary Budgeted Resources for SIP Implementation

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Road transportation represents about 61% of Palo Alto’s existing carbon footprint – and a congestion headache. GHG’s are a function of two factors: Vehicle Miles Traveled (VMT), and the carbon intensity (GHG/VMT). Reducing GHG/VMT is largely driven by Federal Standards, state policy and vehicle offerings (including fuel efficiency and EVs). However, VMT and EV adoption can be influenced by local programs.



## GOALS

- ➔ Expand mobility alternatives to single-occupancy vehicle (SOV) travel
- ➔ Create right incentives for mobility
- ➔ Use balanced development to reduce single-occupancy vehicle (SOV) travel
- ➔ Reduce carbon intensity of vehicles

## NEW/KEY ACTIONS



Key actions related to transportation demand management are in draft form and were still under review at the time of this report. These key actions will be presented to Council at a later date. Only key actions related to electric vehicles are shown.

- ➔ Promote EV charger installation. **P \$**
- ➔ Evaluate incentives, policies and funding sources to stimulate ownership/use of EVs. **P**
- ➔ Encourage local ownership of 3-5,000 EVs by 2020 through programs such as group buys. Explore ways to reduce process and other barriers (such as fee- and rate-related barriers).



## ADDITIONAL RESOURCES PROPOSED FOR FY 2018



The mobility marketplace is changing rapidly: Palo Alto has perhaps the highest EV penetration in the country; US EV sales are increasing 37%/year; “range anxiety” is softening as 200-300 mile range EVs hit the market this year; Lyft and Uber are growing in significance; Autonomous Vehicles are on the way. In addition, land use and mobility interact in substantial and complex ways.

Efficiency, renewables and electrification are key to Palo Alto's—and California's—low carbon energy strategy, but pace of implementation will depend on technology evolution and cost-effectiveness as well as market acceptance. Electrification—and encouraging existing buildings to upgrade to modern energy efficiency levels—may pose significant strategic and operating challenges for the City of Palo Alto Utilities (CPAU).



### GOALS

- ➔ Reduce GHG emissions and energy consumption in buildings
- ➔ Increase building developer/owner/operator learning and accountability via performance requirements
- ➔ Reduce natural gas use in buildings through electrification
- ➔ Reduce carbon intensity of natural gas use via purchase of carbon off-sets

### NEW/KEY ACTIONS



- ➔ Develop higher local energy efficiency (& Net Zero) standards for new & existing buildings through codes & standards. **P**
- ➔ Develop a post-occupancy regulatory process for commissioning/retro-commissioning, and energy benchmarking to improve building design, construction, and performance. **P**
- ➔ Explore options for using performance requirements and transparency to increase learning and accountability of building operators; use data driven decision criteria to improve building performance.
- ➔ Encourage voluntary electrification of natural gas appliances by reducing barriers where legally and practically possible (processes, fees, rates, financing, regulation, supply chain, etc.), educating consumers and contractors, and implementing utility pilot programs (e.g. heat pump water heaters and space heaters). **P**
- ➔ Facilitate the adoption of local distributed energy resources such as PVs, EVs, and storage and achieve the Local Solar Plan goal of generating 2% of electricity needs locally by 2020 (and 4% by 2023).
- ➔ Complete assessment of smart grid investment merits and long term electric distribution system investment needs by 2019 to enable energy and electrification goals. **P**
- ➔ Ensure Utilities Strategic Plan addresses resource needs and business model changes to implement sustainability initiatives, including adapting to impacts of distributed energy resources, new technologies, and other changes to the utility service model. **P**
- ➔ Develop a ZNE Roadmap and baseline energy study for existing buildings. **P \$**
- ➔ Explore formation of an eco-district complete with a board and participating members. **P**
- ➔ Implement utility energy efficiency (EE) programs to achieve cumulative electric and gas EE savings of 2% by 2020.
- ➔ Implement natural gas offset program approved by Council (the Carbon Neutral Gas Plan); prioritize investment in cost-effective local offset projects, where feasible.



### ADDITIONAL RESOURCES PROPOSED FOR FY 2018

\$49 K one time for ZNE Roadmap.



Emissions from natural gas use represent ~25% of Palo Alto's remaining carbon footprint. The decreasing emissions of California and Palo Alto's energy supply due to renewable energy opens the opportunity to reduce natural gas use through electrification in addition to continued efficiency measures. Palo Alto will first seek to reduce natural gas usage through energy efficiency and conservation, followed by electrification of water heating and space heating where cost effective.

# WATER MANAGEMENT

Palo Alto has done an outstanding job of meeting annual water use reduction requirements of the current drought. But both potable water supplies and hydroelectric needs could be challenged by long-term shifts in California's precipitation regime. With shifting climate patterns, and significant long-term water supply uncertainty, it would be prudent to reduce water consumption while exploring ways to capture and store water, as well as to increase the availability and use of recycled water.



## GOALS

- ➔ Reduce consumption
- ➔ Explore water supply alternatives to ensure the right water quality for each use  
Protect creeks, bay, and groundwater
- ➔ Lead by example



## NEW/KEY ACTIONS

- ➔ Develop a local ordinance (similar to San Francisco's) that facilitates the use of non-traditional non-potable water sources such as gray, black, and storm water. **P**
- ➔ Develop programs to encourage more use of non-traditional sources of non-potable water such as gray, black, and storm water. **P \$**
- ➔ Develop a policy and local ordinance to facilitate water self-sufficient (net zero) construction. **P**
- ➔ Explore building a new or modifying an existing City facility to be water self-sufficient (net zero). **\$**
- ➔ Investigate installation of additional trash capture devices in the storm drain system to improve storm water quality.
- ➔ Develop a Green Storm Water Infrastructure Plan to better capture and infiltrate storm water back into the hydrologic cycle and integrate with Urban Forestry Plan. **P \$**
- ➔ Develop a long-term Water Integrated Resources Plan that includes potable water alternatives, demand side management, and recycled water. **P**
- ➔ Investigate delivery of recycled water to other agencies for non-potable use.
- ➔ Investigate delivery of raw water to other agencies for further treatment.
- ➔ Convert ornamental turf on medians and City parks to conserve water use at existing facilities, following evaluation of costs.

## ADDITIONAL RESOURCES PROPOSED FOR FY 2018



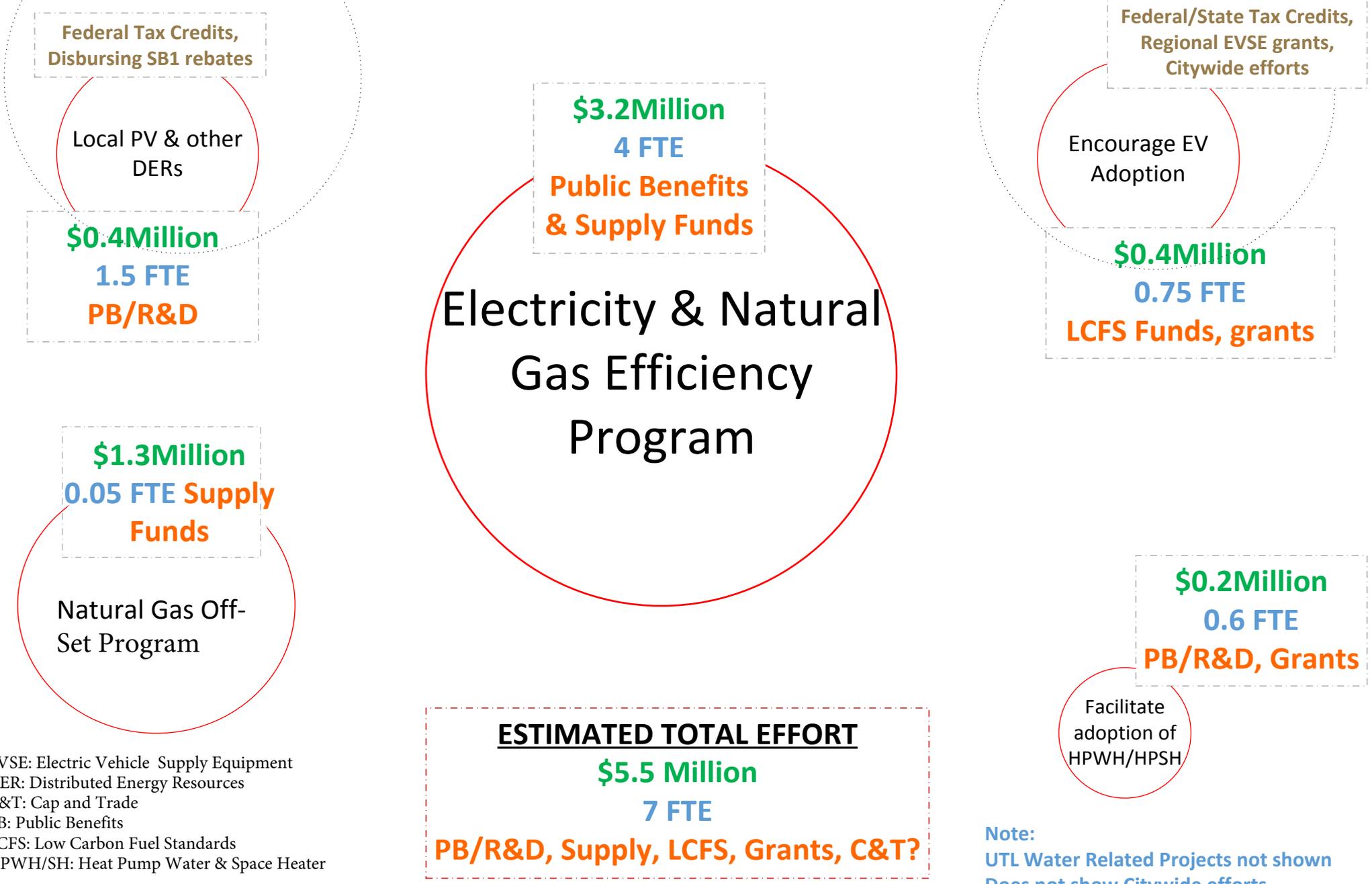
\$140 K in consultant costs to develop programs to encourage use of non-traditional sources of non-potable water  
 \$150 K in consultant costs to develop a Green Storm Water Infrastructure Plan  
 (both are one-time expenses)



Perhaps more than most of the other SIP elements, Water Management will require extensive public engagement, since many people will assume the drought is over, or bristle at rising water rates as deeper consumption cuts take hold .

# Estimate of Relative Efforts Expended by UTL on S/CAP Projects

- Non-Salary Budget/Cost, FTE, and Sources of Funds



**Note:**  
 UTL Water Related Projects not shown  
 Does not show Citywide efforts

EVSE: Electric Vehicle Supply Equipment  
 DER: Distributed Energy Resources  
 C&T: Cap and Trade  
 PB: Public Benefits  
 LCFS: Low Carbon Fuel Standards  
 HPWH/SH: Heat Pump Water & Space Heater