City of Palo Alto (ID # 3550)

City Council Staff Report

Report Type: Consent Calendar **Meeting Date: 3/4/2013**

Council Priority: Environmental Sustainability

Summary Title: Electric Supply Portfolio Carbon Neutral Plan

Title: Finance Committee Recommendation that the City Council Adopt a Resolution Approving a Carbon Neutral Plan for the Electric Supply Portfolio to Achieve Carbon Neutrality by 2013

From: City Manager

Lead Department: Utilities

Recommendation

Staff, the Utilities Advisory Commission, and the Finance Committee recommend that the City Council:

> Approve the attached resolution adopting the Carbon Neutral Plan, which would enable the City to achieve a carbon neutral electric supply portfolio starting in calendar year 2013 within an annual rate impact not to exceed 0.15 cents per kilowatt-hour (¢/kWh).

This carbon neutral rate impact is in addition to the 0.5¢/kWh rate impact limit for acquiring resources for the City's Renewable Portfolio Standard (RPS).

Summary

The proposed Carbon Neutral Plan achieves carbon neutrality for the electric supply portfolio by 2013 with 100% renewable resources. The cost to implement the plan is expected to be less than 0.1¢/kWh in addition to the expected cost of about 0.4¢/kWh to meet the City's Renewable Portfolio Standard goal.

The proposed plan is to purchase renewable energy under long-term contracts for about half of the City's electric supply needs and rely on existing carbon-free hydroelectric resources for the other half of the City's needs. Until those long-term contracts are in place, the plan achieves carbon neutrality by purchasing short-term renewable resources and/or renewable energy certificates (RECs) to supplement existing and committed long-term renewable and hydroelectric resources.

Staff expects that a 50% RPS can be achieved with long-term renewable resources within the existing 0.5¢/kWh rate impact limit approved by Council for RPS. Since about 50% of the current electric supply portfolio consists of carbon-free hydroelectric resources, the additional cost of achieving carbon neutrality in the long term is very low. In the near term (2013-2016) before the long-term contracts are providing renewable energy, the expected cost to achieve carbon neutrality is less than 0.1¢/kWh. The cost could increase if hydro conditions are dry and the cost of RECs goes up significantly. However, the proposed plan includes a retail rate cap of 0.15¢/kWh to achieve carbon neutrality. If the cost is expected to exceed this rate cap in any year, staff will return to the UAC and Council for further direction.

Committee Review and Recommendation

At its February 5, 2013 meeting, the Finance Committee discussed the proposed Carbon Neutral Plan. The staff report to the Finance Committee with the proposed Carbon Neutral Plan is provided as Attachment C. Staff provided a presentation of the Carbon Neutral Plan highlighting the key policy decisions considered in the development of the plan, including alternative products and strategies to achieve carbon neutrality; how to deal with variations in hydroelectric supply resources; rate impacts under various hydroelectric supply and green premium scenarios; how to pay for carbon neutrality; and community support for carbon neutrality.

Staff explained that potential revenues from the auction of carbon allowances under the cap-and-trade system could be used to offset the cost of achieving carbon neutrality, consistent with the policy approved by Council for the use of cap-and-trade revenues (Resolution No. 9307). In the annual budget process, staff will propose how to pay for carbon neutrality considering the use of cap-and-trade revenues, raising retail rates and/or using other electric fund revenues as necessary.

Representing the Utilities Advisory Commission (UAC), Commissioner Steve Eglash indicated that the UAC overwhelmingly supported the proposed plan with the 0.15¢/kWh rate impact limitation and took a close look at the timing and cost of the plan. Committee members commented that they valued the UAC's thorough review. Committee members and speakers from the public remarked on the leadership position the City takes with the adoption of this plan and expressed a desire that other communities follow suit to enhance the effect of its

adoption. After discussion, the Finance Committee voted unanimously to recommend Council approve the proposed Carbon Neutral Plan. The minutes of the Finance Committee's February 5, 2013 meeting are provided as Attachment D.

Resource Impact

The expected annual cost for the next five years, assuming average hydroelectric generation, to implement the proposed Carbon Neutral Plan is shown in Table 1. Also shown is the projected impact of these additional costs on the median residential annual electric bill (based on the median residential monthly consumption level of 407 kWh). The actual cost is subject to actual load, availability of hydroelectric generation, renewable energy costs, renewable attributes banked from one calendar year to the next, and emissions emitted by existing renewable resources and the City's back-up generator.

Deferring implementation of the Carbon Neutral Plan to 2015 or 2017 would result in not spending $1.24 million or $2.72 million, respectively.

Table 1: 5-Year Expected Cost and Bill Impact to Achieve Carbon Neutrality

	2013	**2014**	**2015**	**2016**	**2017**
Total Cost	$630,000	$610,000	$570,000	$910,000	$ 40,000
Median Residential Bill Impact ($/year)	$3.07	$2.93	$2.73	$4.36	$0.19

Adoption of the Carbon Neutral Plan will not result in a need to adjust the adopted electric commodity budget for FY 2013. Any purchases of renewable resources for calendar year 2013 will be included as part of the proposed FY 2014 Electric Fund budget.

As part of the City's annual budget process, staff will estimate the incremental cost associated with implementing the Carbon Neutral Plan based on the latest forecast for electric load projections, supply resource conditions and the price of acquiring renewable resources and will recommend how to cover these costs including the use of Electric Fund reserves, revenues from the sale of allowances in the cap-and-trade auctions, and/or electric rate increases.

Table 2 illustrates potential customer bill impacts under different usage levels for the expected cost and if the full rate impact limit of 0.15¢/kWh is imposed in 2013. The table also shows how the City's bill would compare to neighboring communities including those served by Pacific Gas and Electric (PG&E).

Table 2: Monthly Electric Bill Comparison for 2013

Usage (kWh/month)	Palo Alto's Current Bill ($/month)	Palo Alto's Bill with Carbon Neutral Plan ($/month)		Santa Clara ($/month)	PG&E ($/month)
		Expected Cost	With 0.15¢/kWh		
Residential Customer Monthly Bill					
300	$28.57	$28.75	$29.02	$30.37	$38.54
(Median) 407	$42.50	$42.77	$43.18	$41.66	$53.21
650	$76.33	$76.72	$77.31	$67.11	$117.72
1,200	$172.03	$172.75	$173.83	$124.84	$300.23
Commercial Customer Monthly Bill					
1,000	$127	$128	$129	$156	$163
160,000	$17,245	$17,341	$17,485	$18,002	$18,801
500,000	$50,430	$50,730	$51,180	$54,352	$54,285
2,000,000	$178,800	$180,000	$181,800	$210,129	$222,168

Policy Impacts

Approval of the recommended Carbon Neutral Plan is consistent with the Council-approved Long-term Electric Acquisition (LEA) Objectives, Strategies and Implementation Plan; supports the Council-approved 2011 Utilities Strategic Plan's environmental sustainability objective; is consistent with the City's Climate Protection Plan; and supports environmental sustainability, one of the City Council's top priorities.

Environmental Impacts

Implementation of the Carbon Neutral Plan is expected to reduce 330,000 metric tons of GHG emissions in 2013 through 2016. Beyond 2016, reductions of GHG emissions are mostly attributed to achieving an RPS of about 50%.

Adopting a carbon neutral plan does not meet the California Environmental Quality Act's (CEQA) definition of a "project" under California Public Resources Code Sec. 21065, thus no environmental review is required.

Attachments:

- Attachment A - Resolution Approving Carbon Neutral Plan (PDF)

- Attachment B - Carbon Neutral Plan (PDF)
- Attachment C - Staff Report ID 3404 Electric Supply Portfolio Carbon Neutral Plan Report for Finance Committee (PDF)
- Attachment D - Draft Minutes of the Finance Committee Meeting of 02-05-13 (PDF)

ATTACHMENT A

* NOT YET APPROVED *

Resolution No. _____
Resolution of the Council of the City of Palo Alto Approving a Carbon Neutral Plan for the Electric Supply Portfolio to Achieve Carbon Neutrality by 2013

A. In an effort to combat climate change in December 2007 the City of Palo Alto ("City") adopted the Climate Protection Plan, which set aggressive greenhouse gas (GHG) emission reduction goals to be achieved by the year 2020.

B. In March 2011, the City unanimously approved the Long-term Electric Acquisition Plan (LEAP) a strategic planning document focused on how the City's Utilities Department (CPAU) can successfully balance environmental and economic sustainability as it provides electric service to CPAU customers. LEAP was updated in April 2012 through Resolution 9241.

C. In accordance with the LEAP Climate Protection Strategy #5 to reduce the electric portfolio's carbon intensity, staff evaluated the costs, benefits and impacts of the implementation of an electric portfolio carbon neutral policy and the setting of quantitative goals. Staff's preliminary findings were presented to the Utilities Advisory Commission ("UAC"), Finance Committee and Council and in May 2012, the City Council directed staff to develop a plan to achieve carbon neutrality for the electric supply portfolio by January 2015 (Staff report 2525).

D. On November 5, 2012, Council approved (Staff Report 3194) the following definition of carbon neutrality for the City's electric supply portfolio: A carbon neutral electric supply portfolio will demonstrate annual net zero greenhouse gas (GHG) emissions, measured at the Citygate, in accordance with The Climate Registry's Electric Power Sector protocol for GHG emissions measurement and reporting.

E. Staff presented the Carbon Neutral Plan to the UAC on December 5, 2012 and the UAC voted unanimously (six in favor and one absent) to recommend that the City adopt the Carbon Neutral Plan.

F. On December 16, 2012, UAC Commissioners James Cook (Chair), Steve Eglash and John Melton presented a Commissioner's Memorandum to request the Carbon Neutral Plan be revisited. The Commissioner's Memorandum was discussed at the January 9, 2013 UAC meeting and the UAC voted (four in favor, two opposed and one absent) to recommend to Council that the Carbon Neutral Plan's rate cap be reduced from 0.25 cents/kWh to 0.15 cents/kWh.

G. Subsequent to the January 2013 UAC meeting, staff revised its spending cap recommendation to limit any future electric rate impact to 0.15 cents/kWh.

H. On February 5, 2013, the Finance Committee voted unanimously (four in favor)

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to approve the revised Carbon Neutral Plan, which includes the 0.15 cents/kWh rate cap.

The Council of the City of Palo Alto does hereby RESOLVE as follows:

SECTION 1. The Council hereby adopts the resolution approving the Carbon Neutral Plan as provided for in Exhibit A.

SECTION 2. The Council directs staff to return to the UAC and the Council in the event that the cost of City's achievement of carbon neutrality for the electric supply portfolio would exceed an electric retail rate impact of 0.15 cents/kWh.

SECTION 3. The Council finds that any eventual changes to the City's electric rates impacted by Council's adoption of the Carbon Neutral Plan shall not create special taxes because such rates shall be charges imposed for a specific government service or product provided directly to the payor that are not provided to those not charged, and which shall not exceed the reasonable costs to the City of providing the service or product.

SECTION 4. The Council finds that the adoption of this resolution does not constitute a project under Section 21065 of the California Environmental Quality Act (CEQA) and the CEQA Guidelines, and therefore, no environmental assessment is required.

INTRODUCED AND PASSED:

AYES:

NOES:

ABSENT:

ABSTENTIONS:

ATTEST:

_____
City Clerk

_____
Mayor

APPROVED AS TO FORM:

APPROVED:

_____
Senior Deputy City Attorney

_____
City Manager

_____
Director of Utilities

_____
Director of Administrative Services

Exhibit A to Resolution No XXXX
Adopted by City Council on _____

City of Palo Alto Utilities
Electric Supply Portfolio Carbon Neutral Plan

1. Carbon Neutral Definition

A carbon neutral electric supply portfolio will demonstrate annual net zero greenhouse gas (GHG) emissions, measured at the Citygate[1], in accordance with The Climate Registry's Electric Power Sector protocol for GHG emissions measurement and reporting.

2. Carbon Neutral Plan Objective

Reduce the City of Palo Alto's overall community GHG emissions by achieving carbon neutrality for the Electric Supply Portfolio starting in calendar year 2013 within an annual rate impact not to exceed 0.15 cents per kilowatt-hour (¢/kWh) primarily through the: 1) engagement of customers to increase energy efficiency; 2) expansion of long-term renewable resource commitments; 3) promotion of local renewable resources; 4) continued reliance on existing hydroelectric resources; and 5) meeting short-term balancing requirements and/or neutralizing residual carbon through the use of short-term purchases of renewable resources and/or renewable energy certificates (RECs).

3. Resource Strategies

a. *Energy Efficiency*
   i. Continue to pursue energy efficiency strategies as identified in the Council-approved ten-year Energy Efficiency Plan.

b. *Long-term Renewable Resources*
   i. Continue to pursue the City's Renewable Portfolio Standard (RPS) goal to purchase renewable energy to supply at least 33% of retail sales by 2015 while ensuring that the retail rate impact of these purchases does not exceed 0.5 ¢/kWh.
   ii. Continue to pursue local renewable resources through the Palo Alto CLEAN and PV Partners programs.
   iii. Pursue additional RPS-eligible, long-term renewable resources (beyond the RPS goals) to achieve a target of 100% carbon-free resources based on average year hydroelectric generation.

[1] Citygate is the location of the City's main meter where the City interconnects to the Pacific Gas and Electric transmission system. Emissions associated with of the output of the locally sited fossil gas fired combustions units (COBUG), while not measured at Citygate, will be neutralized.

c. *Short-term Renewable Resources and Renewable Energy Certificates*
   i. For calendar years 2013 through 2016, procure short-term renewables, if the price is comparable to that of an un-bundled REC;
   ii. For calendar years 2013 through 2016, procure RPS-eligible, un-bundled RECs as needed to achieve carbon neutrality based on actual load and resources;
   iii. Neutralize anthropogenic GHG emissions associated with renewable resources with unbundled-RECs, which may or may not be RPS-eligible.

d. *Banking and Truing Up*
   i. In the event that there are surplus renewables beyond the load in a particular year, bank as many RECs as allowable under the TCR EPS protocol from qualifying renewables from that year to minimize the need for purchasing RECs in subsequent years.
   ii. Neutralize emissions associated with market purchases resulting from deviations between expected and actual load and renewable and hydroelectric generation resources with unbundled-RECs, which may or may not be RPS-eligible.

4. Hydroelectric Resources

a. Continue to preserve and advocate for existing carbon-neutral hydroelectric generation resources that provide approximately 50% of average year resource needs.
b. Plan for and acquire carbon neutral resources assuming average hydroelectric conditions going forward.
c. Under adverse hydroelectric conditions, procure unbundled-RECs, which may or may not be RPS-eligible, to achieve carbon neutrality up to the 0.15 ¢/kWh rate impact limit and seek Council direction if carbon neutrality cannot be achieved within the rate impact limit.
d. Under favorable hydroelectric conditions, where carbon neutral resources are expected to be surplus to needs, even after allowable banking, then pursue selling short-term renewable energy, or the renewable attributes, associated with one or more carbon-neutral resources in the portfolio.

5. Financial and Rate Payer Impacts

a. In addition to the RPS annual rate impact limit of 0.5 ¢/kWh, the cost of achieving carbon neutrality shall not exceed 0.15 ¢/kWh based on an average hydro year.
b. Revenues collected from surplus energy sales related to hydroelectric resources under favorable conditions (e.g. wet years), will be maintained within reserves to adjust for the cost of achieving carbon neutrality under adverse hydroelectric years.
c. To the extent available and allowable, revenues from the auction of cap-and-trade allowances may be used to fund resources acquired to meet the carbon neutrality goals.

6. Reporting and Communication

a. Develop a communication plan for stakeholders to inform them of the City's efforts towards achieving a carbon neutral electric supply.

b. Submit an annual, verified report of the carbon content of the electric supply portfolio to The Climate Registry.
c. Provide customers a report of the electric supply portfolio's carbon content to supplement the mandated Power Content Label.
d. Inform large commercial and/or corporate customers of the City's carbon neutral portfolio and its relevance to their individual corporate sustainability goals.

7. Implementation Plan

The tasks that need to be completed in the next two years pending Council approval of the Carbon Neutral Plan in February 2013 are listed in the table below.

Item	Timeframe
1. Modify electric supply portfolio models and Energy Risk Management Policies, Guidelines and Procedures to account for Carbon Neutral objectives, balancing, banking of renewable attributes, reporting and financial impacts.	By April 2013
2. Modify the Long-term Electric Acquisition Plan (LEAP) to include the carbon neutral objective	By June 2013
3. Develop communication plan to inform customers and stakeholders of Carbon Neutral Plan and efforts.	February to April 2013
4. Based on response to the Fall 2012 request for proposals, seek approval of new renewable power purchase agreements to meet the City's RPS up to approximately 100% of the long-term resource needs in average hydro years.	December 2012 to June 2013
5. Determine resource needs for CY 2013 through CY 2016 and develop plan to acquire short-term renewable resources.	By June 2013
6. Determine long-term renewable purchase volumes for beyond CY 2016 and develop plan to acquire long-term renewable resources.	By September 2013
7. Procure RECs as needed to neutralize carbon emissions based on actual load and resources for CY 2013.	By May 2014
8. Along with annual Power Content Label, produce and report to customers the carbon intensity of the electric supply portfolio.	May/June 2014 and annually thereafter
9. Produce and submit Electric Power Sector (EPS) and Local Governments Operation Protocol (LGOP) reports to The Climate Registry (TCR) for CY 2013.	July and October 2014 and annually thereafter
10. Get independent verification of TCR reports and submit audited reports to TCR.	By December 2014 and annually thereafter
11. Redesign the PaloAlto**Green** program according to Council direction.	By December 2013

City of Palo Alto (ID # 3404)

Finance Committee Staff Report

Report Type: **Meeting Date: 2/5/2013**

Council Priority: Environmental Sustainability

Summary Title: Electric Supply Portfolio Carbon Neutral Plan

Title: Utilities Advisory Commission Recommendation that the City Council Adopt a Resolution Approving a Carbon Neutral Plan for the Electric Supply Portfolio to Achieve Carbon Neutrality by 2013

From: City Manager

Lead Department: Utilities

Recommendation

Staff requests that the Finance Committee recommend that the City Council:

> Approve the attached resolution adopting the Carbon Neutral Plan, which would enable the City to achieve a carbon neutral electric supply portfolio starting in calendar year 2013 within an annual rate impact not to exceed 0.15 cents per kilowatt-hour (¢/kWh).

This carbon neutral rate impact is in addition to the 0.5¢/kWh rate impact limit for acquiring resources for the City's Renewable Portfolio Standard (RPS).

Originally, staff recommended a rate impact limit of 0.25¢/kWh for achieving carbon neutrality for the electric supply portfolio. However, staff is comfortable with a rate impact limit of 0.15¢/kWh with the understanding that, if staff anticipates that the cost to achieve carbon neutrality will exceed 0.15¢/kWh, staff will return to Council for direction. This staff position is in response to the Utilities Advisory Commission (UAC) recommendation of 0.15¢/kWh.

At its January 2013 meeting, the Utilities Advisory Commission (UAC) recommended that the City Council approve the attached resolution with a 0.15¢/kWh rate impact limit.

Summary

The proposed Carbon Neutral Plan relies on long-term renewable contracts. However, since those contracts take time to negotiate and the renewable projects take time to build, sufficient renewable energy for the City's needs will not be in place until 2017. In the interim, the plan uses RPS-eligible Renewable Energy Certificates (RECs) from 2013 through 2016. Although the Council directed staff to develop a plan to achieve carbon neutrality by 2015, the proposed Carbon Neutral Plan allows the City to deliver zero carbon electricity starting in 2013 since the cost is expected to be very reasonable ($500,000 to $900,000 per year for 2013 to 2016), causing a rate impact of only 0.05 to 0.09¢/kWh. Options other than the use of RPS-eligible RECs to achieve carbon neutrality can cost slightly less (if non-RPS-eligible RECs are used) or significantly more (if short-term renewable energy is purchased) than the recommended plan. Annual costs may increase due to higher costs for RECs or poor hydroelectric generation, but the plan includes a rate impact limit of 0.15¢/kWh. If costs were to exceed that limit in any year, staff would return to the Council for direction as to whether to continue efforts to achieve carbon neutrality for that year.

Recognizing the significance of climate change resulting from greenhouse gas (GHG) emissions and their potential devastating impacts to both the local and global environment and economy, the City has a record of taking initiatives towards environmental sustainability. As such, the City recognized environmental sustainability as one of its top priorities and in 2007 approved an aggressive Climate Protection Plan which identified community-wide GHG emission reduction goals.

Further, for its electric supply portfolio, the City has taken aggressive steps towards reducing GHG emissions through its energy efficiency efforts, encouragement of the installation of solar photovoltaic panels on rooftops, participation in the PaloAlto**Green** program, and adoption of an accelerated Renewable Portfolio Standard (RPS). Combined, these efforts are expected to account for an over 40% drop in GHG emissions related to the local use of electricity in 2012 compared to 2005 levels (assuming average hydrological conditions).

The proposed Carbon Neutral Plan leaps the City forward in its efforts to combat climate change by implementing a policy to effectively eliminate all GHG emissions from the electric portfolio. Additionally, with the intent of placing the City at the forefront of environmental sustainability, the Carbon Neutral Plan is designed to be transparent, credible, sustainable, inspirational and repeatable by other communities**. The proposed Carbon Neutral Plan achieves carbon neutrality for the electric supply portfolio by 2013 with 100% renewable resources. The cost of this plan is expected to be less than 0.1¢/kWh in addition to the expected cost of about 0.4¢/kWh to meet the City's RPS goal.**

The proposed plan has two phases. In the near term (2013 through 2016), staff recommends purchasing short-term renewable resources and/or RECs to supplement existing and committed long-term renewable and hydroelectric resources. Existing and committed long-term renewable and hydroelectric resources account for 65% to 83% of the portfolio. In the long term (beyond 2016), long-term renewable resources will provide about a 50% RPS level within the existing 0.5¢/kWh annual RPS rate limit. Since about 50% of the electric supply portfolio is carbon-free hydroelectric resources, the additional cost of achieving carbon neutrality between 2017 and 2020 is very small. Table 1 is a summary of the expected cost of achieving carbon neutrality in average hydroelectric conditions.

Table 1: Total Cost to Achieve Carbon Neutrality – cents per kWh

	2013	2014	2015	2016	2017	2018	2019	2020
RPS Plan: committed and additional long-term renewables to meet RPS goal	0.10	0.24	0.38	0.38	0.40	0.40	0.40	0.40
Carbon Neutral Plan: additional costs to achieve a carbon neutral portfolio	0.06	0.06	0.05	0.09	0.00	0.00	0.00	0.01
Total Cost	**0.16**	**0.30**	**0.42**	**0.46**	**0.40**	**0.40**	**0.40**	**0.41**

In dry years, the amount of hydroelectric generation is significantly lower than in an average hydro year. Thus, in dry years, there are expected to be additional costs to replace the reduced hydroelectric generation with carbon-free resources to maintain a carbon neutral portfolio. Therefore, although staff expects that the cost of achieving carbon neutrality will be within the 0.5¢/kWh limit to meet the City's RPS goals, staff is requesting an additional 0.15¢/kWh to achieve carbon neutrality, if needed in the event of a dry year scenario or other unanticipated cost increases for renewable energy.

Table 2 shows the annual cost to implement the proposed Carbon Neutral Plan. The maximum cost, in the event that the full 0.15¢/kWh was needed to achieve carbon neutrality, is about $1.5 million per year, or about 1.2% of total Electric Fund retail revenues. Over the period from 2013 to 2016, the expected cost of the plan is $2.6 million, but if the full 0.15¢/kWh is needed, the total cost would be $6 million.

Table 2: Annual Cost to Implement Carbon Neutral Plan ($millions)

	2013	2014	2015	2016	2017	2018	2019	2020	Total
Expected Cost	0.6	0.6	0.5	0.9	0.0	0.0	0.0	0.1	2.7
Maximum Cost (@0.15¢/kWh)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	12

At its December 2012 meeting, the UAC unanimously recommended Council approve the proposed Carbon Neutral Plan. At its January 2013 meeting, the UAC reviewed the expected and maximum costs of the proposed Carbon Neutral Plan again and recommended a rate impact cap of 0.15¢/kWh.

Background

Policy Direction

Council approved the City's Climate Protection Plan (CPP) in December 2007 (CMR 435:07). The CPP set a goal to reduce GHG emissions by 15% from 2005 levels by the year 2020. In March 2011 Council approved the Long-term Electric Acquisition Plan (LEAP) (Staff Report 1317) establishing general direction for efforts to reduce the electric portfolio's carbon intensity. In July 2011 Council approved the Utilities Strategic Plan (Staff Report 1880), including a performance measure to reduce the carbon intensity of the electric portfolio. When Council last updated LEAP in April 2012 (Staff Report 2710), it clarified that the City's RPS is to pursue renewable purchases of at least 33% of retail sales by 2015 within a retail rate impact of 0.5¢/kWh.

The LEAP implementation plan included a task to evaluate the costs, benefits and impacts of implementing a carbon neutral electric supply portfolio policy and/or setting quantitative GHG emission goals for the electric supply portfolio. On May 21, 2012, Council unanimously directed staff to develop a plan by December 2012 to achieve carbon neutrality for the electric supply portfolio by January 2015 (Staff Report 2525). On November 5, 2012, Council approved the following definition of carbon neutrality for the City's electric supply portfolio (Staff Report 3194):

> Carbon Neutrality: A carbon neutral electric supply portfolio will demonstrate annual net zero greenhouse gas (GHG) emissions, measured at the Citygate[1], in accordance with The Climate Registry's Electric Power Sector protocol for GHG emissions measurement and reporting.

On December 10, 2012, the Council approved a policy for the use of cap-and-trade revenues (Staff Report 33342) which is intended to be consistent with the goals set forth in the State of California's Global Warming Act, also known as Assembly Bill 32 (AB 32). Recognizing a potential cap-and-trade program revenue benefit of approximately $4.5 million per year for the City's electricity customers, the policy establishes the proper use of the potential revenues,

[1] Citygate is the industry term for the location of the City's main meter where the City interconnects to the Pacific Gas and Electric transmission system.

including funding investments in activities to reduce GHG emissions and/or achieve a carbon neutral electric supply portfolio.

Electric Portfolio Mix

Energy Efficiency: As required by state law (AB 2021, 2006), publicly owned electric utilities must identify all potentially achievable cost-effective electric energy efficiency (EE) savings and establish annual targets for energy efficiency over 10 years. The ten-year energy savings and demand reduction targets are required to be updated every four years to reflect changes in technologies, building codes, equipment standards, energy cost, etc. These targets were last updated in December 2012, when the Council adopted the latest 10-year cumulative electric savings target of 4.8% for 2014 to 2023, which included an explicit accounting of savings attributed to appliance codes and building standards upgrades (Staff Report 3358).

Renewable Energy: Staff expects to reach an RPS of 33% of retail sales by 2015 and an RPS of about 50% of retail sales by 2017 within the 0.5¢/kWh RPS rate impact limit. These committed and expected RPS resources are all from long-term Power Purchase Agreements (PPAs). The cost of each resource is compared to the cost of an equivalent amount of brown power and the increased (or decreased) cost, or "green premium" of the renewable energy is calculated. Table 3 is a summary of the City's committed renewable resources and the green premium for each resource type. As shown, the green premium for all committed resources totals $3.86 million, or a rate impact of 0.38¢/kWh.

Table 3 – Summary of Currently Committed Renewable Energy Supplies in 2015

	Annual Generation (GWh)	**Total Annual Green Premium ($1000)**
Small Hydro	10.0	0
Wind	120.3	(339)
Landfill Gas to Energy	126.0	2,229
Geothermal	33.1	1,107
Solar	50.7	857
Total Committed Renewable Supplies	**340.0**	**3,855**

*Annual green premium associated with a rate impact of 0.5¢/kWh is equal to $5.1 million

Community Support for Carbon Neutrality

Sensitive to adding even modest costs to the electric supply portfolio in a time when costs are projected to increase substantially due to external factors including transmission and delivery costs and increased regulatory requirements, staff sought input from the community to assess

support for carbon neutral efforts and their willingness to pay for a carbon neutral electric supply. In general, support by residents for efforts to achieve carbon neutral are high, with 73% of those residents surveyed indicating a willingness to pay at least $2 more per month to achieve carbon neutrality and 63% willing to pay $5 or more.

By contrast, 63% of a relatively small sampling of commercial customers responded to the same anonymous survey and indicated that they would not be willing to pay more in support of carbon neutrality. A summary of the survey responses is provided as Attachment C. In addition, staff individually contacted many of the largest commercial customers and found that all those contacted supported the City's pursuit of a carbon neutral electric portfolio at a moderate cost and stated that such an endeavor would assist them in meeting their own corporate GHG emissions reduction goals.

Discussion

The definition of carbon neutrality establishes the measuring point, scope, and balancing period for the achievement of zero net GHG emissions for the electric supply portfolio. While the Carbon Neutral Plan provides for how and when carbon neutrality will be achieved, it is intended to work in concert with the City's EE goals, local resource generation efforts and RPS to achieve the overall goal of cost effectively eliminating GHG emissions from the electric supply portfolio.

Base Case (Make no extra attempt to achieve carbon neutrality)

The current ("Base Case") electric supply portfolio consists of hydroelectric resources, which provide about 51% of the City's electric needs in an average year. In addition, committed RPS-eligible renewable resources account for 23% and 27% of the City's needs in 2013 and 2014, respectively and 33% of the City's needs in 2015 and beyond. In addition, the City's ten-year EE goals and the long-term PV Partners program goals are assumed to be met.

Since the committed renewable resources consume about 0.38¢/kWh of the RPS green premium, the Base Case assumes that additional renewables will be pursued to meet the City's additional long-term electric needs. Based on the responses to a solicitation released in the Fall of 2012 for additional renewable energy PPAs, staff expects to be able to purchase long-term renewable energy resources for the balance of the City's electric needs within the 0.5¢/kWh rate impact limit starting in 2017.

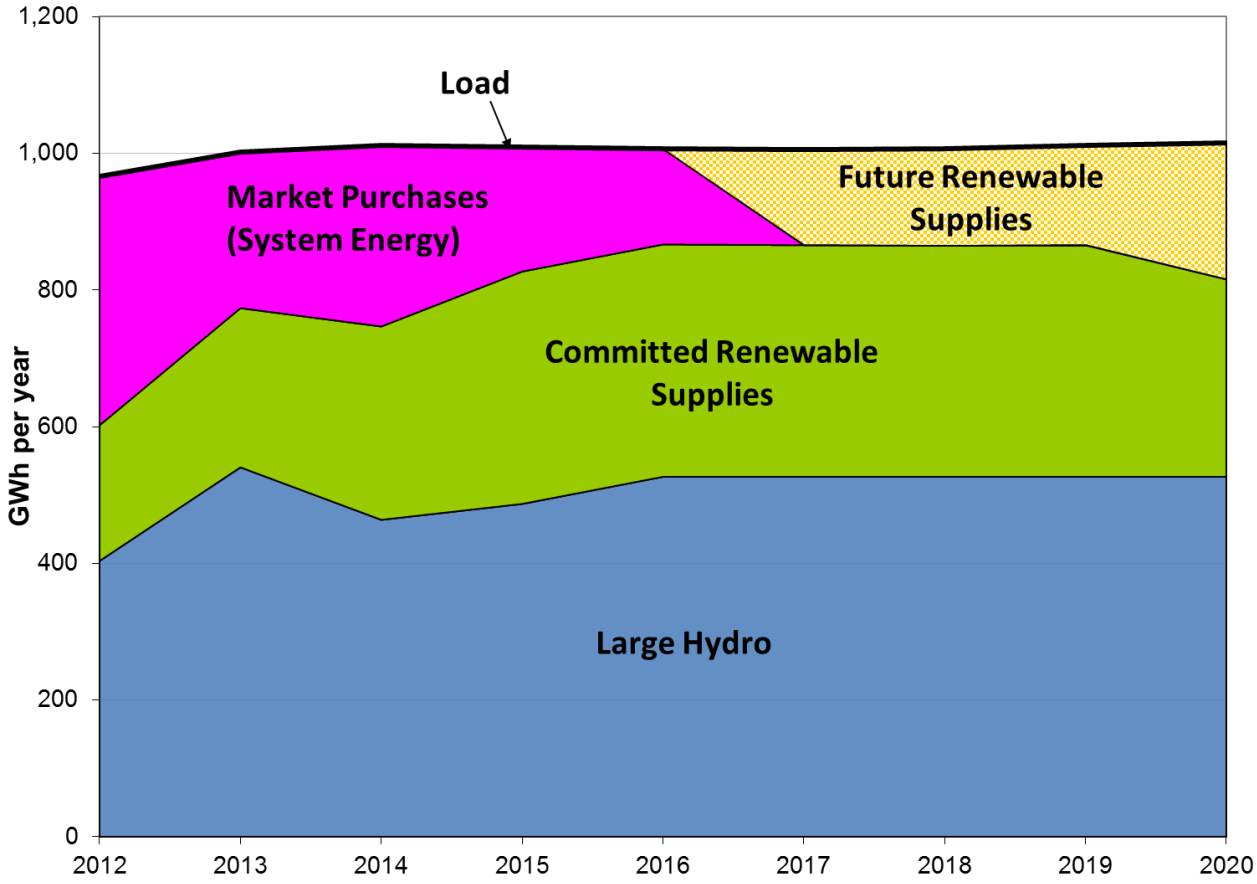
Therefore, due to the RPS goal, and even without a carbon neutral goal, carbon-free large hydroelectric resources would provide about half of the electric supplies required and long-term RPS-eligible resources would provide the other half starting in 2017 (when the additional

long-term resources are expected to be on-line and delivering energy). Staff expects that this can be achieved with a rate impact of only 0.4¢/kWh. Table 4 is a summary of the Base Case resource mix, including the current and additional resources to meet the RPS goal. Figure 1 shows the committed and expected resources to meet the City's RPS in the Base Case portfolio.

Table 4: Committed and Expected (Base Case) Resource Supply Mix

	2013	2014	2015	2016	2017	2018	2019	2020
Load (GWh)	1,040	1,053	1,056	1,054	1,052	1,054	1,057	1,059
Large hydroelectric (% of Load)	43%	44%	51%	51%	51%	51%	51%	51%
Committed renewable RPS-compliant resources								
Committed renewable resources (GWh)	234	281	340	340	339	339	339	339
% of Retail Sales (RPS)	23%	28%	33%	33%	33%	33%	33%	33%
% of Load	23%	27%	32%	32%	32%	32%	32%	32%
RPS Green Premium consumed (¢/kWh)	0.10	0.24	0.38	0.38	0.38	0.38	0.38	0.38
Total committed plus hydro resources (% of Load)	65%	71%	83%	83%	83%	83%	83%	83%
Committed plus additional long-term RPS-compliant renewables – BASE CASE								
Additional long-term resources (GWh)	0	0	0	0	180	176	176	175
% of Retail Sales (RPS)	23%	28%	33%	33%	51%	51%	50%	50%
% of Load	23%	27%	32%	32%	49%	49%	49%	48%
RPS Green Premium consumed (¢/kWh)	0.10	0.24	0.38	0.38	0.40	0.40	0.40	0.40
Total committed and additional renewables plus hydro resources (% of Load)	65%	71%	83%	83%	100%	100%	100%	100%

Figure 1: Electric Portfolio Load and Expected Resource Supply Mix (Base Case)



Due to the electric supply portfolio's heavy reliance on hydroelectric sources, the volume of system energy purchases can vary substantially from year to year given variations in the hydrologic cycle. These hydroelectric generation variations are an important driver of the costs associated with zeroing out GHG emissions in dry years.

Electric Portfolio's GHG Emissions

Under the adopted carbon neutrality definition, which uses The Climate Registry's Electric Power Sector (TCR EPS) protocol, GHG emissions from all supply resources must be counted (See Attachment D for a summary of the TCR EPS protocol). According to the protocol, the only resources in the Base Case with GHG emissions are associated with renewable energy generated from the geothermal project, the small amount of emissions associated with the City-owned back-up generator (COBUG), and the market purchases.

The TCR EPS protocol allows the use of a default emissions factor for landfill-gas-to-energy projects of 38 lb CO2e/MWh if there is no information about the emissions associated with the specific projects in the portfolio. The emissions for these projects are derived from the use of

fossil-fuel based natural gas used to supplement the renewable landfill gas used in the generators. However, for Palo Alto's PPAs for landfill-gas-to-energy projects, only landfill gas is used, so those resources are carbon-free and an emissions factor of 0 lb CO2e/MWh is applied.

Table 5 shows the GHG emissions for the Base Case for the years 2013 thorugh 2020. As shown, the bulk of the GHG emissions for the near term are due to the market purchases. After 2017, due to the large amount of renewable resources, the GHG emissions are projected to be very small.

Table 5: Base Case Electric Supply Resources and GHG Emissions by Year

	2013	2014	2015	2016	2017	2018	2019	2020
Load and Resources (GWh)								
Load	1,040	1,053	1,056	1,054	1,052	1,054	1,057	1,059
Committed Carbon-Free Resources (1)	681	744	840	844	843	846	848	848
Geothermal	0	5	33	33	33	33	33	33
Additional renewables	0	0	0	0	180	176	176	175
Market Purchases ("System Energy") (2)	359	304	182	177	-4	-1	1	3
GHG emissions (Metric Tons CO2e)								
Geothermal	0	589	3,523	3,533	3,523	3,523	3,523	3,533
COBUG	278	278	278	279	278	278	278	279
Market Purchases (2)	107,634	91,120	54,720	52,998	0	0	242	934
Total GHG emissions	**107,912**	**91,987**	**58,521**	**56,810**	**3,801**	**3,801**	**4,043**	**4,746**

(1) Includes hydroelectric, wind, landfill gas-to-energy, and solar resources

(2) A Market Purchase, also called System Energy, is "brown" power whose source is unspecified, or not tied to a specific generator

Resources that Can Be Used to Achieve Carbon Neutrality

Emissions from the sources listed in Table 5 can be zeroed out through three primary methods: purchasing RECs, purchasing renewable energy, and purchasing carbon offsets. RECs can be purchased separately from the associated energy ("unbundled") or together with the energy from the renewable energy project ("bundled").

Renewable Energy Certificates (RECs) – A Primer

The U.S. Environmental Protection Agency (EPA) has provided a definition and descriptions of the various types of RECs[2]. According to EPA:

> "A REC represents the property rights to the environmental, social, and other non-power qualities of renewable electricity generation. A REC, and its associated attributes and benefits, can be sold separately from the underlying physical electricity associated with a renewable-based generation source. RECs provide buyers flexibility in procuring green power across a diverse geographical area, and in applying the renewable attributes to the electricity use at a facility of choice. This flexibility allows organizations to support renewable energy development and protect the environment when green power products are not locally available.
>
> "All grid-tied renewable-based electricity generators produce two distinct products: physical electricity and RECs. At the point of generation, both product components can be sold together or separately, as a bundled or unbundled product. In either case, the renewable generator feeds the physical electricity onto the electricity grid, where it mixes with electricity from other generation sources. Since electrons from all generation sources are indistinguishable, it is impossible to track the physical electrons from a specific point of generation to a specific point of use.
>
> "As renewable generators produce electricity, they create one REC for every 1000 kilowatt-hours (or 1 megawatt-hour) of electricity placed on the grid. If the physical electricity and the associated RECs are sold to separate buyers, the electricity is no longer considered "renewable" or "green." The REC product is what conveys the attributes and benefits of the renewable electricity, not the electricity itself.
>
> "RECs serve the role of laying claim to and accounting for the associated attributes of renewable-based generation. The REC and the associated underlying physical electricity take separate pathways to the point of end use. As renewable generators produce electricity, they have a positive impact, reducing the need for fossil fuel-based generation sources to meet consumer demand. RECs embody these positive environmental impacts and convey these benefits to the REC owner."

[2] See EPA's white paper on RECs at: http://www.epa.gov/greenpower/documents/gpp_basics-recs.pdf

Unbundled RECs

System energy emissions can be eliminated on a carbon accounting basis through purchasing an equal amount of RECs, which are denominated in MWhs. In essence, this "converts" system energy into non-emitting renewable energy. This is similar in concept to how green pricing programs such as PaloAlto**Green** are administered. These unbundled RECs are also referred to as "Bucket 3" RECs[3] and qualifying Bucket 3 RECs can meet a portion of the RPS goals.

TCR protocols allow entities that procure unbundled RECs to adjust their emissions inventories to account for these products. Even though the physical energy is not delivered, TCR allows the use of unbundled RECs—whether RPS eligible or not—to displace an equivalent amount of power from the actual power mix. This adjustment is allowed because the RECs include all renewable and environmental attributes associated with the production of electricity from the renewable energy resource.

RECs are also denominated in pounds of CO2e emissions reductions. Each REC can be used for its MWh denomination, or its carbon intensity, but not both. RECs are assigned carbon emissions factors based on the location of the renewable energy project associated with the REC. The TCR protocol allows such uses of RECs to zero out emissions associated with emitting renewable or brown resources.

As described by the EPA above, RECs mitigate the environmental harm associated with brown power purchases by creating and maintaining the market for renewable energy and providing renewable generators a source of income from buyers wishing to purchase the renewable attribute, even if physical delivery of the energy is too expensive or complicated to complete. In addition, the cost of this mitigation is reasonable, particularly now when the cost of unbundled RECs is quite low. For example, when last purchased for the PaloAlto**Green** program, unbundled REC prices were less than 1¢/kWh so a REC buyer could "green up" brown power purchases for a modest cost.

Renewable Energy – Bundled Energy and RECs

To eliminate GHG emissions, carbon-free resources can be purchased instead of system energy. In other words, instead of purchasing system energy in the spot market or on a forward basis to meet loads, CPAU would purchase energy from carbon-free resources. These carbon-free resources can be purchased in the spot markets, on a forward basis in the short-term (less than three years out), or in the long-term markets (similar to the City's long-term renewable PPAs).

[3] California's RPS rules classify RPS eligible products into three Procurement Categories or "Buckets." Bucket 1 is for bundled energy and RECs that are generated in-state. Bucket 2 is for "firmed and shaped" bundled energy and RECs – which generally means energy from a resource located out-of-state that is delivered to California after it is generated. Bucket 3 is for REC only products (RECs separated, or "unbundled", from the underlying energy).

These carbon-free resources may or may not be RPS-eligible resources. RPS-eligible bundled energy and RECs are also referred to as "Bucket 1" (in-state) and "Bucket 2" (out-of-state) resources.

Environmental Offsets

GHG emissions can be zeroed out, or "neutralized", by purchasing GHG offsets in amounts equal to the emissions. This is a relatively straightforward calculation of computing the total annual tonnage of emissions and purchasing an equivalent tonnage of third party certified carbon offsets.

GHG offsets[4] are tradable credits issued for emissions reductions resulting from qualifying GHG mitigation projects. They can be purchased in the voluntary market (for example to achieve carbon neutral objectives) or in the compliance markets (for example, to meet cap-and-trade requirements). The California Air Resources Board (CARB) currently recognizes offsets issued by the Climate Action Reserve for several types of GHG mitigation projects—including forestry, urban forestry, livestock methane, and ozone depleting substances—for use in meeting AB32 GHG reduction goals.

With the uncertainty associated with the use and eligibility of various types of offset products coupled with the lack of compliance-driven buyers, the market for offsets is currently very illiquid and there is a great deal of uncertainty around the long-term market price of these products.

Alternative Carbon Neutral Portfolios

Alternative electric supply portfolios can be constructed to achieve carbon neutrality. Given the timing of the committed and planned additional renewable resources, it is helpful to evaluate the near term (2013 through 2016) separately from the longer term (2017 and beyond). In the longer term, since the Base Case portfolio consists of hydro resources and long-term renewable PPAs, resources will only be needed to neutralize the small amount of carbon emissions from the portfolio and to balance actual energy production and usage on an annual basis.

The types of resources available to achieve carbon neutrality are limited in the near term to short-term bundled renewable resources, unbundled RECs from existing facilities, or environmental offsets. While the carbon neutral definition allows for the use of environmental

[4] The World Resource Institute defines a carbon offset as "*a unit of carbon dioxide-equivalent (CO_2e) that is reduced, avoided, or sequestered to compensate for emissions occurring elsewhere.*"

offsets to neutralize carbon, staff is not recommending using them at this time, however will continue to evaluate for future consideration. The cost of acquiring renewable resources is dependent on the area from which the renewable energy is derived, whether or not it qualifies as an RPS-eligible renewable resource and the RPS compliance category it falls within. Table 6 is a summary of the estimated green cost premium (cost of green resource above the cost of brown power) of each product.

Table 6: Short-term Products to Achieve Carbon Neutrality

Product	RPS Eligible	Cost Premium ($/MWh)
Bundled renewable energy with RECs from California	Yes – Bucket 1	$10-$30
Bundled renewable energy RECs imported into California	Yes – Bucket 2	$5-$25
Unbundled RECs	Yes – Bucket 3	$1-$10
Non-RPS Unbundled RECs	No	$1-$5

To assess how the different products can alter the costs of achieving carbon neutrality for the electric supply portfolio, staff developed three alternatives to the Base Case portfolio to evaluate how changes in the resource mix result in different costs. In each case, the Base Case portfolio is the starting point so that the long-term portfolio (beyond 2016) is essentially the same for each alternative (about 50% hydro and 50% long-term RPS-eligible PPAs). The alternative portfolios are:

1. Proposed Carbon Neutral Plan: In this plan, carbon neutrality is achieved in the near term (2013 to 2016) by acquiring RPS-eligible unbundled RECs to green up brown market purchases on an annual basis. In dry years, the plan also calls for the purchase of RPS-eligible unbundled RECs to meet needs.

2. Non-RPS Unbunbled RECs Plan: This plan involves procuring non-RPS eligible, unbundled RECs to achieve carbon neutrality in the near term and in dry years.

3. Hard Resources Plan: This alternative limits the purchase of unbundled RECs and, instead, displays a strong preference for actual renewable energy deliveries. In this plan, carbon neutrality is achieved in the near term through commitments to short-term renewable resources (bundled energy and RECs). In dry years, to the extent they are available, short-term renewable resources would be purchased as well. If unavailable, unbundled RECs would be purchased in dry years to meet needs.

In all years and for all of the alternatives, non-RPS eligible unbundled RECs will be used to neutralize actual GHG emissions (e.g. from geothermal resources and the COBUG units) and to cover variations in needs associated with deviations in load, renewable energy and hydroelectric generation output. These purchases will likely be made after the calendar year is over when actual load and resources are known. Staff could pursue acquiring additional hard resources and/or RPS-eligible resources to cover the deviations, however given the timing of when the purchases will be made, it is less likely that such resources will be available and therefore unbundled non-RPS compliant RECs may be the only viable alternative. Table 7 summarizes the Base Case and the alternatives evaluated.

Table 7: Summary of Base Case (Do Nothing) and Carbon Neutral Alternatives

	Base Case	Recommended Plan	Non-RPS Unbundled RECs	Hard Resources
Resources for balance of needs in near term (2013-2016)	Market purchases	Market purchases plus RPS-eligible unbundled RECs	Market purchases plus non-RPS eligible unbundled RECs	Short-term bundled renewable resources
Additional resources required in dry years	Market purchases	Market purchases plus non-RPS eligible unbundled RECs		Short-term bundled renewables (if available) or market purchases plus unbundled RECs
Balancing for actual needs and actual generation	Market purchases/ sales	Market purchases/sales, banking plus unbundled RECs		
Resources to neutralize GHG emissions associated with renewables and COBUG	None	Non-RPS eligible unbundled RECs		
Resources for long-term needs (beyond 2016)	Long-term RPS-eligible PPAs and hydro resources to meet approximately 100% of needs			

Table 8 illustrates the cumulative cost, financial impacts, and RPS for the various alternatives relative to the Base Case, in which carbon neutrality is not pursued.

Table 8: 2013-2020 Cumulative Costs and RPS of Various Alternatives 2013-2020

	Base Case	Recommended Plan	Non-RPS Unbundled RECs	Hard Resources
Cost and Rate Impacts				
Incremental Cost to Base Case ($M)	N/A	$2.93	$1.86	$16.5
Rate Impact (¢/kWh)	N/A	0.035	0.022	0.20
Rate Impact (%) *	N/A	0.3%	0.2%	1.7%
Average Residential Bill Impact ($/year) •	N/A	$1.70	$1.08	$9.60
RPS				
2013	23%	58%	23%	58%
2014	28%	57%	28%	57%
2015 and 2016	33%	51%	33%	51%
Beyond 2016	51%	51%	51%	51%

* Rate impact calculations assume that the system average retail rate for the Base Case is 12.1¢/kWh in 2015

• Assuming median residential class usage of 407 kWh/month (actual from FY 2011)

The analysis shows that the cumulative cost (from 2013 through 2020) of achieving carbon neutrality under the recommended plan is expected to be $2.93 million more than the Base Case and would result in an average increase in rates of 0.035¢/kWh over the Base Case. The analysis also shows that carbon neutrality can be achieved at lower costs by purchasing non-RPS compliant RECs as in the Non-RPS Unbundled RECs case. The cost of pursuing the Recommended Carbon Neutral Plan is $1.07 million more than the Non-RPS Unbundled RECs alternative, with the majority of the cost occurring in the near term. While the Non-RPS Unbundled RECs alternative is less expensive than the Recommended Carbon Neutral Plan, it does not increase the City's RPS in the near term, which may be of value to the community. Conversely, pursuing the Hard Resources alternative would result in a significantly higher cost—$16.5 million over the Base Case and $13.6 million more than the Recommended Carbon Neutral Plan—while having the same RPS as the Recommended Carbon Neutral Plan.

Sensitivity Analysis

The alternatives were evaluated under different scenarios including variations in the green premium price of resources and generation from hydroelectric resources. The estimated rate impact of each alternative plan was assessed under the expected case, which assumes average hydroelectric generation and expected green premiums, and four scenarios, including:

1. High Renewable Premium Price – assumes average hydroelectric generation and that the price of acquiring renewables is 50% higher than expected;

2. Dry Hydroelectric Year – assumes the expected renewable premium price for purchasing carbon neutral resources for quantities up to the amount needed under average hydroelectric conditions. The increased amount needed between the dry hydro and average hydroelectric conditions is made up with non-RPS eligible unbundled RECs, since these RECs would likely be the most readily available;

3. Dry Hydroelectric Year and High Renewable Premium Price – same as the second scenario, but the premiums for acquiring all resources is 50% higher than expected; and

4. Wet Hydroelectric Year – assumes favorable hydroelectric conditions and the expected price for acquiring and/or selling surplus renewables.

Table 9: Cost of Carbon Neutrality of Alternative Plans versus Base Case Plan (cents per kWh)

Strategy/Scenario	2013	2014	2015	2016	2017	2018	2019	2020
Expected - Average Hydro Year, Base Green Premium Prices								
1. Recommended Plan	0.06	0.06	0.05	0.09	0.00	0.00	0.00	0.01
2. Non-RPS Unbundled RECs	0.03	0.04	0.04	0.04	0.00	0.00	0.00	0.01
3. Hard Resources	0.35	0.43	0.35	0.42	0.00	0.00	0.01	0.01
Average Hydro Year, High Green Premium Prices								
1. Recommended Plan	0.09	0.09	0.08	0.13	0.00	0.00	0.01	0.01
2. Non-RPS Unbundled RECs	0.05	0.07	0.05	0.07	0.00	0.00	0.00	0.01
3. Hard Resources	0.52	0.65	0.52	0.63	0.00	0.00	0.01	0.02
Dry Hydro Year, Base Green Premium Prices								
1. Recommended Plan	0.07	0.08	0.10	0.15	0.07	0.09	0.10	0.11
2. Non-RPS Unbundled RECs	0.05	0.07	0.08	0.10	0.08	0.09	0.10	0.11
3. Hard Resources	0.35	0.45	0.39	0.47	0.07	0.09	0.11	0.11
Dry Hydro Year, High Green Premium Prices								
1. Recommended Plan	0.10	0.11	0.13	0.19	0.07	0.09	0.11	0.11
2. Non-RPS Unbundled RECs	0.06	0.09	0.10	0.13	0.07	0.09	0.10	0.11
3. Hard Resources	0.53	0.67	0.56	0.68	0.06	0.09	0.11	0.11
Wet Hydro Year, Base Green Premium Prices								
1. Recommended Plan	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Non-RPS Unbundled RECs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Hard Resources	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00

As shown in Table 9, the cost to achieve carbon neutrality is minimal after 2016 due to the high level of long-term renewable PPAs in the portfolio. In those years, the cost increases somewhat in dry years, but no more than 0.11¢/kWh.

In the near term, under the average hydroelectric conditions and expected green premium prices, the cost of achieving carbon neutrality can range from zero to 0.43¢/kWh, depending on the plan. When subjected to high green premiums and a dry hydro year, the cost to achieve carbon neutrality increases and can be as high as 0.68¢/kWh, depending on the plan. Under the Recommended and Non-RPS Unbundled RECs plans, however, the incremental cost under

all scenarios is expected to remain under the proposed 0.15¢/kWh carbon neutral rate impact limit except in the scenario with dry hydro conditions and high green premium prices. In fact, given that the expected RPS cost is 0.41¢/kWh, the cost of both RPS and carbon neutrality is under 0.50¢/kWh in all but the worst cases.

The analysis shows that the cost in any given year can vary significantly. For example, in 2016 the cost for the Hard Resources plan is expected to be 0.42¢/kWh, but can be as high as 0.68¢/kWh under adverse hydroelectric and market conditions. In such a case, the incremental cost of achieving carbon neutrality is significantly higher than the recommended carbon neutral rate impact limit of 0.15¢/kWh. Should the estimated incremental cost in any year exceed the rate impact limit, staff will seek Council direction about whether or not to pursue carbon neutrality for that year.

Conversely, in favorable hydroelectric conditions, the portfolio can have more carbon neutral resources than needed to meet load. Should this condition materialize, staff will carry over, or "bank", the renewable attributes from one year to the next to the extent allowed under the TCR EPS protocol. The protocol does not allow for the banking of renewable attributes associated with the City's existing hydroelectric resources, therefore only attributes from the City's other renewable resources will be banked. Should the portfolio contain surplus carbon neutral resources in consecutive years, then the City could sell excess renewable attributes to offset the cost of achieving carbon neutrality.

Summary of the Carbon Neutral Plan

The attached Carbon Neutral Plan (Attachment B) provides a summary of the resource acquisition strategies, management of existing hydroelectric resources, communication and reporting to stakeholders, funding carbon neutrality and describes the implementation plan.

In summary, the proposed Carbon Neutral Plan comprises the following policy decisions:

1. What to do in the near term: The options are to buy short-term renewables, unbundled RPS-eligible RECs, or unbundled non-RPS RECs. The proposed plan is to allow staff discretion to buy unbundled RECs with a preference for RPS-eligible RECs, but, depending on the price difference between RPS-eligible and non-RPS RECs, allow the purchase of non-RPS RECs. The expected cost difference is shown in the Table 10.

Table 10: Expected Cost to Achieve Carbon Neutrality in the Near Term

	2013	2014	2015	2016
Expected cost for Recommended Plan (use RPS-eligible RECs)	$630,000	$610,000	$570,000	$910,000
Expected cost to use non-RPS eligible RECs	$360,000	$460,000	$390,000	$470,000
Expected cost to use short-term renewables	$3,600,000	$4,600,000	$3,700,000	$4,400,000

Table 10 also shows the cost to achieve carbon neutrality as early as 2013. If carbon neutrality is not pursued until 2015, for example, the costs shown for 2013 and 2014 would be avoided. Based on the relatively low costs, the Recommended Carbon Neutral Plan is to achieve carbon neutrality starting in 2013.

2. Balancing to true up loads and resources each year: Truing up loads and resources each year to ensure carbon neutrality will occur each year after the fact. This means that loads and resources will not be trued up on a daily, weekly, or monthly basis, but on an annual basis for purposes of achieving a carbon neutral portfolio. The recommended resources for these small amounts are unbundled RECs. Staff expects to purchase these RECs to ensure that the end of the year GHG emissions counting will result in a carbon neutral portfolio. If RECs are needed, staff will purchase them and, if resources are greater than loads, RECs will be banked as allowed by the TCR EPS protocol.

3. What to do in dry years: Additional resources will be required in dry years. Staff requests discretion in what resources to purchase in these years within the allowable rate impact limit. At least some of the purchases will likely take place after the fact as the loads and resources are balanced and unbundled RECs will likely be the best product for this balancing.

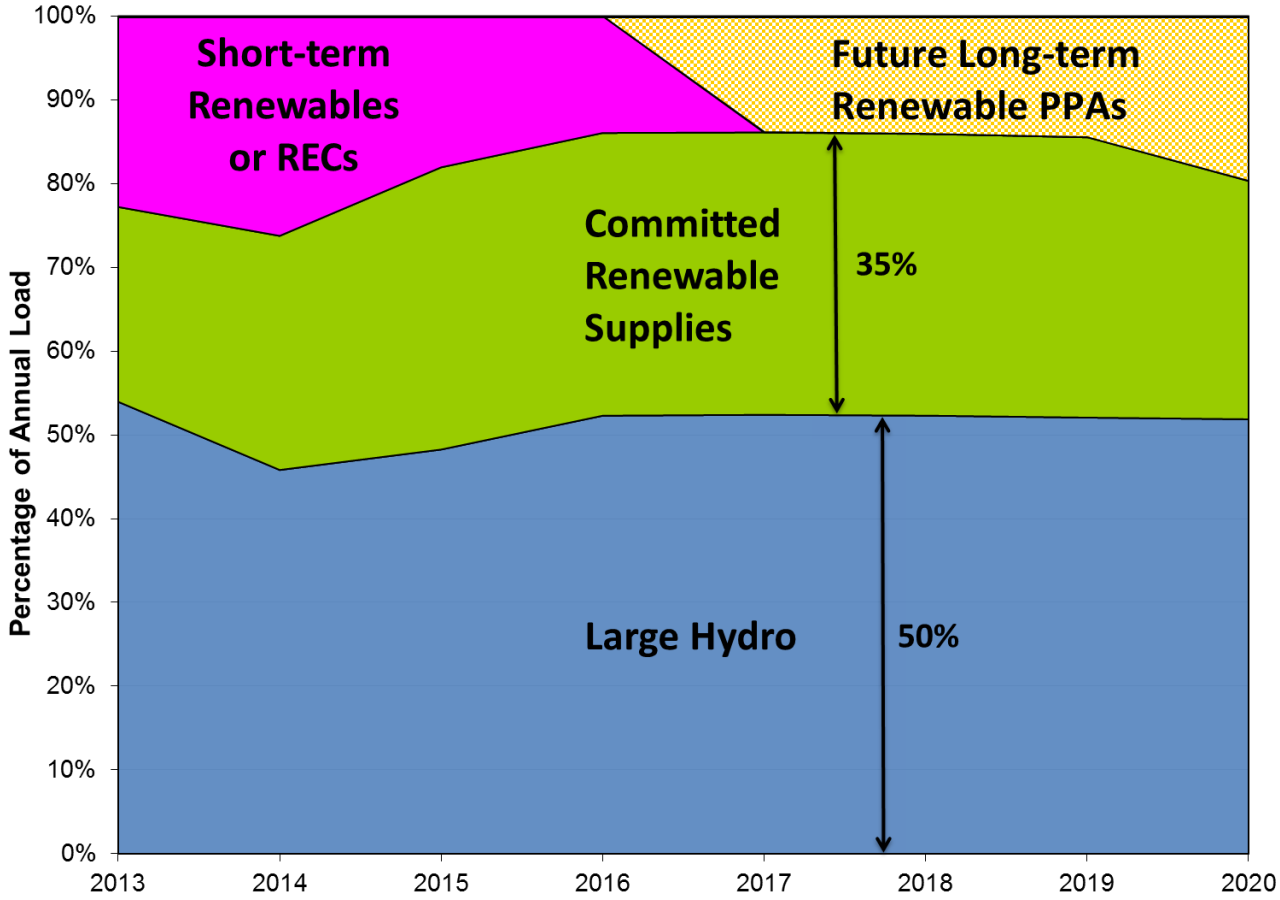
4. What to do in wet years: In wet years, banking of RECs will be pursued as allowed by the TCR EPS protocol. However, not all RECs may be able to be banked, or there may be consecutive wet years so staff expects to sell surplus renewable and/or hydro resources and/or RECs to cost-effectively balance resources and needs.

5. Neutralizing GHG emissions: The plan to neutralize the portfolio's GHG emissions from renewable resources (i.e. geothermal PPA) and the COBUG units is to buy unbundled RECs for their CO2e emissions reductions. Staff plans to buy the lowest cost RECs (in $/pound of CO2e emissions) for these requirements. The geothermal project and the COBUG are estimated to have 3,811 metric tons per year of GHG emissions. The cost

for the RECs (denominated in pounds of CO2e emissions) to neutralize these emissions is expected to cost about $10,000 per year.

Figure 2 shows the resources planned for the Proposed Carbon Neutral Plan. As shown, large hydroelectric supplies provide about 50% of the City's needs while committed renewable resources provide an additional 35% of the City's needs starting in 2017. The plan is for future long-term contracts for renewable energy to provide the balance of the City's needs in the long-term. Short-term renewable energy purchases or RECs are proposed to be used to achieve carbon neutrality until 2017.

Figure 2: Electric Portfolio Expected Resource Supply Mix for Proposed Carbon Neutral Plan



GHG Emission Reductions Beyond the Electric Supply Portfolio

Once the electric supply portfolio is carbon neutral, the primary sources of GHG emissions for the City and community are related to the use of natural gas and transportation fuels. Strategies to reduce GHG emissions for those sources will be addressed in the Climate

Protection Plan and could include some of the following strategies that may impact the electric utility:

1. Support the expanded use of electric vehicles.
2. Support customers who wish to switch from natural gas to electric for appliances.
3. Support customers who wish to switch from natural gas or propane to electric for water or space heating.
4. Modify the PaloAlto**Green** program to compliment a carbon neutral electric portfolio consistent with existing participants' sustainability goals.

The proposed Carbon Neutral Plan for the electric supply portfolio does not address these strategies, but their implementation will affect the electric utility's load and, therefore, the Carbon Neutral Plan.

Commission Review and Recommendation

At its December 5, 2012 meeting, the UAC discussed the proposed Carbon Neutral Plan for the electric supply portfolio. Staff provided a brief presentation of the proposed Carbon Neutral Plan, which at that time included a rate impact limit of 0.25¢/kWh.

The presentation was followed by oral comments from community members in favor of the proposed Carbon Neutral Plan. The discussion by the UAC commissioners centered on the cost of achieving carbon neutrality in the near term versus long-term and the bill impact for residential and commercial customers. The UAC requested that it be noted that savings could be achieved by not pursuing carbon neutrality as soon as 2013 and requested that staff clearly provide Council with the annual cost to achieve carbon neutrality.

The UAC voted unanimously to recommend that Council approve the proposed Carbon Neutral Plan with a rate impact limit of 0.25¢/kWh. The minutes of the UAC's December 5, 2012 meeting are provided as Attachment E.

Subsequent to the UAC's December meeting, members of the UAC provided a Commissioners' Memorandum (Attachment F) requesting further discussion about the expected cost of achieving carbon neutrality and the proposed spending limit of 0.25¢/kWh. A discussion about the Commissioners' Memorandum, which advised a cap on total spending between 2013 and 2016 and a cap on the price per REC purchased, was held at the UAC's January 9, 2013 meeting.

The Commission discussed the impacts of the 0.25¢/kWh limit in the case of adverse conditions, noting that costs could range from $2.5 million to $5 million to achieve carbon neutrality in 2013 instead of 2015, which is the date by which the Council requested staff

develop the plan to achieve carbon neutrality. The Commission made clear that it supported the Carbon Neutral Plan, but was concerned about expenditures that might be required to do so.

Commissioner Eglash made a motion to revise the rate impact cap to 0.15¢/kWh, instead of 0.25¢/kWh. The motion to recommend that Council achieve carbon neutrality for the electric supply portfolio within a cost cap of 0.15¢/kWh passed (4-2) with Foster and Melton opposed and Waldfogel absent. Draft minutes of the UAC's January 9, 2013 meeting are provided as Attachment G.

Following the UAC's January 2013 meeting, staff decided to revise its recommendation for the spending cap to a rate impact limit of 0.15¢/kWh with the idea that, if additional funds are needed to achieve carbon neutrality, it will return to the UAC for recommendation and to the Council for direction.

Resource Impact

Adoption of the Carbon Neutral Plan will not result in a need to adjust the adopted electric commodity budget for FY 2013. Any purchases of RECs and/or renewable resources for CY 2013 will most likely occur after the fiscal year has ended and will be included as part of the proposed FY 2014 Electric Fund budget. The cost of reporting and verifying GHG emissions to The Climate Registry will also be identified and included in the annual budget process. Existing staff resources are sufficient to implement the Carbon Neutral Plan.

Table 11 shows the expected cost per calendar year for the next five years, assuming average hydroelectric generation and the expected cost of acquiring renewable resources based on the proposed Carbon Neutral Plan. Table 11 also shows the impact of these additional costs on the median residential annual electric bill (based on the median residential monthly consumption level of 407 kWh). The actual cost is subject to actual load, availability of hydroelectric generation , renewable energy costs, renewable attributes banked from one calendar year to the next, and emissions emitted by existing renewable resources and the City's back-up generator. The timing for a rate increase to implement the plan depends upon other aspects of the electric budget and the level of reserves. However, if Council approves the proposed Carbon Neutral Plan, the cost would increase as shown in Table 11 as early as 2013. Deferring implementation of the Carbon Neutral Plan to 2015 or 2017 would result in not spending $1.24 million or $2.72 million, respectively.

Table 11: 5-Year Expected Cost and Bill Impact to Achieve Carbon Neutrality

	2013	2014	2015	2016	2017
Total Cost	$630,000	$610,000	$570,000	$910,000	$ 40,000
Median Residential Bill Impact ($/year)	$3.07	$2.93	$2.73	$4.36	$0.19

As part of the City's annual budget process, staff will estimate the incremental cost associated with implementing the Carbon Neutral Plan based on the latest forecast for electric load projections, supply resource conditions and the price of acquiring renewable resources. Further, through the annual budget process, staff will assess the financial situation of the Electric Fund and recommend how to cover any cost increases associated with implementing the Carbon Neutral Plan including the use of Electric Fund reserves, revenues from the sale of allowances in the cap-and-trade auctions and/or electric rate increases.

Table 12 shows the expected and maximum costs (given rate impact limits of 0.15¢/kWh and 0.25¢/kWh) from 2013 to 2020. As shown, the expected cost for the recommended Carbon Neutral Plan is $2.7 million from 2013 to 2020. The maximum cost over that time with a rate impact limit of 0.15¢/kWh is $12 million and the maximum cost with a rate impact limit of 0.25¢/kWh is $20 million.

Table 12: Annual Cost to Implement Carbon Neutral Plan ($millions)

	2013	2014	2015	2016	2017	2018	2019	2020	Total
Expected Cost	0.6	0.6	0.5	0.9	0.0	0.0	0.0	0.1	2.7
Maximum Cost (with a rate impact limit of 0.15 ¢/kWh)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	12
Maximum Cost (with a rate impact limit of 0.25 ¢/kWh)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	20

Table 13 illustrates potential bill impacts under different usages and for the median residential customer, should Council adjust rates to reflect the cost of achieving carbon neutrality in 2013 and how the City's bill would compare to neighboring communities including those served by Pacific Gas and Electric (PG&E).

Table 13: Monthly Electric Bill Comparison for 2013

Usage (kWh/month)	Palo Alto's Current Bill ($/month)	Palo Alto's Bill with Carbon Neutral Plan ($/month)		Santa Clara ($/month)	PG&E ($/month)
		Expected Cost	With 0.15¢/kWh		
Residential Customer Monthly Bill					
300	$28.57	$28.75	$29.02	$30.37	$38.54
(Median) 407	$42.50	$42.77	$43.18	$41.66	$53.21
650	$76.33	$76.72	$77.31	$67.11	$117.72
1,200	$172.03	$172.75	$173.83	$124.84	$300.23
Commercial Customer Monthly Bill					
1,000	$127	$128	$129	$156	$163
160,000	$17,245	$17,341	$17,485	$18,002	$18,801
500,000	$50,430	$50,730	$51,180	$54,352	$54,285
2,000,000	$178,800	$180,000	$181,800	$210,129	$222,168

Policy Impacts

Approval of the recommended Carbon Neutral Plan is consistent with the Council-approved LEAP Objectives; Strategies and Implementation Plan; supports the Council-approved 2011 Utilities Strategic Plan's environmental sustainability objective; is consistent with the City's Climate Protection Plan; and supports environmental sustainability, one of the City Council's top priorities.

Environmental Impacts

Implementation of the Carbon Neutral Plan is expected to reduce 330,000 metric tons of GHG emissions in 2013 through 2016 (based on the EPA's eGRID emissions factor for California for 2012 of 661.2 pounds of CO2e per MWh). Beyond 2016, reductions of GHG emissions are mostly attributed to other Utilities efforts – principally achieving an RPS of about 50%.

Adopting a carbon neutral plan does not meet the California Environmental Quality Act's (CEQA) definition of a "project" under California Public Resources Code Sec. 21065, thus no environmental review is required.

Attachments:

- Attachment A: Draft Resolution Approving Carbon Neutral Plan (PDF)

- Attachment B: Carbon Neutral Plan (PDF)
- Attachment C: Carbon Neutral Survey Results (PDF)
- Attachment D: Summary of TCR EPS protocol (PDF)
- Attachment E: Excerpted Final UAC Minutes of December 5, 2012 (PDF)
- Attachment F: UAC Colleagues Memo, December 16, 2012 (PDF)
- Attachment G: Excerpted Draft UAC Minutes of January 9, 2013 Special Meeting (PDF)

ATTACHMENT A

* NOT YET APPROVED *

Resolution No. _____
Resolution of the Council of the City of Palo Alto Approving a Carbon Neutral Plan for the Electric Supply Portfolio to Achieve Carbon Neutrality by 2013

A. In an effort to combat climate change in December 2007 the City of Palo Alto ("City") adopted the Climate Protection Plan, which set aggressive greenhouse gas (GHG) emission reduction goals to be achieved by the year 2020.

B. In March 2011, the City unanimously approved the Long-term Electric Acquisition Plan (LEAP) a strategic planning document focused on how the City's Utilities Department (CPAU) can successfully balance environmental and economic sustainability as it provides electric service to CPAU customers. LEAP was updated in April 2012 through Resolution 9241.

C. In accordance with the LEAP Climate Protection Strategy #5 to reduce the electric portfolio's carbon intensity, staff evaluated the costs, benefits and impacts of the implementation of an electric portfolio carbon neutral policy and the setting of quantitative goals. Staff's preliminary findings were presented to the Utilities Advisory Commission ("UAC"), Finance Committee and Council and in May 2012, the City Council directed staff to develop a plan to achieve carbon neutrality for the electric supply portfolio by January 2015 (Staff report 2525).

D. On November 5, 2012, Council approved (Staff Report 3194) the following definition of carbon neutrality for the City's electric supply portfolio: A carbon neutral electric supply portfolio will demonstrate annual net zero greenhouse gas (GHG) emissions, measured at the Citygate, in accordance with The Climate Registry's Electric Power Sector protocol for GHG emissions measurement and reporting.

E. Staff presented the Carbon Neutral Plan to the UAC on December 5, 2012 and the UAC voted unanimously (six in favor and one absent) to recommend that the City adopt the Carbon Neutral Plan.

F. On December 16, 2012, UAC Commissioners James Cook (Chair), Steve Eglash and John Melton provided a Commission Memorandum to request the Carbon Neutral Plan be revisited. The Commission Memorandum was discussed at the January 9, 2013 UAC meeting and the UAC voted (four in favor, two opposed and one absent) to recommend to Council that the Carbon Neutral Plan's rate cap be reduced from 0.25 cents/kWh to 0.15 cents/kWh.

G. Subsequent to the January 2013 UAC meeting, staff revised its spending cap recommendation to limit any future electric rate impact to 0.15 cents/kWh.

H. On February 5, 2013, the Finance Committee voted _____.

* NOT YET APPROVED *

The Council of the City of Palo Alto does hereby RESOLVE as follows:

SECTION 1. The Council hereby adopts the resolution approving the Carbon Neutral Plan as provided for in Exhibit A.

SECTION 2. The Council directs staff to return to the UAC and the Council in the event that the cost of City's achievement of carbon neutrality for the electric supply portfolio would exceed an electric retail rate impact of 0.15 cents/kWh.

SECTION 3. The Council finds that any eventual changes to the City's electric rates impacted by Council's adoption of the Carbon Neutral Plan shall not create special taxes because such rates shall be charges imposed for a specific government service or product provided directly to the payor that are not provided to those not charged, and which shall not exceed the reasonable costs to the City of providing the service or product.

SECTION 4. The Council finds that the adoption of this resolution does not constitute a project under Section 21065 of the California Environmental Quality Act (CEQA) and the CEQA Guidelines, and therefore, no environmental assessment is required.

INTRODUCED AND PASSED:

AYES:

NOES:

ABSENT:

ABSTENTIONS:

ATTEST:

_____
City Clerk

_____
Mayor

APPROVED AS TO FORM:

_____
Senior Deputy City Attorney

APPROVED:

_____
City Manager

_____
Director of Utilities

_____
Director of Administrative Services

250113 sdl 6051879

Exhibit A to Resolution No XXXX
Adopted by City Council on _____

City of Palo Alto Utilities
Electric Supply Portfolio Carbon Neutral Plan

1. Carbon Neutral Definition

A carbon neutral electric supply portfolio will demonstrate annual net zero greenhouse gas (GHG) emissions, measured at the Citygate[1], in accordance with The Climate Registry's Electric Power Sector protocol for GHG emissions measurement and reporting.

2. Carbon Neutral Plan Objective

Reduce the City of Palo Alto's overall community GHG emissions by achieving carbon neutrality for the Electric Supply Portfolio starting in calendar year 2013 within an annual rate impact not to exceed 0.15 cents per kilowatt-hour (¢/kWh) primarily through the: 1) engagement of customers to increase energy efficiency; 2) expansion of long-term renewable resource commitments; 3) promotion of local renewable resources; 4) continued reliance on existing hydroelectric resources; and 5) meeting short-term balancing requirements and/or neutralizing residual carbon through the use of short-term purchases of renewable resources and/or renewable energy certificates (RECs).

3. Resource Strategies

a. *Energy Efficiency*
   i. Continue to pursue energy efficiency strategies as identified in the Council-approved ten-year Energy Efficiency Plan.

b. *Long-term Renewable Resources*
   i. Continue to pursue the City's Renewable Portfolio Standard (RPS) goal to purchase renewable energy to supply at least 33% of retail sales by 2015 while ensuring that the retail rate impact of these purchases does not exceed 0.5 ¢/kWh.
   ii. Continue to pursue local renewable resources through the Palo Alto CLEAN and PV Partners programs.
   iii. Pursue additional RPS-eligible, long-term renewable resources (beyond the RPS goals) to achieve a target of 100% carbon-free resources based on average year hydroelectric generation.

[1] Citygate is the location of the City's main meter where the City interconnects to the Pacific Gas and Electric transmission system. Emissions associated with of the output of the locally sited fossil gas fired combustions units (COBUG), while not measured at Citygate, will be neutralized.

c. *Short-term Renewable Resources and Renewable Energy Certificates*
   i. For calendar years 2013 through 2016, procure short-term renewables, if the price is comparable to that of an un-bundled REC;
   ii. For calendar years 2013 through 2016, procure RPS-eligible, un-bundled RECs as needed to achieve carbon neutrality based on actual load and resources;
   iii. Neutralize anthropogenic GHG emissions associated with renewable resources with unbundled-RECs, which may or may not be RPS-eligible.

d. *Banking and Truing Up*
   i. In the event that there are surplus renewables beyond the load in a particular year, bank as many RECs as allowable under the TCR EPS protocol from qualifying renewables from that year to minimize the need for purchasing RECs in subsequent years.
   ii. Neutralize emissions associated with market purchases resulting from deviations between expected and actual load and renewable and hydroelectric generation resources with unbundled-RECs, which may or may not be RPS-eligible.

4. Hydroelectric Resources

a. Continue to preserve and advocate for existing carbon-neutral hydroelectric generation resources that provide approximately 50% of average year resource needs.
b. Plan for and acquire carbon neutral resources assuming average hydroelectric conditions going forward.
c. Under adverse hydroelectric conditions, procure unbundled-RECs, which may or may not be RPS-eligible, to achieve carbon neutrality up to the 0.15 ¢/kWh rate impact limit and seek Council direction if carbon neutrality cannot be achieved within the rate impact limit.
d. Under favorable hydroelectric conditions, where carbon neutral resources are expected to be surplus to needs, even after allowable banking, then pursue selling short-term renewable energy, or the renewable attributes, associated with one or more carbon-neutral resources in the portfolio.

5. Financial and Rate Payer Impacts

a. In addition to the RPS annual rate impact limit of 0.5 ¢/kWh, the cost of achieving carbon neutrality shall not exceed 0.15 ¢/kWh based on an average hydro year.
b. Revenues collected from surplus energy sales related to hydroelectric resources under favorable conditions (e.g. wet years), will be maintained within reserves to adjust for the cost of achieving carbon neutrality under adverse hydroelectric years.
c. To the extent available and allowable, revenues from the auction of cap-and-trade allowances may be used to fund resources acquired to meet the carbon neutrality goals.

6. Reporting and Communication

a. Develop a communication plan for stakeholders to inform them of the City's efforts towards achieving a carbon neutral electric supply.

b. Submit an annual, verified report of the carbon content of the electric supply portfolio to The Climate Registry.
c. Provide customers a report of the electric supply portfolio's carbon content to supplement the mandated Power Content Label.
d. Inform large commercial and/or corporate customers of the City's carbon neutral portfolio and its relevance to their individual corporate sustainability goals.

7. Implementation Plan

The tasks that need to be completed in the next two years pending Council approval of the Carbon Neutral Plan in February 2013 are listed in the table below.

Item	Timeframe
1. Modify electric supply portfolio models and Energy Risk Management Policies, Guidelines and Procedures to account for Carbon Neutral objectives, balancing, banking of renewable attributes, reporting and financial impacts.	By April 2013
2. Modify the Long-term Electric Acquisition Plan (LEAP) to include the carbon neutral objective	By June 2013
3. Develop communication plan to inform customers and stakeholders of Carbon Neutral Plan and efforts.	February to April 2013
4. Based on response to the Fall 2012 request for proposals, seek approval of new renewable power purchase agreements to meet the City's RPS up to approximately 100% of the long-term resource needs in average hydro years.	December 2012 to June 2013
5. Determine resource needs for CY 2013 through CY 2016 and develop plan to acquire short-term renewable resources.	By June 2013
6. Determine long-term renewable purchase volumes for beyond CY 2016 and develop plan to acquire long-term renewable resources.	By September 2013
7. Procure RECs as needed to neutralize carbon emissions based on actual load and resources for CY 2013.	By May 2014
8. Along with annual Power Content Label, produce and report to customers the carbon intensity of the electric supply portfolio.	May/June 2014 and annually thereafter
9. Produce and submit Electric Power Sector (EPS) and Local Governments Operation Protocol (LGOP) reports to The Climate Registry (TCR) for CY 2013.	July and October 2014 and annually thereafter
10. Get independent verification of TCR reports and submit audited reports to TCR.	By December 2014 and annually thereafter
11. Redesign the PaloAlto**Green** program according to Council direction.	By December 2013

Attachment C

City of Palo Alto Utilities – Electric Supply Portfolio
Carbon Neutral Survey

Residential Customers

1. How much more would you be willing to pay on your electric bill for 100% renewable energy supplies?

Answer Options	Response Percent	Response Count
No more	27.3%	259
$2 more per month	9.0%	85
Up to $5 more per month	22.2%	210
Up to $10 more per month	23.3%	221
More than $10 more per month	18.2%	173
answered question		948
skipped question		11

2. Are you currently a PaloAltoGreen customer?

Answer Options	Response Percent	Response Count
Yes	58.1%	554
No	41.9%	399
answered question		953
skipped question		6

3. If your electricity supply is 100% carbon-free, and your electric rate has increased about 4% as a result, would you be more or less motivated to invest in energy efficiency improvements?

Answer Options	Response Percent	Response Count
More motivated	27.5%	261
Less motivated	12.1%	115
No change in motivation	60.3%	572
answered question		948
skipped question		11

4. Do you have any further comments for us on the idea only purchasing "green" carbon-free power?

answered question	514
skipped question	444

#	Response Text	Count
	Negative - Bills too high	93
	Negative - Other Issues	88
	Other Issues - Neutral	125
	Positive - Qualified	85
	Positive - Unqualified	123
	Grand Count	514

Commercial Customers

1. How much more would you be willing to pay on your electric bill for 100% renewable energy supplies?

Answer Options	Response Percent	Response Count
No more	63.0%	17
2% more per month	14.8%	4
Up to 5% more per month	7.4%	2
Up to 10% more per month	7.4%	2
More than 10% per month	7.4%	2
answered question		27
skipped question		1

2. Are you currently a PaloAltoGreen customer?

Answer Options	Response Percent	Response Count
Yes	25.0%	7
No	75.0%	21
answered question		28
skipped question		0

3. If your electricity supply is 100% carbon-free, and your electric rate has increased about 4% as a result, would you be more or less motivated to invest in energy efficiency improvements?

Answer Options	Response Percent	Response Count
More motivated	14.8%	4
Less motivated	14.8%	4
No change in motivation	70.4%	19
answered question		27
skipped question		1

Q4. Do you have any further comments for us on the idea only purchasing "green" carbon-free power?

	Response Count
	10
answered question	10
skipped question	18

ATTACHMENT D

Summary of Implementation of The Climate Registry's Electric Power Sector Protocol in Pursuit of Carbon Neutrality for the City of Palo Alto's Electric Portfolio

The key policy elements discussed in the TCR EPS protocol include:

1. Measurement, Accounting, Reporting and Verification Protocol
2. Inventory Scope of GHG Emissions Covered by Definition
3. GHG Emission Factor by Resource
4. Balancing Periods and Banking
5. Role of PaloAlto**Green** Program
6. Portfolio Alternatives to Achieve Carbon Neutrality

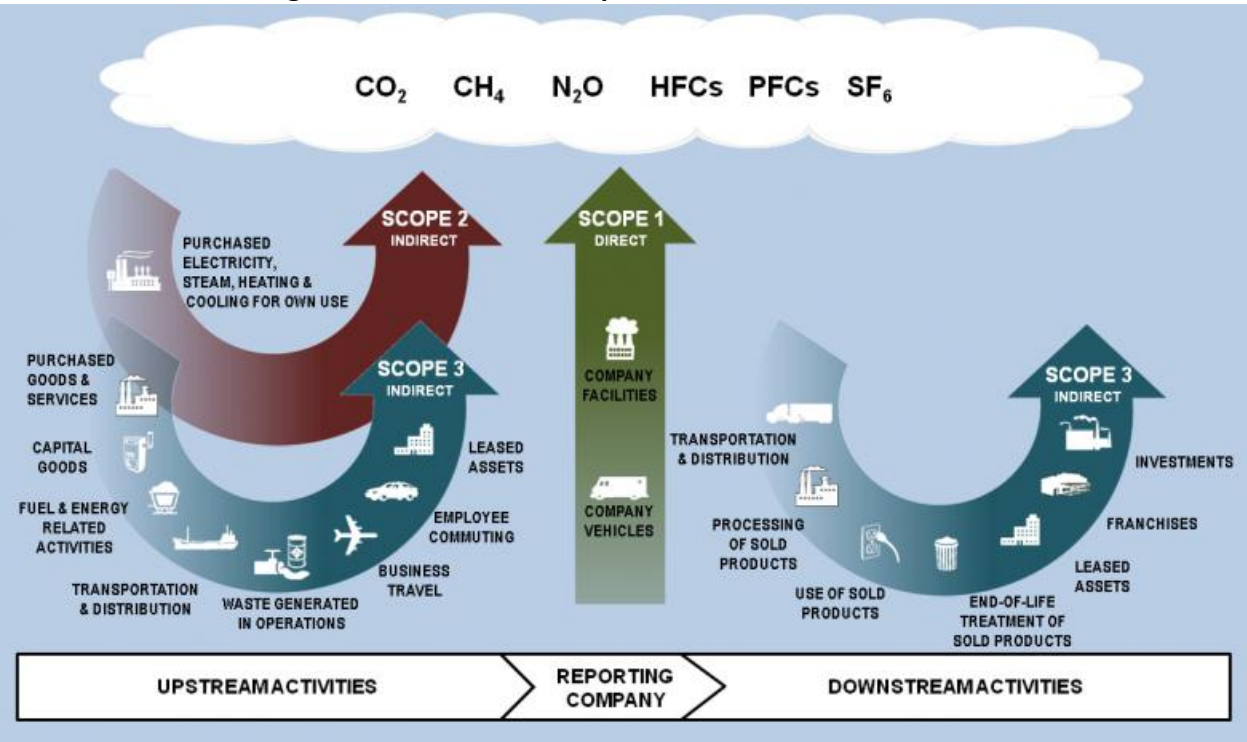
1. Measurement, Accounting, Reporting and Verification Protocol

There are several GHG accounting standards in the industry, although all are based on the accounting architecture developed by The World Resources Institute (WRI). WRI is regarded as a global leader on the topic of GHG measurement and accounting standards through its development of accounting tools for governments and businesses that enable them to understand, quantify, and manage GHG emissions. WRI's methodology divides GHG emissions into three types: Scope 1, Scope 2, and Scope 3. For a GHG reporting entity such as the City, Scope 1 includes the direct emissions the entity has control over, such as factory emissions, building emissions, emissions from utility owned generation and emissions from vehicles it owns or controls. Scope 2 includes primarily emissions associated with electricity the reporting entity consumes for its own operations but did not produce. Scope 3 emissions are all other emissions over which the reporting entity does not have control. Scope 3 emissions include sources such as electricity purchased by electric utilities for the use of its customers, commutes by employees and emissions associated with concrete purchased for construction.

The WRI protocol is the accounting foundation for The Climate Registry (TCR) GHG reporting protocol. TCR is a U.S. Environmental Protection Agency (US EPA) recognized national GHG reporting public platform, and the City has been reporting to this agency (and its predecessor agency, the California Climate Action Registry) since 2005.

Figure 1 is an illustration of the various emissions types and how they are accounted for under WRI's Scope 1, Scope 2, and Scope 3 definitions.

Figure 1: Overview of Scope 1, 2, and 3 GHG Emissions



Source: World Resources Institute

TCR protocol directs an electric utility to report its own Scope 1 and Scope 2 emissions under the General Reporting Protocol (GRP), and allows for the utility to compute the emissions (in metric tons of CO_2e) using standardized emission factors (in pounds of CO_2e per unit of electricity delivered to different customers) under the Electric Power Sector (EPS) protocol[1]. The portfolio or program level emission factors generated by electricity providers, calculated using the EPS protocol, may then be used by end-use customers to report the Scope 2 emissions associated with their own electricity usage.

To help ensure transparency and credibility of the City's efforts towards carbon neutrality, staff recommends that TCR's EPS protocol be adopted as the standard for accounting, reporting, and verification.

2. Inventory Scope of GHG Emissions Covered by Definition

Electric Supply

Staff recommends limiting the scope of the emissions to be counted to those associated with the electric supply portfolio as measured at the City's main meter (Citygate) plus output from City-owned generation facilities (the city-owned back-up generator, or COBUG) within City boundaries. The electric supply portfolio consists of all resources purchased and/or owned, including deliveries from its two hydroelectric resources, Western and Calaveras, all renewable resources acquired under power purchase agreements, and net market purchases (total

[1] www.theclimateregistry.org/resources/protocols/electric-power-sector-protocol

purchases minus total sales in the wholesale markets) made to meet load requirements on an annual, calendar year basis.

Electric Grid Reliability & Transmission Losses

Given the highly variable nature of the City's long-term electric supply resources—on a minute-to-minute, month-to-month and year-to-year level—it is inevitable that the City will rely to some extent on generation reserves connected to the California Independent System Operator (CAISO) grid. Specifically, some generation capacity is always reserved to follow loads in the event that actual load and generation resources deviate widely from forecasted levels. Consistent with the EPS protocol, the emissions associated with these load-following resources are reported by the generation owners as Scope 1 emissions. To the extent that CPAU requires these resources to meet unplanned electric load, this energy will be delivered to Citygate and thus the emissions associated with the energy will be counted as Scope 2 or 3 emissions on the City's emissions inventory, just like all of its purchased power.

In 2008 the City effected a 15-year assignment of its share in the California-Oregon Transmission Project (COTP). Since the City currently does not own or operate transmission, according to the TCR EPS protocol it does not need to include transmission line losses in its emissions calculation. Emissions associated with transmission losses may need to be considered in future inventories depending on TCR protocols, or if the City reacquires transmission ownership rights.

Distribution System

In addition to the GHG emissions associated with electric supply, electric distribution operations also generate GHG emissions. The City reports to TCR on electric utility operational activities producing GHG emissions[2] including fuel consumption by the CPAU vehicle fleet (Scope 1), potential SF_6 emissions from substation breakers (Scope 1), and electricity used in CPAU buildings (Scope 2). However, since carbon neutrality is being defined as emissions related to electricity supply only, emissions associated with operations will not be included in the emission inventory. Electricity losses in distribution system wires, which are estimated at five percent of electric purchases, will be accounted for since the electric supply is measured at Citygate and not at customer meters. Table 1 below is a summary of the emissions to be included in the City's electric supply portfolio inventory.

[2] GHG emissions from electric operations represent less than 0.5 percent of all emissions produced by the electric utility.

Table 1: Electric Portfolio Carbon Neutral Emission Inventory

Scope	Categories	Description
1	Stationary combustion	Emissions from owned/controlled facilities. For CPAU this includes COBUG
2	Distribution system losses	CPAU owned distribution line losses only
	Purchased power for own consumption	Electricity used by all City facilities is included in the measure at the City's meter (Citygate)
3	Purchased power for customers	Electricity purchased for resale to the City's customers measured at Citygate

3. GHG Emission Factor by Resource

TCR protocols allow for project-specific emissions factors, in pounds of CO_2e per megawatt-hour (MWh), to be used as the basis for calculating portfolio emissions. These emissions would be based on actual metered fossil fuel consumption or measurement of GHG releases. If project-specific emissions factors are not known, TCR allows the use of generic technology-based emission factors based on US EPA numbers as shown in Table 2.

Table 2: Default Emissions Factors for Power Purchases from Specific Resources

Resource	Emissions Factor (pounds CO2/MWh)		CPAU Resources
Natural Gas			
Combined Cycle – Two Turbines	909		N/A
Combined Cycle – Single Shaft	860		N/A
Combustion Turbine	1,329		N/A
Steam Turbine	1,532		N/A
Internal Combustion	1,226		COBUG
Biogenic Fuels			
	Anthropogenic	**Biogenic**	
Landfill Gas[3]	38	2,677	6 Ameresco PPAs
Municipal Solid Waste	1,353	2,513	N/A
Geothermal (Non-binary)	200 lbs CO2/MWh 1.66 lbs CH4/MWh	n/a	Western GeoPower PPA

Source: The Climate Registry Electric Power Sector Protocol for Voluntary Reporting Program (Annex 1 to the General Protocol) v1.0, June 2009.

California Non-specific Emissions Factor

The wholesale brown market power purchases that the City executes to balance its resource supply with its load are not from a specific generator, and are called "unspecified" resources. TCR protocols dictate that the emissions associated with power purchases from unspecified resources be calculated by applying a default emissions factor based on the geographic region

[3] Bio-gas and anaerobic digester plants are assumed to have roughly the same amount of anthropogenic emissions as landfill gas generation.

from which the power likely originated. These geography-based non-specific emissions factors are found in the US EPA's Emissions & Generation Resource Integrated Database (eGRID). It is assumed that all of the City's wholesale market power purchases originate in the "WECC California" eGRID subregion, for which the current emissions factor is 661.2 pounds of CO_2e per MWh.

Biogenic and Anthropogenic Emissions

TCR protocols require that both biogenic and anthropogenic emissions be counted – and reported separately – in an entity's emissions inventory. Biogenic emissions of GHGs are those that would occur naturally from living organisms' respiration and digestion. Anthropogenic GHG emissions are due to human activity, mostly from burning of fossil fuels. In the electric generation sector, examples of biogenic emissions include CO_2 emissions resulting from the combustion of plant biomass, sludge digester gas or landfill gas. Since biogenic emissions are not a GHG consequence of City projects and activities, the emissions will not be included in the calculation of emissions for the city's electric supply portfolio.

Anthropogenic emissions factors are shown in Table 2 for various types of generation resources that will be counted in the City's emission inventory along with the eGRID listed emission factors for unspecified resources. For illustrative purposes, Table 3 shows the expected 2015 GHG emissions intensity of the City's electric supply portfolio assuming a 4.2% reduction in usage from energy efficiency; a 33% RPS; average hydroelectric conditions; and the remaining load met through unspecified market purchases.

Table 3: GHG Emissions Associated with the City's 2015 Electric Supply Resources

Resource Type	Generation (GWh)	Emissions Coefficient (lb CO2e/MWh)	Total Emissions (Metric Tons CO2e)
Hydro	533	0	0
Wind	120	0	0
Landfill Gas	126	0[4]	0
Geothermal	33	235	3,523
Other Renewables (for a total RPS 33% of sales)	51	0	0
COBUG	0.5	1,226	278
Market Purchases	193	661	57,869
Total	**1,056**		**61,670**

4. Balancing Periods and Banking

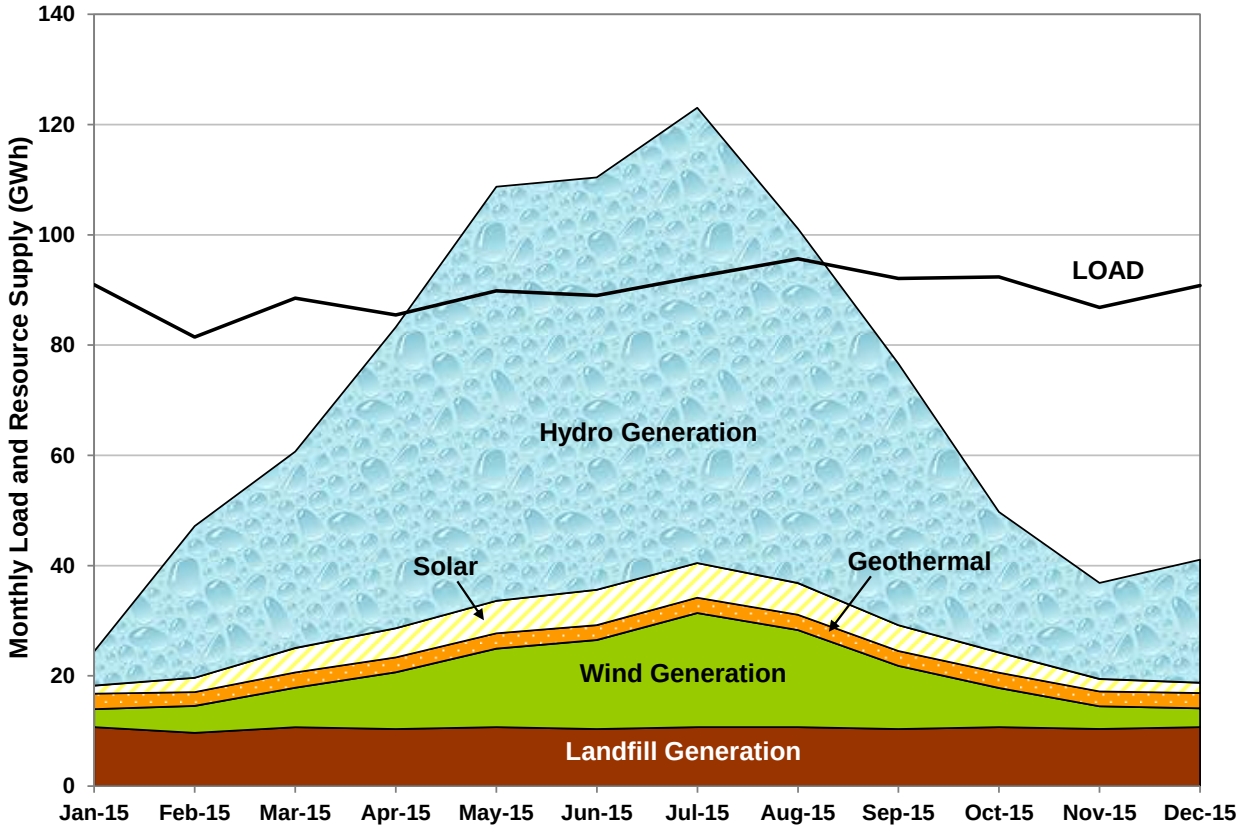
The City's electric load requirements and supply resources vary significantly on an hourly, daily, monthly and annual basis. Under the current plan in 2015, the City's electric portfolio is expected to require market purchases of about 19% of the annual load; however, even in an

[4] The TCR EPS protocol allows the use of a default emissions factor of 38 lb CO2e/MWh for landfill-gas-to-energy plants, but the facilities that Palo Alto has contracted the energy from do not use any fossil-fuel natural gas to supplement the landfill gas so the anthropogenic emissions factor for Palo Alto's projects is zero.

average hydroelectric year the portfolio's electric resources will exceed loads in months when hydroelectric generation and wind output are highest. Figure 2 is an illustration of monthly variability in load and supply resources in 2015.

The City's hydroelectric resources cause large variations in supply resources on an annual basis. Hydroelectric supplies provide from 30% to 80% of the City's annual electric needs depending on hydrologic conditions. Currently, under wet hydrologic conditions the City may have resources surplus to load by as much as 55% during the spring months. Adding additional carbon neutral resources to the portfolio would extend these surpluses even further, particularly if the new resources had an annual load shape like hydroelectric, California wind or solar resources.

Figure 2: Expected Monthly Load and Resource Balance in 2015



Operationally the City's electric load must be balanced with a supply resource every 10 minutes. As the City's scheduling coordinator, the Northern California Power Agency (NCPA) actively buys and sells electricity through the CAISO on a daily, hourly, and real-time basis. The level of granularity the City seeks to pursue through its carbon neutral effort will influence the cost of achieving carbon neutrality and, to some extent, will dictate the types of resources available.

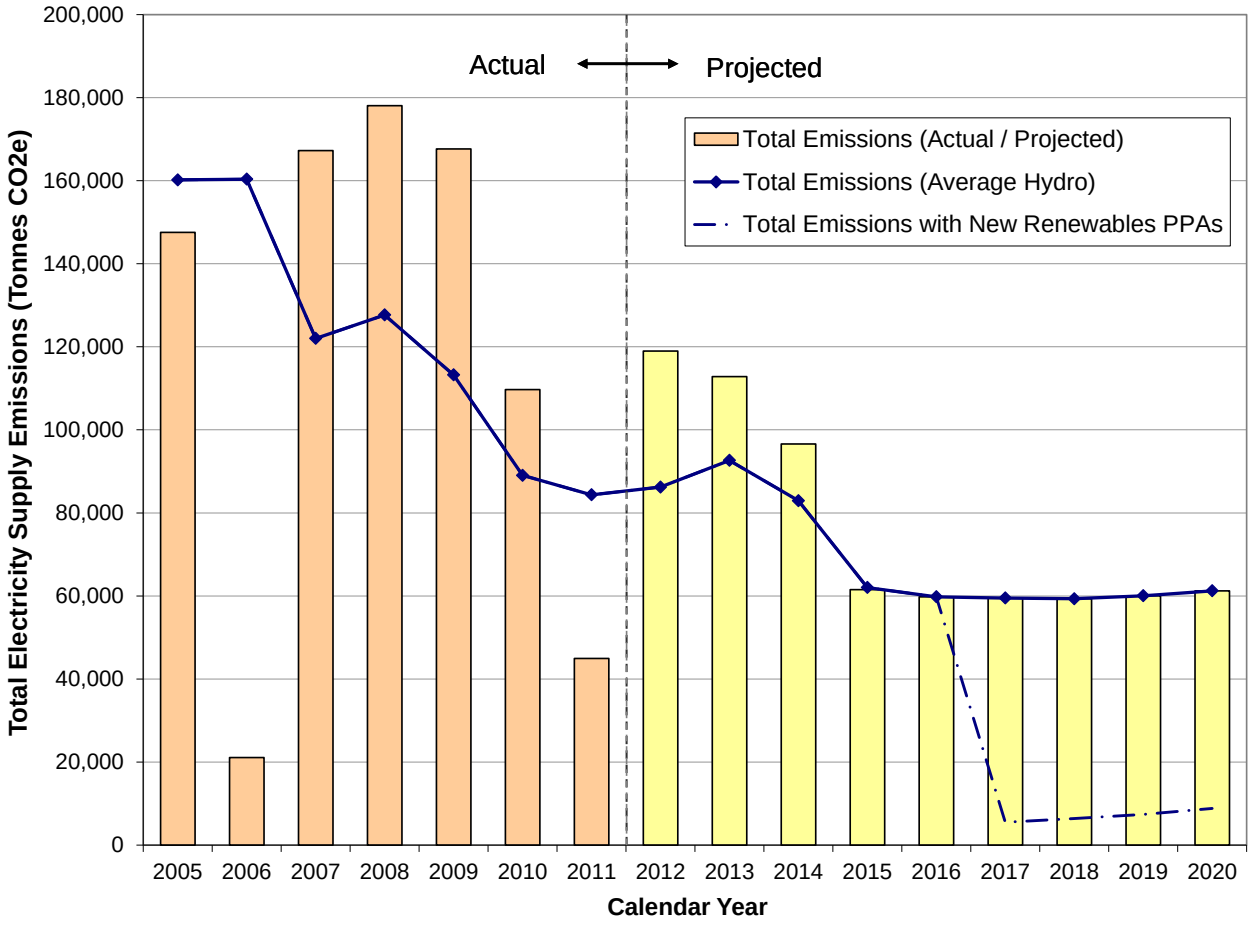
Ensuring that the City's portfolio is carbon neutral on a monthly (or even daily) basis may prove to be costly insofar as it leads to more transaction costs incurred. For example, in the spring

and some summer months, the City's availability of carbon-free resources from wind and hydroelectric resources is highest. Since it is not possible to schedule resources in excess of load, NCPA sells excess supply as a "system sale" (i.e., non-resource specific) and the renewable attributes associated with the resource are retained by the City. Conversely, in months where the City is deficient, NCPA makes system purchases to meet load. Assuring carbon neutrality in time increments less than on an annual basis would require that the City sell excess renewable resources in surplus months and purchase additional renewable resources in deficit months.

The TCR EPS reporting protocol requires an annual report showing net emissions for the calendar year, thus allowing for the carryover of surplus renewable attributes (i.e., RECs) from some months to be used to cover deficits in other months. Further, the protocol allows for the carryover of surplus renewable attributes beyond the calendar year in which they were produced. This practice is referred to as "banking" and is commonly used to minimize transaction costs. TCR protocols allow for banking only for new renewable resources (less than 15 years old), with restrictions on how long the RECs can be banked. As such, because the City's two hydroelectric resources are older than 15 years, RECs from these two resources may only be counted towards offsetting emissions in the calendar year in which they are produced.

Figure 3 shows the City's electric supply portfolio emissions following the recommended reporting protocol given 33% RPS and unspecified market purchases. These emissions would need to be "zeroed out" through the purchase of RECs and/or offsets to achieve carbon neutrality for the electric supply portfolio. The wide annual variation in emissions for the period from 2005 through 2011 is primarily due to variations in generation from hydro resources. The declining amount of emissions projected after 2012 is due to additional renewable resources expected to become available.

Figure 3: Actual/Projected GHG Emissions for the City's Electric Supply Portfolio



5. Role of PaloAltoGreen Program

PaloAlto**Green**, which started in 2003, is a voluntary program where customers elect to pay a premium in order to ensure that their supply is comprised of 100% renewable resources.[5] With roughly 25% of the City's customers (8% of retail load) on PaloAlto**Green**, the City's program is recognized as the top-ranked voluntary renewable program in the country by participation rate. In 2011, PaloAlto**Green** accounted for approximately 28,000 metric tons of CO_2e of GHG reductions for the community.

At the time the PaloAlto**Green** program started, the City did not have a renewable resource portfolio standard and participants received 100% renewable resources for their needs. However, as the City approaches its RPS goal, PaloAlto**Green** participants may have less incentive to remain part of the program and pay extra for renewable resources.

In the event that the City continues to offer PaloAlto**Green** as an alternative to the City's regular supply portfolio, the TCR EPS protocol allows for the reporting of multiple electric

[5] In 2011 PaloAlto**Green** was sourced through RECs purchased from wind projects in Washington and Wyoming (97.5% of supply) and solar projects in California (2.5% of supply).

supply emission tables to be used by customers in their voluntary reporting of their own Scope 2 emissions. However, the TCR EPS protocol does not allow emission reductions from PaloAlto**Green** to be counted towards carbon neutrality efforts of the non-voluntary portfolio.

A task to redesign the PaloAlto**Green** program is part of the LEAP Implementation Plan. That redesign will be done in the context of the pursuit of carbon neutrality for the electric supply portfolio. As PaloAlto**Green** has tapped into an important community resource involving a willingness to support environmental stewardship, PaloAlto**Green** redesign efforts will explore alternatives for continuing to provide GHG emission reduction efforts throughout the community.

6. Product Alternatives to Achieve Carbon Neutrality

There are several types of resources and/or environmental products that the City could use under TCR protocols to achieve carbon neutrality for the electric portfolio. A general description of these products is provided below. The plan to achieve carbon neutrality will provide further detail regarding costs and availability of each resource along with a recommendation of whether or not to use them as part of the City's carbon neutral efforts.

RPS Eligible Resources:

RPS eligible resources are those certified by the California Energy Commission (CEC) and are included in the CEC's RPS Eligibility Guidebook. The City's RPS requires that resources meet the CEC RPS eligibility requirements as well. The list of renewable resource technologies that meet the CEC's RPS eligibility standards includes energy from landfill gas-to-energy, solar photovoltaic, solar thermal electric, wind, small hydroelectric, and geothermal projects. Under California's RPS law (SB X1-2), unbundled RECs (i.e., RECs without any physical energy associated with them, or Bucket 3) and renewable resources that are located out-of-state (i.e., Bucket 2) can be used for RPS compliance, with some restrictions on the degree to which these resources can be relied upon to meet the state RPS requirement. For the purpose of reporting emissions, the TCR protocol does not distinguish between RPS eligible resources and non-RPS eligible resources.

REC-Only Products

TCR protocols allow entities that procure unbundled RECs to adjust their emissions inventories to account for these products. Even though the physical energy is not delivered to the entity, TCR allows the use of unbundled RECs—whether RPS eligible or not—to displace an equivalent amount of power from the actual power mix. This adjustment is allowed because the RECs include all renewable and environmental attributes associated with the production of electricity from the renewable energy resource.

Carbon-free, Non-RPS Eligible Renewable Resources

Non-RPS eligible resources that can be reported as being carbon-free under the TCR protocols include large hydroelectric (such as from Western and Calaveras resources), nuclear and out-of-state renewable resources built before 2005.

Environmental Offsets

GHG offsets[6] are tradable credits issued for emissions reductions resulting from qualifying GHG mitigation projects. They can be purchased on the voluntary market (for example to achieve carbon neutral objectives) or in the compliance markets (for example to meet cap-and-trade requirements). Qualified offsets for California's cap-and-trade system are certified and issued by the Climate Action Reserve and are typically transacted on a bilateral basis. The California Air Resources Board (CARB) currently recognizes offsets issued by the Climate Action Reserve for several types of GHG mitigation projects—including forestry, urban forestry, livestock methane, and ozone depleting substances—for use in meeting AB32 GHG reduction goals for 2020. There are other international offset markets, such as the Clean Development Mechanism which facilitates offsets from developing countries to be sold into the European Union's Emission Trading Scheme.

With the uncertainty associated with the use and eligibility of various types of offset products coupled with the lack of compliance-driven buyers, the market for offsets is currently very illiquid and there is a great deal of uncertainty around the long-term market price of these products.

Table 4 is a summary of the various products including RPS specifications and how they are currently reported under California's Power Content Label requirements.

Table 4: Summary of Various Renewable Energy and Environmental Products

	RPS Eligible Energy	RPS Eligible RECs	Non-RPS RECs	Non-RPS Carbon-free Energy	Environmental Offsets
Description	Bucket 1: In-state projects, and Bucket 2: firmed and shaped products from out-of-state resources	Bucket 3: REC-only deals or other transactions, subject to compliance limits	Unbundled RECs from projects not RPS certified by the CEC	These could include large hydro, nuclear, or older out-of-state renewable energy projects	Emissions reduction credits from qualifying GHG mitigation projects
RPS Eligible?	Yes	Yes	No	No	No
Power Content Label	Eligible Renewable	Eligible Renewable	Eligible Renewable	Specific Resource	Unspecified Market
The Climate Registry	Emissions reported *	Emissions reported *	Emissions reported *	Zero emissions	Emission reductions counted

* Anthropogenic emissions, if applicable, reported.

[6] WRI defines a carbon offset as "*a unit of carbon dioxide-equivalent (CO_2e) that is reduced, avoided, or sequestered to compensate for emissions occurring elsewhere.*"

ATTACHMENT E

EXCERPTED FINAL MINUTES OF THE DECEMBER 5, 2012 UTILITIES ADVISORY COMMISSION MEETING

ITEM 4: ACTION: Utilities Advisory Commission Recommendation that Council Approve a Carbon Neutral Plan for the Electric Supply Portfolio

Senior Resource Planner Monica Padilla presented a summary of the carbon neutral plan report. She stated that after 2016, the portfolio will have very low carbon content due to RPS resources as well as hydroelectric contracts. The key policy decisions include what types of resources to pursue in the near term (until 2016) and long term, what types of resources to use for annual true-ups of load and resources and for covering anthropogenic greenhouse gas (GHG) emissions.

Padilla described the proposed Carbon Neutral Plan as pursuing short-term renewables and/or unbundled renewable energy certificates (RECs) in the near term and using RECs for balancing and for neutralizing the geothermal and back-up generator GHG emissions.

Vice Chair Foster asked if there were any other communities that have pursued carbon neutral plans. Padilla responded that through a study conducted by Navigant Consulting, staff has learned that other communities including Seattle City Light and the Marin Energy Authority are pursuing 100% renewable portfolios through the use of hydroelectric supplies, bundled renewables and RECs.

Public Comment
Walt Hayes indicated his support for the proposed plan and described the moderate cost as well as the strong leadership shown by Palo Alto.

Commissioner Eglash asked Mr. Hayes if he supported this because of the symbolism, or the GHG emissions reductions. Mr. Hayes responded that the City has taken the initiative and stated that after Palo Alto's Green Ribbon task force, other cities nearby began to develop their own sustainability plans.

Bruce Hodge, from Carbon Free Palo Alto, stated his strong support of the plan, especially the move to get to carbon neutral as soon as 2013. He urged the UAC to recommend approval of the plan.

Dirk Morbitzer, stated that he follows market developments of renewable energy across the globe. He stated that other cities across the U.S. and the world will follow Palo Alto's lead. He

recommended that the solar resource be local since that strategy keeps financial resources local and assists with electricity availability in case of emergencies. He noted that solar costs have fallen in Europe and can further fall in the U.S.

Gary Hedden, Los Altos Environmental Commission, noted that the plan is inspirational, but may not be repeatable since they buy their energy from PG&E.

Craig Lewis, CLEAN Coalition, supported the proposed plan and acknowledged the work of staff and community members to complete the plan. He stated that in Germany, local solar projects cost as low as 7 cents/kWh now, which is less than remote renewable energy projects transported to Palo Alto two years from now. Mr. Lewis added that Palo Alto's actions are seen widely around the country and its actions are followed by others since other areas want to emulate what's done in Palo Alto.

Bret Anderson, local resident, supported the proposed plan. He stated that it was important to him that the energy source is green, which makes using an electric car for transportation truly green.

Commissioner Chang asked if the plan for the near term included purchasing short-term renewables and/or RECs to cover the brown energy. Padilla stated that staff plans to shop for both products—short-term renewables and unbundled RECs—and choose the least costly resource. She noted that this is clearly spelled out in the plan, which is Attachment A to the report, under Section 3.b.i.

Vice Chair Foster thanked the speakers for expressing their opinions at the meeting. He noted that the falling price of renewable energy has made the decision an easy one to support the proposed plan.

Commissioner Eglash stated that reducing GHG emissions to be a very important goal. He noted that GHG emissions accrue from many of our actions and the use of electricity is but a small source. He is concerned that the plan is primarily an accounting exercise and that it is symbolic at most since the electric portfolio is almost carbon neutral already. He stated that the cost is low since the impact is low.

Vice Chair Foster responded to Commissioner Eglash's concerns by saying that this is a significant step and that we can then turn to other sources of GHG emissions reductions.

Commissioner Waldfogel said that we should get to carbon neutrality since we're almost there and it's better to be there, than almost there. He asked if the City considered stopping RPS at 33% and then using the additional money under the 0.5 cent/kWh rate impact for carbon neutrality. Assistant Director Jane Ratchye stated that the Council adopted an RPS goal of reaching at least 33% RPS, but to go as far as possible within the rate impact limit.

Commissioner Waldfogel asked if the PaloAlto**Green** program was ended, would other customers see a rate increase as a result of the loss in PaloAlto**Green** revenues. Padilla said

that the revenues for the voluntary PaloAlto**Green** program are separate and used only to offset the cost of procuring RECs for PaloAlto**Green** so there would be no impact.

Commissioner Eglash asked about the cost of achieving carbon neutrality by 2017 instead of 2013. He noted that the cost of carbon neutrality in the near term is $2.7 million for 2013 to 2016 and that this cost will be paid primarily by non-residential customers.

Vice Chair Foster asked how the increased cost (0.05 to 0.09 cents/kWh) would impact the rates and how it would compare to surrounding communities. Director Fong stated that the increase would be minor and that our rates are low compared to PG&E. Vice Chair Foster noted that this is a very small expense to pay for this important program and that we should go ahead now since time is of the essence.

Chair Cook read a statement provided by Commissioner Hall, who was unable to attend the meeting: "I wholeheartedly support Staff's proposed efforts to achieve carbon neutrality ahead of the January 2015 target date set by the Council. I note that the percentage of surveyed residents who are willing to pay more than $2 per month was 66% - a good majority. Happily, it appears possible for residents to support carbon neutrality by the end of 2013 for an average of not much more than $2 per year using the recommended strategy. And, given that the anticipated Cap-and-Trade revenues will far exceed the cost of this program, it's preferable to utilize a sufficient portion of Cap and Trade revenues to offset the cost of this program – so that residents will see no rate increase at all."

Chair Cook asked about risks of the plan, especially the risks of costs rising to implement the plan, for example, if the cost of renewable energy rises significantly leading to a rapid rise in rates. Director Fong stated that the renewable energy contracts have locked in prices so there is protection of rising costs there. In addition, the plan proposed a rate impact limit of 0.25 cents/kWh to protect ratepayers.

Chair Cook thanked the public speakers and noted that the involvement of the community by attending the meeting, providing comments, and sending emails is the most he has experienced in his time on the UAC. He stated that he also supported the plan and stated that the low price to achieve the plan is acceptable. Chair Cook noted that this is a great policy, but there is still more to do.

Commissioner Eglash noted that the cost of getting to carbon neutrality in the near term (2013 to 2016) at $2.7 million accounts for the majority of the costs and that most of the cost will be borne by commercial customers. Commissioner Eglash further asked if the City delayed getting to carbon neutrality from 2013 to 2017 whether the funds could be used for other carbon reduction efforts such as energy efficiency. Director Fong noted that Council directed staff to develop a plan to get to carbon neutrality by January 2015 so staff would not have proposed achieving carbon neutrality by 2017. In addition, the Council has already adopted a very aggressive energy efficiency program. Director Fong stated that if the City decided not to achieve carbon neutrality before 2017, then the funds would simply not be spent so if the City

was not going to seek to achieve carbon neutrality, then the costs would simply not be incurred.

Commissioner Melton asked that in order to aid Council in their decision it be noted in upcoming staff reports the cost of getting to carbon neutrality based on alternative start years (i.e., 2013 versus 2017) and to explicitly state that it is expected to cost an additional $2.7 million to achieve carbon neutrality in 2013 instead of 2017. Then Council will have the information of the price tag to be paid by ratepayers from that policy direction. Director Fong agreed to provide this information in the report and note the discussion in the upcoming staff reports to Council. Chair Cook added that a representative from the UAC can attend Finance Committee and Council meetings to underscore the UAC's discussions.

ACTION:
Vice Chair Foster moved to support the staff's recommendation. Commissioner Melton seconded the motion. The motion carried unanimously (6-0) with Commissioner Hall absent.

ATTACHMENT F

5

CITY OF PALO ALTO UTILITIES ADVISORY COMMISSION
COMMISSIONER MEMO

TO: Valerie Fong, Director, Utilities
Audrey Chang, Jonathan Foster, Garth Hall, and Asher Waldfogel, Utilities Advisory Commission

FROM: James Cook (Chair), Steve Eglash, and John Melton, Utilities Advisory Commission

DATE: Initially submitted December 16, 2012; final version December 28, 2012

SUBJECT: Request to agendize and revisit the cost limitations of the carbon neutral plan for the electric portfolio at the January 9, 2013, UAC meeting

Background. At the December 5, 2012, UAC Meeting the commissioners voted unanimously (six in favor and one absent) to recommend that the City Council adopt staff's carbon neutral plan for the electric portfolio. This plan directs staff to achieve carbon neutrality for the City's electric portfolio beginning in 2013 by purchasing RECs to make up for any brown power consumed by the City. The proposed plan includes Council authorization for CoPA Utilities to spend up to $0.0025/kWh to achieve carbon neutrality. The expected cost is between zero and $2.7 million total for the period 2013 – 2016 and very low thereafter.

The issue. The discussion at the December 5, 2012, UAC Meeting focused primarily on the expected cost and relatively little time was devoted to the spending cap. The authorization permits CoPA Utilities to spend up to $0.0025/kWh, equivalent to approximately $2.5 million per year or $10 million total for the period 2013 – 2016. There is no limit on the price per REC. The purpose of this memo is to request that the carbon neutrality topic be discussed at the January 9, 2013, UAC Meeting with a particular focus on spending limits. Two types of spending caps are recommended: a cap on total spending during 2013 – 2016 and a cap on the price per REC regardless of the number of RECs to be purchased.

Two examples serve to illustrate the possible need for a lower total cap during 2013 – 2016 and the possible need for a cap on the price to be paid for a REC at all times.

Example 1. In the event of a dry hydro year, the City might use more brown power than assumed in the likely scenario. In this case the carbon neutrality plan directs staff to purchase RECs up to a rate impact of $0.0025/kWh, or roughly $2.5 million per year. In the unlikely event that poor hydro conditions required the Utility to do this for all four years 2013 – 2016, then the carbon neutrality plan would cost the rate payers $10 million, not $2.7 million as in the likely scenario discussed in the memo and at the UAC meeting. The authors of this Commissioner Memo would like the UAC to discuss whether a more restrictive cap on total spending is appropriate during 2013 – 2016. One possibility is a cap of $1 million per year, which would have the effect of limiting total spending during the four-year period to $4 million.

Example 2. There is no limit in the proposed plan on the price per REC. In order to protect ratepayers from paying a relatively large amount for a small reduction in carbon emissions, the authors of this Commissioner Memo would like the UAC to consider setting a maximum price per REC that the Utility is authorized to spend, regardless of how few RECs are to be purchased. One possibility is a cap of $20/MWh. (Staff has indicated that the expected price of RPS-eligible unbundled RECs is $1-10/MWh.) Such a limit would be in addition to the limit on total annual spending described in Example 1.

To be clear, it is not the authors' intention to backtrack from our support for the carbon neutrality plan, but rather to put appropriate limits on what the City should spend (more accurately, what the City's ratepayers should be asked to spend) in achieving carbon neutrality. In consideration of the UAC's oversight role, of the UAC's advisory role to the City Council, and of being good stewards of our residential and business ratepayers' money, we believe that the issues raised in this memo should be discussed by the UAC.

ATTACHMENT G

EXCERPTED DRAFT MINUTES OF THE JANUARY 9, 2013 UTILITIES ADVISORY COMMISSION MEETING

ITEM 5: ACTION: Commissioners' Memo Recommendation that the Utilities Advisory Commission Discuss and Potentially Act Upon the Cost Limitation Provision of the Carbon Neutral Plan for the Electric Portfolio

Commissioner Eglash provided a brief synopsis of the memo signed by Chair Cook, and Commissioners Eglash and Melton and stated that the discussion at the UAC's December meeting focused on the expected cost to achieve carbon neutrality and not on the potential maximum cost. Particularly before the long-term renewable resources are on-line, for 2013 through 2016, the cost could be significant to get to carbon neutrality. He summarized the recommendations in the memo as limiting total spending during 2013 to 2016 and a cap on the price of Renewable Energy Certificates (RECs).

Public Comment:
Bruce Hodge stated that the additional limitations recommended by the Commissioners' Memo are unnecessary and supported the cost cap in the proposed plan. He shared his analysis of the bill impact for customers using different amounts of electricity per month and showed that the impact was small and reasonable.

Walt Hays agreed with Bruce Hodge since Bruce Hodge had done the analysis. Walt Hays reminded the Commission of the risks of climate change and said that the City should not quibble with the small costs being proposed in the plan. He added that the plan is more than symbolic and, even if only symbolic, may have greater impact as the bold plan it is.

Commissioner Melton asked for staff's opinion of the recommendations in the Commissioners' Memo. Director Fong stated that staff has put its proposal forward and the Commissioners' Memo provides another option.

Vice Chair Foster stated that he feels like the message the plan sends is valid and that the plan has only a small rate impact anyway and he doesn't support a lower cost limitation. However, he stated that he could support the proposed REC cost limitation.

Commissioner Melton stated that the spending limit proposed in the memo is a "black swan" protection device. He stated that we need some maximum spending limitation in case something changes dramatically.

Responding to Commissioner Melton's recommendation, Vice Chair Foster stated that he agreed that there needed to be a spending limit and that the proposed plan does have a limitation of $2.5 million/year.

Commissioner Eglash agreed that the proposed plan does have a spending limit of about $2.5 million per year. He stated that the question at hand is whether we are comfortable with the proposed rate cap for our residential and commercial customers. This is especially an issue in the years from 2013 to 2016 before the long-term renewable contracts come on line.

Commissioner Chang asked how the cap in the proposed plan of 0.25 cents/kWh was derived. Director Fong said it was proposed by staff to cover the uncertainties in hydroelectric production and the future cost of RECs. She stated that another idea is to have a dollar amount that is a trigger point when staff needs to return to the Council for further direction.

Commissioner Hall stated that he supports a 0.15 cents/kWh which appears to be an adequate cap rather than a total dollar cap. In addition, he doesn't support a price cap on RECs as that limits staff and removes flexibility.

Commissioner Eglash said that the concern raised in the memo is that we could look foolish by some ratepayers, particularly those who are cost sensitive. He doesn't want to spend any amount of money to get the last little bit of carbon neutrality when that additional cost could be extreme.

Vice Chair Foster stated that he supports a trigger point to ensure that costs are not exceeded, but not necessarily a lower cost cap.

Commissioner Melton stated that he supports a trigger point.

Chair Cook said that the point of the memo was to ensure that the UAC has done its job and clearly thought through the costs to make sure that the costs are reasonable.

Vice Chair Foster was concerned that any action will show that the UAC supports carbon neutrality, but doesn't want to pay much at all for it. He would rather not take a new formal action, but rely on staff to less formally provide an early heads up to the UAC and Council if costs are higher than anticipated.

Commissioner Melton asked if staff could come back to the UAC with an update of the cost to get to carbon neutral based on better information about hydroelectric conditions. He asked a cost trigger could be put in place which if met would prompt staff to come back to the UAC to discuss whether or not it made sense to pursue carbon neutrality for that year. The cost trigger would be less than the cap approved by Council, so that staff would not have to return to Council if the decision was to move forward with carbon neutrality.

Director Fong asked Senior Resource Planner Monica Padilla to discuss how a cost trigger would be used by staff. Padilla stated that RECs will be purchased after the fact when hydro conditions are known and we'll have a better idea of REC costs and that staff could return to the UAC with updated costs before purchasing RECs.

ACTION:
Commissioner Eglash made a motion to recommend that Council direct staff that, if cost is higher than 0.15 cents/kWh, staff should come back to the UAC for additional discussion. He explained that it could be left to staff's discretion to inform the UAC regarding a significant increase in the cost of RECs.

Commissioner Hall made a substitute motion to revise the cap to 0.15 cents/kWh, instead of 0.25 cents/kWh. Commissioner Eglash seconded the substitute motion. Commissioner Hall explained that it's more straightforward to have a cap, rather than a trigger point to return for discussions. If it looks like the cap will be exceeded, staff could return and request additional spending authority.

Vice Chair Foster stated that he supports a request for discussion, rather than a lowering of the cap. But, if a lower cap is proposed, then he would support a cap of 0.2 cents/kWh, not 0.15 cents/kWh.

Commissioner Eglash stated that Council supported carbon neutral by 2015, but the additional costs to move it up to 2013 were high and a cap will reduce the cost of moving up the date of implementation.

Vice Chair Foster proposed an amendment to the substitute motion to revise the cap to 0.2 cents/kWh. The amendment died for lack of second.

The substitute motion to recommend that Council achieve carbon neutrality for the electric supply portfolio within a cost cap of 0.15 cents/kWh passed (4-2) with Foster and Melton opposed and Waldfogel absent.

ATTACHMENT D

FINANCE COMMITTEE DRAFT MINUTES

Regular Meeting
Tuesday, February 5, 2013

Chairperson Burt called the meeting to order at 7:00 P.M. in the Council Conference Room, 250 Hamilton Avenue, Palo Alto, California.

Present: Berman, Burt (Chair), Schmid, Shepherd

Absent:

ORAL COMMUNICATIONS

None

AGENDA ITEMS

1. Utilities Advisory Commission Recommendation that the City Council Adopt a Resolution Approving a Carbon Neutral Plan for the Electric Supply Portfolio to Achieve Carbon Neutrality by 2013.

Monica Padilla, Senior Resource Planner reported in December 2007 the Council approved the Climate Protection Plan (CPP), setting out broad goals to reduce greenhouse gas (GHG) emissions. In March 2011, the Council approved an updated Long-term Electric Acquisition Plan (LEAP), setting broad objections for management of the portfolio and directing Staff to review cost benefits of achieving a carbon neutral portfolio. Staff determined the City could achieve carbon neutrality quickly with minimal risk. In May 2012 the Council directed Staff to develop a Plan to achieve carbon neutrality by 2015. First, Staff defined carbon neutrality, and the Council approved the definition in November 2012. In developing a Carbon Neutral Plan (Plan), Staff established high level objectives: achieve community-wide reductions in GHG emissions consistent with the CPP; achieve carbon neutrality quickly and with a reasonable cost; support the City's continued commitment to energy efficiency and long-term renewables; and meet the Renewable Portfolio Standard (RPS) for remote and local renewables and large hydroelectric generation. If the Council took no action, Staff expected to have approximately 50 percent of supply needs

met through large hydroelectric generation, 33-35 percent through committed renewable resources, and the remainder through market purchases. Beyond 2016, Staff expected to bring on some new renewable resources to meet RPS within the 1/2 cent rate impact limit. Through those contracts for renewable resources, Staff believed the City could attain 100 percent carbon neutrality by 2017 within the 1/2 cent rate impact. In struggling with actions to take between 2013 and 2016, Staff considered key policy decisions of using 100 percent long-term renewables, combining long-term and short-term renewables, using Renewable Energy Certificates (REC), allowing for banking, buying unbundled RECs, and using cap-and-trade revenues or other ratepayer funds. Staff's recommendation did not include a method to pay for carbon neutrality, because that would be part of the Budget process. In developing the recommended Plan, Staff considered alternative strategies that could be employed to reach carbon neutrality.

Chair Burt requested an explanation of acronyms.

Ms. Padilla explained Power Purchase Agreements were PPAs, and RPS was Renewable Portfolio Standard. The recommended Plan included continued purchases from the brown market in order to meet load requirements, while neutralizing those purchases through the use of RPS eligible unbundled RECs and possibly short-term renewables if available at a comparable price. In a dry year, the City would continue to make market purchases to meet load and neutralize market purchases with non-RPS-eligible unbundled RECs. Use of only RPS-eligible renewables could be quite exorbitant in a dry year. To annually true up the portfolio, Staff proposed banking as much as possible, and then using unbundled RECs to neutralize resources. To neutralize anthropogenic and small emissions associated with the cooperatively owned backup unit generator (COBUG), the City would use non-RPS-eligible unbundled RECs. Use of non-RPS unbundled RECs was less expensive; however, use of only short-term bundled renewable resources was the gold standard for a carbon neutral portfolio.

Chair Burt asked Staff to explain the difference between RPS-eligible renewables, non-RPS-eligible unbundled RECs, and other resources.

Ms. Padilla explained the California Energy Commission certified resources to meet the RPS. There were some vintage requirements that resources be built after a certain date and that resources cover a variety of types of generation including biogas, wind, solar, small hydroelectric, and geothermal.

Chair Burt inquired whether resources must be in state or could be out of state.

Ms. Padilla stated out-of-state renewables were RPS eligible but there were limits on the number that could be brought into California.

Chair Burt reiterated that only a certain portion of resources in the RPS-eligible category could be out-of-state.

Ms. Padilla agreed.

Chair Burt added those out-of-state resources must have certain characteristics.

Ms. Padilla explained a REC was essentially the green attribute associated with a particular renewable facility. The REC could be stripped from the actual energy and sold as an unbundled REC. Under the RPS rules an unbundled REC was an RPS-eligible resource but there were limitations on how many a portfolio could contain. A bundled REC was the renewable attribute and the energy together. They were eligible for RPS with few limitations.

Valerie Fong, Utilities Director noted all renewable resources currently under contract were fully eligible under the state rules because the City was keeping the energy and the green attribute together. There were markets to purchase bundled and unbundled RECs.

Ms. Padilla reported all resources in the City's RPS were RPS eligible. To meet carbon neutrality, the City did not have to pursue RPS-eligible resources; resources had to be carbon free and/or renewables.

James Keene, City Manager asked why market purchases were included in resources for the near term.

Ms. Padilla explained the City had to make market purchases in order to meet load requirements. Once the City knew how many market purchases were made to meet load requirements, it would then buy an equivalent amount of RECs.

Mr. Keene inquired whether offsetting RECs would negate the market purchases.

Ms. Padilla answered yes.

Chair Burt posed the scenario of utilizing 50 percent hydroelectric, 40 percent renewables, and 10 percent market purchases, and asked if the City

would then need to purchase under this proposal non-RPS-eligible unbundled RECs to compensate for the 10 percent of market purchases.

Ms. Fong replied yes, under that scenario.

Council Member Berman inquired whether the City could purchase either RPS-eligible RECs or non-RPS-eligible RECs.

Ms. Fong suggested the City could purchase RPS-eligible unbundled RECs.

Mr. Keene inquired about a scenario that would allow the City to bank RECs.

Ms. Padilla stated a wet hydroelectric year would allow that.

Chair Burt indicated the recommendation was to offset market purchases with RPS-eligible RECs.

Ms. Padilla noted the table on Packet Page 15 discussed the prices of the different products. The least expensive product was a non-RPS unbundled REC with a premium between $1 and $5. An RPS-eligible unbundled REC had a premium between $1 and $10. A bundled renewable energy and REC, short -term bundled product, had a premium between $5 and $25 for an out-of-state product, and a premium between $10 and $30 for an in-state product. The prices were market prices at the time the report was produced and were subject to change.

Council Member Berman noted the City did not have to meet the RPS standards yet; however, the portfolio had to reach 33 percent at some point.

Chair Burt stated the portfolio had to reach 33 percent by 2020.

Ms. Padilla explained those were interim compliance requirements, and the City was on track to meet all of them.

Council Member Berman believed the real reason for purchasing RPS versus non-RPS RECs was the environmental benefit.

Chair Burt provided an overview of the Council's discussions of and objectives for carbon neutrality. The Plan was not driven by state or federal mandate but by a Palo Alto initiative.

Council Member Berman inquired about the cost difference between the recommended Plan and the non-RPS Plan using the hypothetical of 50 percent hydroelectric, 40 percent renewables, and 10 percent market

purchases.

Ms. Padilla reported the recommended Plan fell between the two alternatives. All plans achieved carbon neutrality by the adopted definition. Staff recommended implementing the recommended Plan as early as 2013 because it could be achieved relatively inexpensively. From 2013 through 2015 the City could achieve carbon neutrality through the use of short-term renewables, if they were available at a reasonable price, and/or unbundled RECs to neutralize brown energy associated with market purchases. Beyond 2016, use of the 1/2 cent would achieve 50 percent carbon neutrality. The City could reach carbon neutrality with hydroelectric and renewables in 2017 while balancing unbundled RECs and utilizing the banking mechanism to the extent the possibilities. Anthropogenic emissions and COBUG emissions could be neutralized with non-RPS-eligible RECs.

Chair Burt requested an explanation of anthropogenic and COBUG.

Ms. Padilla explained anthropogenic emissions were the result of man extracting steam from geothermal plants. No anthropogenic emissions were associated with Palo Alto's landfill gas generators.

Chair Burt stated anthropogenic emissions were associated with renewables.

Ms. Padilla explained biogenic emissions occurred naturally and anthropogenic emissions occurred because man did something to the site to extract energy. Staff recommended neutralizing anthropogenic emissions with non-RPS-eligible RECs. COBUG had emissions because of the fossil-fuel fired generator.

Vice Mayor Shepherd asked why COBUG did not need to have RECs.

Ms. Fong explained COBUG was exempt from the compliance requirements.

Ms. Padilla reported Staff recommended achieving carbon neutrality within a rate impact limit of 0.15 cents per kWh. If Staff determined the limit would be exceeded they would return to the Council for direction. Between 2013 and 2016 market purchases were covered with short-term renewables or RECs to neutralize that part of the portfolio. Everything else remained the same. If the Plan was approved and implemented Staff expected the cost to attain carbon neutrality would be relatively moderate. In 2013-2016 the cost would range between $610,000 and $910,000 annually. Beyond 2016 the costs became minimal at approximately $40,000 per year, associated mainly with the anthropogenic emissions and COBUG. The costs were based on expected hydroelectric production and expected product costs. The

expected cumulative costs between 2013 and 2020 would be approximately $2.9 million. An average residential bill would increase between $2.60 and $4.20 a year. Beyond 2016 an average residential bill would increase approximately 10 cents a year.

Ms. Fong requested Ms. Padilla explain why there was a marked contrast between the 2013-2016 period and beyond 2016.

Ms. Padilla reported beyond 2016 Staff used the 1/2 cent premium allocated to the RPS. Costs were in addition to the 1/2 cent premium. At 0.15 cents per kWh, the cap on costs to reach carbon neutrality equated to approximately $1.5 million per year.

Ms. Fong indicated the $1.5 million amount compared to the expected value of $610,000 to $910,000 per year.

Ms. Padilla stated if costs reached the maximum of $1.5 million a year the cumulative costs between 2013 and 2020 would be approximately $12 million. Because the portfolio and all cost assessments were based on expected values, which were not likely to occur, Staff considered different scenarios for the recommended portfolio and the alternatives. There are very few months in a dry year when the City could meet load requirements. In a wet year, the City had surplus resources in many months. In 2020 when Staff expected to have additional long-term renewables, the problem in a wet year was exacerbated because more renewable resources were available. The Plan called for neutralizing on an annual basis not a monthly basis.

Council Member Berman suggested Staff provide the average monthly load requirement and the average monthly amount generated for the different options to understand it did even out.

Ms. Padilla reported the scenario analysis provided the expected costs in a wet year, a dry year, a high-price year, and a hybrid. With the exception of 2016, in all years Staff expected to be within that 0.15 cent rate limit. The analysis assumed that those renewables being evaluated were viable and could be billed and delivered at the price expected.

Mr. Keene inquired whether Chart 1 assumed the baseline scenario and whether the gap would be made up through the new renewable portfolio in 2020.

Ms. Padilla indicated the portfolio would reflect Chart 1 in 2020 with the new renewables.

Ms. Fong explained in the expected year, the City would not meet load requirements. The winter months typically had less hydroelectric generation and the summer months had more hydroelectric generation. That was the pattern for determining the value in the market.

Ms. Padilla stated the City did not have sufficient hydroelectric resources to meet load requirements in every month, so market purchases would be used to compensate.

Mr. Keene noted the projection for 2020 was 100 percent renewable resources, so the market purchases would be of renewable resources.

Ms. Fong explained all the excess would be used to average out the gap. It was an annual accounting issue when discussing the annual profile for carbon neutrality under the adopted protocol.

Ms. Padilla reported the graph showed what the costs under expected hydroelectric and market price conditions would be for the different portfolios. Costs for the recommended Plan were approximately 0.06 cents per kWh through 2016 when Staff expected costs to increase slightly due to an increased price of renewable resources.

Ms. Fong stated the City would have more renewables in its portfolio.

Vice Mayor Shepherd asked if renewables were hard resources.

Ms. Fong explained hard resources were the bundled energy plus the renewable attribute.

Ms. Padilla added shorter-term PPAs as hard resources. In that case, the City would not reach carbon neutrality at less than 0.15 cents even under expected conditions. Staff sought community input regarding willingness to pay and support for pursuit of carbon neutrality. 27 percent of residential customers were not willing to pay any more for carbon neutrality; however, the vast majority were willing to pay at least $2 more per month to reach carbon neutrality. 58 percent of survey participants were PaloAltoGreen participants.

Chair Burt inquired whether Staff knew how low the monthly cost would be when it conducted the survey.
Ms. Padilla answered no.

Chair Burt felt more residents would participate if the new cost was only 25

cents per month.

Ms. Padilla reported the proposed Plan relied heavily on aggressive energy efficiency efforts, long-term pursuit of RPS, and large hydroelectric resources. It was comprised of 100 percent renewable resources and relied on RECs only until long-term renewable resources came online in 2017. The Plan could be implemented as early as 2013 at a moderate cost, supported Palo Alto environmental leadership goals, and followed a verifiable and established protocol. Staff asked that the Finance Committee support the recommendation to recommend to the Council adoption of a Resolution to approve the Plan with the 0.15 cent per kWh rate impact.

Steve Eglash, Utilities Advisory Commissioner reported the Utilities Advisory Commission (UAC) and public comments overwhelmingly supported the Plan. The UAC had no disagreement on any of the high level points, but recommended significant limits on the amount to spend to achieve carbon neutrality, particularly prior to 2016. Because of the City's progress in meeting its RPS, beginning in 2017 the cost would be zero. The UAC attempted to balance the benefits of carbon neutrality with respect for the ratepayers. In trying to balance that, the UAC voted for a slightly tighter limit on spending between now and 2016. The UAC recommendation was reflected in Staff's recommendation.

Chair Burt inquired whether the 0.15 cent cap on rate impact was Staff's recommendation and the UAC's recommendation.

Ms. Fong answered yes.

Mr. Keene believed Staff had been promoting the higher rate but was convinced by the UAC and the fact that the cap could be revisited.

Mr. Eglash indicated Commissioners who did not support a tighter cap felt the message of achieving carbon neutrality was more effective; however, the majority of Commissioners supported the rate cap.

Chair Burt asked if Staff considered use of cap-and-trade revenues to offset this expense.

Ms. Fong reported Staff left the funding source open, because they would need to explain how they proposed spending cap-and-trade funds during the Budget process. Cap-and-trade revenues could be used for energy efficiency or for this Plan.

Chair Burt suspected that there would be some difference in thinking by the

Council, the UAC, and members of the public if the cost of the Plan was offset by cap-and-trade revenues. From a policy standpoint, whether or not the Plan impacted ratepayers would influence the parties.

Mr. Eglash stated the UAC did not discuss cap-and-trade revenues in relation to the Plan.

Ms. Fong reported one tenet for spending cap-and-trade revenues was to spend those monies on projects the Council would do anyway in case of a legal challenge.

Bruce Hodge was pleased to offer unqualified support for the Plan. Both the timeline and costs were worth noting. Beyond the immediate benefits, this Plan would send a message of hope and change to the larger audience.

Walt Hays felt climate change was the most severe threat humankind had faced. If people knew the cost would be only 25 cents per month, the percentage of survey respondents agreeing would have been substantially higher. He hoped the Finance Committee would follow Staff's recommendation.

Herb Borock stated this was the first time a legal reason had been asserted for not recommending the use of cap-and-trade revenue. In the UAC discussion regarding the rate impact limit, the argument was made that the cumulative amounts paid by commercial customers could be a burden on them; however, the amount paid by top commercial electric users was minute.

Council Member Schmid felt the issue was presenting the Plan to the public and noted the survey indicated 58 percent of residents participated in PaloAltoGreen, whereas the performance report indicated 20 percent of residents participated in PaloAltoGreen.

Ms. Padilla clarified that 58 percent of those responding to the survey participated in PaloAltoGreen.

Council Member Schmid suggested Staff be careful how they present information regarding customers.

Ms. Fong agreed.

Council Member Schmid understood the 1/2 cent per kWh would attain the goal of 33 percent and asked if it would attain the 50 percent goal.

Ms. Fong answered yes.

Council Member Schmid inquired whether Staff was confident that given the price structure of renewables the amount approved two years ago was enough to attain the 50 percent goal.

Ms. Fong indicated the Council approved the amount six or seven years ago and got it right.

Council Member Schmid stated that was a real accomplishment given the cap set years ago. He recalled a scenario of a dry hydroelectric year with high renewable prices and felt that was a likely scenario.

Ms. Fong explained if RECs were increasingly high the cap would take effect.

Council Member Schmid inquired about the effects of 100 percent renewable resources or carbon neutrality on the PaloAltoGreen program.

Ms. Fong stated the Council would have a Study Session on PaloAltoGreen the following week.

Chair Burt reported the Study Session recognized that the PaloAltoGreen program would not serve a purpose in its present form as the City moved to 100 percent renewables.

Council Member Schmid noted the trading or banking of hydroelectric credits had to be made within a calendar year and inquired about the effect of using the City's fiscal year; which would split the wet season between years.

Ms. Padilla reported the carbon neutral definition required use of the calendar year basis not fiscal.

Council Member Schmid asked what would be the effect if the fiscal year was used.

Ms. Fong stated the Council adopted the protocol of the calendar year.

Mr. Keene clarified that Council Member Schmid asked for the implication if it were structured on the fiscal year.

Council Member Schmid expressed concern about the ability to bank. The goal could be achieved more effectively if the diagram was split in half.

Ms. Fong indicated a protocol had to be followed once it was adopted. It

was difficult to change accounting rules in midstream with respect to meeting goals.

Council Member Schmid explained that at the end of the year in December, the City could not use the surplus generated in hydroelectric past that date. The City would have a surplus that could be shared with others, but the City was not able to use the surplus effectively.

Ms. Fong stated it was a bit more complicated than that. In hydroelectric generation, the reservoirs allowed for crossover to different fiscal years or even into different calendar years. The reservoir heights were typically managed such that not all hydroelectric fuel was burned in one year.

Council Member Schmid noted several statements indicating it could not be done after the calendar year was over as allowable, yet Staff implied it was more flexible.

Ms. Fong reported the definition, the protocol and the accounting were not flexible. Council Member Schmid was concerned that water in the reservoir would be used in one year; however, hydroelectric generation was not typically run that way.

Council Member Schmid indicated there was a substantial change year from year with regard to dry, average and high, and there would not be much banking, trading, shifting, or moving.

Mr. Keene did not understand why that was different if the year was divided in July rather than December.

Chair Burt inquired whether the graph indicated there was a year-to-year fluctuation of a high hydroelectric, low and median, or was it a range over several years.

Ms. Padilla reported the graph represented how hydroelectric generation would materialize in a typical year on a month-to-month basis.

Chair Burt inquired whether the graph reflected what might occur in a single year of a dry or wet year or did it level out the impact over several years.

Ms. Fong explained the graph was what Staff predicted would happen in 2015 under wet conditions and dry conditions in terms of the actual generation. What was not shown was what 2016 might look like.

Vice Mayor Shepherd asked if dry and wet years could be merged if this year

was dry and the next was wet.

Ms. Padilla answered no. The Climate Registry's protocol did not allow for banking of hydroelectric generation.

Ms. Fong indicated a calendar year or fiscal had to be chosen and used.

Council Member Schmid stated under this scenario trading could not occur in December. At the peak of the summer period, it would be easy to say this was a great year and to use that credit in the next year.

Mr. Keene asked for clarification of Council Member Schmid's question.

Chair Burt said the hydroelectric suppliers were not draining the reservoirs in a dry year and overproducing in a wet year; thus, it would level out.

Council Member Schmid stated the graph showed quite dramatically that there was a very different outcome in electrical generation from the hydroelectric sources in different years, and the sharing was very weak.

Chair Burt believed it did not show how hydroelectric was leveled. If a fiscal year was used, then Council Member Schmid's argument would only hold true if hydroelectric was not leveled. Otherwise, there was an impact in the second half of the outlying fiscal year.

Ms. Fong stated the net result was almost the same.

Mr. Keene explained there would not be enough credits at the beginning of the year to cover the winter, resulting in the same scenario whether a fiscal year or calendar were used.

Ms. Fong felt it was irrelevant whether the 12-month period began in July or January.

Council Member Schmid inquired where The Climate Registry's protocols came from.

Ms. Fong indicated it was the Council's discretion.

Chair Burt indicated that topic was not before the Finance Committee.

Ms. Fong explained if a different protocol was chosen Staff would work with the new parameters.

Council Member Schmid felt issues were raised about banking, saving, and the time period of 15 years. He asked if that meant that next year every solar array that was produced 16 years ago would drop out of the RPS standard portfolio.

Ms. Fong stated those hypotheticals did not apply. The City signed its first renewable contract in 2005. The oldest resource was hydroelectric generation, which was not RPS eligible.

Council Member Schmid believed by agreeing to that, 50 percent of carbon neutral energy generation was not renewable.

Ms. Fong reiterated that it was acknowledged as carbon neutral, and the discussion concerned carbon neutrality.

Council Member Schmid recalled a few years past PaloAltoGreen considered coal as renewable energy, now it was carbon neutral.

Ms. Fong said PaloAltoGreen was 100 percent green through RECs, not through hard resources. RECs were used to make a portfolio have a different look.

Chair Burt stated the discussion would not revisit the definition of carbon neutral, which the Council adopted the prior year. The topic for discussion was the proposed Plan based upon the adopted definition.

Council Member Schmid believed they were approving The Climate Registry's definitions.

Chair Burt stated the adopted definitions had to be included in the Plan. It was not a reconsideration of a definition.

Council Member Schmid felt it was reasonable when considering consequences.

Chair Burt overruled Council Member Schmid.

Ms. Fong reported Staff's recommendation was to approve the Plan to attain carbon neutrality. The key points were the year to reach carbon neutrality and the cap to apply to the carbon neutral portfolio.

Council Member Berman inquired whether the Finance Committee would recommend a Plan.

Mr. Keene clarified that to mean which purchases to make.

Ms. Fong indicated the recommended Plan included the renewable RPS.

Council Member Berman felt it was helpful to understand the decision points.

MOTION: Vice Mayor Shepherd moved, seconded by Chair Burt to recommend the City Council adopt the Resolution adopting the Carbon Neutral Plan, enabling the City to achieve a carbon neutral electric supply portfolio starting in calendar year 2013 within an annual rate impact not to exceed 0.15 cents per kilowatt-hour.

Vice Mayor Shepherd noted the Council had made incremental decisions to reach the current point. One of the decisions was the technique for discussing purchases and consideration of the label of carbon neutrality. The COBUG was exempt.

Ms. Fong clarified COBUG was exempt from AB 32 compliance. Exempt meant the City did have to purchase allowances to offset the emissions.

Vice Mayor Shepherd applauded the UAC's questioning and study of issues. RECs were limited and using them was a privilege.

Chair Burt reported the history of the definition of carbon neutral. The City was able to use a budget established seven years ago for renewables to achieve a greater outcome than originally projected to have costs lower than Pacific, Gas, and Electric (PG&E)'s costs was quite an achievement. Implementation of a Plan would assist corporate customers with achieving their own sustainability goals.

Council Member Berman supported achieving a carbon neutral electric supply portfolio in 2013; utilizing a rate cap of 0.15 cents per kWh; Staff's recommended model; and the Motion. The City should share its achievements to encourage other cities to consider a carbon neutral plan.

Council Member Schmid felt the use of the 0.15 cents per kWh cap while achieving 50 percent renewables should be the main focus of the discussion.

Mr. Keene indicated possible changes in the PaloAltoGreen program could leverage more investments resulting in a more sustainable Palo Alto.

MOTION PASSED: 4-0

FUTURE MEETINGS AND AGENDAS

Lalo Perez, Administrative Services Director reported the next scheduled meeting was February 19, 2013. Topics for upcoming Agendas included the following:

2/19/13 (Shepherd Absent)

FY 2013 Q2 Financial Results and Midyear BAO—capture changes in the Budget

Potential Modification to Street Sweeping Program—Pilot program recommendation

Contract Amendment with Brad Lozares—five-year agreement for management of the Golf Course Clubhouse

3/5/13

Review of Follow up Items from Human Services Needs Assessment—follow-up from previous year

3/19/13

Cost of Services Study—sample methodologies and timeline

He provided a timeline of the May Budget hearings, and requested the Finance Committee (Committee) members provide him with dates they would not be available. Three members present were needed for a quorum. The Budget wrap-up would allow the Committee to revisit decisions made when a member was absent.

Council Member Schmid inquired whether the final vote on the Budget would be held on June 10, 2013.

Mr. Perez indicated the Budget wrap-up could be held on May 21, 2013 with a back-up date on May 23rd if necessary. The Council's Budget hearing would open on June 3rd with adoption of the Budget on June 10th.

James Keene, City Manager reported the schedule was designed to provide the Council with a few meeting dates between Budget adoption and the Council recess.

Chair Burt noted fiber to the premises was not included in the items for referral to the Committee, even though it was elevated to a priority consideration.

Mr. Keene would provide a timeline for the Committee on fiber to the premises.

Vice Mayor Shepherd stated the topic would come to the Committee before being presented to the Council.

ADJOURNMENT: Meeting adjourned at 8:35 pm.