TO: HONORABLE CITY COUNCIL

FROM: CITY MANAGER

DATE: JUNE 21, 2004

DEPARTMENT: UTILITIES

SUBJECT: SHORT-TERM ELECTRIC LADDERING STRATEGY

This is an informational report and no Council action is required.

BACKGROUND

BOARD/COMMISSION REVIEW AND RECOMMENDATIONS
The STEAM strategy was presented and discussed at the June 2, 2004 UAC meeting. Key commission questions and comments are summarized below with staff responses.

1. There is an apparent discrepancy between the pie chart percentages of Figure 5 and the long-term supply balance in Figures 1-3.

   Staff stated that it would check the arithmetic on the figures. The percentages for the pie charts of Figure 5 of the UAC report should be corrected as follows in Table 1.
Table 1. Projected electric load-supply balance for FY 2008/09 for Dry, Average, and Wet hydro conditions.

<table>
<thead>
<tr>
<th></th>
<th>Dry</th>
<th>Average</th>
<th>Wet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Old</td>
<td>Corrected</td>
<td>Old</td>
</tr>
<tr>
<td>Calaveras</td>
<td>4%</td>
<td>5%</td>
<td>11%</td>
</tr>
<tr>
<td>Western</td>
<td>21%</td>
<td>22%</td>
<td>34%</td>
</tr>
<tr>
<td>Renewables</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Market</td>
<td>9%</td>
<td>11%</td>
<td>9%</td>
</tr>
<tr>
<td>Deficit</td>
<td>56%</td>
<td>53%</td>
<td>36%</td>
</tr>
</tbody>
</table>

2. How can one translate the hydro variability shown on an annual basis in Figure 5 to how it looks during the year?

An example of the seasonal variation between dry, normal, and wet years is illustrated in Figure 6 in the UAC report, for hydroelectric generation only. However, Figure 8 in the UAC report illustrates that the monthly pattern can vary significantly between one “wet” year and another, as there are many possible patterns whose twelve months add up to a 90th percentile year. This monthly pattern variability, along with monthly variability in load, requires transactions within the month to remain in balance, even if the annual energy requirement exactly matches the annual total supply.

3. Should we be considering a longer time frame for laddering in diversified energy purchases?

The 3-year horizon is a rolling 36-month view, which staff feels is an adequate horizon for portfolio management decisions. There are readily available products from the market in the 3-year time frame. If experience finds that a 3-year horizon is not effective, staff will return to Council to request a change. At this time, staff would bring any specific transactions that are recommended that exceed the rolling 3-year window to Council for approval. For example, staff is working to complete negotiations for some wind and landfill gas generation contracts which are longer-term deals; these will be submitted to Council for approval.
4. Does this strategy meet with the risk management policies?

The STEAM strategy has been developed in cooperation with the Energy Risk Manager, and has been presented to the relevant risk oversight bodies. It conforms to Council approved risk management policies.

5. How are the 20% tolerance bands determined and applied?

The target ranges strike a balance between keeping costs low and guarding against assuming excessive risk from having too much supply in a wet year or not enough in a dry year. The analysis includes deviations in hydro generation, load uncertainty, and market price fluctuations. Tolerance bands that are too tight would result in buying and selling energy too frequently just to stay within range as supply and load forecasts could change. The optimal position for the portfolio within the bands will vary with market conditions, projections for financial reserves, and other factors.

6. Please explain capacity. Where does it come from? Is there a cost to us to maintain the 15-17% capacity reserve?

Capacity is the rate at which energy can be delivered. Generally, when one buys energy, it comes with capacity. As time passes, staff will buy energy to meet the City’s load. CPAU generally will have sufficient capacity associated with the energy supplies.

Mandated capacity reserve requirements were in place prior to deregulation, and the interconnection agreement with PG&E facilitated sufficient reserve capacity. Post-deregulation, during the energy crisis, without sufficient reserve capacity the City experienced blackouts. Capacity reserve requirements are being reintroduced to maintain reliability, and the responsibility is shared. There is a cost to each utility to maintain these capacity reserves, and there is also a benefit in the form of greater system reliability.
POLICY IMPLICATIONS
The Short-Term Electric Asset Management strategy supports the Council-approved Utilities Strategic Plan (CMR 432:02) and Utilities Strategic Implementation Plan (CMR:223:01).

STEAM facilitates a disciplined approach to managing the City’s electric portfolio in support of Council-approved CPAU Energy Risk Management Policies (CMR 400:02).

ATTACHMENTS
A: June 2, 2004 UAC Report
B: Minutes from UAC Meeting June 2, 2004

PREPARED BY:

KARL E. KNAPP
Senior Resource Planner

DEPARTMENT HEAD:

JOHN ULRICH
Director of Utilities

CITY MANAGER APPROVAL:

EMILY HARRISON
Assistant City Manager
MEMORANDUM

TO: UTILITIES ADVISORY COMMISSION

FROM: UTILITIES DEPARTMENT

SUBJECT: SHORT-TERM ELECTRIC LADDERING STRATEGY

DATE: JUNE 2, 2004

REQUEST:
This report is for the Commission’s information only. No action is required.

EXECUTIVE SUMMARY:
The Director of Utilities has adopted a short-term electric commodity purchasing strategy (Short-Term Electric Asset Management, or “STEAM”), which together with Long-term Electric Acquisition Plan (LEAP) Guidelines, Risk Management Policies, Guidelines and Procedures, and supply contract limits, specifies the operating tolerance bands for the electric supply portfolio in the 0-to-36-month time horizon. The strategy applies to delivery months starting in January 2005.

Electricity supplies are purchased by CPAU to meet the City’s retail load. As forecasts for both loads and supplies fluctuate, tolerance bands that are too tight would result in too frequently purchasing and selling supplies to stay within range. Tolerance bands that are too large could result in assuming excessive market price risk, purchasing more energy than could reasonably be used to satisfy the City’s load, or relying too heavily on the spot market. The selected STEAM strategy balances these tradeoffs.

The STEAM strategy proposes that staff maintain the monthly energy supply position be within 80% to 120% of forecasted load in the near 12 months; 70% to 110% of forecasted load for 13 to 24 months out, and 60% to 100% of load for 25 to 36 months out, and to maintain 15-17% capacity reserves for the near 12 months. Additional limits maintained in the Risk Management Guidelines and Procedures ensure that that energy is purchased to meet forecasted load, in compliance with CPAU’s anti-speculation policy.

BACKGROUND
This report describes the short-term resource management strategy for post-2004 operations for electric supply (STEAM). It provides quantitative target ranges for electric portfolio procurement and management in the 0-36 month time frame. This strategy is
analogous to the gas laddering strategy described in a January 14, 2004 UAC report and reported to Council on March 15, 2004 [CMR:167:04]. The electric portfolio differs from the gas portfolio in that ~45% of electric load needs are already met through long-term supply resources, which are planned to increase to ~65% with the addition of renewable energy resources, whereas the gas portfolio does not have any supply resources that extend beyond 36 months, and a large fraction of electric long-term resources are subject to supply fluctuations due to hydrologic conditions.

The monthly ranges are primarily derived based on:

- annual hydro production variability, which is close +/-20% of annual load;
- significant seasonal and monthly hydro production variability;
- anticipated addition of 5-8% of load from intermittent renewable resources;
- regulatory and system reliability standards to maintain 15-17% capacity reserves.

The STEAM strategy target ranges are additional to: (1) the limits stipulated in LEAP Guidelines approved by Council, (2) contractual limits contained in the Electric Master Agreements approved by Council, and (3) the Risk Management Guidelines established by the Risk Oversight Committee (ROC), which are highlighted in the table below.

<table>
<thead>
<tr>
<th>(1) LEAP</th>
<th>0-12 months</th>
<th>13-24 months</th>
<th>25-36 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guideline 3c, Fixed price purchases % of forecasted annual load</td>
<td>-</td>
<td>-</td>
<td>≤90%</td>
</tr>
</tbody>
</table>

| (2) Contracts | | | |
|----------------| | | |
| Gross Transaction Limits | $75 million each | | |
| Security Threshold – Exposure Limits | Varies by contract and counterparty credit rating and financial condition. | | |

<table>
<thead>
<tr>
<th>(3) Risk Management Guidelines</th>
<th>0-12 months</th>
<th>13-24 months</th>
<th>25-36 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Position Limit % of forecasted quarterly load</td>
<td>≤110%</td>
<td>≤110%</td>
<td>≤110%</td>
</tr>
<tr>
<td>Commodity Risk Limit (VaR) 5-day Net Revenue at Risk at 95% confidence level 12-month time horizon</td>
<td>≤ $4 MM AND ≤ 10% of year-end SRSR</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Credit Risk Limits Maintained by Energy Risk Manager</td>
<td>Term (months) 12-month Forward Volume (GWh) and Exposure (MTM) Total Exposure (MTM)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DISCUSSION**

The STEAM strategy outlines the methodology being applied to balance electric energy resources and load requirements in the 3-year time horizon. In addition to the total energy balance, firmness of the energy supply, hydro production variability, capacity reserve needs, and related factors must also be considered in positioning the electric portfolio.
The STEAM minimum and maximum guidelines provide staff the flexibility to manage the portfolio to meet all these diverse decision making criteria. Implementing STEAM will also take into account rates, rate stabilization reserves, market prices levels, and regulatory requirements. The discussion is organized as follows:

1. STEAM Strategy Objectives
2. Long-term Energy Balance Picture (25 years)
3. Short-term Energy Balance Picture (3 years)
4. Hydro Generation Variability
5. Capacity Reserves
6. STEAM Tolerance Bands
7. STEAM Implementation

1. STEAM Strategy Objectives

The Council-approved Primary Portfolio Planning Objectives and the Long Term Electric Acquisition Plan (LEAP) Guidelines set the overall direction for planning and managing the electric supply portfolio and are attached for reference as Attachment A. In addition, the Energy Risk Management Policies and Guidelines provide parameters within which short-term strategies should operate in order to adequately address the risks inherent in managing the electric portfolio. The STEAM parameters and strategies were developed primarily to meet LEAP Objectives 1 & 2, and Guidelines 2 & 3.

The fundamental parameters that guide the STEAM strategy development are:

2. Meet City retail electric load requirements at low and stable rates and preserve a portfolio cost advantage.
   a. Energy Risk Management Policies: Objectives (Section III)
   b. Energy Risk Management Guidelines: Transacting Objectives
   c. LEAP: Objectives #1 and #2.
3. Maintain adequate capacity reserve margins.
4. Provide adequate range to facilitate operational flexibility.
   a. Large annual and monthly variability of hydro production (LEAP Guideline 2);
   b. Variability of intermittent renewable resources;
   c. Minimum practical electric energy monthly block transaction size of ~10 MW.
5. Manage market price and cost risks (LEAP Guideline 3) in a manner consistent with retail rate revenues and budgeted spending projections, minimizing unexpected variability in rate stabilization reserve projections.
6. Strategy must be simple, measurable, and easy to communicate.

2. Long-term Energy Balance Picture

Long-term resource planning is guided by the LEAP Objectives, Guidelines, and Implementation Plan. The long-term projected load-resource electricity balance as of March 31, 2004 is illustrated below in Figure 1 for average hydro conditions. The planned addition of renewable energy supplies are included in Figure 2, the first of which are in the process of contract negotiations. LEAP also recommends 25-50 MW of generation capability to meet a portion of the remaining deficit and to provide capacity during low hydro generation conditions. Figure 3 illustrates the added contribution that hypothetical generation capacity would have in lessening the energy supply deficit. STEAM focuses on management of the portfolio in the first three years.

![Figure 1. Current long-term electric supply balance (as of April 2004) based on average hydro conditions.](image-url)
**Figure 2.** Long-term electric supply balance (as of April 2004) based on average hydro conditions, inducing the effect of planned additions of renewable resources. LEAP also recommends thermal generation (not shown) to meet a portion of the remaining deficit.

**Figure 3.** Long-term electric supply balance (as of April 2004) based on average hydro conditions, inducing the effect of hypothetical generation capability.
3. Short-Term Energy Balance Picture

Approximately 53-57% of load requirements (in an average hydro year) are expected to be met through long-term contracts (34% of energy through Western, 11% through Calaveras, 8-12% renewable resources coming soon) over the next few years. The recommended STEAM minimum and maximum strategies for post-204 operations applied to the electric portfolio for the next 36 months is illustrated below in Figure 4.

![Post 2004 Load Resource Energy Balance with Planned Renewables - Average Hydro Year](image)

**Figure 4.** Load-resource balance for 36 months starting January 2005. STEAM ranges and supplies indicated are as of May 24, 2004.

4. Hydroelectric Generation Variability

Actual resources may exceed the energy load forecast due to hydro production variability. In any given year the hydro production variability could be +/-20% of City’s annual load, and as high as +/- 50% of average hydro production in some of the winter/spring months. The effect of hydro variability on Palo Alto’s annual electric energy mix for the current projected picture for 2008 is depicted in Figure 5.
Figure 5. Future electric supplies are subject to annual variations due to hydro conditions. These charts illustrate the supply mix for calendar year 2008 under 90th percentile, average, and 10th percentile hydro generation conditions, including current contracts and expected renewable energy contribution.

Hydro variability is often characterized as either a “wet”, “average” or “dry” year, typically depicted for simplicity as shown below in Figure 6, based on “Green Book” hydro generation information published by Western and estimated generation from Calaveras by NCPA.

Figure 6. Palo Alto hydro supply variability alone in 2005, based on hydroelectric generation
variability representations from Western (CVP) and NCPA (Calaveras). However, hydro generation variability is not completely described by the simple 3-scenario representation. The graphics below illustrate the tremendous variability evident in the monthly pattern of Western hydroelectric generation. Figure 7 shows all seventy years of simulated generation. Figure 8 shows the variability even within “Wet Years”, showing the monthly pattern for four different years with nearly identical 90th percentile annual generation volumes from the CVP hydro simulation data from Western. This chart illustrates that a “Wet” year is not necessarily “flush” or “dry” in any particular month.

**Figure 7.** 70+ years of net generation simulation data for Western’s Central Valley Project. Net generation is gross generation minus pump loads. In some dry years, monthly pumping load can exceed CVP gross generation, resulting in negative net generation.
**Figure 8.** The monthly pattern of a “Wet” year can vary tremendously. All four years are between 88th and 92 percentile years based on net CVP generation. A “wet” year is not necessarily certain to be “flush” or “dry” in any particular month.

Figure 9 illustrates the effect of hydro variability on the net portfolio position for CY 2005 (assuming average hydro conditions) as of April 2004. As time progresses from Oct/November 2004 through to the end of the hydro season in May/June 2005, the actual positions will be known with greater clarity, as the hydro generation forecast becomes more accurate. If actual production is below expectations (dry year scenario), staff expects to buy energy in the market to make-up the shortfall. Conversely, if greater than expected production is projected (wet year scenario), staff expects to sell the surplus.
Figure 9. Average, Wet and Dry year hydro production from Western plus Calaveras, superimposed on CPAU energy position shown as supply deviation from expected load.

5. Capacity Reserves

Capacity requirements are determined by reliability technical standards, measured in MW. Capacity reserves are required to be maintained to reliably operate the grid in real time. Typically, utilities maintain 7-10% operating generation reserve margin, and 7-10% planning generation reserve margin.

- Operating reserves are categorized into regulation reserve, spinning reserve, and non-spinning reserve. These spare generation units held in reserve must have the capability to promptly begin producing energy if a generating unit or transmission line fails unexpectedly or loads exceeded forecasted levels.
- Planning reserves are required so that generators can be taken down for routine maintenance.

Best industry practices are reflected in the following:

- Western Electric Coordination Council (WECC) Minimum Operating Reliability (MOR) criteria, which requires maintaining 7-10% operating reserves.
- CPUC Resource Adequacy proposals which advocate maintaining a capacity reserve target level of 15%-17% of expected monthly peak load. The entire reserves must be available before the beginning of the month, and at least 90% procured 12 months in advance.
Operating reserve requirements are also part of NCPA/Palo Alto Metered Subsystem agreement with the IS, defined under Article VIII of the Aggregate Metered Subsystem Operating Agreement [CMR:298:02].

Consistent with these considerations, staff expects to transfer the electric portfolio to NCPA ahead of each month for real time dispatch and scheduling with a 15-17% capacity reserve level to maintain adequate reliability and comply with regulatory or contractually mandated levels. Adequate capacity to meet these reserve targets will be secured up to 12 months out, and tracked for 36 months out.

The current capacity reserve balance for the 36-month period beginning in January 2005 is illustrated below in Figure 10. For example, projected Palo Alto peak load forecast (as of January 2004) for 2005 is 188 MW, projected to take place in July. Capacity reserve requirements are thus 28-32 MW for July at this time. The 1-in-10 high peak for July is 199 MW, which would use almost half of this reserve level. Although the peak load only takes place for a single hour in the month, capacity reserves are needed for the entire month, as the specific time and day when the peak occurs can vary significantly, frequently occurring in June, August or September instead of July.

![Post 04 Capacity Balance w/Renewables - Average Hydro](image)

**Figure 10.** Near-term monthly capacity balance. The error bars indicate a 17% reserve target above expected peak demand.
6. STEAM Tolerance Bands

The STEAM strategy energy balance targets apply to all electric energy supplies that are one month in duration or longer, including all must-take fixed-price and index-priced forward contracts, fixed-price call options, and planned allocations from generation facilities and the Western Base Resource contract. Staff will manage the electric portfolio to maintain the monthly energy supply position be within the limits in the following table. Staff expects to transfer the electric portfolio to NCPA ahead of each month for real time dispatch/scheduling within the 80% to 120% energy band to minimize within-the-month market price exposures.

<table>
<thead>
<tr>
<th>STEAM Strategy Energy Limits</th>
<th>0-12 months</th>
<th>13-24 months</th>
<th>25-36 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Energy Position</td>
<td>120%</td>
<td>110%</td>
<td>100%</td>
</tr>
<tr>
<td>% of forecasted monthly load</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum Energy Position</td>
<td>80%</td>
<td>70%</td>
<td>60%</td>
</tr>
<tr>
<td>% of forecasted monthly load</td>
<td></td>
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</tr>
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</table>

Staff will procure adequate resources in order to transfer the electric portfolio to NCPA ahead of each month for real time dispatch and scheduling with a target of a 15-17% capacity reserves. Adequate capacity to meet these reserve targets will be secured up to 12 months out, and tracked for 36 months out.

<table>
<thead>
<tr>
<th>STEAM Strategy Capacity Targets</th>
<th>0-12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity Reserve Target (% of monthly peak load)</td>
<td>15-17%</td>
</tr>
</tbody>
</table>

Planning criteria for transmission and ancillary services must evolve with the yet-to-be-finalized market structure, and are not included in STEAM at this time. Ancillary services are largely managed within the month via the NCPA pool, comprising products and services that are needed to balance loads with resources in real time. Transacting for ancillary services products will be addressed on a case-by-case basis.

7. STEAM Implementation

STEAM limits apply to delivery months starting in January 2005. STEAM will be integrated into the Energy Risk Management Procedures Manual.

Implementation Guidelines
The following rules apply to implement STEAM for post-2004 transactions.

1. No transactions that would push the portfolio position outside the limits shall be entered in to without prior ROC notification.
a. Executing an **energy** transaction that causes the energy position to exceed the STEAM strategy limits constitutes an exception to the Front Office Procedures.

b. If the energy position falls outside the limits due to events outside the control of staff (such as hydro production or load forecast changes), there is no exception to the Front Office Procedures.

c. If the energy position falls outside of its relevant limit in order for the capacity reserve to be in compliance with its target level, there is no exception to the Front Office Procedures.

d. Executing a **capacity** transaction that causes the capacity reserve to exceed the STEAM target level constitutes an exception to the Front Office Procedures.

e. If the capacity reserve falls outside the limits due to an energy transaction that is within the energy position limits, or due to events outside the control of staff, there is no exception to the Front Office Procedures.

2. If and when generation forecasts or load forecast changes result in portfolio positions falling outside the min-max range, staff expect to transact to bring the balance within the range. If compelling reasons warrant maintaining the position outside the limit, ROC will be notified along with justifications to do so.

3. Hydro resource forecast is expected to be updated once each month, as Western and NCPA make their latest official forecasts available.

4. Staff will also maintain conformance to Portfolio Risk Limit Guidelines (summarized in the Background section).

5. Actual portfolio positioning within the min-max target will be managed by RMD staff based on analysis taking into account parameters that include:
   a. Availability of firm capacity to meet capacity reserve requirements;
   b. Market transacted forward price curve, forward price view based on fundamentals, and other market intelligence available;
   c. Most recent load and generation forecasts; and
   d. Budgeted cost, retail rate levels, and rate stabilization reserve levels.

*Rationale*

The ability to transact in the market with multiple counterparties reduces credit risk. Diversifying over time reduces the risk of purchasing too much when prices are high.

Keeping the supply resources close to the realized load reduces the risk of having to buy excessive amounts of energy within the month to meet deficits at very high prices or selling excessive surplus energy within the month at very low prices. Limiting the net portfolio position to remain within the STEAM tolerance bands reduces this effect of
market price uncertainty, reducing the risk of cost shocks and limiting the potential upside as well.

Electricity supplies are purchased by CPAU to meet the City’s retail load. As forecasts for both loads and supplies fluctuate, tolerance bands that are too tight would result in too frequently purchasing and selling supplies to stay within range. Tolerance bands that are too large could result in assuming excessive market price risk or purchasing more energy than could reasonably be used to satisfy the City’s load. The STEAM strategy balances these tradeoffs.

STEAM aims to maintain the net resource position to be within 20% of expected load before handover of the monthly portfolio to NCPA in any given month. Each prompt month portfolio position will be finalized in the consultation with NCPA and Western’s latest energy forecast, and will be handed over to NCPA 3-5 days before the beginning of the month based on the scheduling calendar.

The upper +20% margin should provide sufficient tolerance to facilitate having sufficient energy to meet the City’s load in any month and to limit exposure to market prices should hydroelectric generation be less than forecasted or demand greater than forecasted. The upper +20% margin should also provide sufficient capacity to comply with the 15-17% capacity reserve requirements. To guard against the risk of load decline resulting in energy surpluses, and to enable the flexibility to offer market-based rates in the future, it is also recommended to keep expected resources below 100% of monthly load requirements in the third year out, with an additional constraint of no more than 90% of the annual load be purchased at fixed price beyond 2 years out. This second constraint is stated in the Council-approved LEAP Guideline 3c.

To implement the incremental purchases in a laddered fashion, it is recommended that at least 60% of monthly load energy requirements be purchased at a known cost 3 years out, at least 70% of monthly load energy requirements 2 years out, and at least 80% of monthly load requirements up to 1 year out. This laddered minimum target will systematically limit the price exposure.

Risk-Reward Tradeoffs
The major aspects of implementing STEAM (time horizon, relative size of incremental purchases, and relative timing of purchases) involve trade-offs between rate stability and competitive rates. CPAU staff currently pursues low and stable commodity costs, and therefore low and stable rates, by exercising a limited degree of transaction execution flexibility. For example, an authorization for a commodity purchase will allow the trader a period of time during which the trade must be completed within the approved price and quantities. The trader may exercise judgment regarding the exact trade day within that approved time period. Therefore, if an event occurs such as a gas price spike, heat wave, major transmission disruption, etc., the trader will have some latitude to avoid price

Item 2: Short Term Electric Laddering Strategy
spikes. In this way, lower rates may be achieved. A tightly scheduled approach does not achieve this objective.

Approved Products
STEAM does not specify which products will be used to manage electricity costs. The approved products are specified in the Energy Risk Management Policies and Guidelines, and include physical fixed-price contracts, physical options, gas tolling contracts, index-priced contracts, and generation facilities. The mix of these products is at the discretion of the Utilities Director and is not specifically called out in STEAM. The Utilities Director will decide on the products to be utilized as market conditions change over time, making some of these products more attractive than others at various times. For example, in extremely volatile markets, physical call options become very expensive. Leaving the flexibility for staff to mix products types to meet the STEAM strategy is more likely to result in low and stable rates than if that flexibility were eliminated.

Prudent management of the electric portfolio could be improved by expanding the list of approved products, including financial products. New products must undergo a thorough review process to be adopted as approved products, and will be pursued as further analysis is refined and procedures are established to ensure that any concomitant risks managed appropriately.

Coordination with Financial Reserves
Electric supply portfolio management practices reflected in the STEAM strategy interact with and are complementary to the Supply Rate Stabilization Reserve. These financial reserves facilitate stabilizing rates by cushioning adverse impacts of the electric portfolio that remain even after applying the STEAM strategy. Reserve Guidelines were described in a report to the UAC on October 1, 2003, and approved by Council (Finance Committee October 21, 2003, [CMR:467:03]; Council December 15, 2003 [CMR:483:03]). STEAM limits the degree to which these reserves may be required. Conversely, the portfolio is managed more conservatively when financial reserves are low, further stabilizing retail rates.

PREPARED BY: Karl E. Knapp, Senior Resource Planner
Shiva Swaminathan, Senior Resource Planner

REVIEWED BY: Girish Balachandran, Assistant Director, Resource Management

APPROVED BY: JOHN ULRICH
Director of Utilities
2. **Short-term electric laddering strategy (Information)**

Ulrich remarked that we are at the very end of 40-year contract with Western. The LEAP with Risk Management Policies and Guidelines take care of longer and medium range, now we need to address guidelines and implementation from 0-35 months providing forecasts to make sure we are not purchasing more when we have a load. This is a very complex issue.

Girish Balachandran stated that with STEAM, we have a 3-year window and will set a minimum and maximum similar to how we buy gas under the laddering strategy. We figure how to purchase power in a 3-year time frame. City Manager has the authority to purchase and has delegated authority to John. John approves strategy minimum and maximum month by month. Karl Knapp and Shiva Swaminathan both worked on developing the strategy.

Rosenbaum asked about the numerators and denominators percent from Western and Calaveras. Our chart average hydro year, shows we expect 550 giga-watt hrs but pie chart percentages suggest about 45% of energy from those two sources, looks like closer to 55%. What is difference?

Karl Knapp stated this must be a graphic distortion; the figures in the pie chart are the actual numbers. Karl promised to check the figures.

Bechtel asked if we want to have a short end view of where energy coming from for the year and asked staff to look at the pie chart on page 7, figure 5.

Knapp stated about 45% comes from Western and Calaveras.

Bechtel asked if in the pie chart, to translate, if he wanted to see how it looks during the year, he’d look at ...

Knapp stated the pie chart only shows annual hydro variability. Chart in Fig 8 shows how much difference there can be from one wet year to another. is the monthly patterns are completely different, part of where seasonal variability comes in, to try to have enough for peak load.

Bechtel mentioned that there is quite a bit of variation and it is difficult to follow. On 3-year program, we’re likely to .... Any effect on seasonality on hydro as we look forward three years out and we have a dry year we’re in trouble because that’s
where we’re purchasing less. Wondering in contrast to gas, is the same timeframe still the right one or should we be looking at a different time span for laddering?

Girish Balachandran said this is a rolling 3-year ladder and he believes it is a right time span. We buy based on the actual forecast. If we see 3-year ladder is not suitable, we’ll return to the UAC and Council and ask for a change. We believe it is appropriate at this time.

Bechtel agreed that he hopes we are right and asked if from a market point of view, does the market match up with our ability to buy with this marketing strategy?

Balachandran said with a power plant in place, it may be fixed. We are also looking at gas tolling options and may propose a contract outside of the 3-year window. Whatever resources we put in place, resources are variable so we need some type of guidelines.

Knapp stated that staff doesn’t approve purchases beyond three years out, but if recommended, they would be brought to council for approval. We would come back to the Commissioners and Council for the decision.

Bechtel wondered if this added too many levels of complexities to purchasing.

Balachandran stated that staff will soon bring wind and gas coming to the Commission, 25-30 year deals. Our supply portfolio will change significantly. It is not possible to predict and it is getting more complex. We weren’t exposed to this level of vulnerability before.

Bechtel asked if the strategy had been reviewed with risk management.

Balachandran said Utilities has run through an independent risk overview. Future repots will give all purchases we make in a similar format. These will be presented to the UAC and Council on a quarterly basis.

Bechtel remarked that this sounds good.

Dahlen asked how the minimum and maximum targets were set and then the projected load. How do you set the minimum and maximum guidelines?

Knapp summarized the combination of looking at the actual deviation, what year verses normal, deviation in actual load forecast and forecast already done for GULP, such as laddering versus dollar cost averaging strategies. The 20% number is primarily derived from the first six months of the year. In a wet year, you haven’t taken on a lot of market risk and in a dry year you don’t have to buy so much.

Dahlen asked when will we do an analysis doing some months prior to forecast? Not set up in advance based on actual ...

Knapp replied that will be based on what ends up to your financial reserves.

Dahlen questioned when does projected load become part of that analysis.
Knapp stated that you take projected load, Palo Alto’s loads are actually pretty flat during year.

Dahlen said we would shoot to have the projected load in the middle of minimum – maximum?

Knapp replied yes.

Rosenbaum asked about capacity. We were supposed to have between 15-17% capacity reserve, do we buy and where does it come from?

Balachandran asked the Commission to look at chart figure 10, you’ll see that in several months we had adequate capacity. Also in figure 4; January 2006; before we get to January 06 we will be buying energy. Energy comes with capacity. If we need to buy to meet 15-17% reserve requirements we can buy from the market. In the past, when we had an inter-connection agreement with PG&E, we used to buy capacity in the power pool. For example, we had a contract with Washington Water Power to buy capacity. We can enter into contract buying combustion turban capacity (CT) paying a fixed price for the capacity with a strike price that you determine before hand and if you ever need to call on that, you call on it. The whole purpose is to maintain system reliability, we used to have this, it’s not just Palo Alto but the whole country had it. In 1998 when we had the new market system, it went to an energy based system. Now, a capacity component is being re-introduced so we have adequate capacity. So if one or more large units go off-line there is enough capacity to keep the system up and all this capacity gets shared by the whole system.

Rosenbaum asked if there really is not a cost to us?

Balachandran said yes, there is a cost. During the energy crises there was a cost to us. The cost ended up being several blackouts. On a physical basis we didn’t have enough energy committed and the system operator did not have control of it. The cost to us may be more dollars. The benefit now will be greater reliability.

IX. Gas Utility Long-Term Plan (GULP) Recommendation (Action)

Girish Balachandran announced Karla, Bernard, and Shiva worked on this presentation. They will go through the change from the last recommendations made to the Commission. Since then they have completed more analysis. Girish handed it over to Karla.

Karla Daily began the presentation stating that the preliminary recommendation was made to the UAC in February. This presentation will include staff’s request, time line, recommendations highlighting changes from the preliminary recommendations and end with suggested next steps.

Staff is requesting that the UAC recommend that City Council approve these six GULP recommendations. If the UAC does recommend approval, we will take this to Council in July and start implementing as soon as approved by Council.
The first two recommendations are identical to what you saw in February. Do not contract for natural gas storage capacity at this time and do not acquire additional natural gas pipeline at this time.

The third recommendation is in spirit not changed but is reworded. For the gas reserve acquisition part of GULP staff is asking that we can move forward to the extent that we identified. We have reworded the gas reserve acquisition part of GULP. We still are asking if the required reserve would be attractive to Palo Alto it would have to be part of a consortium. We are asking that staff be allowed to move ahead to identify a consortium and if we do find such a consortium, we could spend up to $65,000 in consultants to look for properties. This is not to say approving this recommendation approves in any way acquiring a reserve. This is just a step to take towards studying it further. This is a very preliminary step. We feel like this resource has enough potential, we’re not in a position to eliminate it from possibilities yet. The gas pre-pay deal, when we brought recommendation to you in February we proposed further investigation of gas pre-pays. Since that time, we’ve come to the conclusion that this doesn’t make sense for us right now. Possibly at some time in the future, it may become more attractive for us. We’ve changed the recommendation to not participate in a gas pre-paid deal at this time. We’ve added a new measure recommendation: pursue any low-cost high-value prospects resources that may arise from time to time.

The last recommendation is for demand side management. The spirit of the recommendation has not changed, just the wording. There is some discomfort with having a goal of spending a certain amount of money as opposed to having a goal of making good decisions and coming up with reasonable management goals and an implementation plan. The recommendation was reworded that hopefully has more meaning and something that could be followed better than what was previously written.

Rosenbaum asked for questions.

Dahlen questioned on page 3 of 19, point 9. How did you come up with that percentage and isn’t that high?

Dailey replied that the figure probably is high. Our base load in the summer is about 5,000 MMBtu per day and our average annual load is about 10,000 a day. Given that production is a fairly steady resource, we would need to take it every day of the year and wouldn’t want it to be more than our base load which would be 50%. Karla didn’t believe we would actually look at anything that big.

Dahlen asked if Karla thought it would be realistic to secure that much?

Dailey said yes, definitely, but she is not sure Palo Alto would want to.

Dahlen asked for Karla to give a more realistic percentage.

Daily replied that her gut-feeling range would be 20-30% but quickly stated that figure might now be agreed on by everyone at the table.
Ulrich confirmed that staff will do an in-depth review of this information.

Melton asked on Item 3 he was wondering why we would limit to U.S. producing regions as opposed to any North American?

Daily asked on shore to off shore?

Melton inquired why isn’t Canada there as a possibility?

Dailey stated they wouldn’t have the tax exempt status which would make that option less attractive to us. The GULP recommendations would apply to any project. Staff is not asking Council to officially stamp these criteria. We would retain an opportunity if any project fell outside of these criteria and we could still move forward if we had reason to. U.S. production makes much more sense. Off-shore is very risky.

**MOTION:** Bechtel moved to accept the staff recommendation that Council approve 6 gas it recommendation listed on page 1 of the staff report.

Dahlen seconded.

Rosenbaum commended our look at the options.

**Motion Passed:** 4-0

Ulrich thanked everyone.

**x. Public Health Goals for Drinking Water (Information)**

Scott Bradshaw stated that he had no presentation but was here to answer questions on how we are prepared for goals set by the California Health and Safety. He asked for any questions regarding the report.

Bechtel mentioned that the report says there were times we didn’t meet certain standards or guidelines or so on but he didn’t see any discussion of when or where. The table on A-5 didn’t follow that well. Mr. Bechtel asked for an explanation if we didn’t meet certain things.

Ulrich shared we worked on this quite extensively to try to make it clear. The word ‘exceed’ is good and sometimes the word is not good. In layman’s terms, there are public health goals adopted by the California EPA and then there are maximum contaminant goals (MCLGs) which are adopted by the U.S. Environmental Protection Agency. These PHGs and MCLGs are not enforceable standards and no actions to meet them are mandated. They are attempting to show a goal, similar to our goals for safety goals which is no accidents and no injuries is where you want to be but to get there is extremely difficult. In some cases, we deliver what we get. It’s important to be able to report information in the report that goes out to our customers annually. Every three years, we need to make this more detailed report about these PHGs and MCLGs so you can see we are trying to get down to the goals and to report where there is a discrepancy.
between meeting those goals and where we've not been successful in fluoride and chloroform to meet all the standards for each of these periods of time.

Bechtel looked again at next to last paragraph and stated the following paragraph explains what happened. He had no further questions. He stated that the tables had so many columns he was unable to follow the “less-than” or “equals.” He is satisfied we’ve done what is expected.

Dahlen commented that Table 1 is great and will use for her own resources.

Bradshaw thanked Dahlen.

Rosenbaum referred to the three bullets on page 2. He said these were exceedingly bureaucratic statements. He wanted to know how many times and why isn’t the information provided?

Ulrich said we’re reporting what is expected to be reported. Part of this report is to give a summary of what occurred. We keep records of everything but we don’t put in a document and attach.

Rosenbaum said that raises the question if the information is not available.

Bradshaw made it clear that at no time did we ever exceed maximum levels. We did find when we went back and did recheck, in keeping track of them, since they did not exceed MCL’s we would have to go back to gather information. We exceeded goals but at no time did we exceed MCL’s.

Ulrich thought putting it any other way in the report would be going beyond what is expected and required.

Melton followed up on Scott’s comment about retesting. He asked if the test says over goal and now when retesting it says not over goal, what does this imply? Is what you’re measuring that variable from day to day? What do you think is happening?

Bradshaw used an example of a coliform test, if there is a gram of dirt it could show a hit. When we go back and test and find no problem we know it was some type of abnormality. It could also be a contaminant at test source or could be leaching lead at the homeowners property. We would go back in and retest.

Dahlen asked if Palo Alto does any testing for legionella.

Bradshaw stated no.

Dahlen asked what legionella testing does SFPUC do?

SB didn’t know.

IX. ADJOURNMENT

Regular business completed.
Ulrich spoke of the follow up report for FTTH and stated staff will have a report before we go to City Council, which is scheduled for August 2\textsuperscript{nd}. We will provide to you before the meeting.

Budget adoption has recently been changed to June 28\textsuperscript{th}. August 2\textsuperscript{nd} Fiber to the Home is still an accurate date.

Rosenbaum checked his schedule stating Council might have questions about the electric rate proposal so he will plan to attend the budget adoption meeting. In July we will decide who will attend when FTTH is presented.

George Bechtel will review minutes that Dee is preparing.

Meeting adjourned at 9:03 p.m.