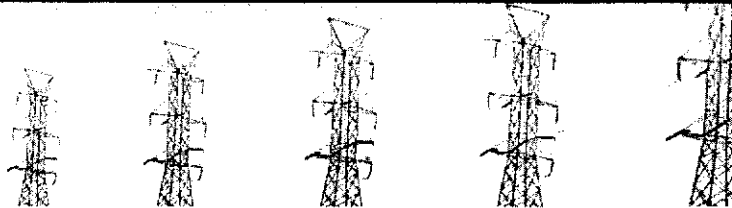


**California is Still Coming Up
Short on Electricity:
The State's power sector
remains troubled and is at risk
of a future supply shortfall**

Bay Area Economic Forum

A partnership of the Bay Area Council and the
Association of Bay Area Governments

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BAY AREA COUNCIL


**BAY AREA
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Foreword

Despite California's aggressive response to the 2000-2001 energy crisis and the ongoing work of regulators to reach policy consensus, there is still a meaningful risk that future power supplies will come up short. One of the key drivers of this risk is a highly uncertain investment climate. In addition, the State's power policy still has significant flaws that will challenge long-term reliability and will contribute to continued high retail electricity costs for consumers.

This paper's aim is to highlight the risks of a near- to medium-term power-supply shortage and set forth options policy makers have for alleviating these risks. This paper also identifies the key longer-term challenges that policy makers face in reforming the State's power sector and highlights the key principles that policy makers should embrace when addressing these challenges.

The paper highlights the importance of promoting an environment in the State that is more attractive to competitive, private sector investment. Although the State has the option of re-regulating power generation – or building new power plants on its own – to address the risks of a future power-supply shortfall, experience has shown that both options are likely to perpetuate high retail electricity prices. On the other hand, private sector investment in well-designed competitive markets has been successful in many other states in ensuring reliability, promoting lower costs, and encouraging efficient investment decisions.

This report does not directly address the causes of the last power crisis, nor does it extensively compare the different options for policy reform. Several prior reports by the Bay Area Economic Forum and its sponsors, the Bay Area Council and the Association of Bay Area Governments, have explored these issues:

- "The Bay Area – A Knowledge Economy Needs Power," published in April 2001, which explains the causes of the recent power crisis.

- "California at a Crossroads – Options for the Long-Term Reform of the Power Sector," published in October 2001, which examines the history of deregulation in power and other industries and shows that deregulation leads to lower costs, improved satisfaction, and greater reliability.
- "California's Energy Future: A Framework for an Integrated Power Policy," published in November 2002, which provides a framework for a new power-market design in the State.

This report refers back to the key principles identified in these prior reports and builds upon our previous findings and ongoing analysis of the California power market. In the context of the current near-term and longer-term challenges facing the State, this paper identifies the steps that should be taken to help ensure future reliability and promote lower costs for consumers through embracing a rational and competitive market design.

Part I. Introduction: The State's electric power market remains broken; fixing it will take political leadership

THE 2000 TO 2001 CRISIS IS BEHIND US, BUT MORE CHALLENGES LIE AHEAD

In 2000 and 2001 worldwide public attention focused on California's electric power market, because of its sustained and costly power crisis. In response to the crisis, the State took aggressive action, signing long-term supply contracts with generators and marketers that provide 13,200 megawatts (MW) of peak power needs today, or 25 percent of total peak requirements. In addition, it installed a monitoring system to prevent manipulation of the power market. The State also suspended retail choice and its wholesale Power Exchange ceased operating.

The high wholesale power prices that characterized the power crisis dropped in 2001 when the Federal Energy Regulatory Commission (FERC) imposed energy price controls, hydroelectric supplies improved, and electricity demand declined in the State due to conservation and the downturn in the economy. Moreover, new power-generating capacity built in 2001 and 2002 helped to improve the State's electricity supply-demand balance immediately following the crisis.

Today, the threat of future power supply shortages seems remote to most policy makers. The temporary steps taken by the State and the FERC to react to the energy crisis served their purpose and wholesale power prices are now low. However, a fact-based look at today's policies shows that major problems remain. Based on current projections, there is a meaningful risk of another supply shortfall in the State within only a few years. Further, decisions made by the State during the energy crisis and utilities prior to the crisis have locked in extraordinarily high retail electricity prices that will discourage businesses and industries from growing their operations in the State.

This paper has two goals: 1) to highlight to policy makers that there is a risk of a future supply shortfall that could put reliability at risk; and 2) to reiterate basic principles that policy makers should follow to adopt a more stable, reliable electric power-market design that promotes private-sector investment and well-managed competition.

POLICY MAKERS FACE KEY CHALLENGES

A number of key problems should be addressed by policy makers today: inadequate infrastructure, an uncertain regulatory environment, a lack of incentives for consumers to conserve, and high retail electricity prices. Unless these problems are addressed, future reliability will be at risk, inefficient decisions will continue to be made that will contribute to higher retail electricity prices, and businesses will be discouraged from growing in the State.

- **The State still badly needs investment in power infrastructure:** Since the last power crisis, the State has made some progress in attracting investment in new power infrastructure. A significant amount of new generating capacity has been added. In addition, new interstate natural gas pipeline capacity, to provide fuel for power plants, has been built. Efforts are also underway to upgrade the electric transmission pathway that connects Northern and Southern California.¹

Recent California Energy Commission (CEC) and California Independent System Operator (ISO) data, however, indicate that the amount of generating capacity available to serve demand could drop to low levels in 2003 with hot weather. Moreover, the amount of reserve capacity to ensure a reliable supply of electricity will drop below typical utility planning levels by 2006 under average weather and to dangerously low levels if there is a hot summer. Careful analysis based on current data indicates there is further downside risk to reliability and a **meaningful risk of another supply shortage** in the future, particularly if there is

¹ This pathway connecting Northern and Southern California is commonly known as Path 15.

limited investment in power infrastructure in the State.

- **Ongoing regulatory uncertainty in the State is discouraging new investment:** A growing California economy will require the construction of new power plants sited inside the State and better access to power supplies in other interconnected Western states. But there are competing opinions about how the power market should function in California – whether it should move to a regulated, cost-of-service model for power supply, to a competitive market with customer choice, or perhaps a hybrid of both. Investment decisions by both utilities and competitive, private sector investors are likely to be delayed as these issues are debated, putting future reliability at risk and threatening the viability of any system that is ultimately adopted.
- **Despite persistent supply challenges, retail customers in the State still have no incentives to adjust consumption during peak periods:** There is still no mechanism in California that directly encourages consumers to reduce power usage during peak demand times. The most efficient device would be a link between retail electricity prices and the underlying cost of power. The State's key energy agencies recently adopted a rulemaking process to examine the possibility of introducing real-time pricing and advanced metering to California, which is a positive step, but policy makers need to do more to support action on this issue.² A number of states, such as New Jersey, New York, and Pennsylvania have such links between retail and wholesale energy prices.³ Even some states that continue to embrace retail regulation, such as Washington, tie customer pricing to wholesale costs and demand. The lack of sustained incentives for customers to use less during high-demand periods will exacerbate the risk of another power shortage in California.
- **Retail electricity prices in the State are among the highest in the country:** Residential customers in California pay retail electricity

² In addition, the PUC has adopted a real-time pricing experiment. Currently, this is a very limited, optional program.

³ Jersey Central Power and Light in New Jersey offers standard real-time pricing for large customers. In New York and Pennsylvania, the utilities provide real-time pricing as an option for customers.

prices that are 42 percent higher than the national average and 61 percent higher than in other Western states. Business customers suffer an even greater disadvantage, with prices that are 71 percent above the national average and 93 percent above Western states (Exhibit 1). These lofty prices impose high costs on consumers and discourage business investment. Retail prices are high primarily because of poor investment decisions made by utilities and the State prior to deregulation, as well as due to high-priced supply contracts that the State signed during the energy crisis. Retail prices will likely only get higher if the State cannot maintain adequate investment in its power infrastructure, create a regulatory environment that promotes efficient decision making by private sector investors, and encourage conservation.

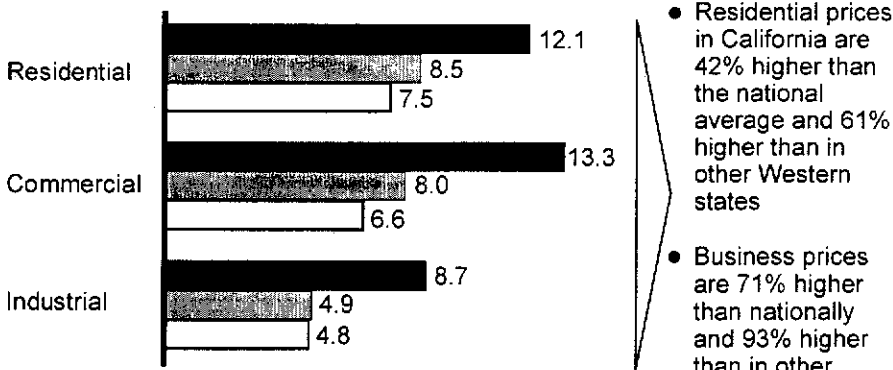
Exhibit 1

CALIFORNIA'S POWER PRICES ARE WELL ABOVE NATIONAL AND WESTERN STATE AVERAGES

■ California
 ■ U.S.
 □ Western states**

2002 average retail delivered power prices*

Cents per kWh



* Through November 2002

** Includes Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, and Wyoming

*** Business prices are calculated as simple average of commercial and industrial prices

Source: US Energy Information Administration; *Electric Power Monthly*

RECENT ADOPTION OF A POLICY PLAN BY THE STATE'S POWER AGENCIES IS A POSITIVE STEP, BUT IMPLEMENTATION IS NECESSARY

California should adopt reforms to improve its electricity market and spur new investment in infrastructure. Recent efforts by the State's power agencies to develop and adopt a coordinated policy plan are a positive first step. The State's three major energy policy agencies – the CEC, the Public Utilities Commission (PUC), and the California Power Authority (CPA) – met in June 2002 and again in March 2003 to develop a joint action plan for reform. This plan was adopted by all of the agencies in May 2003.

Now is a crucial time for policy makers to build on these efforts. Policy makers need to move beyond adoption of their plan and take immediate steps to:

- **Recognize and begin to reduce the risk of near- to medium-term supply shortages:** The first section of this paper highlights this important issue, with a focus on the expectations for future power plant construction and the highly uncertain investment climate in the State, which jeopardizes even existing capacity.
- **Implement a rational power policy:** Policy makers need to devise a consistent and integrated policy framework for electric power, one that addresses needed improvements in wholesale market design, retail electricity pricing, and the role of State agencies in promoting low-cost power. Previous reports by the Bay Area Economic Forum and its partners have addressed these issues in detail, and the final section of this paper explores them again briefly.⁴

⁴ Past reports include: "The Bay Area – A Knowledge Economy Needs Power," April 2001; "California at a Crossroads: Options for the Long-term Reform of the Power Sector," October 2001; and "California's Energy Future: A Framework for an Integrated Power Policy," November 2002.

Part II. The State needs to address a major near-term reliability challenge

NEW POWER SUPPLIES WILL BE LOWER THAN ONCE EXPECTED

Significant power plant cancellations have occurred over the past year

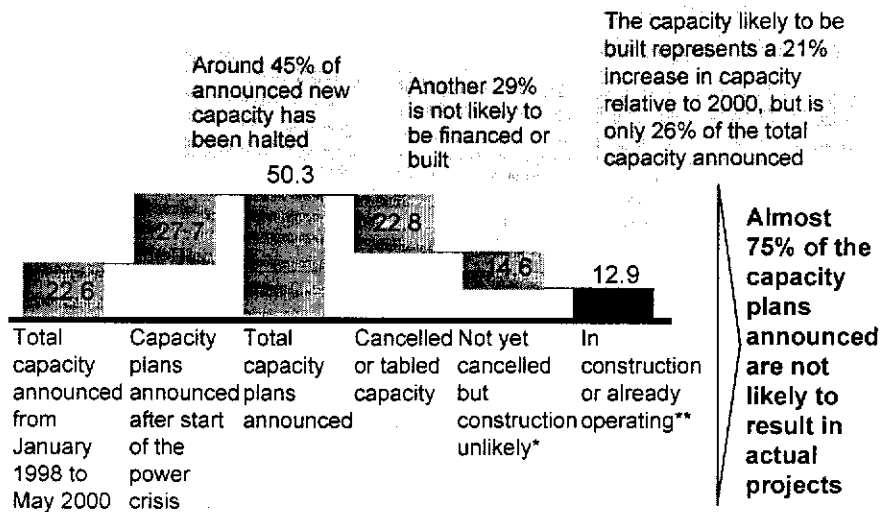
Since the opening of California's wholesale market in 1998, investors have proposed building more than 50 gigawatts (GW) of new power-generating capacity in the State. Almost 28 GW of this capacity, or nearly 60 percent, was announced after the start of the power crisis. Unfortunately, only 13 GW is likely to be built. In other words, only around 25 percent of total capacity announcements will likely result in new plants (Exhibit 2). This is still a significant boost in the State's power supply – an increase of 21 percent over that in 2000. However, it is only enough to offset more than a decade of underinvestment in the State's power infrastructure.

Exhibit 2

50 GW OF CAPACITY PLANS HAVE BEEN ANNOUNCED SINCE 1998, BUT ONLY 13 GW WILL LIKELY BE BUILT

Plant capacity, GW

█ Likely new capacity



* Includes 13.4 GW of "proposed" and "early development" capacity and 1.2 GW of so-called "advanced development" capacity that is unlikely to be built

** Includes 6.3 GW of operating capacity and 6.7 GW of capacity under construction

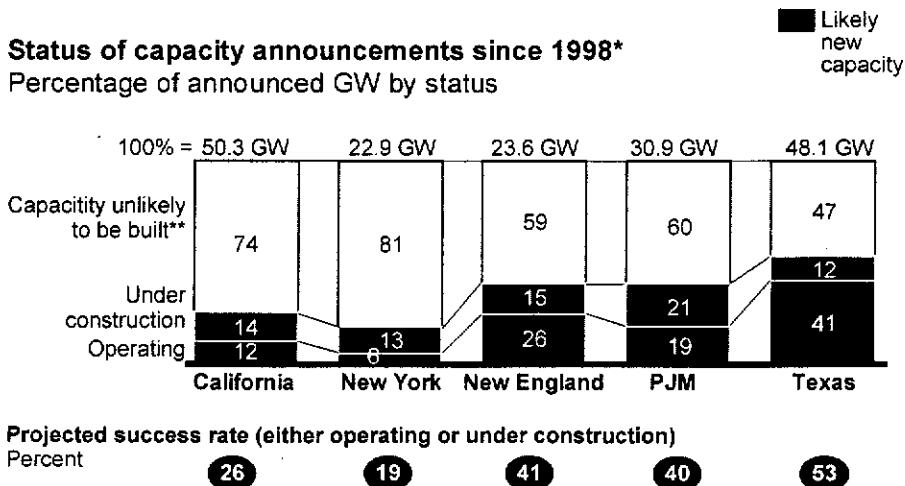
Source: Platts NewGen database; California Energy Commission

The success rate of proposed power plant investment is higher in other states

It is common for the level of announcements of capacity to exceed the amount that is ultimately built. This pattern has been observed in many states. However, the success rate for new investment in other states that have restructured has generally been significantly higher than in California. The Mid-Atlantic states and New England are expected to see around 40 percent of announced capacity built (Exhibit 3). In Texas, the level exceeds 50 percent. In fact, the only major state with a success rate as low as California is New York, where there is only a 19 percent success rate. Unlike California, however, New York had a much better supply-demand balance prior to deregulation and is addressing the need for new supply by requiring utilities to procure reserve capacity – something California should seriously consider, as will be discussed later.

Exhibit 3

THE PROJECTED SUCCESS RATE OF GENERATION ADDITIONS IN CALIFORNIA IS LOWER THAN IN MOST RESTRUCTURED STATES



* Summary of plants announced for construction since January 1, 1998, as tracked by Platts

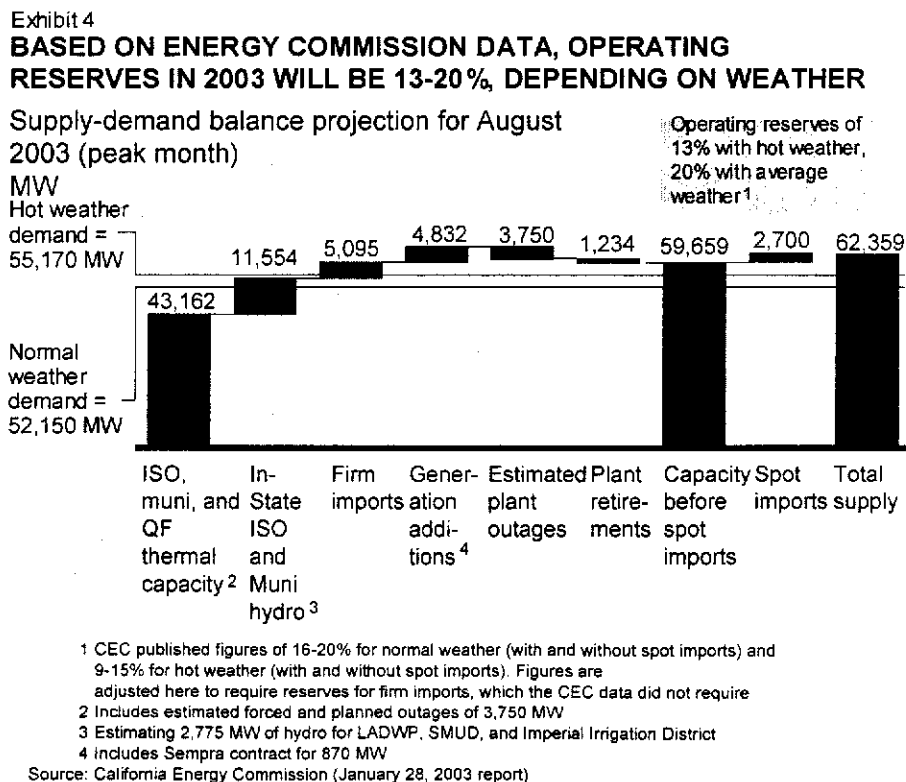
** Includes so-called "advanced development" plants that are now unlikely to be built, early and proposed development, tabled plants, and cancelled plants

Source: Platts NewGen database

SHORT-TERM OUTLOOK: THE SUMMER OF 2003 IS LIKELY TO BE TIGHTER THAN PREVIOUSLY ANTICIPATED

Reserve supplies should be adequate for 2003, although somewhat tight if weather is hot

Recently released CEC data suggest that summer operating reserve margins in California will be between 13 and 20 percent in 2003, depending on whether the summer season is normal or hot (Exhibit 4).⁵ The California ISO believes operating reserve margins in the ISO control area could be even lower: only 7 to 13 percent, depending on whether the summer temperature



is average or hot.⁶ Operating reserve margins measure the amount of excess capacity available to serve peak customer demand after accounting for power plant outages and taking into account projected spot imports from other states. These projected reserve levels are lower than might have been anticipated, given the positive expectations that followed new capacity

⁵ Based on CEC data released on January 28, 2003. New data are expected to be released in May 2003, but are not expected to be released in May 2003, but are not expected to yield results that are significantly different than those presented here.

⁶ Based on the California ISO's "2003 Summer Assessment," released April 11, 2003. The ISO assumes lower spot imports than the CEC.

announcements and long-term power contracts signed by the State during the power crisis. However, based on the CEC's data they are adequate: typical utility planning reserve margins, which measure reserves before potential power plant outages, are in the range of 15 to 20 percent. California's operating reserve margins, which already take into account potential power plant outages, are within this range if the CEC's data proves correct.

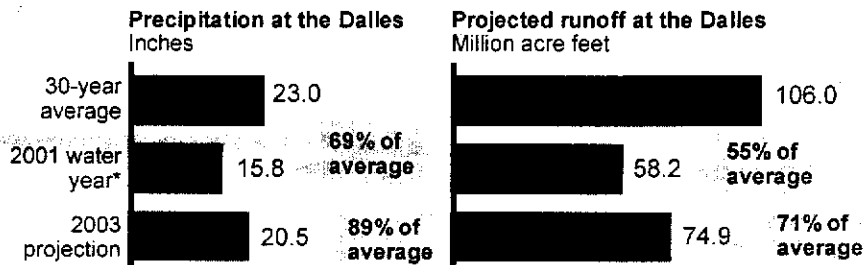
There is some downside risk, which could cause power supplies to be tighter relative to demand

The CEC data takes into account conservative hydro conditions, but during very dry years the peak supply can be lower than the CEC assumes. Already, the projected 2003 runoff for hydro power from the Northwest is 71 percent of average, a figure that meets the Bonneville Power Administration's definition of a drought condition for hydro power (Exhibit 5). These levels

Exhibit 5

HYDRO CONDITIONS AT THE BENCHMARK DALLES DAM IN THE NORTHWEST SUGGEST REDUCED HYDRO IMPORTS IN 2003

AS OF APRIL 2, 2003



The Bonneville Power Administration (BPA) is projecting runoff at the Dalles of 74.9 million acre feet, or 71% of average in 2003 – low enough to put drought conditions into effect**

* October 2000-September 2001

** When runoff is below 85 million acre feet at the Dalles, BPA considers drought conditions to be in effect in the Northwest and BPA limits spot hydro sales

Source: Bonneville Power Administration

are better than those observed in 2000 and 2001, but are low enough to put downward pressure on spot imports into the State.⁷

Another meaningful downside risk is the possibility that the State's electricity consumers will conserve less. Although conservation was high during the energy crisis, consumers today still receive no price signals during peak demand times, making them less likely to continue to conserve during these crucial times. The CEC assumes 1,300 megawatts (MW) of voluntary reduction at peak periods in the summer of 2003, which is 40 percent of 2001 voluntary conservation levels. Yet in 2002 voluntary conservation fell by almost 45 percent relative to 2001, so conservation this year can easily fall by more than the CEC assumes.

Considering the potential impact of lower Pacific Northwest hydroelectric availability and less conservation, operating reserves during the summer of 2003 could drop to 16 percent under average weather conditions, and to 10 percent under hot summer conditions (Exhibit 6). An operating reserve

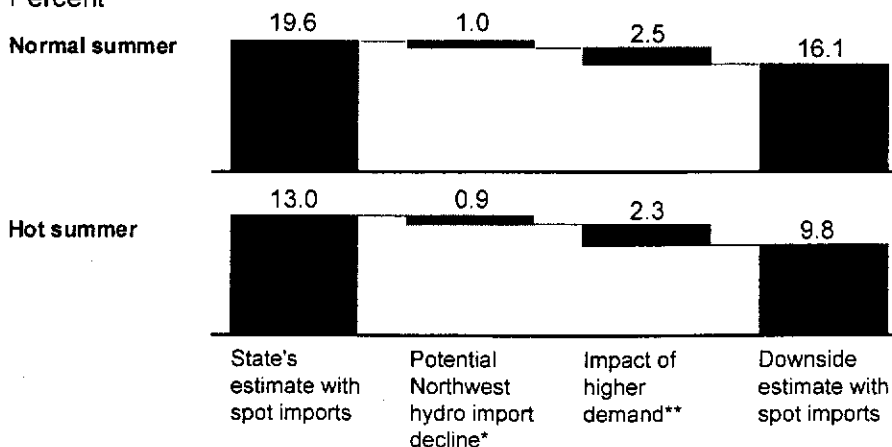
Exhibit 6

**THERE IS SOME DOWNSIDE RISK
IN THE STATE'S 2003 FORECAST**

ILLUSTRATIVE

Operating reserve margin estimates

Percent



* Assumes 500 MW derate of spot imports, reflecting lower Pacific Northwest hydro availability

** Assumes no voluntary conservation (1,300 MW demand increase)

Source: California Energy Commission data and discussions

⁷ In-State precipitation has been near average year-to-date for most river basins in California, which will help limit any further declines in hydro availability.

margin of 10 percent under hot weather conditions provides a small, but likely adequate buffer above the approximate 7 percent operating reserve level at which system reliability begins to be diminished and Stage One emergencies start to become necessary.

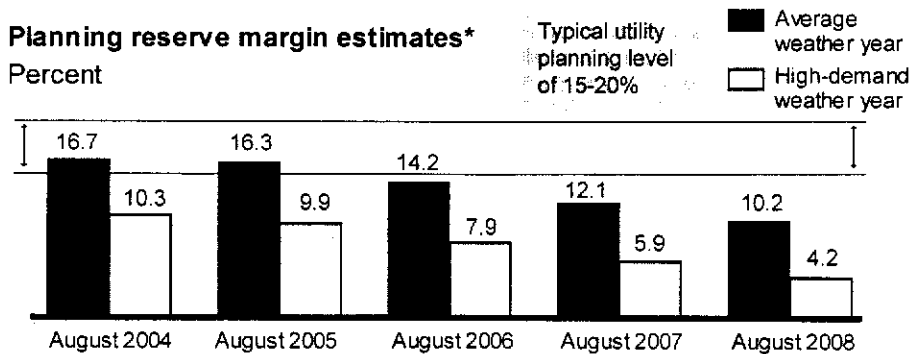
MEDIUM TERM OUTLOOK: THERE IS A MEANINGFUL RISK OF ANOTHER SUPPLY SHORTFALL IN A FEW YEARS

Very low reserve margins are likely after 2003, posing a threat to system reliability

In future years, the reserve margin outlook is less healthy. Planning reserve margins, which measure installed capacity and firm power imports relative to peak demand, are likely to drop below a typical utility industry planning reserve margin of 15 to 20 percent by 2006, under an average weather scenario (Exhibit 7).⁸ On an operating reserve margin basis, which accounts for potential power plant outages, CEC data indicate that operating reserve

Exhibit 7

PROJECTED PLANNING RESERVE MARGINS FOR THE STATE DROP BELOW TYPICAL UTILITY PLANNING LEVELS BY 2006



- By 2006 California's reserve margins under average weather will be below typical utility planning levels
- Very dry hydroelectric conditions, reduced conservation, or additional plant retirements will exacerbate the risks of currently low reserves

* CEC data include more than 1,500 MW of new capacity for 2006-08 that is only in early development or projected under renewables programs (not yet started construction). CEC data also include firm imports of more than 5 GW

Source: California Energy Commission (January 28, 2003 report)

⁸ The CEC's report at the end of January calculates a "planning reserve margin" that includes spot imports. This paper calculates planning reserves based only on dependable capacity, or installed capacity plus firm contracted imports. This calculation methodology conforms with typical planning reserve definitions and is used consistently in this paper to compare multiple power markets. The CEC's projections also do not require any reserves as insurance for firm imports. The calculations in this paper do calculate reserve requirements for firm imports. An upcoming revision to the CEC's forecasts is likely to address both of these issues.

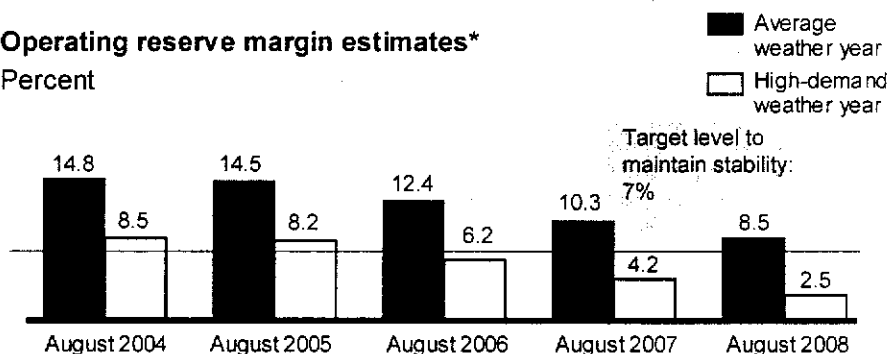
margins in the state could be in the range of 6 to 12 percent in 2006 (Exhibit 8). At a 7 percent operating reserve margin, the State's power system begins to exhibit risks of reliability failures and the potential for blackouts.

Exhibit 8

OPERATING RESERVE MARGINS DROP TO LEVELS THAT SUGGEST THERE COULD BE RELIABILITY DOWNSIDE IN 2006

Operating reserve margin estimates*

Percent



- Operating reserves will drop below levels for maintaining system stability if the summer is hot, starting in 2006
- Very dry hydroelectric conditions, reduced conservation, or additional plant retirements will exacerbate the risks of currently low reserves

* CEC data include more than 1,500 MW of new capacity for 2006-08 that is only in early development or projected under renewables programs (not yet started construction). CEC data includes 2,700 MW of spot imports in addition to estimated firm imports of more than 5 GW. CEC estimates include 3,750 MW of forced power plant outages during peak

Source: California Energy Commission (January 28, 2003 report)

This is only 3 years away and historically it has taken 4 years or more to permit, site, and build a clean, new baseload power plant in California. New peaking power plants can be built more quickly – in some cases they can be built within a year – but they often take 2 to 3 years to build, including design, siting, and permitting. They also cost more to operate than baseload facilities.⁹

In 2008 the situation is even worse than in 2006: projected operating reserve margins range between 3 and 9 percent, a dangerously low level. Clearly, starting in 2006 the power system is likely to see very low reserves, with 2006-2008 representing a period of increasingly high risks.

⁹ Some very small peaking plants can be built within a matter of months. However, this requires expedited permitting and siting and cannot be accomplished for larger plants.

There are downside risks to this medium-term forecast, including the potential for even drier hydro conditions and additional plant retirements

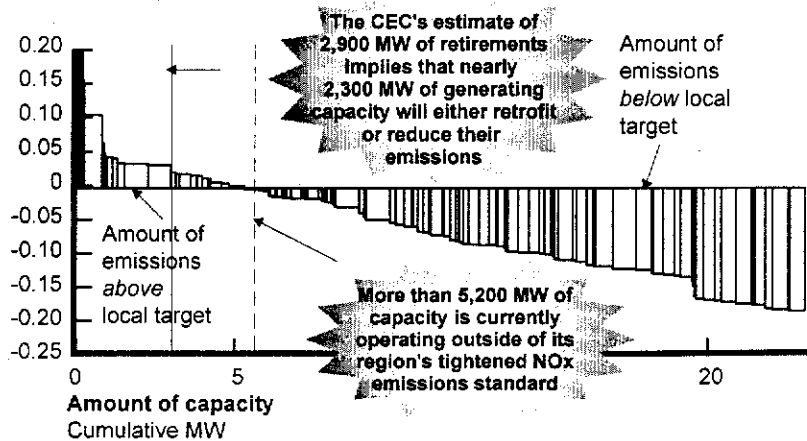
These forecasts could prove optimistic. They do not take into account the full potential downside impact of dry hydroelectric conditions. They also assume only limited power plant retirements, despite much tighter emissions standards that may shut down many older power plants in the State. Both are "reasonably probable" downside events based on past experience.

As many as 5,200 MW of plant retirements could occur over the next several years in the State, due to the imposition of strict new environmental limits (Exhibit 9). These limits will require older plants to install new

Exhibit 9

5,200 MW OF POWER PLANTS ARE AT RISK OF RETIREMENT DUE TO TIGHTER EMISSIONS LIMITS BEING ADOPTED

2001/2002 power plant emissions performance against new local requirements
Difference between plant emission rate and allowed rate
NOx emission, Lbs/MMBtu



Source: Platts; EPA Constant Emissions Monitoring System (CEMS) data; California AQMD Regions

environmental controls, or to retire. Many plants cannot justify this investment due to the high cost of control technologies, particularly those that sell power primarily into the spot market and are only infrequently

dispatched. The CEC currently projects only 2,900 MW of plant retirements, compared to the 5,200 MW that are possible.

Assuming a dry hydro year and about half of the potential incremental power plant retirements that are possible, operating reserve margins could be as low as 9 percent in 2006 with average temperatures, and 3 percent if the summer is hot (Exhibit 10). Beyond these factors, there is additional potential downside, including further reduced energy conservation (or higher demand) and more frequent power plant outages. Incorporating these influences, reserve margins could drop to 5 percent with average temperatures, and to as low as -1 percent if it is hot.

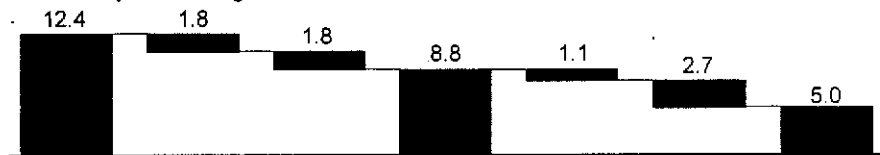
Exhibit 10

**CALIFORNIA'S RESERVES IN THE 2003-08 PERIOD
COULD BE LOWER THAN THE CEC CURRENTLY PROJECTS**

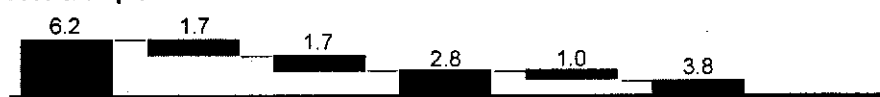
Operating reserve margin estimates
Percent

ILLUSTRATIVE

2006 example – average weather



2006 example – hot weather



State's estimates with spot imports	Poor hydro year ¹	Additional plant retirements ²	"Reasonably probable" downside case	Less conservation or higher demand ³	Additional plant outages ⁴	Full potential downside case
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1 Assumes 500 MW derate of spot imports, reflecting lower Pacific Northwest hydro availability; also assumes 500 MW additional derate of in-state hydro resources

2 Additional 1,000 MW of retirements based on inability to comply with new environmental rules

3 Assumes 50% reduction in program conservation (500 MW demand increase) and a reduction in ongoing voluntary conservation (100 MW demand increase); or, alternatively, 600 MW of higher demand due to an abnormal demand spike

4 Plant outages at average 2000 levels of 5,300 MW versus current CEC estimate for 2006 (unchanged from 2003) of 3,750 MW

Source: California Energy Commission data and discussions

It is true that certain events could also lead to upside in 2006. However, hot summers and the risk of retirements are reasonably probable events.

Moreover, in 2007, 2008, and beyond, similar downside risks to those that could occur in 2006 remain very possible. Unfortunately, in these future years the starting point for operating reserves is even lower – with "average" weather operating reserves already at dangerous levels. Given the amount of time it takes to build new generating capacity in the State, something clearly needs to be done today.

Based on the CEC's data, there are risks of power outages; under downside conditions there could be sustained shortages

Reserves at the levels projected for 2006 and beyond – even at the "average" weather levels the CEC's own data indicate – would pose a significant system reliability risk. In 2000 and 2001, reserves were at similarly low levels to those that are possible in 2006.¹⁰ At that time, the highest cost power plants were required to serve customers. In addition, supply was inadequate to reliably serve all demand. This led to rotating power outages in December 2000 and in January through March of 2001.

The supply-demand imbalance also created an opportunity for suppliers to exercise market power, which contributed to extraordinarily high wholesale electric power prices. It should be noted that the Federal Energy Regulatory Commission (FERC) recently found that while this behavior contributed to higher wholesale power prices, a supply-demand imbalance was the primary cause of the power crisis.

Given the amount of time it takes to build new baseload or peaking capacity in the State, the process of adding new generating capacity and ensuring that existing peaking capacity has financial incentives to stay on-line, needs to start today. If this process does not start today, it will be very hard to minimize the risk of a future power supply shortage in the 2006 to 2008 time period.

10 In August 2000, State-wide operating reserves were around 3.5 percent during the peak. In December 2000, State-wide operating reserves were approximately 6.8 percent, yet there were still periods of power shortages in parts of the State.

The economic costs of a power shortage, or even very tight supply conditions, are high

Power shortages are an expensive risk we can forestall. California's experience shows the importance of reliability: In 2001, rotating outages in January through March may have cost the State as much as \$150 million of lost gross state product and imposed as much as \$300 million in economic costs on customers, based on the estimated value of service to customers. This does not include the high wholesale power-procurement costs incurred by utilities. In addition, prior analysis by the Bay Area Economic Forum and its partners indicates that sustained power shortages for the duration of a tight summer could reduce gross state product by \$2 billion and impose \$3 billion in lost value of service costs.¹¹

CALIFORNIA IS THE ONLY MAJOR RESTRUCTURED POWER MARKET THAT FACES THIS PROBLEM

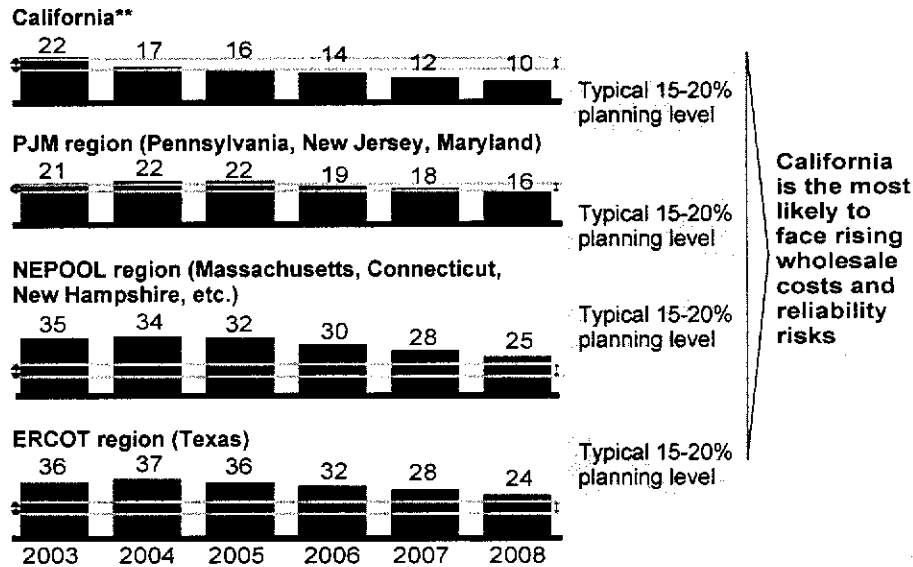
California is one of several states that adopted electricity restructuring. In the aftermath of California's electricity crisis a number of states have either repealed or put on hold their attempts to redesign their markets. Other states, however, have continued with restructuring and have been very successful, including creating effective regional electricity markets. They include Texas, the New England states, and the Mid-Atlantic states of Pennsylvania, New Jersey, and Maryland.

These other major markets have a much healthier projected supply-demand balance. California is the only one of these major markets to see average weather planning reserve margins drop below 15 percent, or below the typical minimum utility planning level, by 2006 (Exhibit 11).¹² By 2008 California's planning reserves are projected to drop to 10 percent under average weather conditions. In contrast, reserves in Texas, New England, and the Mid-Atlantic are expected to range from 16 to 25 percent as far out as 2008.

¹¹ These figures represent blackout costs that the Bay Area Economic Forum and its partners estimated would have been observed in the summer of 2001 if weather had not been cooler than normal, given the low operating reserves at that time. See "The Bay Area - A Knowledge Economy Needs Power," April 2001, p. 36.

¹² Planning reserves are higher than the operating reserves just discussed, because they exclude unplanned power plant outages (although this is slightly offset by also excluding spot market imports).

Exhibit 11
CALIFORNIA'S PLANNING RESERVE MARGINS ARE WORSE THAN MANY OTHER KEY RESTRUCTURED POWER MARKETS
 Forecasted planning reserve margin*



* An apples-to-apples comparison: installed dependable capacity less peak demand, with no spot imports and no forced power plant outages

** Normal weather conditions

Source: Platts NewGen database; CEC; PJP ISO; ISO New England; ERCOT; Texas PUC

These figures indicate that other restructured power markets have been more successful in attracting and retaining investment. Given the relatively poor outlook for additional supply in California, policy makers should consider what they can do to promote a market design that encourages investment in power infrastructure, with appropriate monitoring of market behavior. Other states have accomplished this.

Part III. The State needs to adopt near-term reforms, as well as develop a broader, integrated long-term policy

The current poor outlook for supply and demand clearly indicates that policy makers need to take action to minimize the risk of a future supply shortage. They should also not lose sight of the larger picture. The State needs an energy policy that links wholesale and retail markets, rationalizes and clarifies the role of the State's energy agencies, and promotes renewables and efficiency. A rational and consistent power policy will ultimately result in lower costs and greater reliability for customers.

The State has two very different options for resolving its supply-demand challenges and reforming its power market: It can re-regulate its power sector, or it can adopt policy reforms that will promote competitive markets and private investment, with appropriate government oversight. Past reports by the Bay Area Economic Forum and its partners provide strong evidence that well-designed competitive markets, with private sector investment, lead to better outcomes, but this section addresses both choices.

The State's three key power agencies – the CEC, the PUC, and the Power Authority – have recently adopted a joint Energy Action Plan for reform of the State's energy policy. The direction of the action plan is positive and sets a constructive foundation for policy. The plan embraces a number of key principles:¹³

- The need to send signals to the capital markets that California is a safe place to do business, as well as to encourage investment in power generation and transmission;
- The need for a vigorous, competitive wholesale power market;
- The need to promote environmentally sound and cost-effective policies;

¹³ Six key actions are also planned: 1) optimizing energy conservation and resource efficiency; 2) accelerating the State's goal for renewable generation; 3) ensuring reliable, affordable electricity generation; 4) upgrading and expanding the electricity transmission and distribution infrastructure; 5) promoting customer- and utility-owned distributed generation; and 6) ensuring reliable supply of reasonably priced natural gas.

- The need to restore the financial viability of the State's utilities;
- The need for market-based incentives to encourage customers to use energy efficiently; and
- Recognition of the fact that California is part of a larger, Western electricity system

Now is the time to turn this groundbreaking agreement by the State's energy agencies into action. Timely implementation is essential. In that spirit, this section suggests steps that can both help avert a near-term supply shortage and lead to a more effective energy policy over the medium- to longer-term.

NEAR-TERM STEPS SHOULD BE TAKEN TO ENCOURAGE INVESTMENT IN POWER PLANTS

The State faces a risk of a future supply shortage in large part because investors are not building new capacity or investing in existing capacity

Until recently, supply-demand projections for the State were much more optimistic than they are today. Only a year ago the CEC projected that operating reserve margins in California would be about 24 percent in 2003 and almost 30 percent by 2004.¹⁴ In November of last year, the Western Electricity Coordinating Council (WECC) was even more optimistic, estimating operating reserves of more than 25 percent in 2003 and almost 50 percent in 2004.

All of these projections assumed that power generators would build significant new capacity in the State, since they had announced plans to do so. As shown earlier, however, only about 25 percent of the capacity additions announced will likely result in the construction of new plants.

As a consequence, the future reserve margin outlook in the State is risky, due to plant cancellations and limited investment in existing plants, particularly when the lack of demand-side incentives to reduce consumption is taken into account.

¹⁴ California Energy Commission staff reports in November 2001 and February 2002; Western Electricity Coordinating Council 10-Year Coordinated Plan, September 2002.

Private sector investment is crucial to ensure that supply will be adequate, as long as appropriate market safeguards are in place

Private investment by power generators in the State is crucial. This investment in clean, low-cost, natural gas-fired power generation helps contribute to lower power costs, lower emissions, and adequate reserve margins. The State could invest in power generating capacity itself, but this would be costly and would not be desirable given its current financial situation or the impact its investment might have in deterring future private investment.

Recent findings by the FERC indicate that behavior by private marketers and generators contributed to the high prices experienced during the State's power crisis, but that a supply-demand imbalance, however, was the primary cause. Moreover, had California's power market been better designed, the opportunity for such abuse would have been greatly reduced. Deregulated markets require oversight and effective market monitoring at the State and Federal level.

A proposal has been made in the State's legislature to re-regulate the power sector, which would end all direct access; return the State to fixed, administratively determined cost-of-service pricing; effectively prohibit universal time-of-use or real-time metering; and discourage California's participation in a regional transmission organization.

This proposal is not only unnecessary, but is also likely to prolong uncertainty in California's electricity industry, further delaying potential private investment. Such a proposal would result in a market similar to the old model in the State that contributed to high retail electricity prices, due to poor investment decisions, and later to a lack of necessary infrastructure investment. Other deregulated states – including Texas and those in the Northeast and Mid-Atlantic – have been very successful in attracting low-cost investment from private investors and have not seen supply shortages like California's. In addition, well-designed competition in generation generally leads to lower costs, better quality, and improved reliability, as

illustrated in prior reports by the Bay Area Economic Forum and its partners.

A financial downturn for power companies today does not preclude new private sector investment, but regulatory uncertainty does

Several power-generation and development companies face financial challenges today, as a result of widespread overcapacity in many power markets and large declines in their profits. Lower profits and overcapacity in many markets outside California are leading investors to withdraw plans to build new power plants or invest in existing plants in a number of U.S. markets. Financial institutions are also less willing to fund power investment today, unless they see strong prospects for repayment. In general, power plants today are unlikely to obtain financing unless they are able to secure stable, long-term contracts with credit-worthy parties. Despite these challenges, there are still a number of healthy power generation companies and financial institutions willing to invest in existing and new capacity, if market rules are clear and there is a need for this investment.

States like California that lack regulatory certainty, however, pose special challenges for investors. Energy prices in the State are low today, despite the risk of supply shortages in a few years, and it is not clear how power generators will be compensated for addressing near- to medium-term supply risks. Although utilities are now allowed to enter into contracts with private generators for supply, there are limited incentives for utilities to sign these contracts and there are still open questions about the PUC's process for reviewing performance under the contracts after they are signed.¹⁵ Finally, the outlook for reserve capacity contracts, access to customers, and well-defined wholesale and retail market rules is unclear.

Efforts to re-regulate the industry, rather than proceed on the path established by the State's key energy agencies in the joint Energy Action Plan, heighten uncertainty for investors and threaten further delays in new power infrastructure investment.

¹⁵ Assembly Bill 57, signed near the end of 2002, gives utilities the right to sign long-term contracts for power supply and attempts to "eliminate the need for after-the-fact reasonableness reviews" of procurement decisions, including decisions to sign long-term contracts. These are strong steps in the right direction. However, the PUC still has authority to verify that contracts are being administered appropriately and to resolve contract disputes. Ideally, this authority will be used in a benign manner, but it is unclear how this authority will ultimately be applied.

Actions the State can take to encourage investment and to address California-specific structural barriers to power investment

California's market outlook and need for capacity in a few years should be providing incentives for generators and financial institutions to invest in needed power plants. However, a number of structural problems persist in the California market that discourage private investors from investing in new capacity and plant upgrades. These structural problems have been discussed in past reports by the Bay Area Economic Forum and its partners, in detail, and are addressed briefly here. Resolving these problems will help to encourage power plant investment in the State. The State should specifically consider the following actions:

- **Further clarify the sanctity of long-term contracts:** In today's financial climate, generators increasingly need long-term contracts to gain funding for power plant investment. Legislation implemented at the end of 2002 has affirmed that utilities have the option of signing procurement contracts with generators and has adopted the principle of eliminating after-the-fact reasonableness reviews of contracts. Generators require firm assurances that utilities will be allowed full recovery of contract costs, through customer rates, and that the PUC will not later re-open contracts. The PUC should clarify that it will embrace the new principle of up-front prudence reviews of contracts and will not use its ongoing authority over the review of contract performance for the purpose of retroactively disallowing power-procurement contracts. Future PUC members should also respect past contract approvals, without re-opening these in the future after prior PUC members have left.
- **Promote reliability by implementing capacity-reserve requirements:** The lack of a capacity market, which compensates power generators for maintaining reserve capacity, makes it less likely that older plants will stay on-line to provide insurance against power shortages and also limits new investment.¹⁶ The

¹⁶ Particularly with energy price caps, which are currently in place in California, a capacity market is necessary to provide peaking power plants with opportunities to cover their fixed costs. Energy price caps limit the ability of peaking plants to earn profits that cover their costs of staying available to provide power. Peaking plants operate only infrequently to provide reserves and power during high-demand periods, so depend upon either high energy prices during peak periods, or capacity-reserve payments.

State should introduce a capacity market and mandate minimum capacity reserves for all utilities. Other power markets require that utilities maintain minimum reserves. California should do the same. This will depend upon transparent and consistent reporting requirements for future supply and demand. It will also depend upon introducing a capacity market that is forward-looking to ensure that new capacity is built before problems develop. With energy price caps in place today, a capacity market is an important market design feature that will help ensure that long-term supply needs are correctly forecast and adequately met.¹⁷

- **Streamline the power plant permitting process:** A major contributor to California's difficulty in adding new supply in the past has been the long duration of permitting decisions made in the State. This slows down the process of adding capacity and also discourages new investment. The State should extend streamlined processes put in place during the energy crisis and continue to streamline existing processes, to ensure that needed new capacity can be added quickly.
- **Clarify wholesale market rules:** For generators without long-term contracts, the potential ability of the Power Authority or incumbent utilities to build new power plants makes investment in the State less attractive. The State should clarify the role of these entities and ensure that private generators will be given reasonable opportunities to bid against them for new supply contracts. In addition, there is effectively no functioning wholesale market that allows merchant generators to sell power to customers on a month-ahead, day-ahead, or hour-ahead basis. Hence, generators struggle to find opportunities to sell their power in California. The State should re-introduce a viable, robust wholesale spot market into which generators can sell their power to credit-worthy customers. This will also increase the

¹⁷ The Power Authority and PUC currently recommend reserve margin targets of 15 to 17 percent. However, these are goals and not formal requirements.

likelihood that power from outside the State will be available for import, through sales into California's spot market.

- **Allow direct access:** Allowing power generators to sign contracts directly with large customers would encourage investment in new and existing generating capacity. This would expand the customer base for generators and provide more credit-worthy counter-parties. Recently, proposals have been made in the legislature toward this end, through so-called "core /non-core" proposals, which would open up direct access to large consumers (non-core), while continuing to require small consumers (core) to buy power from utilities.¹⁸ This approach, which follows the structure already successfully in place for the natural gas market, has been highlighted in past Bay Area Economic Forum reports. The major challenge of allowing direct access is that the State needs to ensure that utilities can repay the long-term contracts it signed during the last power crisis. Fortunately, such a guarantee is possible under direct access, through an appropriate exit fee mechanism for non-core customers.

LONGER-TERM ACTIONS THAT WILL CONTRIBUTE TO A BETTER OVERALL ENERGY POLICY

In addition to taking steps to prevent a near- to medium-term supply shortage, policy makers should take several additional actions to create a viable, integrated power policy in the State. These are elaborated upon in more detail in the November 2002 report published by the Bay Area Economic Forum and its partners, "California's Energy Future: A Framework for an Integrated Power Policy." The key details are summarized here:

- **The State should link retail electricity prices to wholesale energy costs:** Without a link between retail prices and wholesale costs, consumers will lack clear incentives to cut their power consumption during high-demand/high-cost periods and will not pay the true costs of consumption. The PUC has approved a

¹⁸ A recent proposal would encourage competition and retail choice, while protecting small customers from market volatility. Aggregation of small customers to take advantage of direct access would be allowed. Utilities would be required to establish a diversified portfolio of short- and long-term energy supplies, including renewables, sufficient to meet customer demand and provide for reserve capacity, and to implement demand-management measures such as time-of-use pricing. Customers choosing to purchase from non-utility sources would be required to pay their share of past stranded costs.

limited real-time pricing experiment, which is a step in the right direction. In addition, the State's key energy agencies have adopted a rulemaking process to explore broader implementation of real-time pricing programs and advanced metering. Real-time and time-of-use pricing programs, with prices linked to underlying wholesale power costs, should be further adopted and expanded. These programs – which would encourage lower consumption at times of high demand and high power costs – will help to limit the risk of future price spikes and power shortages.

- **The State should permit full retail choice (direct access):** Letting retail customers choose their electricity provider, the services they consume, and the pricing for these services, helps to improve consumer satisfaction and gives customers options for finding the lowest-cost, most-flexible service packages to meet their needs. Although a "core/non-core" approach is a good first step, full retail choice should be the State's ultimate goal.
- **The State should give more attention to electric and gas transmission infrastructure siting and investment:** Power generation is only one component of a stable energy infrastructure. The State needs to be more willing to approve of and promote new electricity-transmission investment, which would improve the flow of electricity across the State and into the State from neighboring states. Moreover, new power generation will depend upon adequate access to natural gas supplies in the future. It is a positive step that the State's current Energy Action Plan embraces actions in these areas.
- **The State should give consumers the option to self-generate power, under nondiscriminatory rules:** Although the State must ensure that utilities recover the costs of paying for long-term contracts that the State signed during the power crisis, it can still provide opportunities for consumers to self-generate power. This

can be allowed in exchange for paying a fair system exit fee, just as with direct access. The PUC recently agreed to exempt small customers who choose to self-generate from paying an exit fee and the State's Energy Action Plan encourages more widespread self-generation. Giving consumers the right to self-generate provides another mechanism for the State to avert power shortages and reduce overall customer costs.

- **The State should issue clearer mandates for its power agencies and require more consistency in their decision-making:** California's multiple power agencies continue to have overlapping mandates. They also have a long history of reversing past agency decisions, which contributes to uncertainty. A viable power policy for the State should clarify the roles of the State agencies and promote consistent decision making. Current cooperation and coordination between agencies should continue and be expanded, while a longer-term rationalization and coordination plan is developed.
- **Policies should responsibly promote efficiency and resource diversity:** Though most new capacity built in the State will be efficient, environmentally friendly, natural gas-fired generation, the State also seeks more resource diversity, through efficiency and the use of renewables. This is embraced in the State's current Energy Action Plan. Improved efficiency can yield sustained energy gains. The State should also encourage responsible investment in renewable resources, taking into account their higher costs and lower reliability. In addition, it should continue to promote new conventional power plant construction, which will improve efficiency and further lower emissions.

* * *

In summary, the State needs to act at once to minimize the risk of another supply shortage by choosing to encourage new private sector investment. History shows that competition and private sector investment is generally the best approach, assuming that effective oversight mechanisms are in place. To capture the benefits, however, the State will need to create an atmosphere that is more favorable to private sector investment than exists today.

The state should also adopt broader, longer-term reforms. These include linking retail prices to underlying wholesale costs, allowing direct access for retail customers, and promoting more consistent and integrated policy decision making. Such reforms will limit the growth of future retail electricity prices and create a more attractive environment for private investment and economic growth.

Prolonged uncertainty without a clear policy direction discourages new infrastructure investment and increases the risk of supply disruptions in the future. The outlook for reserve margins in the next several years suggests that the risks are real. Developing a clear policy now, and implementing its key components in a timely manner, is necessary to assure a strong and vibrant economy to sustain California's economic growth.

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