

# **Report on California Electric Utility Natural Gas Supplies**

R.04-01-025

October 6, 2005

CPUC Energy Division

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**Summary and recommendations:**

**California electric generators consume a considerable portion of the natural gas used in California.** According to recent data collected by the California Energy Commission (CEC), this portion amounted to one half in 2004.<sup>1</sup> In addition, roughly 50% of the electricity demand in California is generated using natural gas as a fuel.<sup>2</sup> California's electric investor-owned utilities (IOUs) are responsible for procuring a significant portion of the gas used for electric generation in California.

**California consumers, including electric generators, will be somewhat vulnerable to high natural gas prices and price volatility in coming years.** Natural gas prices have significantly increased in recent years, and the volatility of prices has increased as well. About 85% of California natural gas supply is imported via interstate pipelines, so California must compete in the national gas market for supplies.

**The IOUs should consider assuring delivery of natural gas purchased at the production basin by securing firm interstate capacity rights for the baseloaded utility-owned electric generation (UEG) plants and for baseloaded plants under contract with the California Department of Water and Power (DWR).** Significant changes will likely occur in coming years regarding the ownership of interstate pipeline capacity rights. If firm interstate pipeline capacity rights are not held to California delivery points, the effective delivery capacity on those pipelines may very well be reduced. A diverse set of interstate pipeline contracts also act as a hedge against increases in border-basin differentials.

**The IOUs can take other measures to lessen the impact of high natural gas prices and volatility on electric rates.** The IOUs can hedge gas procurement costs with

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<sup>1</sup> "2005 Integrated Energy Policy Report", September 2005, California Energy Commission, p. 105. In the "Preliminary Reference Case in Support of the 2005 Natural Gas Market Assessment: Staff Report", June 2005, California Energy Commission, p.19, the portion of gas used by electric generators in 2006 in California is put at 33%.

<sup>2</sup> Utility-specific data contained in Confidential Appendix B indicate that about 50% of electricity used in California is gas-based. Furthermore, published data from the federal Energy Information Agency (EIA) show that 50% of California electric power in 2002 was gas-based.

storage, financial tools, and fixed-price commodity contracts, where these are deemed prudent. The Customer Risk Tolerance guideline is a useful yardstick for guiding risk mitigation measures.

**The Commission can adopt or encourage measures that will help to mitigate gas price risk, and hopefully dampen cost increases due to natural gas price rises.** These measures include adopting or encouraging:

- higher electricity and gas conservation and end-use efficiency savings goals;
- more electricity generation from renewable sources;
- introduction of an incentive mechanism to motivate a low and secure price for EG gas procurement;
- adequate interstate and intrastate pipeline capacity,
- greater efficiency in gas-burning electric generators (EGs), and
- access to new supplies, including liquefied natural gas supplies.

The Commission is already pursuing most of these policy strategies.

Confidential Appendix A summarizes data on utility activity (historical and planned) in the areas of commodity procurement, transportation, storage, and hedging of natural gas. Confidential Appendix B contains tables summarizing gas-based generation in the context of California electricity production.

### **An Assigned Commissioner Ruling in R.04-01-025 requested the Energy Division to report on EG gas supply requirements**

In its May 11, 2005 Ruling in Rulemaking (R.) 04-01-025, the Assigned Commissioner included the following request.

... in order to more fully understand the adequacy of the California natural gas infrastructure and the impacts of current procurement practices, we have asked the Energy Division to examine electric utility plans to supply, transport and store natural gas for electric generation in those plants for which the utility is responsible to provide the gas. The Energy Division will then issue a report including any recommended actions for the Commission to take. The target date for release of the report is September 15, 2005. Comments on the report will be

due October 17, 2005. The comments should address the merits of the Energy Division recommendations, and specifically identify any factual disputes related to the report that would suggest the need for evidentiary hearings prior to including the report in the record for this proceeding.

On September 13, 2005 the Administrative Law Judge in R.04-01-025 granted an Energy Division (ED) request, and extended the due date for this report to October 6, 2005, with comments due November 4.

### **The Energy Division has relied upon public and non-public data sources**

In gathering data for this report, ED issued several data requests to the three major California electric IOUs: Pacific Gas and Electric Company (PG&E), Southern California Edison Company (Edison), and San Diego Gas & Electric Company (SDG&E). Much of the data gathered in the responses to data requests was submitted under conditions of confidentiality. Other documents were also consulted, including the following: Gas Supply Plans for gas tolling arrangements related to long-term power contracts held by the California Department of Water Resources (DWR); the utilities' electric procurement plans; the California Energy Commission's June 2005 "Preliminary Case in Support of the 2005 Natural Gas Market Assessment" and September 2005 "2005 Integrated Energy Policy Report"; utility FERC filings; and data published by the Energy Information Administration.

### **The IOUs are responsible for procuring a significant amount of natural gas and this amount is expected to increase**

Collectively, EGs providing power to customers of California investor-owned utilities (IOUs) are burning about 1,800 mmcf/d in 2005.<sup>3</sup> Of this gas, the California electric IOUs are responsible for supplying about one third now, rising to half five years from now. The IOU-procured gas total can be broken into three categories: utility-owned electric generation (UEG); gas tolling contracts under the California Department of

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<sup>3</sup> Based on responses to data requests submitted by Energy Division (ED) to CA electric IOUs.

Water and Power (DWR) electric contracts; and gas tolling contracts not under DWR electric contracts. The DWR tolling contracts represent the largest IOU-procured gas category, and the non-DWR tolling contracts represent the smallest IOU-procured gas category. The UEG category is quite small, but will grow substantially in the next five years, as each of the major IOUs begins to procure natural gas for new power plants in California.

### **The Commission has expressed concerns about interstate pipeline capacity in its Gas Supply and Infrastructure Rulemaking**

On January 22, 2004, the Commission issued R.04-01-025 in order to ensure reliable, long-term natural gas supplies to California at reasonable rates. This would require, among other things, that sufficient firm interstate and intrastate pipeline capacity will be available to serve California. In the OIR, the Commission stated that “recent developments seriously threaten California’s supply of natural gas in the long-term, although there is no immediate threat of a natural gas shortage during this year. One such threat is the loss of interstate pipeline capacity to California.”<sup>4</sup>

In this regard, the Commission observed in the OIR that California had lost 533 million cubic feet per day (mmcf/d) of El Paso Natural Gas Company (El Paso) capacity to El Paso's East of California (EOC) customers as a result of terminated contracts, and California had lost even more El Paso firm capacity rights and other interstate pipeline firm capacity rights due to long-term capacity releases of firm capacity by entities previously serving California. The Commission also noted that certain interstate pipeline transportation contracts between California natural gas utilities and El Paso, Transwestern Pipeline Company (Transwestern) or Gas Transmission Northwest Corporation (GTN) will expire in 2005 or 2006, and contracts for interstate pipeline transportation service (to California delivery points) between certain marketers and these interstate pipelines may terminate in 2005 or 2006.<sup>5</sup> Consequently, the Commission found that there was “uncertainty over whether California will have enough interstate

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<sup>4</sup> Order Instituting Rulemaking (R.) 04-01-025, p.5.

<sup>5</sup> R. 04-01-025, p. 6.

pipeline capacity rights secured by firm transportation contracts in the future to meet California's long-term needs.”<sup>6</sup>

The Federal Energy Regulatory Commission (FERC) has made clear that without sufficient contracts for firm transportation service on interstate pipelines to California, California cannot assume that in the future the current physical design capacity of those interstate pipelines will actually be available for use by California consumers. It follows that, without sufficient interstate pipeline contracts, California cannot assume that there will be sufficient interstate pipeline capacity available to meet California's needs. According to the FERC, the interstate pipelines have no firm service obligations to California without firm contracts, and the pipelines can market the capacity under expiring contracts to other markets, or even reduce the capacity of a pipeline in order to avoid losing money.<sup>7</sup> In light of the above, we must review whether or not the California electric utilities have ensured sufficient infrastructure to meet their natural gas supply obligations for managing the DWR contracts and to provide natural gas to their own electric power plants.

**Interstate pipeline physical capacity does not guarantee deliveries unless firm contracts are in place**

The Commission is still reviewing the overall adequacy of California utility natural gas infrastructure to serve demand in R.04-01-025. The Commission is examining the degree to which peak demands can be met, the amount of slack capacity that is appropriate, the level of reliability that should be assured by natural gas utilities, and other issues.

While there currently appears to be a surplus of interstate (and intrastate) installed physical pipeline capacity to serve California demand on an average annual basis under normal weather conditions, FERC policy places no responsibility on interstate pipelines to assure the delivery of natural gas on a firm basis, unless parties have firm capacity

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<sup>6</sup> R.04-01-025, p. 7.

<sup>7</sup> See Public Utilities Commission of the State of California v. El Paso Natural Gas Company (2003)105 FERC ¶ 61,201 at P147; see also El Paso Natural Gas Company (2003) 104 FERC ¶ 61,045 at P141.

contracts. In the absence of contracts for firm pipeline capacity rights, physical pipeline capacity can fail to reliably deliver gas to California in the event that upstream customers (such as in Arizona, Nevada, Oregon, or Washington) contract for firm capacity and effectively reduce the capacity of the pipeline for reliable deliveries to California. In addition, pipeline owners may respond to underutilization of pipeline capacity by mothballing or removing compressors on that line in order to save money. Reduced compression capability on a pipeline effectively reduces the firm delivery capacity of the pipeline. In order to assure the availability of interstate pipeline capacity to California, California utilities and other customers will likely need to enter into contracts with pipelines for firm capacity. The total amount of firm capacity needed under such contracts will likely decrease when LNG supplies become substantially available to California.

For the baseload natural gas supplies that California's major IOUs must purchase on a reliable basis, the Energy Division believes that firm interstate pipeline contracts should be entered into to serve those requirements. A diverse portfolio of contracts could be developed in a way similar way to how the California natural gas utilities have entered into such contracts for core customers' needs. This does not necessarily mean that the IOUs must pay maximum tariff rates. On the contrary, this appears to be an opportune time to obtain such contracts. California natural gas utilities have entered into such contracts, and in a number of cases have obtained discounts from the maximum pipeline tariff rates.

**Liquefied natural gas supplies are overall expected to enhance reliability of supplies and dampen price increases**

In response to high natural gas prices, a number of liquefied natural gas (LNG) terminals have been proposed to be located on or near U.S. coastal areas, including several in southern California (offshore and onshore) and Baja Mexico. Deliveries of significant quantities of LNG are generally expected to begin in 2008 or 2009. LNG is expected to have three significant impacts on California natural gas supplies. First, LNG will significantly increase the amount of supplies available to the market and possibly to California. Second, LNG will offer a new source of commodity that could help to lower

national prices or at least have a dampening effect on further price increases. Third, LNG terminals in the California and Baja California, Mexico will essentially increase the delivery capacity of supplies to California. Before LNG arrives, however, California could be somewhat vulnerable to both supply shortfalls (if inadequate interstate pipeline contracts are in place for California deliveries) and to price spikes.

**Decisions to lower risk are being evaluated for effectiveness or necessity on a case-by-case basis, using the Customer Risk Tolerance as a guide.**

*Hedging:* Hedging tools commonly include call and put options, forwards, and basis swaps. Call options essentially protect a buyer from paying above a pre-determined price, effectively placing a ceiling on the sale price – and cost the gas buyer an “insurance” premium. Put options effectively protect a seller from selling below a pre-determined price, effectively placing a floor on the sale price – and also cost the gas seller a premium. Price collars combine call and put options – and thus can be calibrated to cost nothing. Forward contracts also essentially fix the price at which gas will be delivered, and can also be calibrated to cost virtually nothing. Basis swaps effectively cap the price differential between two trading points. Because forward contracts are most commonly available at Henry Hub in Louisiana, California gas buyers often combine forward contracts with basis swaps, thus limiting price risk on natural gas delivered to the California border.

*Customer Risk Tolerance:* The utilities develop their hedging strategies in the context of the Customer Risk Tolerance (CRT), which was adopted by the Commission in Decision (D.) 03-12-062. The CRT basically mandates that over a 12-month period total electricity rates should not deviate from projected levels by more than one cent per kWh. The CRT covers IOU purchases for IOU-owned EGs, as well as DWR contracts and non-DWR contract procurement, including Qualifying Facilities. If procurement costs and price volatility increase, there is more urgency to hedge its “open” position. If, on the other hand, procurement costs and price volatility turn out lower than projected, the utility may hedge less of its portfolio. Since natural gas is a significant factor influencing electricity prices and the risk associated with electricity price movements, IOUs often use natural gas financial instruments to hedge electric price risk.

All three major IOUs in California use the CRT as their guide in hedging decisions, with the result that hedged quantities vary from year to year. Sophisticated statistical analyses are used to determine the likelihood that the CRT will be approached or exceeded, but judgment plays an important role in determining when, how, and how much risk to mitigate.

*Long-term fixed-price natural gas procurement contracts:* There is very limited use of long-term fixed-price natural gas contracts by California IOUs for the EGs or electric contracts for whom they have natural gas procurement responsibility. A long-term fixed-price natural gas contract, whose function resembles that of a forward hedging contract, should be considered as one of the means by which an IOU can mitigate the risks associated with gas price volatility.

*Natural gas storage:* There is now little use of long-term storage for EG gas by the three major California IOUs. Reasons for this include availability of hedging, which is seen as a cheaper and more liquid alternative. Another reason for the lack of EG gas storage is that the high season for electric generation is the summer, which had been traditionally the season of cheapest spot gas. However, some market analysts now contend that two peak price periods occur during the year, i.e. during the summer and during the winter. This has come about due to the increasingly heavy reliance on natural gas as a fuel for electric generators. Air conditioning demand during the summer can have a significant impact on natural gas prices.

The IOUs employ some short-term storage, primarily for daily and monthly balancing, rather than for seasonal price arbitrage.

*Firm pipeline capacity contracts:* The IOUs who are responsible for procuring gas for EGs are evaluating the benefits of associated firm intrastate and interstate transportation capacity on a case-by-case basis.

With all of these tools, ED generally supports an individual, case-by-case evaluation of the effectiveness or necessity of the proposed risk mitigation strategy. ED also believes that the CRT is a prudent and useful guiding principle in mitigating risk. As noted below, ED believes that IOUs should secure firm interstate pipeline capacity contracts for the portion of natural gas supplies that they need on a reliable basis.

**ED recommendations:**

An appropriate response by the Commission and IOUs to protect California ratepayers from rising prices in gas costs should include multiple components. As will be seen, most of these strategies are already being pursued:

*1) secure firm transportation contracts for baseloaded EG gas supplies:*

The IOUs should consider assuring delivery of commodities purchased at the production basin by securing firm interstate capacity rights for the baseloaded utility-owned electric generation (UEG) plants and for baseloaded plants under contract with the California Department of Water and Power (DWR). Firm interstate pipeline capacity rights will ensure the reliable delivery of those supplies. As discussed earlier, without such contracts, deliveries to California cannot be assured, even if the physical pipeline capacity to California exists.

*2) promote gas and electric end-use efficiency and conservation:*

These investments will have significant impacts on electricity and gas consumption. In addition to ensuring diverse access to supplies, including new supplies, California needs to take, and is taking, measures to limit natural gas demand.

*3) promote efficient electricity generation from gas:*

Since 2000, many old plants have been replaced with efficient new generators, resulting in a significant savings in gas use. This improvement is largely the result of plant owners seeking to become more cost competitive and has occurred without any mandates from governmental authorities.

*4) promote generation of electricity from non-gas resources:*

The CPUC has adopted the Renewable Portfolio Standard, which will ensure that no later than 2017 at least 20% of California's electricity will be generated by non-gas resources. The Commission and the CEC have also adopted Energy Action Plan II, which envisions a 33% renewable portfolio by 2020.

*5) continue to allow for and encourage hedging, storing, and long-term commodity procurement, where effective or necessary:*

These tools are currently in use by the IOUs procuring gas for EGs. The IOUs should be encouraged to use these tools prudently, guided by the CRT and market signals to reduce costs. Natural gas volatility could give rise to higher seasonal spreads in prices, making storage more valuable as a means by which to manage natural gas costs. Of course, if storage is seen as more valuable, the price of storage may increase as well.

*6) consider introducing an incentive mechanism for EG gas procurement:*

The cost-minimizing advantages of PBRs need to be weighed against their disadvantages, including the tendency to encourage all short-term market purchases and to discourage certain kinds of hedging activity. Prior to going down this road, these pros and cons should be evaluated, and ways of avoiding typical PBR pitfalls should be envisioned.

*7) provide access to new supplies, including LNG supplies:*

In D.04-09-022 the Commission recognized that LNG could be an important future component of California's gas resource base. Indeed, one of the thrusts of R.04-01-025 is to facilitate access to this resource on an equitable and safe basis. The creation of open access tariffs and standardized agreements and the development of new gas quality standards are two aspects of this effort to facilitate importation of LNG and access to new supplies.

*8) monitor the potential for intrastate and interstate pipeline congestion:*

One of the recommendations of D.04-09-022 was to establish an advisory committee comprised of natural gas utilities state agency officials, and other parties who would monitor the interstate pipeline capacity situation to ensure sufficiency. This recommendation is being implemented. The first meeting of natural gas utilities and state agencies has already taken place, and an expanded meeting of this group with other interested parties will be scheduled shortly.