Ratepayers for Affordable Clean Energy
CPUC Rulemaking 04-01-025
March 23, 2004

Addendum E:

Local Impacts of LNG Terminals[1]

1. Summary

To determine how ratepayers are impacted by LNG terminal development, it is critical to acknowledge the local issues that are causing ratepayers to reject the construction of LNG terminals in local communities on both coasts of the United States. Moreover, while we have shown that any benefits of an LNG terminal will not go to core gas customers, ratepayers' broader interests go beyond the *price* of gas or electricity. California ratepayers are often more compelled by the potential public health, safety, environmental and economic impacts from LNG terminals. In the eyes of many ratepayers, these local costs exceed the benefits claimed by LNG producers and developers as a new gas source for California, particularly given that LNG would not flow into California for many years to come, while alternative clean energy sources could take up any slack in supply in a shorter period of time.

[1]This addendum prepared with assistance from Elena Ducharme and Bry Myown.

Key ratepayer interests include:

- Safety and security issues relative to the potential of LNG tankers, pipelines and terminals to catastrophic accidents and terrorist attacks;
- Respiratory health impacts from LNG tankers, diesel-fueled dredgers, tugboats and Coast Guard escort vessels, and any associated power plants;
- Disruption of local commuter, recreational and commercial maritime traffic and fishing due to buffer zones around the LNG tankers;
- Extensive dredging of local waterways that would disrupt water patterns and potentially harm fisheries and wildlife;
- Substantial negative local economic impacts;
- Substantial local government costs.

2. LNG Terminal Security and Safety

A recent report of the Congressional Research Service identified LNG terminals, tankers and pipelines as prime terrorist targets. In the United States, federal warnings about Al Qaeda threats since September 11, 2001 have repeatedly mentioned energy infrastructure. In June of 2003, for example, U.S. Intelligence agencies warned about possible Al Qaeda attacks on energy facilities in Texas. [2] On the morning of Sept. 11, 2001, top officials in the White House situation room expressed an almost immediate fear of an attack on Boston through the Liquefied Natural Gas port in Everett, warning the Coast Guard that Boston Harbor may be an Al Qaeda target, according to the former White House terrorism chief Richard A. Clarke, who coordinated the government's response to the attacks:

"After the Millennium Terrorist Alert we had learned that Al Qaeda operatives had been

[2]Paul W. Paformak, Specialist in Science and Technology Resources, Science, and Industry Division, "Liquefied Natural Gas (LNG) Infrastructure Security: Background and Issues for Congress," Congressional Research Service, Library of Congress, September 9, 2003.

infiltrating Boston by coming in on liquid natural gas tankers from Algeria."[3]

In its letter to intervene in the case of Mitsubishi's proposed Sound Energy Solutions LNG terminal in Long Beach, the CPUC said it had no intention of regulating the price of LNG in California but rather " the siting and safety of SES's proposed LNG facilities in California...the CPUC already regulates these subject areas, as well as many other subject areas, with regard to other natural gas utilities in California." [4]

While the CPUC has jurisdiction over the safety of a gas utility's facilities, ensuring the safety of an LNG terminal anywhere near an urban area may be classed as a contradiction in terms. While federal agencies are seeking to pre-empt local and state jurisdiction over new LNG terminals, existing federal regulation is weak. The Environmental Protection Agency does not require a risk management plan for LNG terminals. Few if any permits are required for the location and construction of pipelines. There are few or any federal or state regulations requiring even minimal inspection and maintenance of pipelines - a major terrorist risk - and failure to adhere to federal regulations is only caught in the event of a pipeline failure, which is a major safety concern of LNG terminals apart from the terminal itself.

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[3] Bryan Bender, "US feared 9/11 hit in Boston, book says: LNG site in Everett was considered at risk," *Boston Globe,* March 23, 2004.

[4]Harvey Y. Morris, CPUC Principal Counsel, "Notice of Intervention and Protest by the Public Utilities Commission of the State of California,"February 23, 2004, pp.4-5.

The Congressional Research Service report outlines the potential for an attack on any of the four existing facilities in the continental United States, or on 15 formally proposed facilities, confirmed LNG can pose a“serious hazard, ” indicating that although there has not yet been a terrorist attack on LNG tankers or land-based facilities, gas and oil pipelines and oil tankers have been attacked in at least six countries, including the 2002 attack on the French oil tanker *Limberg* off the Yemeni coast by a bomb-laden boat:[5]

> "Because LNG infrastructure is highly visible and easily identified, it is also potentially vulnerable to terrorist attack...LNG is inherently volatile and is usually shipped and stored in large quantities." [6]

Potential hazards include pool fires, which occur when a combustible gas-air mixture burns above a pool of leaked LNG. "Such pool fires are intense, burning far more hotly and rapidly than oil or gasoline fires," the report adds. "Many experts agree that a pool fire, especially on water ..., is the most serious LNG hazard."[7]

If LNG were released in an attack, it would most likely ignite immediately. However, if the LNG escaped without catching fire, a cloud of the gas could drift elsewhere and cause a fire, according to the report.

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[5]Paformak, p. 14.

[6]Paformak, Summary.

[7]Paformak, p.11.

Beyond physical damage, an attack on an LNG facility could also shut down power plants, military bases, and other facilities that depend upon the fuel.

The Long Beach LNG project attracted intense public attention in Long Beach when a January 19, 2004 explosion at an LNG export facility in Skikda, Algeria, killed 27 people. But this was not the first time, nor the last, that local California communities have rejected LNG terminals for safety and security concerns. The story of the Bechtel-Shell Vallejo proposal outlines the various health and safety concerns individuals have about the construction of LNG terminals in populated areas. The Vallejo proposal included a LNG receiving and offloading terminal, a regassification plant, two to three storage tanks, and a 900-megawatt gas-fired power plant. Due to public outcry, in August of 2002, the City of Vallejo, California commissioned a health and safety study of the Bechtel-Shell LNG project proposal for Mare Island. At a cost of approximately $300,000, this is the only city-commissioned study to date. The study Project Manager was Thomas Tobin of Thomas Tobin & Associates. Topics covered included air quality and emissions, LNG dangers, including vapor cloud drift and fire potential, seismic issues. The Final Report is attached hereto and incorporated by reference as Exhibit 7.

In Alabama, a similar LNG terminal proposal for the City of Mobile led the *Mobile Register* to conduct research which it claimed "revealed significant flaws in the research used by the (federal) government when approving the construction of such facilities." Leading LNG scientists warned that an accident or terrorist attack involving a tanker could lead to a fire a mile wide, inflicting second-degree burns on people two miles away," leading to overwhelming local

public opposition to the $600 million ExxonMobil proposal. [8]

A study by Lloyd's Register of Shipping presents a chilling examination of what might happen if terrorist attacked an LNG tanker ship. According to the study, terrorists who blew relatively small holes in the inner and outer hulls of an LNG tank ship could trigger an escalating series of explosions and fires. The ship, said the Lloyd's study, "would become a total loss with a continuous fire that would be inextinguishable until all gas had been consumed."[9]

At a length of 1000 feet, an LNG ship is one of the largest ships to enter some harbors,[10] carrying 33 million gallons of liquefied natural gas to terminal every few days. Some scientists familiar with the highly flammable nature of LNG say they do not believe the terminals should be built within two to three miles of populated areas.

The nation's only urban area LNG terminal is located in the Port of Boston,[11] where the Coast Guard coordinates a complex security system - a helicopter, police divers, marine patrol, environmental police, fire-fighting tugs, city police boats, Coast Guard vessels. The Tobin

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[8] Bill Finch, "Poll finds growing opposition to LNG Majority in Mobile and Baldwin counties against terminal in Mobile Bay," Mobile Register, March __, 2004.

[9] LNG Watch: "Samoa LNG: What is it?" February, 2004.

[10] Karen Testaap, "Concerns mount over safety of LNG tankers, as more U.S. terminals proposed," The Associated Press, February 7, 2004.

[11] The only three other continental U.S. ports that receive LNG by ship are Lake Charles, Louisiana, Cove Point, Maryland, and Elba Island, Georgia.

Bridge, a major commuter pass, is closed as the tankers move below its 135-foot-high span - clearing it by just 10 feet. Police cruisers dot the mainland to ward off a land-based missile attack.

Heightened fears of terrorism and a recent surge in proposals to build dozens more gas terminals around the United States have led U.S. Energy Secretary Spencer Abraham to ask the Sandia National Laboratory to study LNG safety issues, particularly transportation.

The LNG industry maintains it has established rigorous safety standards in cooperation with the Coast Guard, and generally denies that there is a safety problem with LNG terminals. One recent example of this denial comes from Mitsubishi-backed Sound Energy Solutions, which is seeking to build a terminal on the dense urban Port of Long Beach. On its Sound Energy Solutions website, Mitsubishi's answer to fears about a terrorist attack on the Western Hemisphere's largest container port, says that:

> "LNG terminals and ships are *unattractive targets*. A terrorist's rationale for target selection includes:
>
> · Loss of life
> · Economic impact
> · Vulnerability
> · Access
> · Symbolism
> · Political implications
>
> An LNG terminal and ship *do not satisfy these objectives*."[12]

[12] Http://www.Soundenergysolutions.com

The Mayor of Boston does not agree. Mayor Thomas M. Menino sued to keep LNG tankers out of Boston harbor after the Sept. 11 attacks, two of which had hijacked jets departing from Boston's nearby Logan Airport - despite the fact that the Coast Guard insisted the tankers could safely pass through the harbor. Menino lost that court fight but maintains they should not be coming into a metropolitan area. Boston fire officials told a state panel last February they remain unprepared to deal with the potential disaster stemming from an explosion aboard one of the giant tankers that carries liquefied natural gas through Boston Harbor. [13]

But massive security measures are now involved in bringing each LNG tanker into Boston. Whereas one Coast Guard vessel once accompanied the tankers to their dock in Boston Harbor, since Sept. 11 at least a dozen vessels clear a safety and security zone two miles ahead, one mile behind the ship - and the Coast Guard also inspects the tankers offshore.

But experts point out that these measures are inherently limited. James A. Fay, professor emeritus of mechanical engineering at the Massachusetts Institute of Technology, is a leading expert on liquefied natural gas and former chairman of the Massachusetts Port Authority board. He believes a boat bomb, like the one used against the USS Cole in 2000 or the French oil tanker Limburg in 2002 -would cause at least half of the ship's cargo to seep over the water and ignite in a raging blaze. "There's no doubt that with a big enough bomb you can blow a hole in the side of

[13] Mac Daniel, *Boston Globe,* February 27, 2004.

the vessel and the cargo will burn," Fay said."It's well understood that for the big fires we're talking about that distances like half a mile or so, you can get second-degree burns to exposed skin in about 30 seconds."

> "In just over three minutes, the fire could spread two-thirds of a mile from the ship. There is nothing safety officials can do in such a case. There would have no time to evacuate people or to put out the fire....Like the attack on the World Trade Center in New York city, there exists no relevant industrial experience with fires of this scale from which to project measures for securing public safety." [14]

Jerry Havens, a University of Arkansas professor and expert in both fires and weapons of mass destruction, said he agrees with Fay's assessments, even though both he and Fay are not opposed to LNG in general. "I for one believe that serious consideration should be given on a site-by-site basis to whether or not the risk since 9-11 is sufficient to cause increased reason to take it offshore or put it someplace else," Havens said.

a. Government Secrecy Increasing

Disturbingly, while the Coast Guard, FERC and Department of the Interior seek jurisdiction over the terminals, the risks of planned liquefied natural gas terminals are being kept secret from residents where terminals are planned because of recent federal rules issued under the U.S.A. Patriot Act - and even California energy agencies and local governments have already denied local citizens access to information about LNG terminal proposals in their communities.

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[14] *Energy Security*, January 21, 2004

Local and state officials on both coasts and in the Gulf, who are just becoming familiar with the rules, may be kept from gaining full access to the safety studies -- as well as residents in affected areas.

To date, the Federal Energy Regulatory Commission has restricted access to more than 90,000 documents under the rules. "A considerable percentage of them are about safety and environmental compliance," said Sean Moulton, senior information policy analyst for the federal OMB [Office of Management and Budget] Watch in Washington, who has examined the titles of the restricted items. "LNG is definitely going to be the area where this policy will get its toughest test," said Moulton. LNG poses "a significant risk to the workers and the surrounding community." [15]

While the federal commission issued the rules a year ago, their effect is only now being realized by cities, states, and citizen groups as the federal regulators apply the information controls to communities opposing the 30 LNG terminal proposals across the nation.

Last month, for instance, the California Energy Commission dropped a plan to publish a compendium of LNG safety studies for state residents and local governments to use as they consider terminal projects along the coast, said David Maul, director of natural gas and special

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[15]William J. Kelly, "The Patriot Ax," *AlterNet,* March 19, 2004; reprinted from *California Energy Circuit.*

projects for the commission. Maul's staff found that most of the studies were considered confidential for either security or proprietary reasons.

Meanwhile, the city of Long Beach, Calif. -- which has entered a tentative LNG terminal agreement with Sound Energy Solutions -- will not share much of the safety information it receives with the public, according to Dominic Holzhaus, deputy city attorney.

"We get access to quite a bit of this, but we're bound to various confidentiality agreements with FERC," said Robert Kanter, director of planning for the Port of Long Beach. He said FERC's critical energy infrastructure information rules require the city to keep the information secret.

The federal commission's infrastructure rules are aimed at keeping confidential any information that may aid "enemies," according to Tamara Young Allen, a spokesperson for the agency. Parties with a need to know can file a federal request for safety studies; if granted access, they must sign a nondisclosure agreement.

While LNG terminal developers deny their facilities and tankers are terrorist targets, they justify restricting public access to information on their proposals based on the Patriot Act. BHP Billiton, one of the companies that have proposed LNG terminals in California, plans to provide the public with a general description of the results of its risk assessment, but not the whole document, according to Kathi Hann, public affairs manager for the company. Because of concerns about terrorism and trade secrets, only state and local agencies concerned with the

project will be able to receive the full assessment, she said.

The federal commission claims legal authority for its strictures under the Patriot Act, though OMB Watch's Moulton said the statute does not explicitly authorize the rules at issue.

Of immediate concern is whether FERC will release in the weeks ahead a study done under contract by ABS Consultants to analyze the likely effects of a catastrophic accident on an LNG ship. FERC will have to examine the report before deciding whether it will be subject to the regulatory restrictions, said Young Allen.

"This [study] is crucial information because that defines how safe these ships are in our community," said Casi Callaway, executive director of Mobile Bay Watch, a community group that is fighting proposed LNG terminals in Alabama.

b. Security Costs Skyrocket

LNG tankers and terminals are vulnerable to terrorism, according to a report released by the Congressional Research Service. The cost of screening each LNG shipment to Boston is about $80,000 per tanker, according to the report. This includes an investment of about $30,000 per tanker from the surrounding communities and the state - that is $80,000 every three days total,

$30,000 every three days billed to surrounding communities and the state.[16] The report is one of the first publications to weigh both industry studies, journalistic articles and scientific reports on liquefied natural gas.[17]

Continuing to implement and maintain such security raises several hurdles, according to the report. Communities are concerned about the costs of LNG security, and the growth in those costs is bound to increase as more LNG import facilities are built, according to the report.

While building offshore terminals is one option, some developers say it's not feasible, and the report suggests that "the recent trend to build new LNG marine terminals offshore may have security benefits for U.S. seacoasts, but may *increase the vulnerability* of the terminals themselves":[18]

> "Offshore oil and gas facilities...have been attacked in the past during wartime and in territorial disputes. Since September 11, 2001, international concern about terrorist attacks on these platforms has grown. Some experts believe terrorists attacks against offshore platforms have been on the rise recently in countries with a history of terror activity....Because offshore oil and gas facilities are remote, isolated, and often lightly manned, some experts believe they are more vulnerable to terror attacks than land-based facilities. ..if several new offshore terminals were attacked in the future, the effects on

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[16]Paul W. Paformak, Specialist in Science and Technology Resources, Science, and Industry Division, "Liquefied Natural Gas (LNG) Infrastructure Security: Background and Issues for Congress," Congressional Research Service, Library of Congress, September 9, 2003.

[17]Jessica Resnick-Ault, "Federal report cites LNG security dangers," Providence Journal, March 5, 2004.

[18]Paformak, Congressional Research Service, p.20.

natural gas availability and prices could have serious consequences for U.S. energy markets."[19]

c. Pipeline Safety Issues

Transmission pipelines are a serious local concern. The gas lines that transport gassified LNG from the source to the distribution system would be very large (30 or possibly even 36 or 42 inches), and under very high pressure (1000 or more pounds). This is significantly more hazardous than typical local distribution systems which take the gas to the ratepayer. (*Cf*: In a typical neighborhood, pipes range from 2-8 inches, with 60 pounds or less pressure. Pipes into homes are generally 3/4 inch, and gas pressure in homes (regulated at the meter outside the house) is about 1/4 pound psi).

Given the major distinction between pipelines that transport gas from a distant point source (such as Texas or Canada), and the transmission pipeline bringing gas from a local source through the local community, significant public health and safety issues are raised by local LNG terminals.

RACE asserts that it would be unsafe locate a transmission pipeline in a populated area; for instance, through existing neighborhoods. In fact, this is an issue that is facing PG&E right now in Bakersfield, where it is having to replace/upgrade miles of main pipeline because of residential development that has crept up to the lines. CPUC regulations do require buffers, and

[19]Paformak, Congressional Research Service, p. 23.

may prohibit specific actions such as building new schools over high-pressure pipelines. But there may be nothing to prevent running a pipeline under already existing schoolyards.

Gas leaks and explosions are a major concern. In addition, if there is a gas leak from the pipeline, and it does not immediately light, it can remain in the area or drift for a while before dissipating. The gas in transmission pipes is under such high pressure that a small hole it can rip open and large amounts of gas can escape. In most cases -- such as a six to eight inch pipe that gets damaged by construction -- the danger is in the immediate vicinity. But with a very large transmission pipe, the hazard potential is great. In the event the BTU's are not adjusted prior to moving the gas onshore, a leak in the line between the terminal and the dilution facility would mean the gas would burn much hotter.

Recent pipeline accidents have resulted in deaths and destruction. An El Paso gas transmission pipeline ruptured and erupted a within the last couple of years on the Arizona/California border and several campers were killed. And there has been more than one devastating NG pipeline accident in Carlsbad, New Mexico, in the last few years.

Unanswered questions that must be addressed include:

* What are the specifications for new transmission pipelines?
* What are the buffer zones or easements required?
* What are the limitations on pipelines close to residential areas? Schools?
* What systems are required to make sure the pipes are maintained as safely as possible? (e.g., Will it be sectioned so that each section closes off in the event of a break or

seismic disturbance, with monitors on each section?)

* Where will the BTU's be adjusted and exactly what is involved in this process?
* Who will own the pipelines from the facility, and who or what entity would have oversight? Would the same regulations apply to private and public utility owners?

In light of the many safety issues raised by major new transmission pipeline development, any decisionmaking must involve significant public input and analysis of this issue. [20]

d. Gas Adjustment Facility Concerns

The commonly held assumption that LNG receiving terminals are limited to storage and regassification is inaccurate. In truth, the LNG facilities currently proposed for the West Coast anticipate purchasing gas from multiple sources, accepting multiple densities, processing it onsite, and/or developing it for a "spot market." Mitsubishi is currently asserting that it can buy gas from anywhere and process it to "any current or future standards." This may in fact represent a significant change from how the LNG market and processing technology has historically operated.

Long Beach Citizens for Utility Reform have determined that the Mitsubishi facility will will actually have 3 operations: (1) a receiving/regas terminal; (2) a natural gas processing plant to strip high-BTU NGLs from the product; and (3) an LNG-vehicle fuel facility referred to as a "truck-loading facility" that will somehow manufacture vehicle-grade LNG after processing.

[20]See Harpswell Exhibit 9 for further discussion of pipeline safety issues.

The often unmentioned gas processing portion of the operation has raised three concerns for Long Beach ratepaying residents and residents of any community where BTU adjustment and other gas processing facilities would be located. First, apparently most of the processing involves similar BTU-content gas processed near the wellhead and produces gas that meets specific, and probably similar, BTU-content standards. It may be the case that historically most LNG receiving/regas terminals have purchased gas from stable sources on long-term contracts and thus, the issues related to regas facilities that accept many different densities of gas for onsite processing after storage is new. Mitsubishi's determination to purchase gas from multiple sources raises the safety question of tank "rollover," and the "40-year safety record" cannot speak to such new processes.

Safety questions are also raised concerning the NGL removal process itself and the onsite ethane/LPG storage. In Long Beach, both would occur in proximity to the LNG receiving, storage and regas operations. The safety of the NGL removal process – as proposed by Mitsubishi and likely to be adopted by other operators – is itself unknown because Mitsubishi has claimed it will use a "new" stripping method that will be the first of its kind in the United States. Their documents are vague, but they do state that the same warmed water used to regas will warm the transfer columns. This suggests boil-off, which would necessarily entail regassification of methane before the higher temperatures at which other gases boil off are reached. Nevertheless, last week Mitsubishi's PR rep told RACE coalition members that the high-BTU content gases would be removed while the gas is in a liquid state. We are unaware of

prior examples of separating various gasses from liquid that is already cryogenic; it is understood that the various higher-boiling point gasses are usually boiled off from gas as the temperature is progressively reduced. Whatever Mitsubishi's method, it appears that at the very least it lacks a "40-year safety record."

Because Mitsubishi also intends to sell vehicle fuel, it must further make vehicle-grade LNG out of its processed LNG. Again, its documents are vague; Mitsubishi describes the process as "recondensation". Whatever the method, it will occur onsite in proximity to LNG receiving, storage & regassification operations.

3. Air Quality Issues

From a local perspective, one of the most problematic aspects of LNG terminal operation are the tanker emissions and emissions of other so-called "secondary sources." LNG receiving terminals bring a number of sources of pollution into local airsheds from the following operations:

- 1NG tankers;
- Diesel-fueled dredgers, tugs and Coast Guard security vessels;
- Associated power plants;
- Facilities to adjust Btu's and process vehicle fuel.

LNG tankers are generally powered by huge steam turbines, which are fueled by LNG, diesel and bunker fuel. According to Shell, these tankers burn on average 100 tons of fuel equivalent per day while in port. In the newer ships, diesel and bunker fuel make up 20 percent of the fuel

burned. Older ships run mostly on the more polluting fuels, and there are no EPA emissions standards for LNG tankers entering U.S. ports, because all are foreign-flag vessels. Most terminals anticipate visits from tankers three times per week, with an up to 24-hour turnaround and offloading time, depending on the harbor.

Extensive and constant use of associated diesel-powered vessels, including coast guard boats, tugs and dredgers, would contribute significantly to emissions. These emissions are also not subject to EPA regulations, and use diesel, one of the dirtiest and most harmful of the commercial fossil fuels.

Vallejo's situation was similar in many ways to that of Long Beach. There residents found concerns about public health and safety to a totally unacceptable. Emissions from the LNG tankers was a major concern in Vallejo, which, like Long Beach, boasts of one the highest asthma rates in the state. Vallejo residents pointed out that it was already surrounded by oil refineries and power plants in Rodeo, Martinez, Richmond and Benicia. The popular government and utility argument that they should contribute to the well-being of the state was undermined by the sense that their community shouldn't have to shoulder any more of the burden to provide California's energy needs.

In the Vallejo study, it was determined that the *emissions from one LNG tanker and one tugboat would actually exceed emissions from the proposed 900-megawatt gas-fired power plant.* Shell and BAAQMD's figures from comparable projects estimated that the 900-megawatt power

plant would release over 1,692 tons per year (4.9 tons per day) of greenhouse gasses and other pollutants into Vallejo's air. This was broken down as follows:

- 201.9 tons of Nitrogen Oxides;
- 876.3 tons of Carbon Monoxide;
- 41.7 tons of Volatile Organic Compounds such as Benzene, Hydrocarbons, and Reactive/Precursor Compounds;
- 129.6 tons of PM-10;
- 18.3 tons of Sulfur Dioxide.

It can be assumed that the actual emissions for marine vessels associated with a receiving terminal would well-exceed these sums, especially in light of the fact that the estimates do not include emissions from the multiple tugboats, the coast guard escort vessels, and diesel-fueled dredgers.

Given that the air quality impact of siting an LNG receiving terminal is equivalent to siting a very large polluting point source, importing LNG is not as glamorously clean or cost-effective as it is purported to be. Significant health impacts from greatly increased emissions translate locally into higher health care costs, more school absences by children with asthma, and higher work absences by parents, due to their own illness and to care for their sick children.

Continued and escalating ratepayer opposition to rate-basing LNG and the prudence of policy that encourages investment in LNG infrastructure lieu of immediate and concerted development of non-polluting energy sources is therefore inevitable.

4**. Local Economic Impacts**

It is generally understood that LNG terminals will generate revenue to a region in the form of property tax on the project site, at a minimum. But it is important to examine carefully the degree to which such revenue generation will be offset by external effects, both in terms of physical impacts of the development, and lost opportunity/foregone revenue. Only some of these effects can be mitigated through careful negotiation with the companies for indemnification and payment. Others cannot, in particular the long-term economic opportunity/foregone revenue losses. Ratepayers have expressed a wide variety of concerns regarding the local economic burdens of LNG terminals, including:

- impacts on community character and image, and therefore investment;
- industrialization of economic base and accompanying impact on local economic trends;
- decreased residential property values due to perceived danger, actual pollution and blight;
- increased economic burdens on cities in the form of direct and indirect public costs, including the costs of expanded city services to cover and manage health and safety risks (police/security/fire/hazard mitigation), public works capital outlays and maintenance costs (for infrastructure such as roads, traffic lights and signs), administrative and legal expenses (including eminent domain proceedings for transmission corridors and liability issues).

RACE incorporates by reference the discussions in Exhibits 8 and 9 on local fiscal impacts of an LNG terminal. The analysis of the Harpswell study applies equally to west coast terminal development, and sets forth the major, recurring, long-term expenses which must be included in any consideration of the economic benefits LNG might offer to the state and to ratepayers.

5. Conclusion

While California's gas utilities have claimed that bringing LNG to California will benefit customers, it is far more certain to harm them. It will threaten the lives of ratepayers with catastrophic accidents or terrorist attacks, it will exacerbate respiratory diseases among their children, will impoverish their local economies, and impose demands on underfunded local governments. Considering that the strict rate benefits of LNG promised to core gas customers by the gas utilities are themselves dubious and more likely to benefit non-core customers and power plant owners, the net impact of LNG on ratepayers must be regarded as negative.

Respectfully,

Paul Fenn
Ratepayers for Affordable Clean Energy

6. Exhibits

The following publications and studies are attached hereto and incorporated by reference. In addition to general LNG hazard and economic information, several of the attached studies apply to specific cities, including Vallejo, California, Boston, Massachusetts and Harpswell, Maine.

Exhibit 1: Model of spills and fires from LNG and oil tankers, *Journal of Hazardous Materials*, Fall 2002. Dr. James Fay, Ph.D. Professor Fay is Professor Emeritus of the Department of Mechanical Engineering at MIT, and has been a preeminent researcher on LNG since the 1970's. Dr. Fay's CV follows this article.

Exhibit 2: Spills and Fires from LNG and Oil Tankers in Boston Harbor, March 26, 2003. This study uses Boston harbor as an example of the effects of a boat bomb attack on an LNG or oil tanker. Although this report has not been peer reviewed and published in a professional journal, its technical basis is indicated in the footnote references.

Exhibit 3: Public Safety Issues at the Proposed Harpswell LNG Terminal, November 5, 2003

Exhibit 4: LNG Release Hazards, Ronald P. Koopman, Ph.D., P.E., presentation to the Health and Safety subcommittee in the Vallejo study, December 4, 2002. Dr. Koopman's background is set forth in this document. At the time of his study and presentation, he was the Special Projects Manager of the Chem/Bio Security Program at the Lawrence Livermore National Laboratory. Dr. Koopman created and managed the Liquefied Gaseous Fuels Program from 1978-1988 and created the Spill test Facility at the Nevada Test Site.

Exhibit 5: Key Excerpts adapted for Vallejo from the study and analysis of LNG Release Hazards by Ronald P Koopman, Ph.D., P.E. This document was created by community members and applies Dr. Koopman's findings directly to the local Vallejo area in a series of visual maps that are of enhanced clarity.

Exhibit 6: Key Excerpts adapted for Humboldt/Eureka from the study and analysis of LNG Release Hazards by Ronald P Koopman, Ph.D., P.E. These maps are adapted from the Koopman study to illustrate the potential impacts on the geographic area around the Eureka, California airport location proposed by Calpine. This project was recently withdrawn.

Exhibit 7: Liquefied Natural Gas in Vallejo: Health and Safety Issues, Final Report. LNG Health and Safety Committee of the Disaster Council, City of Vallejo, California. January 2003.

Exhibit 8: Report on Potential Economic and Fiscal Impacts on the Town of Harpswell Maine of the LNG Terminal Proposed by TransCanada Pipelines and ConocoPhillips, Yellow Wood Associates, Inc., Feb. 2004. This comprehensive professional study was commissioned by the community of Harpswell, Maine, to evaluate a variety of downstream economic impacts. It includes a review of LNG terminal alternatives.

Exhibit 9: HFMA Board of Directors' Statement. Lays out the problems posed to local fisheries and maritime economy by Calpine's Humboldt Bay LNG project. This statement was released with the announcement of the organization's unanimous vote to oppose the proposal.

Exhibit 10: Paul W. Paformak, Specialist in Science and Technology Resources, Science, and Industry Division, "Liquefied Natural Gas (LNG) Infrastructure Security: Background and Issues for Congress," Congressional Research Service, Library of Congress, September 9, 2003.