

## ADDRESS TO THE ENVIRONMENTAL REGULATION, ENERGY, AND MARKET ENTRY SYMPOSIUM

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The emerging issue that I want to discuss is LNG. First, I would like to say that, although I am the Commissioner of the Federal Energy Regulatory Commission (“FERC”), these are my personal views and not necessarily the views of the Commission. I would also like to note that the spontaneity that I used to have as a law professor has been tempered given my present position.

I will address what LNG is and why it is an emerging issue. I will also discuss the environmental, safety, regulatory, and economic concerns surrounding LNG, and the broad public policy issue of emerging dependence on foreign gas.

LNG stands for “liquefied natural gas.” Many people think that LNG is a gas that is ready to explode. That is not correct. In fact, I think that the name is probably a misnomer or an unsatisfactory title. LNG is a cold liquid. It is not held under pressure. It is superchilled methane. Methane in its natural state (i.e., unchilled) is a gas which we commonly call natural gas. Methane is traditionally transported to us through pipelines, as a gas. However, if methane needs to be transported across the ocean, it cannot be transported as a gas. It must be transported as a liquid, and it becomes a liquid by chilling it. LNG is typically shipped by a tanker in cryogenic tanks that lose almost no heat in the transport process. When the tanker arrives at the terminal, the LNG is warmed so that it turns into a vapor that then enters the pipeline system.

The reason why LNG is an emerging issue is very simple. In the United States, our demand for gas is outstripping our supply. Traditionally, almost all gas consumed in the United States is delivered by pipeline from our domestic production or from Canada. U.S. demand for natural gas continues to grow. Until recently, it has

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been the economic fuel of choice. However, in the last two years, the price of gas has more than doubled, from a little over three dollars to well over six dollars. The futures price of gas for the January 2005 futures market is over seven dollars. Surprisingly perhaps, we do not have much gas in North America. Only 4 percent of the world's reserves are in North America. Although less than 4 percent of the world's reserves are in the United States, the United States currently consumes one quarter of the world's gas.

Most of the gas consumed in the United States comes from the gas-producing regions in and around the Gulf of Mexico. Almost every state has some gas production, but today the bulk of it comes from the Gulf region. There are also substantial gas reserves in Alaska. Within the United States, there are additional production areas that we could tap, but we have made public policy decisions not to drill in those areas.

It is projected that domestic production of natural gas will not keep pace with projected demand in the United States. In addition, pipeline imports from Canada are declining. Canada has traditionally exported gas to us. Canada is interested in keeping its export volumes stable, but is not interested in increasing exports to us because Canada's own demand for gas is increasing. Domestic production is, at best, holding stable. The predictions are that production fell this year, but we do not have the final numbers yet. Predictions for the upcoming year are that domestic production of natural gas will, at best, hold stable, but may drop up to 2.5 percent.

Where is natural gas if it is not in North America? Much of it—42 percent—is in the Middle East. Interestingly, 33 percent is in Eastern Europe. Russia has the most gas reserves of any single country in the world. This will raise interesting policy considerations. If we are going to be dependent on foreign gas, will we care where the gas comes from? If we care about where the gas comes from, how will we institutionalize that concern?

Traditionally, our LNG has come from Algeria. Algeria was our main supplier, if not our sole supplier, until the late 1990s. In 1999, Trinidad appeared on the scene, and today is the United States' major supplier. In 2003, Trinidad accounted for over 75 percent of our imports, and Nigeria was the second leading supplier, followed by Algeria.

Methane destined to become LNG is liquefied where it is produced, e.g., Algeria, Trinidad or Nigeria. Then it is put into tankers. Most of the world's LNG tankers are built in South Korea.

The tankers contain cryogenic tanks in a double-hulled ship. The tanker makes its way across the ocean to a receiving terminal where the gas is warmed and vaporized. Typically, there are storage units on the terminal site for either the vaporized gas or the liquefied gas. The vaporized gas enters the pipeline system and is transported to market, like domestic natural gas.

Today, the United States has only four LNG terminals. One is located outside of Boston in Everett, Massachusetts. A second one is located in Cove Point, Maryland. Another one is on Elba Island, Georgia, and the fourth one is in Lake Charles, Louisiana. However, in the last year or so, FERC and the U.S. Coast Guard have approved four more terminals.

I should explain who has jurisdiction over the siting of LNG terminals in the United States. FERC has jurisdiction over terminals built on land. The four terminals that exist in the United States are terminals on land. However, offshore LNG terminals are being proposed. They have never been built anywhere in the world, but there are plans to build them. Any application for a terminal off U.S. shores is under the jurisdiction of the Coast Guard rather than FERC.

The four LNG terminals approved in the last year include one in Louisiana (the Hackberry terminal), an expansion of Louisiana's existing Lake Charles terminal, and two offshore terminals to be sited in the Gulf of Mexico. Also, FERC has approved three offshore pipelines that would bring gas from an LNG terminal in the Bahamas to the east coast of Florida. Most of the offshore terminals that are being planned have a stationary liquefaction facility. The facility could be floating, but it would be stationary. However, one offshore terminal that was just approved by the Coast Guard does not include a stationary platform. Instead, the vaporization facility is located on the tanker itself. The tanker positions itself near an offshore pipeline and delivers natural gas through a docking facility to the offshore pipeline.

We have four existing LNG terminals and several more proposed terminals that have been approved, but there are many more terminals that are being proposed. This level of activity tells you that LNG is a real issue for the country. There are twelve additional terminals that have been proposed and applications have been filed at FERC. There are six more applications for offshore terminals that have been filed with the Coast Guard. And there are twelve terminals that are on the drawing board for the U.S. There is also significant LNG development activity in Canada. Seven terminals have been

proposed in Canada. Two of the seven have been approved, one in St. John, New Brunswick, and one in Pt. Tupper, Nova Scotia. In Mexico, five terminals have been proposed, two of which have been approved. One is a Shell project in Alta Mira, which is under construction, and the other is a Sempra/Shell project in Baja. Another Baja California offshore project has received its environmental approvals from the country of Mexico.

This overview gives you a perspective on the extensive LNG-related commercial activity today. I would also like to provide you with a brief overview of the activity region by region. What you would expect, and what we have seen, is that LNG terminals are likely to be proposed for siting at the end of the pipeline, that is, at the market. As I mentioned earlier, most of the gas comes from the Gulf area, so New England is at the end of many pipelines. In New England, we already have one LNG terminal, which is located in Everett, Massachusetts, outside of Boston. There are two applications for other New England terminals filed at FERC. One is proposed for Fall River, Massachusetts, and its final environmental impact statement is being developed. Another one is proposed for Providence, Rhode Island, and its draft environmental impact statement is being prepared. There are also three proposals being discussed. One company is proposing to put an offshore terminal in Long Island Sound, on the New York side of the boundary between New York and Connecticut.

In the mid-Atlantic market region, again we are at the end of the gas pipeline, and so it is not surprising that we have an existing terminal at Cove Point, Maryland, and a proposal to expand it. There are two proposed terminals, one at Logan Township, New Jersey, and another one in Philadelphia, on the Delaware River. Philadelphia Gas Works, a municipal gas utility, with the Mayor's support, wants to put an LNG facility in Philadelphia. They see this as increasing their business to be an export business, and they would propose to bring the gas down to the Delmarva Peninsula. Peninsulas are geographically difficult to deliver gas to. For example, there are three LNG proposals for the Bahamas which would supply gas to the Florida peninsula. This would provide another entryway into Florida. It will be interesting to see if the entrepreneurial spirit of Philadelphia will prevail and there will be a terminal there.

In the Southeast market region, there is an LNG terminal already located in Georgia. As I mentioned earlier, there are three proposals to bring natural gas from the Bahamas in a pipeline. The

LNG would be vaporized offshore in the Bahamas, and then the pipeline would bring gas into Florida and up north.

The other place to locate an LNG terminal is at the supply end of a pipeline – in order to augment the existing supply available to the pipe. The existing Lake Charles, Louisiana terminal is one such LNG terminal. FERC has also approved an expansion of the Lake Charles terminal. There are other approved terminals in the Gulf area, one is at Freeport and two are offshore. There are also many other terminals being proposed for the Gulf region, both onshore and offshore.

California is the western U.S. market for LNG. California itself has very little gas production. There is a proposal before FERC to put an LNG terminal onshore at Long Beach and there are two proposals to site LNG terminals offshore.

LNG terminals are also on the drawing board for the Northwest.

LNG importation into the U.S. is an issue already and is taking up a lot of lawyers' time and resources. I want to make a strong point about LNG development— not all of those proposals, even ones that get approved, will be built. However, if they all were to be built, they would provide 40 percent of the United States' daily demand.

Because natural gas demand continues to grow, we are very likely going to need more LNG import capacity. The United States cannot meet projected demand in the coming years without LNG unless we shed industrial load. There is little interest in doing that because natural gas is a desirable fuel. Natural gas is relatively clean-burning. There has been a lot of discussion about other new sources of gas for U.S. consumption, including gas from the Arctic and Canada. In October 2004, Congress authorized a corridor for an Alaskan natural gas pipeline and provided some financial incentives to get that built.

This slide shows how we get our gas (referring to slide). Here is our domestic gas. Here is the gas we get from Canada. The red line is the existing LNG gas. You can see that by 2005, we are really going to need the LNG gas. It will not be backup, storage, or emergency gas. We are going to need LNG into 2007, 2008, and 2009. This green block represents terminals that have already been approved. The blue block represents net exports to Mexico; we actually have obligations to export to Mexico. Assuming the Alaskan natural gas pipeline gets built and production flows, you can see it is likely to come in and if it is built on time, it will be online in 2012. We theoretically will not need it then, but we are going to need it, unless we change the

demand for gas, or unless we conserve, or unless we produce more in the United States. Our existing production areas in the United States are problematic because they are older production areas. We have actually increased the number of drilling rigs by 20,000 in the last year or two, but the production has not increased because the deliverability declines over time with a producing basin.

So, are we going to need LNG? It looks like it and that is why LNG is an emerging issue.

What are the environmental and safety issues that arise? I think the easiest way to think about it is that there are issues that arise with the location of the terminal and then there are issues that arise with the tanker. Interestingly, the biggest issue that has come to light in the last year and a half since this LNG activity has been progressing at FERC has been concern about terrorism on the tankers. FERC does not have jurisdiction over the tankers. The Coast Guard has jurisdiction over the tankers and the Coast Guard has jurisdiction over the movement of the tankers into the port or onto the offshore facility.

FERC handles the environmental issues procedurally through the National Environmental Policy Act (“NEPA”) process. I would like to give you an overview of how FERC does that. There is a pre-filing process for LNG developers who are interested in pursuing an application for a terminal that allows them to get the process started before actually filing the application. They use this process to test the waters of public acceptance and to begin a public study of the environment and safety matters. This is the flow diagram for how the process works at FERC (referring to slide).

There is a lot of public input in this process along with a lot of environmental review. But the issues of biggest concerns to the public today are the safety issues – safety of the terminal, but more so, safety of the tanker.

The major concern associated with the location of the terminal is its proximity to residential and commercial areas. It raises public safety concerns. There is a blueprint for exclusion zones, so the idea is to isolate this facility from residential and commercial areas. I told you that it is liquefied. What does that mean as a safety issue? The liquid does not explode, but what could happen and what can happen if you were to puncture the tanker, or puncture the storage facility where the LNG is, or have a leak of liquid LNG as you go to vaporize it? It would spill as if it were water. It would spill and it would sit on the water. It would not explode, but it could be ignited. If it were

ignited, it could begin a big fire. The size of the fire depends on the size of the spill. That is where the debate is: Would it be a little spill? Would it be a big spill? Could the tanker spill its entire LNG load if there was a terrorist attack on the tanker? Could the tanker be blown up causing the entirety of the load to spill? If so, what kind of fire would you have? The key decision making issue here is how you deal with a very small probability of a big catastrophe. How should that be factored into the decision making?

LNG can only explode when it becomes a gas that is contained. The rate at which liquid methane moves to gas is relatively slow. It takes a lot of energy to heat it up into a vapor. If it moves to gas unconstrained in the open air, the concentration of the gas in the air will not be enough to allow for an explosion. However, if for some reason the gas were encased, the pressure could build and explode.

The Department of Transportation enforces security. FERC has ongoing jurisdiction over the safety of LNG terminals. LNG has been in commerce in the United States for 40 years with no safety incidents.

Another issue that is important to the appropriate siting of an LNG terminal is its proposed takeaway capacity. A terminal cannot be sited just anywhere. It must be near a pipeline and in an area where there is room for safe storage. If a pipeline does not exist at the terminal site, it will have to be built.

Although FERC is the leading agency for approval of land-based terminals, other federal and state agencies must issue permits to enable the development of an LNG terminal. The U.S. Department of Transportation's Office of Pipeline Safety is involved in setting an exclusion zone around the terminal. The U.S. Coast Guard has jurisdiction over the operations of the LNG tankers. The U.S. Army Corps of Engineers must approve any necessary dredging. The National Marine Fisheries Service and the U.S. Fish and Wildlife Service implement the Endangered Species Act. The States have some jurisdiction over the project through the Coastal Zone Management Act if they have a coastal zone program in place. If they do, then the State must determine that the terminal's location and operation will be consistent with the coastal zone management plan.

FERC has responded to the increased interest in LNG with a number of initiatives. FERC recently completed a study to determine what models should be used to predict what could happen in a worst case scenario. In Algeria, there was a serious accident in the beginning of 2004 at a liquefaction terminal. There was an explosion

and a number of people were killed. I want to stress that this occurred at the liquefaction end of the process and not the vaporization end. Nevertheless, FERC has worked with the Algerian government to determine what went wrong there. FERC has reorganized itself to devote more resources to LNG review and more particularly to the safety aspects of LNG.

I would also like to explain the economics of the LNG business. The cost of producing and transporting gas from the production area to the liquefaction area is 25 percent of the cost of LNG. The chilling of the gas is very expensive and is equal to 33 percent of the final cost. The cost of shipping the gas is also very expensive, another 33 percent of the final cost. The cost of receiving and vaporizing the LNG at the terminal is only 8 percent of the cost. With the high cost of natural gas in the United States, which is generally higher than the international market price of gas, there is room for more money to be spent on improvements. More specifically, for environmental and safety purposes in the LNG import facilities.

There are three basic regulatory issues concerning LNG. First, how do you treat the terminal as an open access or contract terminal? I do not want to get into too much detail, but if there are questions later I would be happy to answer them. In the last fifteen years, FERC has said that pipelines are common carriers and a private entity can own the pipeline, but it has to be open to all that want to ship. LNG facilities were initially treated that way. However, a year and a half ago, FERC changed its policy on the LNG terminal itself and said that we are not going to require that it be open access. FERC did that in response to the amount of money that is necessary to invest in this stream of commerce. If you plan to import LNG, you must have an investment. There must be some type of investment or contracts, for the foreign supply, for the tankers, for the shipping itself, and the terminal. Those who proposed the LNG terminals said: if it is going to be open to the public and we cannot guarantee that we can keep this space ourselves, then we are not going to build it. So, FERC changed its policy and said: we will treat you as a gas production well, and it will be your well, and you will get to keep it.

The other issue is jurisdiction. For at least 15 years, FERC has used the international commerce provision of the Natural Gas Act as the basis upon which it has jurisdiction over LNG facilities. Under the Natural Gas Act, FERC also has jurisdiction over interstate pipelines, but not intrastate pipelines. If you recall, I showed you the proposal for the terminal at Long Beach in California. That terminal would



bring foreign gas in and connect it to an intrastate pipeline. The State of California objected to FERC's jurisdiction under the international jurisdiction clause of the Natural Gas Act. California argued that FERC does not have jurisdiction over LNG under that provision. They also suggested that FERC was limited to interstate pipeline jurisdiction and since the terminal is connected to an intrastate pipeline, we do not think you have jurisdiction. That is currently being litigated in the Ninth Circuit. As Dick [Pierce] mentioned, more than likely, whoever loses will not be happy, and will look to take it up to the Supreme Court.

The other issue that is arising is sort of a reverse of the transmission issue and that is partly what was raised by California. Traditionally, and I believe personally, FERC has jurisdiction over LNG facilities and FERC has certificated and sited them. However, as there has been more controversy surrounding LNG, and particularly post-9/11, local communities are concerned about FERC having that jurisdiction. California and the greater community of Long Beach do not want that terminal in Long Beach. There is more interest in the States over trying to get jurisdiction, and in fact trying to get the Natural Gas Act amended so that even if the terminal were connected to an interstate pipeline, the States would have jurisdiction over it. So, that is another issue that is coming up.

Finally, there is the public policy issue of dependence on foreign gas. At the moment, it is a public policy issue because there is nothing in the law that limits our dependence on foreign gas. We have not had much foreign gas. The foreign gas that we have had has been with dependable trading partners, like Canada. The LNG imports have been less than 1 percent. The LNG imports doubled last year from 1 percent to 2 percent. They only went up from 1 percent to 2 percent, but it doubled. The anticipation is that the LNG could be up to 10 percent of our supply. We will probably start seeing the debate of whether we want to be dependent on foreign gas. There is not really a forum for that, except perhaps it could be used to mount more pressure to begin drilling in those areas within the United States that have been off limits for drilling. I think that is the most likely first arena for that issue to be discussed.

Thank you very much, and I look forward to your questions.