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The Tasks of Public Policy with Respect to Natural Gas
COMPLETING THE TRANSITION TO COMPETITIVE MARKETS

Prepared Testimony of
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Before the
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Introduction

Natural gas will be the chief strategic source of primary energy for the U.S. economy over the next decade and most likely well into the next Millennium. Some of the reasons for my judgment are set out in an earlier paper, "Prospective on World Energy Markets," which I have appended to my prepared statement. I shall confine today's statement to what I believe are the immediate tasks of public policy with respect to natural gas.

The Outlook for Natural Gas

The Uses of Gas

Natural gas will play an indispensable role in bridging the transition to clean, non-fossil sources of primary energy. Gas-fired combustion turbines are, for example, superior to coal or nuclear-fired steam plants in almost every economic dimension --- capital cost per kilowatt, thermal efficiency, minimum economic scale, construction time, and reliability. Of all the combustion resources, moreover, gas contributes the least to global carbon-dioxide emissions, and is cleaner with respect to most other pollutants.

The Supply Outlook

Natural gas is the most abundant hydrocarbon in the earth's crust. Tiny molecules of methane are far more mobile, moreover, than those of crude

oil or, of course, coal, and are thus able to move to and permeate the spaces in a vastly greater variety of rocks or deposits of sand. The bulk of the methane thus far classified as a "fossil fuel", booked as natural-gas reserves, and produced commercially has been found in petroleum reservoirs or geological structures closely resembling such reservoirs. The ultimate methane resource is nevertheless so varied as to defy definition, and so huge as to defy quantification.

Since the mid-1970s government and industry forecasters have had a near-perfect record of underestimating the deliverability and overestimating the replacement cost, of natural gas. In 1981 hearings before the predecessor of this Subcommittee regarding the proposed Alaska gas pipeline, a consortium of major producers, pipeline companies and gas utilities, together with the Department of Energy, sponsored testimony that predicted a 1990 market value of natural gas about ten times today's free-market price level!

This consistent record of defective predictions comes in part from extrapolating exploration results in an environment constrained or distorted by price controls, the economic immobilization of gas reserves (e.g. via their eternal "dedication" to specific buyers), and government-enforced monopoly control over transportation. It also stems from a failure to appreciate the steady addition to the menu of recognized geological targets for gas extraction, the steady decline in real costs of **inputs** to natural-gas exploration and production, or the steady advance in geological knowledge and extraction techniques.

The vastness and diversity of methane resources and the wide and growing menu of extraction technologies mean that small increases in antic-

ipated prices can be expected to evoke larger increases in potential supply --- if not from conventional resources in the established producing areas of North America, then from deeper into the earth, from tighter formations, from the Arctic or the deep offshore, or from abroad in the form of LNG, methanol, synthetic gasoline, or other methane derivatives suitable for tanker transport.

Change in Market Structure and Regulation

From a Collection of Pervasively Regulated Utility Services to a Network of Vigorously Competitive Commodity Markets.

Over the last decade the natural-gas industry in North America has been changing from a balkanized collection of pervasively regulated utility services to an integrated network of vigorously competitive commodity markets. This transformation is now almost complete in the producing sector and in the "wellhead" or first-sale markets for gas, which are coming to resemble textbook examples of "perfect competition".

The associated changes in market organization and business practices have dramatically reduced the effective cost of gas supply, eliminated the regional supply and price disparities and the shortages that characterized the old regulatory regime, and insure against their return. Changes in supply and demand now generate the correct price signals, and direct them to the appropriate producers and consumers. These price signals can be counted on to balance the aggregate supply and demand for natural gas and to steer whatever supply is available at a given time to its best and highest uses with a minimum of government involvement.

The Critical Distinction Between Competitive and Natural-Monopoly Functions

The recent evolution of gas-market structure rests on a new public consensus that both the primary extraction of natural gas --- including its exploration, development, production, and gathering --- and its marketing are inherently and irrepressibly competitive activities. Both lines of business are carried on most reliably, efficiently and cheaply if there are no regulatory barriers to entry and exit, or restrictions on pricing and other terms of sale. Hundreds of sellers controlling thousands of wells are capable of competing for each final sale of natural gas, while thousands of purchasers are capable of competing for each such supply source --- **provided they have effective and equal access to the physical means of delivery.** In such an environment, competition is clearly a more effective tool than regulation for insuring the "public necessity and convenience" regarding the primary supply of natural gas, and with respect to the "justness and reasonableness" of first-sale prices for that supply.

This proposition was subject to bitter debate in the 1950s, 1960s, and 1970s, but no longer provokes serious controversy. The "natural-monopoly" elements that once seemed to justify pervasive regulation are now recognized as features of the **physical transmission and distribution of gas**, as opposed to its production or sale. To the extent economic regulation remains necessary, its function is to prevent control over essential transport, storage and distribution facilities from being exploited to monopolize or create undue preference in buying and selling of natural gas, or to undermine their flexibility and efficiency.

Thus, over the last decade two complementary themes have dominated both public policy and the natural evolution of market structure in the gas industry: (1) Deregulation of inherently competitive activities, production and marketing, and (2) drawing a clear distinction for purposes of market organization and regulation between such competitive activities and the physical delivery of gas, for which the traditional rationale for public-utility regulation retains some force.

Completing the Transition

Two main tasks of public policy remain with respect to natural gas at the federal level; accomplishing them will permit the private sector (with the assistance of state public utilities commissions) to discharge its responsibilities effectively.

The first of these tasks is to complete the separation between competitive gas-marketing activities and regulated transmission services by abolishing the regulated "merchant function" of the pipelines, which is now under the jurisdiction the Federal Energy Regulatory Commission ("FERC"). This regulated service is an anachronism whose direction and supervision consumes a disproportionate amount of FERC energy and attention, and whose very survival the Commission is able to perpetuate only by allowing the pipelines to restrict or cripple more efficient service alternatives. The second task is to facilitate the creation and operation of an unregulated secondary market in those transportation services whose primary supply is now (and probably must remain) subject to Commission jurisdiction.

Closing out the Interstate Pipelines' Regulated "Merchant Function"

Under the "old regime" shaped by the Natural Gas Act of 1938 and especially by the Supreme Court's 1954 Phillips decision, interstate pipelines functioned mainly as buyers and resellers of gas at regulated rates, as opposed to common- or contract carriers of shipper-owned gas. Throughout the 1960s and 1970s, more than nine-tenths of the gas sold in interstate commerce was purchased by pipelines under long-term contracts at regulated prices, and resold to local distribution companies at "bundled" rates made up of average ("rolled-in") gas-acquisition costs plus a regulated transportation markup.

Today's market, however, was shaped under the Natural Gas Policy Act of 1978. More than three-fourths of interstate gas sales now represent gas whose first-sale price is not regulated, and which is not purchased for resale as regulated "system supply" by the pipeline which first transports it but is, instead, transported by that pipeline on behalf of a shipper that is not subject to FERC regulatory jurisdiction, generally under a FERC-approved transport tariff. Such shippers include producers, local distribution companies regulated by state utility commissions, gas-consumers, and gas-marketing companies.

Despite the availability on every major pipeline system of "unbundled" transmission service, which ought to permit the various gas-industry participants to match supplies or markets with the required transport services in any desired combination, the pipelines continue to offer a combined "system-gas" sales service regulated by FERC. In most cases, moreover, FERC continues to permit or encourage the pipelines to use their power over essential transport

facilities to favor this traditional, but inflexible and inherently inferior, service at the expense of marketing services offered by competing vendors.

While the proportion of regulated pipeline sales in total gas sales has shrunk dramatically in recent years and continues to shrink, a disproportionate share of the nation's firm transport capacity remains dedicated to these services, and thus unavailable to competitive sectors of the gas market. Not surprisingly, many pipelines will continue to offer and defend their traditional regulated sales service so long as it is a vehicle by which FERC allows them to hold on to a preferential position relative to potential competitors for "firm" gas sales.

Fallacious Rationales for Perpetuating System-Gas Sales Service

Pipelines and regulators still offer a number of rationalizations for preserving a regulated sales service. The chief of these rationalizations are (1) the need of "core" customers' (homes and businesses served by local distribution companies) for supply security; (2) the desire of some such customers to continue receiving a "bundled" (sales + delivery) service; (3) the desire for price stability; and (4) economies of scale and aggregation that can be achieved in a pipeline's system-supply portfolio. On examination, none of these rationales has substantive merit.

Provision of Bundled Service

It is true that many customers of the interstate pipeline companies (not to mention **their** customers) prefer to delegate the separate negotiations regarding primary gas acquisition, long distance transmission, and local delivery, to someone else, and to continue

buying a bundled service at a delivered price. There is no reason, however, why regulated pipelines or utility companies should have an exclusive or preferential position in the provision of bundled service at delivered prices. **If transmission services are made available to all shippers on equal terms, producers and other marketers (including unregulated marketing affiliates of the pipelines) can compete on equal terms for "rebundled" gas purchases by local distribution companies or any other party seeking such supplies.**

Supply Security

It is also true that local distribution companies require a high degree of reliability of supply in purchases on behalf of core customers. But there is nothing about purchases from a pipeline company, purchases of gas on a bundled basis, or purchases subject to a regulatory "supply obligation" (as opposed to an ordinary commercial contract) which makes such purchases inherently more reliable than acquisition of gas and transport services à la carte in a competitive market.

Any marketer or end-user is capable of buying gas at the wellhead with the same degree of firmness as a pipeline's regulated system-supply portfolio; a direct supply commitment from a major producer is, rather, likely to be marginally **more** reliable than a pipeline's contractual resale commitment. Regulation indeed makes a supply commitment **weaker** than an unregulated contractual supply obligation. Unlike the courts, regulatory commissions seldom require companies under their jurisdiction to perform on a contractual obligation that turns out to be unprofitable, nor do they compel compensation for failure to perform.

Pipeline "system supply" is a more secure supply source today only because and to the extent that FERC allows the pipelines to deny the same degree of "firmness" to their contractual transportation customers that they provide for their regulated sales customers.

Price Stability

Perhaps there is a substantial demand for the kind of "price stability" historically offered by pipeline sales of system gas. It is not evident, however, that many pipeline customers are willing to pay higher prices for such stability, and even less evident that public policy should accommodate such a preference, by which demand is rendered less sensitive to current market conditions. The question is becoming moot, however, in any event. As pipelines negotiate new supply contracts and renegotiate their old ones, their average gas-acquisition costs are coming to fluctuate increasingly with the spot market, while FERC is permitting the pipelines to modify their purchased-gas-adjustment ("PGA") mechanisms so that resale prices track current movements of such first-sale prices.

Finally, every price smoothing or hedging mechanism that is now available to the pipelines with respect to their system-gas portfolios is also available to any other gas purchaser or reseller at a comparable or lower price. **To the extent a real demand exists for price stability, therefore, pipeline system-gas sales possess no inherent advantage in serving this demand.**

Economies of Scale and Diversity of Aggregation

It is also true that economies of scale and diversity exist in the acquisition and aggregation of natural gas for resale. But the optimum scale may well be larger or smaller, and the optimum scope more or less diverse with respect to climate or other load factors, than that of a given pipeline's system-gas portfolio. A competitive market will seek out and favor the most efficient scale and configuration of portfolio aggregation. **A regulatory preference for pipeline system supply simply creates a preference for a given scale without regard to its optimality, and protects the pipeline's marketing operation from competitors, even of the same scale, that might in fact aggregate more efficiently.**

What Is to Be Done?

The task to be accomplished is a simple one in concept, and though its detailed implementation will involve some complexity, it will be far simpler than the contortions the FERC is now imposing on the pipelines and their customers in its attempt to perpetuate and rehabilitate a traditional regulated sales service whose justification is past --- through rate "reform" and proceedings directed at crafting "gas inventory charges" ["GICs"] for example.

FERC's strategic error, beginning with its creation of special marketing programs ["SMPs"] in the early 1980s, through Orders No. 436 and 500, has been to authorize unbundled transportation of shipper-owned gas as new services, in addition to the traditional bundled and regulated sales service, with separate volume projections and cost-allocations, separate rate schedules, and distinct terms of service. The simpler, more expeditious, and more

efficient course would have been (and still is) to split the existing sales service into (1) a single schedule of stand-alone transport services, rates, and service conditions that would apply to both customer-owned and pipeline-owned gas, and (2) a competitive marketing business, deregulated to the greatest degree permissible under the NGA and NGPA.

FERC should now require (and if FERC is unwilling or unable, Congress should mandate) the total separation --- functional, accounting, and organizational --- of the buying and selling of natural gas from its physical delivery. To the extent the pipeline companies remain marketers of natural gas --- and all or most of them will choose to remain so --- they should be required to carry on these functions in separate marketing affiliates that would deal at arms-length with their regulated transportation units. Whatever balancing rights or penalties applied to non-affiliates and whatever storage services were provided under transmission tariffs would be the same for affiliates as for non-affiliates --- in great contrast to the present situation.

Creating a Secondary Market in Transport Services

The Need for, and Inevitable Faults of, Cost-of-Service Rate Regulation

The justification for regulating gas pipelines has been and remains the classical concept of "natural monopoly". Unregulated entry into naturally monopolistic industries is expected to result in wasteful excess capacity, while the combination of restricted entry and unregulated rates is expected to encourage price discrimination and monopoly exploitation of consumers

(and/or "monopsony" exploitation of producers).

Precisely where rate regulation is most justified, however --- where and when capacity is inadequate --- cost-of-service ratemaking fails to perform one of the most critical functions served by prices in unregulated markets --- the rationing of limited supply to its highest-valued uses. Allocation of price-constrained supplies of any good then has to be accomplished by some non-optimal and, indeed, non-economic mechanism or set of rules, such as "first-come-first-serve", lotteries, prorationing, or administratively-determined "priorities". Some such mechanisms are inevitable concomitants of cost-of-service rate regulation or any other ratemaking formula that fosters an apparent shortage or surplus of capacity by mandating prices that are not market-clearing prices. Inefficiencies and dislocations are particularly mischievous to the extent that demand is subject to seasonal and other, unpredictable fluctuations, as is the case in the gas industry.

The present combination of ratemaking and allocation rules for interstate pipelines is specially troublesome. It reduces effective delivery capacity at periods of peak demand and fails to allocate to its most valued uses that capacity which is made available, as parties with firm transport rights "hoard" or underutilize them, and that effective capacity is not allocated to its highest-value use. While some rate reforms under consideration by FERC --- seasonally differentiated rates, for example --- will reduce capacity misallocation, I know of one and only one fundamental corrective.

A Free Secondary Market In Transport Services ("Capacity Brokering")

The one simple innovation that can effectively mitigate these inefficiencies and, indeed, "clear the market" for regulated transport capacity, while allocating that capacity to its highest uses, **is a free secondary market in transport services.** Whatever non-economic basis is used for the **original allocation** of transportation rights, all that is necessary for an efficient **reallocation** is to permit the free (unregulated) subdivision (by volumes, season, priority of service, etc.), recombination, and purchase, sale, exchange, or assignment of such rights.

Participation of pipelines as regulated entities in the secondary market for capacity on their own or other pipeline systems would have to be restricted or regulated so as to prevent them from using "capacity brokering" (FERC's misnomer for the secondary market) as a device to enhance market power or evade cost-of-service revenue restrictions. Free trading of capacity entitlements among other parties, however, would assure that potential buyers and sellers alike would act on the true scarcity value (= "opportunity cost") of transport services, at both seasonal peaks and slack periods. Accurate scarcity (or surplus) prices would correctly signal the relative value of other peak-supply options, including existing or contemplated storage facilities, and contemplated new pipelines or capacity enhancements.

What Is to Be Done?

FERC has grasped --- albeit very dimly --- the uses and value of "capacity brokering" but has seemingly done everything in its power to limit its scope and indeed to discredit and provoke opposition to the very concept. What is

required is not a complex auction system administered by FERC, or particularistic capacity-brokering "experiments" controlled by the "host" pipelines. There is certainly no need to extend FERC certification authority to otherwise non-jurisdictional pipeline **customers** desiring to "broker" transport rights in the secondary market.

In outline, all that FERC (or, at last resort, the Congress) must do is to order that every right or obligation pursuant to a FERC-approved transportation certificate, tariff, rate schedule, or service agreement, be divisible and assignable, in whole or in part, temporarily or permanently, without unreasonable restriction, and that any non-assignment terms in existing certificates, tariffs, rate schedules, or service agreements are henceforth unenforceable.

Such an order will require various follow-up actions by FERC in the areas of cost-allocation and rate design, for example. As far as I can anticipate, however, all such corollary moves will involve **simplifications** and rationalizations relative to the status quo of FERC regulation. A robust secondary market implies, for example, that provision of "interruptible" transport service will mainly be the function of primary or subsequent purchasers of firm transport rights, rather than the pipeline itself. This development will call for increasing the proportion of fixed costs allocated to fixed charges for firm pipeline service --- perhaps by resurrecting the classical (un-"modified") "fixed-variable" rate format. Such a change, however, would relieve the pipeline and FERC of the duty they now have, in setting rates, of speculating on the future split between "firm" and "interruptible" throughputs.

Certification of New Pipeline Capacity

The need for regulation of transportation charges is much weaker in today's mature gas industry than it was when the NGA was enacted. Most of North America's major gas-producing areas and load centers already have multiple competing pipeline connections, while the gas industry as a whole faces vigorous competition from many sources of energy. Some regulatory oversight must remain on transportation charges in the many less-than-fully competitive geographic markets, however, and to prevent the leveraging of market power over transportation into undue preference in sales markets.

The case for control over new pipeline construction and capacity additions is even weaker. The evils of overbuilding and "wasteful competition" that motivated the certification requirement in the NGA are nonexistent in a competitive industry, provided new capital costs are not imposed on captive customers or suppliers by regulation or contract. The only remaining justification for FERC's active exercise of its jurisdiction in this area is to provide a one-stop federal review of environmental impacts and requirements.

FERC is thus not an appropriate entity to decide what pipeline facilities should be built and by whom. Nor, I might add, is the California Public Utilities Commission. They lack the necessary information, insight, and incentives, and the ability to proceed with necessary dispatch or to arrive at sufficiently flexible outcomes.

Unfortunately, however, neither is the private sector now capable of making such decisions rationally. Investors also lack proper information and incentives, because of the misleading signals associated with regulated and inflexible

transport rates, and the inflexible and preferential allocation of existing transport and storage capacity. These market distortions are now creating false readings of shortage and of the market value of specific additions to transmission capacity, much as the false signals generated by mixture of dedication, price regulation and deregulation in the early years of the NGPA, regarding the need for additional gas-producing capacity.

The first and most urgent task of the regulators today with respect to the need for new pipeline construction is, therefore, to complete the transition to flexible, competitive markets through measures such as I have suggested here.

Summary

I believe that the natural-gas industry is in excellent shape, and already properly organized to meet a major part of the nation's primary-energy demand well into the new Millennium. Flexible prices and market incentives will evoke the physical resources we need without any dramatic new government incentives. What is called for now is simply to complete the revolution in market structure that has been underway since passage of the NGPA in 1978. This means, first, cleaning up the biggest and clumsiest relic of the old regime --- the regulated sales services of the pipelines, and second, extending the same market flexibility that now exists in the production and sale of gas to its delivery, through free exchange of transportation services in a secondary market.