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ATTACHMENT A

California Public Utilities Commission

Preliminary Staff Recommendations for
Treatment of Natural Gas Sector
Greenhouse Gas Emissions

July 12, 2007

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I. Introduction

The staff of the California Public Utilities Commission (Public Utilities Commission) prepared this paper to assist the agency and the California Energy Commission (Energy Commission) in the development of strategies for reducing greenhouse gas (GHG) emissions occurring in the natural gas sector. This effort is being undertaken at the Public Utilities Commission in Rulemaking (R.) 06-04-009 and in Docket 07-OIIP-01 at the Energy Commission. In these proceedings, the two Commissions will provide the California Air Resources Board (ARB) with joint policy recommendations consistent with Assembly Bill 32 for both the natural gas and electric sectors.

GHG emissions associated with the combustion of natural gas for electricity generation is already being addressed in the joint proceeding. On May 24, 2007, the Public Utilities Commission amended R.06-04-009 to broaden its inquiry regarding natural gas sector GHG emissions. As defined in the amendment, additional activities that will be examined are the GHG emissions associated with (1) combustion of natural gas by non-electricity generator end-use customers and (2) all transmission, storage, and distribution of natural gas within California.¹ The amended scope does not include GHG emissions associated with the extraction, gathering and processing of natural gas.

The natural gas sector (excluding natural gas used for electricity generation) constitutes approximately 14% of the State's GHG emissions. The majority of GHG emissions in the sector are attributable to natural gas combusted by end users. Less than 1% of statewide emissions result from the transmission of natural gas.

Achieving meaningful GHG reductions will require lowering consumption through energy efficiency programs such as those administered by the Public Utilities Commission and the Energy Commission. These efforts include setting rigorous building and appliance standards, weatherization of structures, and replacing obsolete equipment. For every million therms of natural gas saved, over 5 thousand metric tons of carbon dioxide (CO₂) is prevented from entering the atmosphere.

In this paper staff identifies and discusses various policy issues associated with developing a regulatory regime to control GHG emissions in the natural gas sector. Staff also presents its preliminary recommendations.² To ensure consistency of treatment among the various sectors in the California economy, staff recommends that the natural gas-related emissions should be capped. Emissions should be regulated at the utility level (public and investor-owned) to capture emissions associated with the combustion of natural gas by small end users such as residential and commercial customers. All emissions from the transmission, distribution and storage of natural gas, including emissions from California utilities, private pipelines, and interstate pipelines operating within California, would be regulated. Staff recommends that large end users be responsible for their own

¹ D.07-05-059, p. 6. Go to: http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/68285.htm.

² The views expressed in this paper are those of the staff of the Public Utilities Commission and do not necessarily represent the views of the Public Utilities Commission or the Energy Commission.

emissions and that emissions from natural gas vehicles be considered by ARB as part of the transportation sector. Emissions resulting from the generation of electricity would be treated as part of electric sector emissions.

Staff recommends that to the extent possible, the electricity and natural gas sector recommendations be developed together. In a few areas, staff recommends separate development of recommendations including reporting and tracking protocols, current entity-specific emissions, and 1990 baseline for the sector.

II. Overview of Natural Gas Sector

A. The Majority of California End Users Receive Service from a California Utility

California is a major consumer of natural gas. The state used over 5,700 million cubic feet of natural gas per day during 2005.³ Consumption is expected to grow by approximately 0.5 percent annually over the next 20 years.⁴ The state relies upon a diverse portfolio of supplies to meet this demand. About 85% of the supply comes from several basins located outside California with the remainder from in-state production.

The state's natural gas sector essentially operates as an integrated system. Out-of-state supplies are primarily delivered to California's two largest utilities at several locations at the state border through connections with interstate pipeline companies. After receipt, the natural gas may flow into storage, be distributed to the utility's own customers or forwarded to other utilities for use by their customers. Instate supplies also enter this system at various points. Exceptions to this arrangement are those consumers that use proprietary operations tied to an in-state supply source to meet their needs or receive service directly from an interstate pipeline company.

Out-of-state sources of natural gas are the Southwestern U.S., Rocky Mountain region and Canada. Liquefied Natural Gas (LNG) facilities being completed in Baja California will also provide California with supplies in the near future. In-state production comes from the Sacramento and San Joaquin Valleys as well as offshore fields located off the Southern California coast.

Over 90% of California's end users are served by the state's three biggest investor-owned natural gas utilities (IOUs): Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E) and Southern California Gas Company (SoCalGas). Collectively, these utilities serve over 10 million customers within the state. In addition to these companies, smaller investor-owned utilities and publicly-owned (e.g., municipal) utilities also provide service in California. The number of customers served by these other entities is considerably smaller. Appendix A contains a

³ 2006 California Gas Report, p. 19. Go to: <http://www.pge.com/pipeline/library/regulatory/downloads/cgr06.pdf>.

⁴ *Ibid.*, p. 5.

list of the utilities serving California and other descriptive information.

Investor-owned utilities are subject to Public Utilities Commission jurisdiction and are obligated to meet the needs of their customers at just, reasonable and non-discriminatory rates. Appendix B describes the Public Utilities Commission's regulatory authority over natural gas utilities. Publicly-owned utilities are subject to the service and rate requirements of the appropriate local governing body.

B. About 20% of California's End-Use Load is Served By Interstate and Private Pipelines

In addition to those customers who take service provided by a utility operating within California, some end users receive natural gas under alternative arrangements. Some pipelines may be proprietary in nature, serving only the needs of their owners, and not available to others. Natural gas transactions involving these pipelines, called direct sales, use in-state sources of natural gas. Such proprietary pipelines are not subject to rate or service regulation. Another alternative is offered by interstate pipelines serving end users directly, without transferring natural gas through local distribution networks. Kern River Gas Transmission Company and Mojave Pipeline Company are the two interstate pipeline companies that serve end users in the state. Consumers that are served in this way are called "bypass" customers. Interstate pipeline companies operate under Federal Energy Regulatory Commission jurisdiction. Direct sales and bypass alternatives typically are used by large facilities using substantial quantities of natural gas.

Direct sales and bypass volumes represented approximately 20% of the natural gas used in the state during 2005. The following table provides direct sales and bypass volumes for 2005.⁵

Table 1

2005 Natural Gas End User Direct Sales and Bypass Volumes (million cubic feet per day (MMcfd))				
	California Direct Sales	Kern River	Mojave	Total
Direct sales/bypass	474	675	108	1,257

C. Residential, Commercial and Industrial End Users All Consume Significant Amounts of Natural Gas

Natural gas is combusted for a number of different purposes. Residential and commercial (e.g.,

⁵ 2006 California Gas Report, p. 19.

office buildings, hotels, restaurants) use is generally similar in nature. These consumers typically use natural gas for space heating, water heating and operating appliances. On an individual basis their usage is relatively small, but in aggregate represents a significant proportion of overall demand. Other major users of natural gas include the industrial and electric generation market segments. In contrast to other end users, these consumers burn substantial quantities of natural gas at each of their facilities.

In the short term, consumption can fluctuate year to year mostly due to weather. This is primarily because of space heating requirements in response to winter temperatures. Also, the amount of precipitation the State receives can affect how much hydroelectricity is produced and the need for natural gas fired generation. Natural gas prices can also affect usage but demand is generally considered to be relatively inelastic. Switching to other fuel sources (e.g., fuel oil) in response to high natural gas prices or shortages is less prevalent in recent years due to more stringent air quality standards.

Several factors will affect future trends in natural gas consumption. Technological developments and public policy initiatives can cause shifts in consumption between market segments or change demand. For example, cogeneration and distributed generation have caused a move away from centralized electricity production. Further advances may significantly expand the applications of these innovations to smaller scale settings such as home use. Expansion of state sponsored energy efficiency programs will lead to further energy savings and reduced consumption.

The following table shows the quantities of natural gas delivered to end users by California's three largest utilities in 2005:⁶

Table 2

2005 Recorded Natural Gas Usage (MMcfd)					
Market Segment	PG&E	SoCalGas	SDG&E	Total	Percent of total
Residential	512	660	86	1258	29%
Commercial	233	271	48	552	13%
Industrial	431	409	10	850	20%
Electric generation	753	676	163	1592	37%
Other	5	54	0	142	1%
Total	1934	2070	307	4311	100%

California's three largest utilities generally group their customers into six broad categories for reporting purposes:

⁶ 2006 California Gas Report.

Residential: Natural gas used in private dwellings, including apartments, for space and water heating, cooking and other household chores. Typical average monthly usage is approximately 50 therms.

Commercial: Establishments engaged in the sale of goods or services such as hotels, restaurants, wholesale and retail stores and other businesses. Usage is generally less than 20,800 therms per month.

Industrial: Firms engaged in a manufacturing process, food processing or similar activity. Natural gas used by the facility is usually more than a commercial entity. Usage is generally over 20,800 therms per month.

Electric generation: Natural gas used in the generation of electricity.

Natural gas vehicle (NGV): Natural gas used by vehicles for propulsion.

Enhanced oil recovery (EOR): Natural gas injected into an oil well to force additional supplies out or used to produce steam to lower the viscosity of the oil so it can more readily flow from the well.

Service is provided to these customers in several different ways. For most residential and commercial customers, the IOUs procure their natural gas and provide transportation, distribution, and storage. Some residential and commercial customers choose to use a third party, called a core aggregator, to buy their natural gas. For IOUs, residential and commercial service commonly is referred to as core service. Larger customers (e.g., industrial, electric generation and EOR) are typically responsible for procuring their own supplies and storage, with the utilities providing only transmission and distribution service to these customers. For IOUs, this is commonly referred to as non-core service. Natural gas intended for use by these large customers can be diverted to residential and commercial customers if a shortage exists. In addition, some large industrial customers may choose to have IOUs buy gas on their behalf along with the smaller residential and commercial customers. Publicly-owned utilities likely have analogous service levels for their different types of customer segments.

III. Natural Gas Sector's GHG Emissions

A. About 14% of Statewide GHG Emissions are from Combustion of Natural Gas Sector (Excluding Electricity Generation)

Natural gas contributes to climate change in two principal ways—by its combustion and its release into the atmosphere. Combustion of natural gas produces a significant amount of thermal energy with substantially less pollution than other fossil fuels. As it burns, the main byproducts produced are carbon dioxide (CO₂) and water vapor.

The majority of GHG emissions in the natural gas sector are the result of its combustion. The following table shows CO₂ emissions associated with the combustion of natural gas for the natural gas sector and in comparison to the state's overall GHG emissions.⁷

Table 3

2004 California GHG Emissions (million metric tons of carbon dioxide equivalent (MMTCO₂E))		
Source	Emissions	% of total:
Natural gas sector end user combustion:	68.23	13.87%
Residential	26.49	5.38%
Commercial	11.13	2.26%
Industrial	30.41	6.18%
Transportation	0.20	0.04%
Natural gas combustion during transmission, distribution, and storage ⁸	0.67	0.14%
Natural gas-fired electric generation (in state) ⁹	47.14	9.58%
Emissions from all other sources	376.00	76.42%
Statewide GHG emission including electricity imports Total	492.04	100%

As Table 3 shows, natural gas sector emissions from the combustion of natural gas by end users (excluding electric generation) and the transmission, distribution, and storage of the commodity within the state are approximately 69 MMTCO₂E, or 14% of gross California GHG emissions (492 MMTCO₂E).

B. Direct Release of Natural Gas

⁷ California Energy Commission Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004, Table A-4, pp. 62-67. Go to: <http://www.energy.ca.gov/2006publications/CEC-600-2006-013/CEC-600-2006-013-SF.PDF>.

⁸ CO₂ emissions from compressors and other equipment used in the transmission, storage and distribution of natural gas.

⁹ GHG emissions associated with the generation of electricity are considered part of the electric sector in R.06-04-009.

The second source of GHG emissions from the natural gas sector is direct release into the atmosphere. This may occur unintentionally (fugitive emissions), from incomplete combustion, or for operational reasons. These releases are predominately methane (CH₄). Fugitive releases happen because of leaks in pipelines, flanges, valves and pressurized equipment. Incomplete combustion results from inefficient furnaces, boilers and other appliances or equipment. Intentional releases can result from venting from compressors or other equipment for safety reasons, or for maintenance.

Per unit of mass, methane has a significantly greater impact on climate change than carbon dioxide. On the Global Warming Potential index, methane is assigned a value of 21, meaning that methane is 21 times more potent per unit of mass than carbon dioxide on average over a long time frame.

In its most recent inventory, the Energy Commission reported that 1.36 MMTCO₂E of methane was emitted by the transmission of natural gas in 2004.¹⁰ This is about 0.28% of total statewide GHG emissions of 792 MMTCO₂E. The manner in which the Energy Commission reflected incomplete combustion of natural gas in its inventory is not clear.

Appendix C contains a description of the steps involved in the delivering of natural gas after it is processed to the end user and the related sources of GHG emissions.

C. Reporting of GHG Emissions From the Natural Gas Sector

Mandatory GHG emissions reporting requirements for the natural gas sector do not yet exist. However, ARB and the California Climate Action Registry (CCAR or Registry) have ongoing efforts to estimate the level of GHG emissions occurring within the state, including those associated with the natural gas sector. Each entity pursues a different approach in this endeavor.

Prior to AB 32, the Energy Commission used state and federal data sources to create sector-based estimates of GHG emissions. The Energy Commission's method was a "top-down" estimate that did not rely upon individual entities reporting their own GHG emissions. An inventory was published periodically showing its analysis. The most recent issue was published in December 2006 (updated in January 2007) and is titled, "Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004." With the passage of AB 32, responsibility for estimating total GHG emissions by sector was transferred from the Energy Commission to ARB. Future reports will be issued by ARB.

The Registry is a non-profit voluntary registry for GHG emissions established by the state Legislature. The purpose of the registry is to provide entities operating in the state with an organized way to report their GHG emissions which can serve as a baseline for measuring GHG emission reductions over time. The Registry's method is a "bottom-up" method that relies upon each entity to measure or estimate their individual emissions. Unlike the Energy Commission's estimate, the Registry's estimate does not include statewide GHG emissions resulting from end user combustion of natural gas.

¹⁰ California Energy Commission, Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004, p. 65.

CCAR reports GHG emissions from data submitted by registered entities. Several California utilities are reporting GHG emissions from their system operations. GHG emissions caused by the end users they serve are not reported by the utilities. A general set of protocols are used to determine GHG levels to report. Validation procedures authenticate the data.

CCAR is working with the World Resources Institute to produce reporting protocols specifically designed for entities engaged in natural gas transmission, storage and distribution. This effort is being undertaken with a group of stakeholders which includes the Public Utilities Commission. ARB may consider adopting these protocols if mandatory reporting for the sector is instituted.¹¹

IV. Potential for Reducing GHG Emissions

A. The Single Largest Potential Source of GHG Reduction in Natural Gas Sector is Increasing Efficiency of End Users' Combustion

GHG emissions from the natural gas infrastructure (transmission, distribution, and storage of the commodity) are relatively small in comparison to the sector's overall emissions. Unlike the electricity sector, in which fuel and technology diversity result in generation sources with widely varying GHG intensity, almost all of the natural gas combusted in California has the same global warming potential because the quality of natural gas is very uniform. Thus, affecting end user consumption is the largest potential source of GHG emission reductions. The two primary ways to affect end user consumption are by promoting conservation and by improving efficiency.

The Public Utilities Commission and the Energy Commission are strong proponents of conservation and energy efficiency. In the 2003 Energy Action Plan, both agencies pledged to make these activities a high priority in order to help California meet its energy needs and gain widespread environmental benefits. Reducing natural gas demand will directly lower GHG emissions as each million therms of natural gas consumed releases over 5,200 metric tons of CO₂ into the atmosphere.¹²

1. Energy Commission Building and Appliance Standards

A major focus of the Energy Commission's effort is the development of energy efficiency standards for buildings and appliances. For more detailed information about these and other related programs, go to: <http://www.energy.ca.gov/>.

Energy efficiency standards are adopted for newly constructed buildings as well as for alterations to existing structures. These are updated periodically to allow for the incorporation of new energy

¹¹ For more information about CCAR, go to: <http://www.climateregistry.org/Default.aspx?refreshed=true>.

¹² D.05-09-043, Tables and Attachments, footnote 1 to Table 2. Go to: http://www.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/49859.DOC.

efficiency technologies and methods. Residential and nonresidential buildings are covered by the standards, which include a wide array of specifications governing such items as heating, air conditioning and lighting systems. The Energy Commission is also involved with other agencies in the implementation of Governor Schwarzenegger's Green Building Initiative setting energy savings goals for state owned buildings (Executive Order S-20-04).

Energy Commission appliance standards apply to a variety of appliances used in households and other settings including furnaces, lamps and washing machines. Revisions to the standards are also made in response to energy efficiency innovations.

According to the March 2006 Climate Action Team Report, the continued implementation of existing standards will reduce emissions by 7 million metric tons of CO₂ equivalent GHGs by 2020.¹³

2. Public Utilities Commission Energy Efficiency Programs

The Public Utilities Commission authorizes energy efficiency programs for the state's investor owned utilities on a multi-year basis.¹⁴ Each utility must show that its portfolio of energy efficiency programs is forecast to be cost effective and to meet or exceed energy savings goals. Key aspects of the natural gas related activities are advising customers about ways they can conserve and providing them with financial incentives to purchase more efficient equipment. Specific program elements include weatherizing homes, rebates for retiring inefficient household appliances and auditing facilities to identify areas for upgrades. Existing energy efficiency funding is set through 2008 at over \$330 million with expected savings of 121 million therms (excluding electric generation) and a corresponding reduction of approximately 646,000 tons of CO₂. For more detailed information about these programs, go to: <http://www.cpuc.ca.gov/> and http://www.californiaenergyefficiency.com/2006_08_programs.html. Additional programs are directed specifically at low income utility customers.¹⁵

Energy savings goals adopted by the Public Utilities Commission serve as the basis for the energy efficiency programs. These are developed according to the potential amount of conservation that can be achieved under various scenarios. To determine the current goals, a joint study was conducted by Public Utilities Commission and Energy Commission staff to review a consultant's analysis. According to the study, 4,559 million therms (excluding electric generation) could be saved over 10 years if all technically feasible measures were installed.¹⁶ The Public Utilities Commission did not adopt this target because it was not justified as cost effective at current prices.

¹³ California Environmental Protection Agency, Climate Action Team Report to Governor Schwarzenegger and the Legislature, March 2006, p. 47. Go to: http://www.climatechange.ca.gov/climate_action_team/reports/2006-04-03_FINAL_CAT_REPORT.PDF.

¹⁴ D.05-09-043 authorized energy efficiency programs for 2006 through 2008. See footnote 11 for website.

¹⁵ D.06-12-038 authorized low income energy efficiency programs for 2007 and 2008. Go to: http://www.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/62942.DOC.

¹⁶ D.04-09-060, pp. 12-13. Go to: http://www.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/40212.DOC.

However, it is an indication of the total amount of savings that could be achieved if necessary to meet GHG limitations. New energy savings goals are being considered by the Public Utilities Commission in proceeding R.06-04-010 for use in the next energy efficiency program cycle.

Appendix D contains information about Public Utilities Commission energy efficiency program funding levels and energy savings.

B. U.S. EPA's Natural Gas Star Program Has Greatly Reduced Emissions from Natural Gas Infrastructure

In 1993, the United States Environmental Protection Agency (U.S. EPA) created a voluntary program to work with companies (referred to as "partners") that produce, process and distribute natural gas. The objective of this arrangement is to identify and promote the implementation of cost effective technologies and practices to reduce methane emissions. Through this interaction, information about the costs, effectiveness of emissions reductions efforts and other experiences are shared amongst the participants. This includes ways to limit methane losses from compressors, maintenance operations and other activities. According to the U.S. EPA, the program has achieved significant success with a reduction of 74.6 billion cubic feet of methane emissions in 2005. PG&E, SoCalGas and Southwest Gas are listed as partners. For more information, go to: <http://www.epa.gov/gasstar/>.

C. Use of Alternative Sources of Natural Gas Could Reduce GHG Emissions in Other Sectors

A promising way to reduce GHG emissions is to capture methane generated from the decay of organic material such as livestock waste or refuse. Referred to as biogas, this gas can be captured and combusted on site or injected into a utility pipeline system if it meets quality specifications. Burning biogas will release less harmful CO₂ into the atmosphere instead of methane. Putting biogas to productive use would not reduce GHG emissions from the natural gas sector; however, it will have a beneficial impact on statewide emission levels overall by reducing emissions of methane. An additional benefit is that biogas will expand the supply of natural gas.

The Public Utilities Commission recently approved PG&E's request to enter into a 10-year contract with a company that will convert the waste from 3,000 dairy cows into 3 billion cubic feet per year of pipeline quality gas.¹⁷ Used for electricity generation, it is enough to meet the demand of 50,000 residential customers. A similar request by PG&E is pending before the Public Utilities Commission.¹⁸ With over 1.4 million dairy cows in the state, a significant opportunity exists for the large-scale production of biogas which could be used by all end users.

¹⁷ Resolution E-4076. Go to: http://www.cpuc.ca.gov/WORD_PDF/FINAL_RESOLUTION/68429.DOC.

¹⁸ PG&E Advice Letter 2996-E.

V. Issues

As mentioned above, the majority of emissions associated with natural gas and within the scope of this proceeding and paper are caused by end-user combustion of natural gas, and to a lesser extent by the infrastructure used to provide end users with natural gas. Significant quantities of natural gas are combusted by all end user segments. Any comprehensive framework to control GHG emissions associated with natural gas should address each of these segments.

Several key policy issues need to be considered and resolved as the Public Utilities Commission and the Energy Commission jointly develop recommendations to ARB for a comprehensive GHG emission control strategy for the natural gas sector. In addition, the Market Advisory Committee, in its June 30, 2007 report to ARB, recommended several options for treatment of natural gas sector-related GHG emissions.¹⁹

A. Scope of Emissions Covered

One of the most important issues is to define the scope of emissions attributed to the natural gas sector that should be subject to control via regulation. As described above, the majority of GHG emissions from the natural gas sector result from end-user combustion. A key question is whether the scope of regulation should be restricted to emissions associated with the activities needed to provide end users with natural gas or whether it should include emissions from end-user combustion. In addition, whether to regulate emissions associated with upstream transactions (such as extraction, gathering, and processing of natural gas),²⁰ mid-stream transactions (such as transmission, distribution, and storage), or downstream transactions (such as combustion at the burner tip) is a significant decision point for the sector. Another element of defining the scope is to determine which greenhouse gases are being regulated. The primary GHG emission from end-user combustion is CO₂, but the primary GHG emission from providing natural gas to end-use customers is methane.

B. Point(s) of Regulation

The groups of entities that are legally responsible for achieving reductions in GHG emissions are referred to as the point of regulation. For the scope of this proceeding, options for the point of regulation in the natural gas sector include the gas transmission pipeline companies, gas distribution utilities, storage companies, and/or individual end users of natural gas. The regulatory system may assign responsibility to different entities for different categories of emissions.

Issues which should be considered may include, but are not limited to, the scope of regulatory authority, the effectiveness of potential regulations, the structure of the natural gas market, and the

¹⁹ See “Recommendations for Designing a Greenhouse Gas Cap-and-Trade System for California, June 30, 2007, posted www.climatechange.ca.gov, especially Chapter 4.

²⁰ Consistent with the scope of Phase 2 specified in D.07-05-059, this paper does not make recommendations regarding GHG regulations for the extraction, gathering, or processing of natural gas.

feasibility of regulating individual retail customers. If larger customers are regulated by ARB as point sources and smaller customers are regulated at the distribution utility level, an important issue is the demarcation between those customers to be regulated as point sources and the remaining smaller customers to be regulated at the utility level.

C. How to Regulate GHG Emissions

The method of regulation also needs to be determined. In coming to its conclusion that a load-based cap was the preferred mechanism to control GHG emissions associated with the electricity sector, the Public Utilities Commission reviewed a variety of regulatory mechanisms. Two major options were considered: (1) using regulatory programs to achieve reductions in GHG emissions and (2) putting in place a cap-and-trade framework.

Under the first approach, emissions reductions are achieved by regulatory agencies setting specific goals for utilities or end users in programs that affect GHG emissions, e.g., energy efficiency and building and/or appliance standards. The achievement of the goals results in quantifiable GHG emission reductions.

The second approach places a limit (cap) on all emissions from the sector and allows responsible entities to use a combination of methods, including the trading of emission allowances, to keep their emissions within the specified annual cap. Over time the cap is reduced, resulting in declining emissions for the sector. A cap-and-trade mechanism in the natural gas sector would need to rely heavily upon utilities achieving programmatic goals. As noted above, the major source of future GHG emission reductions will be increased end-user efficiency.

A related consideration is the parity of treatment of different but interrelated sectors of the California economy. In general, the assumption is that ARB will want to regulate as many sectors as possible in a parallel manner. Staff is mindful that differences in treatments of sectors can result in unintended consequences, e.g., increases in GHG emissions or creation of perverse incentives to undertake certain activities. For example, if the electricity sector is subjected to a hard cap (in a cap-and-trade system) and the natural gas sector is not capped, but merely faces energy efficiency targets, there may be an increased incentive for electric utilities to encourage consumers (or for consumers themselves) to switch some flexible appliances from electricity to natural gas (for example, water heaters, clothes dryers, etc.). This could reduce the electric utilities' need to purchase allowances. Depending on relative emissions in the electricity and natural gas sectors, such fuel switching could increase (or decrease) GHG emissions. Such considerations could also be important in the industrial sector where certain energy-intensive processes may be powered with either electricity or natural gas.

D. Design of Regulatory Mechanism

Under either a programmatic approach or a cap-and-trade framework, many design elements need to be considered in the current proceeding before a recommendation can be made to ARB. Design decisions for the programmatic approach include the following:

- The level of GHG emissions that can be expected if current programmatic goals are achieved.
- How annual changes in GHG emissions from the natural gas sector should be factored into establishing programmatic goals.
- Whether current Public Utilities Commission and Energy Commission programmatic goals should be modified (e.g., increased and/or longer-term goals established).
- Whether new programs that reduce GHG emissions should be adopted, e.g., programs to reduce fugitive emissions.
- A determination of the costs and feasibility of potential new programs or modifications to current programmatic goals.
- The type and level of penalties, including whether entities should be required to purchase offsets.

Other design elements are involved in a cap-and-trade mechanism. Many of these elements are similar to those already being considered by the two agencies in the development of recommendations for the electricity sector, and several of them likely will be undertaken regardless of the chosen method of regulation. Elements include the following:

- Reporting protocols for emissions related to providing natural gas to end users, fugitive emissions and emissions from end-user combustion.
- The natural gas sector's share of the 1990 statewide GHG emission level.
- Current entity-specific emission levels.
- Whether allowances should be administratively allocated to individual entities, or auctioned, or a combination of both methods.
- Determination of annual sector-wide caps.
- If allowances are allocated administratively, the basis on which they would be allocated (i.e., historical emissions, usage, population, etc.).
- Identification of emission reduction measures to quantify level of GHG emission reductions that can be achieved, determine feasibility, and estimate total costs.
- The nature and extent of flexible compliance options allowed. This includes banking, borrowing, compliance periods, and the use of offsets.
- The type and level of penalties.
- Many of the design elements considered in developing a programmatic approach will also need to be examined because current energy efficiency programs (end user, building standards and appliance standards) will be the significant source of emission reductions.

Many of the above design elements could apply equally to both the electric and natural gas sectors.

As noted above, one of the key advantages of a cap-and-trade approach is the ability to trade emission allowances across sectors. To achieve this advantage, the design of emission reduction programs for the electric and natural gas sectors should be as consistent as possible. In presenting recommendations on design elements, parties should provide explanations in situations where they propose different resolutions of issues for the two sectors.

VI. Staff Recommendations

To facilitate discussion and comment at the prehearing conference and to stimulate dialogue among stakeholders, staff has developed a set of preliminary recommendations that address some of the design issues identified above. The straw proposal represents initial thoughts and has not benefited from input of parties. Staff's desire is to stimulate dialogue, not to pre-determine issues or limit discussion of important issues.

A. Recommended Policies Regarding Natural Gas GHG Regulation

As an initial starting point, staff recommends the following as key elements of a natural gas sector greenhouse gas reduction framework:

1. **If a cap-and-trade regime is established for the California economy, the natural gas sector should be a capped sector under the regulations.** To ensure consistency of treatment among various sectors of the California economy, and in particular the energy sectors, staff recommends that natural gas-related emissions be treated in a manner similar to the treatment of electricity-related emissions in the final approach adopted by ARB. The principal advantage of a cap-and-trade approach is that emission allowances can be traded within the sector and among sectors, which could result in a lower cost of compliance for individual entities and therefore for the economy as a whole.
2. **The scope of emissions regulation should include both emissions from end users and emissions from natural gas infrastructure.** Staff believes that the scope of emissions should include both emissions from end-user combustion (to the extent possible and reasonable) and emissions associated with providing end users with natural gas. End-user combustion is the most significant source of GHG emissions associated with the natural gas sector, and not including it would severely limit the effectiveness of any regulatory approach. With the Registry's planned development of reporting protocols for infrastructure emissions, regulation of emissions from natural gas infrastructure would be feasible and would provide more complete coverage of natural gas sector emissions. Thus, the recommendation is for the scope of regulation to cover not only end-user combustion, but also fugitive emissions from pipelines and other gas transmission, distribution, and storage activities.
 - a. **Regulation of emissions from smaller end users should be at the distribution utility level.** There are millions of residential and commercial end users, so regulation at every point of combustion is impractical. Moving the point of regulation for smaller end users to the distribution utility is more efficient and feasible. Staff believes that investor- and publicly-owned utilities are in the best

position of any midstream source to affect residential and commercial end users' consumption patterns through energy efficiency programs and customer education. It may be appropriate, however, to treat the largest commercial customers as point sources.

- b. **Electric generation natural gas customers should be treated as part of the electricity sector (not the natural gas sector).** Emissions related to production of electricity using natural gas fuels should be regulated as part of the electricity sector and not included in the natural gas sector. Therefore, end-user combustion-related emissions from electricity generation using natural gas would be subtracted from the natural gas distribution utility's obligation to reduce emissions.
 - c. **Industrial customers should be covered as point sources.** The point of regulation for large non-electric generation industrial customers (including enhanced oil recovery) should be the entities themselves, which should be treated by ARB as individual regulated point sources as part of separate sectoral requirements, and not as part of the natural gas sector. This recommendation encompasses customers of private and interstate pipelines, in addition to customers of California utilities. However, it may be appropriate to regulate the smallest industrial customers at the natural gas distribution utility level.
 - d. **Emissions from transportation-related uses should be addressed separately by ARB.** Emission associated with natural gas used in transportation sector (LNG and Compressed Natural Gas vehicles) should be part of ARB's regulatory approach strategy to address the transportation sector.
 - e. **Infrastructure emissions associated with the transmission, distribution, and storage of natural gas for all end uses should be the responsibility of infrastructure providers and should be regulated within the natural gas sector cap.** This includes investor-owned utilities, publicly-owned utilities, independent storage providers, and interstate pipelines for their operations within California. Private pipelines and associated operations that serve a few dedicated customers need to be studied further to determine how to assign GHG emissions responsibility.
3. The treatment of distributed generation and combined heat and power facilities should be examined further and coordinated as policies for the electricity and natural gas sectors are considered.

B. Structure of Phase 2 of the GHG Proceeding

Staff recommends that, when possible, issues should be developed jointly for both the electric and natural gas sectors. However, in some cases, because of the progress already made in the electricity sector or because of distinct issues in the two sectors, issues may need to be treated separately or on a different timetable. In the electricity sector, we have developed six distinct "tracks" for addressing issues within Phase 2 of R.06-04-009. Those tracks are listed below, along with an initial proposal for how to treat the same set of issues within the natural gas sector.

Reporting and tracking: Staff is aware that the California Climate Action Registry, in cooperation with the World Resources Institute, is developing a reporting protocol for GHG emissions from the transportation, distribution, and storage of natural gas. Staff has recommended that this protocol be expanded to include end-user emissions. In addition, ARB has ultimate responsibility to adopt mandatory reporting regulations for the natural gas sector. Staff proposes to rely on those processes to be the primary vehicles for addressing reporting requirements for the natural gas sector. Thus, this proceeding would not include a separate track for natural gas reporting and tracking.

Baseline and current emissions development: For this issue area, an effort parallel to that being conducted for the electricity sector will be necessary. Staff expects that ARB's process to finalize the 1990 emissions inventory will be the primary place to address any concerns about the baseline numbers related to the natural gas sector as a whole. Staff expects to issue a data request in this proceeding to obtain entities' current emissions data.

Emissions reduction measures and annual sector emissions caps: Staff proposes to address these issues simultaneously for both the natural gas and electricity sectors. Thus, there would not be a separate track for natural gas emission reduction measures.

Flexible compliance mechanisms: Staff proposes to address these issues simultaneously for both the natural gas and electricity sectors. Thus, there would not be a separate track for natural gas flexible compliance mechanisms.

Entity-specific allowance allocation: Staff recommends that the overall policy options for allocations to natural gas entities be considered along with the electricity sector, since it will likely be logical to utilize the same principles when deciding whether to auction or allocate allowances to both energy sectors.

Modeling: Staff does not propose to undertake detailed modeling for the natural gas sector along the lines of that being conducted for electricity. At some point, it may make sense to conduct some form of simplified modeling for the natural gas sector to assess relative costs and benefits of various design options. Staff will consider this as a separate effort from the electricity sector model, if and when it becomes identified as necessary.

Staff views the policy issues identified in subsection A above regarding the framework for GHG regulation in the natural gas sector as a separate "track" that generally should be handled separately from electricity sector issues.