### Ad 1- Warming

#### Advantage one is the environment.

#### Lack of pipeline infrastructure leading to massive increases in natural gas flaring

Park 12 ENERGYOIL AND NATURAL GAS¶ Increase in "Flaring" Tied to Pipeline Shortages¶ by Minjae Park May 14, 2012 <http://www.texastribune.org/texas-energy/oil-and-natural-gas/increase-gas-flaring-due-gas-pipeline-shortages/>

With oil production on the rise in Texas, drilling companies are increasingly burning off the natural gas that surfaces with the oil because they can't get pipelines in place fast enough to transport it.¶ “There’s just more demand for pipelines than they can currently keep up with,” said James Mann, a lawyer who represents pipeline companies.¶ But the process — called "flaring" — is raising concerns among environmentalists, who say it releases nitrogen oxide, sulfur oxide and other emissions with public health risks into the atmosphere.¶ “There is clearly a cause for concern with the sheer magnitude of flaring that is taking place due to the potential air quality and climate impacts," Ramon Alvarez, a scientist at the Environmental Defense Fund, wrote in an e-mail to the Tribune. ¶ The number of flaring permits approved by the Texas Railroad Commission has increased sharply in recent years, from 107 in fiscal year 2008 to 651 in fiscal 2011, according to Ramona Nye, an agency spokeswoman. This corresponds with a dramatic increase in demand for drilling permits. ¶ ¶ The Railroad Commission issued 9,347 drilling permits in the long-active Permian Basin last year, up from 3,369 in 2009. The West Texas region, which is 250 miles wide and 300 miles long, has generated at least 260 million barrels of oil in each of the last three years. ¶ The gushing flow from the Eagle Ford Shale, an oil field 50 miles wide that stretches 400 miles along southeast Texas, is more recent, made possible by a drilling technique known as hydraulic fracturing. Oil production from the Eagle Ford Shale has spiked from 130,802 barrels in 2004 to more than 30 million barrels last year. Drilling permits issued for the shale area have also risen dramatically in recent years, from 26 in 2008 to 2,826 in 2011.¶ Pipeline companies have struggled to keep pace, the result of infrastructure needs like processing plants to remove contaminants and compression systems to pump natural gas. Even before construction of a pipeline can begin, there are legal issues to take care of, Mann said, such as acquiring the rights to private land and obtaining the various government permits. Materials, equipment and workers must also be available.¶ One indication of how much capacity is needed in the Eagle Ford Shale is the amount of money that pipeline companies plan to invest there. The Texas Pipeline Association’s 39 member companies have so far announced $6 billion in investments for the oil-rich shale field, said Thure Cannon, the association’s executive director.¶ Oil companies could pause or reduce oil production in order to capture more of the natural gas byproduct. Unlike oil, gas is difficult to transport using trucks. But their preferred option — especially with oil prices so high — is not to lower production; it's to flare the gas while building a gas pipeline.¶ “When crude oil is $100” a barrel, Mann said, “nobody wants to shut in their oil wells to wait for a gas gathering line to take away their gas.”

#### **New wells have led to flaring being on the rise for the first time since 2008.**

Vukmanovic 2012 (Oleg 5/3/2012, Reuters, Huffington Post, Natural Gas Flaring Rises Globally, Fueled By U.S. Shale Boom, <http://www.huffingtonpost.com/2012/05/03/natural-gas-flaring-rises-globally_n_1474838.html>, gem)

LONDON, May 2 (Reuters) - The U.S. shale energy boom is fuelling a rise in the burning of waste gas after years of decline, a World Bank source told Reuters ahead of the release of new data, giving environmentalists more ammunition against the industry. Global gas flaring crept up by around 2 billion cubic meters (bcm) in 2011, the first rise since 2008, preliminary data from the World Bank shows. The increase is mostly due to the rise in shale oil exploration in North Dakota, propelling the United States into the top 10 gas flaring countries along with Russia, Nigeria and Iraq. The preliminary data - which will be released in detail later in May - shows that global gas flaring crept up to around 140 billion cubic meters (bcm) in 2011, up from 138 bcm the previous year.

#### Massive global gas boom inevitable- only a reduction in flaring can ensure it does not lead to a spike in GHG emissions

Reuters 12 World to gain from gas glut if regulation right: IEA By Henning Gloystein and Oleg Vukmanovic¶ LONDON/OSLO | Tue May 29, 2012 11:54am EDT¶ (Reuters) <http://www.reuters.com/article/2012/05/29/us-energy-gas-iea-idUSBRE84S0XJ20120529>

A boom in unconventional natural gas over the next 20 years could see the United States and others benefit from cheaper energy while the importance of the Middle East declines, the International Energy Agency (IEA) said on Tuesday.¶ Growth in shale in the United States and China could match gains made in conventional gas in Russia, the Middle East and North Africa combined, IEA Chief Economist Fatih Birol told Reuters.¶ "Unconventional gas will fracture the status quo, and will be a complete game changer with major geopolitical implications," Birol said.¶ High natural gas prices have helped spur investment in previously unavailable, unconventional gas reserves that include tight-gas, shale gas, and coalbed methane resources.¶ Yet the boom can only run if measures are taken to ensure these reserves are extracted in a socially and environmentally satisfactory way, the IEA said in a report.¶ "Greenpeace opposes the exploitation of unconventional gas reserves because the impacts have not been fully investigated, understood, addressed and regulated," the environmental group said. "The IEA report essentially affirms that these concerns are real but falls short of actually addressing them."¶ The IEA admits that unconventional gas production will pump 12 percent more greenhouse gases into the atmosphere, compared with conventional extraction methods, but says the figure could drop below 3.5 percent if producers follow its recommendations and stop venting gas and minimize flaring.¶ Speaking at the report's launch in London on Tuesday, the IEA's Executive Director Maria van der Hoeven said the most important thing is for gas to substitute more polluting fossil fuels such as coal in electricity generation.¶ Falling prices driven by an unconventional gas glut would help displace coal, Hoeven said, potentially slashing emissions further.¶ But gas must be accompanied by renewables and the roll out of carbon capture and storage (CCS) technology, an as yet unproven technology designed to trap exhausts from coal-fired power stations, in order to limit a long-term global rise in temperatures to 2 degrees Celsius above pre-industrialized levels.¶ "Renewables are indispensable to this goal and that means government measures for supporting renewable energy must be there for years to come...because otherwise lower gas prices will make renewables uncompetitive," Hoeven said.¶ The IEA report underscored the economic gains offered by the rapid growth in unconventional gas, with "countries that were net importers of gas in 2010, including the United States, gaining the wider economic benefits associated with improved energy trade balances and lower energy prices."¶ Australia, India, Canada and Indonesia are also set for big increases in unconventional gas production, it said.¶ "The share of Russia and countries in the Middle East in international gas trade declines from around 45 percent in 2010 to 35 percent in 2035," the report said.¶ For Europe, where shale is expected to play a smaller role than elsewhere, Birol said that growth could still be enough to offset a decline in conventional gas output.¶ "The main benefit for Europe will that there will be lower gas import prices, putting pressure on oil-indexation of traditional gas supply contracts," Birol said.¶ Europe's main gas suppliers, Russia and Norway, sell their gas under long-term contracts that are linked to the oil market.¶ Because oil prices have remained firm on strong demand from emerging economies while European gas prices have fallen on weak domestic demand, European gas suppliers are forced to sell imported gas to their customers at a loss, and utilities lose money when generating electricity from imported gas.¶ The IEA said this price structure could change as a result of a global unconventional gas glut.¶ The report said that natural gas could become the world's second most important energy source after oil within the next two decades, should the right rules be introduced to ensure safe and environmentally sustainable use of unconventional gas resources.¶ Global gas demand could rise by over 50 percent between 2010 and 2035 and reach 25 percent of the world's energy mix, overtaking coal to become the second largest primary energy source after oil, the IEA said.¶ Growth in the gas sector would equal the combined growth in the coal, oil and nuclear sectors and outstrip expansion in the renewable energy sector, the IEA said.¶ "Production of unconventional gas, primarily shale gas, more than triples to 1.6 trillion cubic feet in 2035," the IEA said.¶ "The share of unconventional gas in total gas output rises from 14 percent today to 32 percent in 2035."¶ It noted the majority of the gas production increases would come after 2020 as producers needed time to develop a commercial unconventional gas sector.¶ Expanding unconventional gas production at such rapid rates will require a total of 1 million unconventional wells to be produced by 2035 globally, the IEA said. That's compared to the 500,000 such wells drilled in the past 20 years.¶ Of that 1 million, the U.S. will require 300,000 and China 200,000, with the remainder shared with the rest of the world.¶ The U.S., the world's biggest shale gas producer, currently has just 100,000 unconventional wells in operation.¶ COSTLY REGULATION NEEDED¶ The IEA said the rules needed to ensure unconventional gas production is both environmentally and socially acceptable would raise production costs.¶ "I hope that the industry will recognize that it will be tested against the worst practices in the sector," Birol said.¶ The report said such measures "could increase the overall financial cost of developing a typical shale gas well by an estimated 7 percent."¶ Yet should the industry fail to implement strict enough rules, the IEA said a lack of public acceptance would likely mean that only a small share of unconventional gas resources would become available for development.¶ As a result, unconventional gas production rises only slightly above current levels by 2035, sending worldwide gas import bills 60 percent higher than in the scenario of an unconventional gas glut.¶ Yet Birol said he was "cautiously optimistic" that industry and governments would introduce the needed measures to enable a global gas boom.¶ Shale gas is extracted using a technology called hydraulic fracturing or fracking, which involves pumping large amounts of water and chemicals underground.¶ The technology has been blamed for causing slight earthquakes and been banned in several countries, but it has also transformed the U.S. energy sector and caused domestic energy prices to plummet in recent years.

**The best and most recent study has found that warming is real and anthropogenic with absolute certainty**

**Gleckler et al 2012** (P.J., B. D. Santer, C. M. Domingues, D.W. Pierce, T. P. Barnett, J. A. Church,

K. E. Taylor, K. M. AchutaRao, T. P. Boyer, M. Ishii and P. M. Caldwell [Program for Climate Model Diagnosis and Intercomparison, Lawrence Livermore National Laboratory; Antarctic and Climate Ecosystems Cooperative Research Centre; Centre for AustralianWeather and Climate¶ Research andWealth from Oceans Flagship; Climate¶ Research Division, Scripps Institution of Oceanography; Indian Institute of Technology; National Oceanographic Data Center, NOAA; Climate Research Department,¶ Meteorological Research Institute]; Human-induced global ocean warming on multidecadal timescales; DOI: 10.1038/NCLIMATE1553; kdf)

Large-scale increases in upper-ocean temperatures are evident¶ in observational records1. Several studies have used¶ well-established detection and attribution methods to demonstrate¶ that the observed basin-scale temperature changes¶ are consistent with model responses to anthropogenic forcing¶ and inconsistent with model-based estimates of natural¶ variability2–5. These studies relied on a single observational¶ data set and employed results from only one or two models.¶ **Recent identification of systematic instrumental biases6¶ in expendable bathythermograph data has led to improved¶ estimates of ocean temperature variability and trends7–9 and¶ provide motivation to revisit earlier detection and attribution¶ studies.We examine the causes of ocean warming using these¶ improved observational estimates**, together with results from¶ a large multimodel archive of externally forced and unforced¶ simulations. The time evolution of upper ocean temperature¶ changes in the newer observational estimates is similar to¶ that of the multimodel average of simulations that include the¶ effects of volcanic eruptions. **Our detection and attribution¶ analysis systematically examines the sensitivity of results to¶ a variety of model and data-processing choices. When global¶ mean changes are included, we consistently obtain a positive¶ identification (at the 1% significance level) of an anthropogenic¶ fingerprint in observed upper-ocean temperature changes**,¶ **thereby substantially strengthening existing detection and¶ attribution evidence.¶** We examine volume average temperature anomalies (1T) for¶ the upper 700m of the global ocean (see Methods). Figure 1a¶ compares uncorrected observational 1T estimates ISH-UNCOR¶ (ref. 10) and LEV-UNCOR (ref. 11) with improved versions,¶ ISH (ref. 8) and LEV (ref. 9), which incorporate corrections for¶ expendable bathythermograph (XBT) biases. The bias-corrected¶ temperature analysis7 from a third group (DOM) is also shown.¶ Bias corrections have a substantial impact on the time evolution¶ of 1T, particularly during the 1970s–1980s, when they markedly¶ reduce spurious decadal variability. ¶ As shown below, **these bias adjustments have important¶ implications for detection and attribution (D&A) studies**. Although¶ there are no significant differences between the 1T trends (which¶ range from 0.022 to 0.028 ◦C per decade) in the three improved¶ observational data sets, Fig. 1a illustrates that substantial structural¶ uncertainties remain. The impact of different XBT bias corrections¶ is a major source of this uncertainty12. Another important component of observational uncertainty¶ relates to the sparseness of ocean temperature measurements and¶ to the different methods used to objectively infill data where¶ and when measurements are not available13–15. ISH and LEV use¶ objective mapping techniques to carry out infilling, generating¶ anomalies that are biased towards zero in data-sparse regions.¶ The infilling method of DOM employs statistics of observed¶ ocean variability estimated from altimeter data. We compare the¶ spatially complete infilled estimates (1TIF) with subsampled 1T¶ data (1TSS) restricted to available in situ measurements (see¶ Methods). Not surprisingly, the 1TSS variability in Fig. 1b is¶ greater than that of 1TIF, particularly at the times/locations of the¶ sparsest sampling (early in the record and in the southern oceans;¶ Supplementary Fig. S1).¶ We use results from phase 3 of the Coupled Model Intercom-¶ parison Project (CMIP3; see Methods and Supplementary Informa-¶ tion) to obtain information on the behaviour of 1T in unforced¶ (control) simulations and in externally forced twentieth-century¶ runs (20CEN). **External forcing is by a variety of anthropogenic¶ factors (primarily greenhouse gases and sulphate aerosols). In some¶ models, the applied forcing also includes natural changes in volcanic¶ aerosols and solar irradiance**. The seven CMIP3 models (with the¶ data required for our analysis) incorporating the effects of volcanic¶ eruptions (VOL) in the 20CEN simulations uptake less heat than¶ the six that do not (NoV)16.

#### **Flaring creates acid rain, global warming, and causes species extinction.**

Nigerian Compass 2012 (April 23, nigeriancompass.org, <http://www.compassnewspaper.org/index.php/features/life-style/2481-towards-achieving-zero-level-gas-flare>, Towards achieving zero level gas flare.)

Other health hazards and effects associated to gas flaring and oil pollution includes; increased environmental temperature, heat-wave/mental heat and of course global warming. This condition dehydrates surroundings, habitats, ecosystem, food chain, nitrogen cycle, oxygen cycle, flora and fauna, animals and vegetation that thereby cause their actual deaths or poor yields of environmental resources. The presence of carbon and traces of nitrogen and sulfur in natural gas leads to the production of various oxides and sulfides, when these chemicals are inhaled through the flaring it settles in nostrils down to the lungs as thick carbon monoxide, which blocks the passage of oxygenated blood to the heart of human beings and animals. The oxides and sulfides in hydrocarbon with gaseous chemicals when flared combine with water in the atmosphere to form various types of corrosive acids such as nitric and sulfurous acids that irritates the human skin and prevent plants chlorophyll from functioning. This also leads to cancer of the skin and corrode galvanized roofing sheets close to oil and gas production zones like Egi-Ali-Ogba Clan communities in Rivers State. Gaseous acids like cadmium, benzene and calcium also pollutes streams, natural water ways like swamps, creeks, ponds, including arable farm lands rivers soil nutrients and thereby killing fishes, aquatic animals and plants and stave human beings of source of water.

#### That causes human extinction.

Tickell 8 [Oliver, Climate Researcher, The Guardian, 8-11, “On a planet 4C hotter, all we can prepare for is extinction”, http://www.guardian.co.uk/commentisfree/2008/aug/11/climatechange]

We need to get prepared for four degrees of global warming, Bob Watson told the Guardian last week. At first sight this looks like wise counsel from the climate science adviser to Defra. But the idea that we could adapt to a 4C rise is absurd and dangerous. Global warming on this scale would be a catastrophe that would mean, in the immortal words that Chief Seattle probably never spoke, "the end of living and the beginning of survival" for humankind. Or perhaps the beginning of our extinction. The collapse of the polar ice caps would become inevitable, bringing long-term sea level rises of 70-80 metres. All the world's coastal plains would be lost, complete with ports, cities, transport and industrial infrastructure, and much of the world's most productive farmland. The world's geography would be transformed much as it was at the end of the last ice age, when sea levels rose by about 120 metres to create the Channel, the North Sea and Cardigan Bay out of dry land. Weather would become extreme and unpredictable, with more frequent and severe droughts, floods and hurricanes. The Earth's carrying capacity would be hugely reduced. Billions would undoubtedly die. Watson's call was supported by the government's former chief scientific adviser, Sir David King, who warned that "if we get to a four-degree rise it is quite possible that we would begin to see a runaway increase". This is a remarkable understatement. The climate system is already experiencing significant feedbacks, notably the summer melting of the Arctic sea ice. The more the ice melts, the more sunshine is absorbed by the sea, and the more the Arctic warms. And as the Arctic warms, the release of billions of tonnes of methane – a greenhouse gas 70 times stronger than carbon dioxide over 20 years – captured under melting permafrost is already under way. To see how far this process could go, look 55.5m years to the Palaeocene-Eocene Thermal Maximum, when a global temperature increase of 6C coincided with the release of about 5,000 gigatonnes of carbon into the atmosphere, both as CO2 and as methane from bogs and seabed sediments. Lush subtropical forests grew in polar regions, and sea levels rose to 100m higher than today. It appears that an initial warming pulse triggered other warming processes. Many scientists warn that this historical event may be analogous to the present: the warming caused by human emissions could propel us towards a similar hothouse Earth

#### Evaluate climate change through the precautionary principle

**Friedman** 2009 (Thomas; Going Cheney on Climate; December 8; www.nytimes.com/2009/12/09/opinion/09friedman.html; kdf)

This is not complicated. **We know that our planet is enveloped in a blanket of greenhouse gases that keep the Earth at a comfortable temperature.** As we pump more carbon-dioxide and other greenhouse gases into that blanket from cars, buildings, agriculture, forests and industry, more heat gets trapped. **What we don’t know, because the climate system is so complex, is what other factors might over time compensate for that man-driven warming**, or how rapidly temperatures might rise, melt more ice and raise sea levels. It’s all a game of odds. We’ve never been here before. **We just know two things: one, the CO2 we put into the atmosphere stays there for many years, so it is “irreversible” in real-time** (barring some feat of geo-engineering); **and two, that CO2 buildup has the potential to unleash “catastrophic” warming.** **When I see a problem that has even a 1 percent probability of occurring and is “irreversible” and potentially “catastrophic,” I buy insurance**. That is what taking climate change seriously is all about. If we prepare for climate change by building a clean-power economy, but climate change turns out to be a hoax, what would be the result? Well, during a transition period, we would have higher energy prices. But gradually we would be driving battery-powered electric cars and powering more and more of our homes and factories with wind, solar, nuclear and second-generation biofuels. **We would be much less dependent on oil dictators who have drawn a bull’s-eye on our backs; our trade deficit would improve; the dollar would strengthen; and the air we breathe would be cleaner. In short, as a country, we would be stronger, more innovative and more energy independent. But if we don’t prepare, and climate change turns out to be real, life on this planet could become a living hell. And that’s why I’m for doing the Cheney-thing on climate — preparing for 1 percent.**

#### Acid rain causes destruction in multiple areas of the environment; all marine life will die

Lindstrom, 11 - Professor of Political Science with Saint John's University/College of Saint Benedict since 2005, Ph.D from North Arizona University (Matthew, Encyclopedia of the U.S. Government and the Environment, 2011, //)

**Acid rain has been a fully realized ecological problem** for only a few decades. The effects of acid rain have been recorded in the eastern United States, Great Britain, Germany, and elsewhere. More recently, **acid rain is becoming a significant problem** in China, Japan, and other rapidly industrializing nations like India and Taiwan. **Scientists fear the negative effects will continue to worsen unless governments and industries work together. Acid rain can affect bodies of water by increasing the acidity until fish and marine vegetation can no longer survive**. As acidity rises, **forms of aquatic life struggle to survive**. At pH 5.5, bottom-dwelling bacterial decomposers start to disappear, leaving organic debris to collect. In such cases, **plankton, the base of the aquatic system, lack its food source, negatively affecting all marine life**. Further, if the composed leaf litter problem persists, **toxic metals such as aluminum and mercury can be released and seep into the groundwater. At pH levels of 4.5 and below, nearly all aquatic life will die**. **Acid rain also greatly affects forests and soil by washing away vital nutrients and replacing them with harmful toxins. Some of the great forests in Germany and western Europe are** believed to be **dying from acid deposition**, which is a result of a combination of wet and dry acid pollution. Scientists believe **essential nutrients for plant life are washed away by acid rain, which can also affect crop yields**. During this process, **toxic metals are transferred from the atmosphere to forests. These** deposits of lead, zinc, copper, chromium, and aluminum, among others, **retard growth of local plant life**, as well as mosses, algae, nitrogen-fixing bacteria, and fungi, all of which contribute to the health of forests.

#### Biodiversity loss outweighs all other impacts

Clarke 2012 (Chris [Director of Desert Biodiversity]; Is There a Bigger Environmental Issue Than Climate Change? Scientists Say Yes.; May 15; www.kcet.org/updaily/the\_back\_forty/wildlife/is-there-a-bigger-issue-than-climate-change-scientists-say-yes.html; kdf)

Climate change is a serious issue, but a couple of recent studies remind us that it may not be the biggest threat to life on Earth as we know it. It may in fact be essentially a symptom of a broader problem, one which hasn't gotten nearly as much attention from either green groups or the environmentally oriented press. What's the issue? Loss of biodiversity, also known as extinction. And ignoring it to focus on climate change can have dire consequences, especially in the California desert.¶ Over the last few years an increasing number of scientists have suggested that the planet's collapsing biological diversity may well be the largest and most intractable environmental problem we face. As threatening as climate change may be, it could be mitigated substantially by making a few wrenching but nonetheless straightforward changes in the way we do our business. (The fact that we lack the political will to make even those changes says more about our collective shortsightedness than about the nature of the problem itself.)¶ In the interests of full disclosure, I should say that for the last few months I've been working to launch a non-profit, Desert Biodiversity, to promote and defend the biological diversity of North America's deserts. I'm not an objective observer here. The deserts of North America are an uncharted biodiversity hotspot, largely intact and with a surprising wealth of species: think "rainforests without rain." And they're ground zero for industrial renewable energy development propelled by national concern about climate change. We have here a situation in which proponents of a solution to a huge environmental problem may actually be worsening a bigger problem.¶ Despite my non-disinterested point of view, I think it's arguable that the collapse in biodiversity has deeper roots. Even if we transform our society to a carbon-neutral one, as long as our numbers continue to swell and our demand for comforts continues, other species will pay the ultimate price. As we convert more and more of the planet to resources for our own use, we deprive other species of the habitat they need to survive. Most biologists agree that species are going extinct at at least 100 times the "background rate," perhaps more like 1,000. As one species after another dies out, the total biological diversity of the planet dwindles, and the resilience of the ecosystems on which we depend suffers. The pace of extinction hastens and the web of life unravels even faster.¶ A recent study out of UC Santa Barbara lends support to the idea that biodiversity and the resilience of the environment are deeply intertwined. The study, published in Nature on May 2, found that ecosystems that had lost species suffered losses in plant productivity. (This is important: plant productivity -- the use of sunlight to turn water and carbon dioxide into organic matter - is the basis of most life on Earth.) Researchers found that the greater the loss of plant species in an ecosystem, the lower plant productivity became. As postdoctoral fellow Jarret Byrnes said in a press release from UCSB's National Center for Ecological Analysis and Synthesis (NCEAS),¶ "For the past 15 years, ecologists have built a rich understanding of the consequences of humans driving species extinct. What we didn't know before this paper is whether those impacts of species loss rank up there with those from the major drivers of environmental change. Our work shows that, indeed, the impacts of species loss look to be on par with many kinds of human-driven environmental change."¶ In other words, according to NCEAS, loss in biodiversity poses just as big a threat to the planet as climate change or pollution. NCEAS isn't alone in this assessment. In January, biodiversity researchers from around the world convened in Copenhagen to coordinate a United Nations response to the extinction crisis. In a statement released after that meeting, Carsten Rahbek -- Director of the Center for Macroecology, Evolution and Climate at the University of Copenhagen -- said "The biodiversity crisis is probably a greater threat than global climate change to the stability and prosperous future of mankind on Earth."

### Ad 2- Shocks

#### Advantage 2 is price shocks

#### Status Quo Bias towards incremental pricing makes gas price shocks inevitable from the lack of infrastructure

Tye and Garcia 07 Copyright (c) 2007 Federal Energy Bar Association¶ Energy Law Journal¶ 2007¶ 28 Energy L. J. 1¶ LENGTH: 22979 words¶ ARTICLE: WHO PAYS, WHO BENEFITS, AND ADEQUATE INVESTMENT IN NATURAL GAS INFRASTRUCTURE¶ NAME: William B. Tye \*Jose Antonio Garcia \*\*¶ BIO: \* William B. Tye is a Principal at The Brattle Group in Washington DC. Ph.D. in economics from Harvard University. He specializes in regulatory and antitrust issues. Dr. Garcia is a Senior Associate at The Brattle Group's Washington DC office

The natural gas industry is currently facing short-term and long-term interrelated concerns. These concerns are evidenced by energy price spikes, underinvestment in basic infrastructure (both storage and transmission) connecting supply sources with final demand, and insufficient gas supply. Each [\*38] of these three challenges is closely interrelated and must be properly addressed in order to avoid a significant risk of infrastructure failure in the natural gas industry. Recent energy price spikes have taught us that the price elasticity of energy is very steep in the short run. As a result, insufficient supply causes prices to consumers to rise very rapidly. Demand adjustments may be a short-term response to alleviate price spikes but do not constitute a long-term solution to the problem. Price spikes and price volatility motivated by inadequate infrastructure will continue to plague the industry.¶ Former Chairman Greenspan of the Federal Reserve has warned that the dramatic rise of natural gas prices and volatility, motivated in his opinion by a fundamental shift in natural gas supply/demand balance, can significantly affect the long-term path of the US economy. He noted that large and timely infrastructure investments are necessary to bring forth new supplies in order to avoid a risk of infrastructure failure in the natural gas industry. More specifically, it has been claimed that new frontier resources such as LNG, Arctic natural gas including pipeline natural gas from Alaska, and natural gas from Eastern Canada and the U.S. Atlantic Basin are of critical importance to meet growing demand. n147 Gold (2006) suggests that several companies are already planning to build natural gas pipelines to bring gas to the East Region over land from other parts of the country (Texas and Rocky Mountains) instead of investing on more economical LNG terminals in the East Coast. n148 The author suggests that stiff community opposition (from an environmental and permitting standpoint) is threatening most LNG terminal projects along the East Coast. In addition, at present, there are three potential projects being seriously considered for bringing Alaskan natural gas from the Alaskan North Slope to lower forty-eight state markets: (i) The Alaska Natural Gas Transportation System (ANGTS); (ii) the Trans-Alaska Gas System (TAGS), a LNG export project; and (iii) a third potential project involves a new pipeline to transport gas from the North Slope of Alaska to the Canadian border. n149¶ Whereas tight supply generates price spikes, underinvestment in basic infrastructure contributes to the problem. Even if there were a surplus of the natural gas (or LNG) supply, the market does not have the necessary pipeline capacity to transport it. Furthermore, even in the hypothetical situation in which there was adequate transmission infrastructure, the market lacks the capacity to [\*39] store it. The underlying shortages in basic infrastructure, both in terms of storage and transportation capacity, constitute the major constraints on both supply and demand growth and the key determinant of natural gas price volatility. The development of storage facilities is closely dependent upon the availability of interconnecting transportation. It is not enough to promote additional LNG supplies if storage and transportation facilities are inadequate.¶ Facility expansions in transportation and storage assets reduce price volatility by reducing price spikes for the entire gas market, not just the gas purchased by the new customers. Shortages in bottle-necked markets can cause price spikes across markets unless there is appropriate infrastructure. The existence of bottlenecks and operational constraints can create pricing differentials and amplify price spikes in the constrained zone. Investment in transmission infrastructure that helps to alleviate or eliminate these bottlenecks will force prices downward for both customers taking service on an incremental pipeline project and existing customers in the connected adjacent markets. In a similar manner, investment in storage facilities may dramatically reduce price volatility. Storage capacity helps the market to tackle supply and demand shocks and allows it to run surpluses and deficits that smooth the swing in prices. Any bias in favor of incremental pricing would likely frustrate this needed investment in storage and transmission facilities because it ignores the system benefits of increased supply reliability and reduced price spikes to existing customers that can arise from projects designated in part to serve new customers. A clear contradiction arises between the proposals to promote investments in facilities necessary to bring forth a new gas supply that improves the efficiency and security of gas transmission systems and the disincentives to investment that any bias in favor of incremental pricing is designed to create.

#### Distribution bottlenecks will lead to widespread price variation

Foss 12 Congressional Documents and Publications¶ ¶ April 17, 2012¶ ¶ House Science, Space, and Technology Committee Hearing; ¶ "Tapping America's Unconventional Oil Resources for Job Creation and Affordable Domestic Energy: Technology and Policy Pathways."; ¶ Testimony by Michelle Michot Foss, Chief Energy Economist, Center for Energy Economics, Bureau of Economic Geology, University of Texas-Austin, l/n

Importantly, a robust resource base does not fully protect producers and customers from sharp swings in price. Short and mid-term deliverability can be impacted by any number of factors, ranging from natural disasters to operational events to pronounced business cycles. Oil and natural gas are commodities for which we are all price takers. However, sustaining a robust resource base is essential to restoring market balance. Coupled with operational and market flexibility, ever advancing technology, and a more elastic policy and regulatory environment, a robust resource base can help mitigate swings in price. We are entering a phase in which continued deliverability of natural gas from dry (nonassociated) producing locations, which constitute the bulk of natural gas supply capacity, will be challenged by the low price environment. In testimony last year, I emphasized the shift in drilling already taking place as higher oil prices lure capital investment away from pure natural gas plays and into locations that are "liquids rich". We continue to receive pipeline imports of natural gas from Canada, and as liquefied natural gas (LNG) from other locations. But at some point, natural gas prices will rise; increased demand for low priced natural gas and stronger economic recovery will hasten that adjustment. The expectation is that the robust shale gas resource base that has been proved up along with conventional play opportunities will facilitate responsiveness. Constraints to responsiveness, such as midstream bottlenecks or policy and regulatory hurdles, would exacerbate imbalances. In the history of our natural gas industry, the U.S. has had plenty of experience with policy and regulatory induced imbalances. On the oil side, going forward, the Gulf of Mexico remains a critical component of our replenishment and deliverability system. Midstream bottlenecks are preventing cheaper crude oil and liquids from entering the market. These bottlenecks could impact dry gas deliverability since, in the low natural gas price environment, associated gas production would become more important for deliverability. Refining remains a challenging business segment.

#### Gas prices key to American chemical manufacturing competitiveness

Welo 12 What low natural gas prices mean¶ Low natural gas prices could provide an edge to U.S. chemical companies.¶ BY TOBIAS WELO, PORTFOLIO MANAGER, FIDELITY VIEWPOINTS – 07/18/2012 https://www.fidelity.com/viewpoints/what-natural-gas-prices-mean

U.S. chemical companies are among the world’s biggest consumers of natural gas—the primary raw material in countless end products, as well as the main energy source used in the manufacturing process itself. Because of their dependence on natural gas, chemical company profit margins are very sensitive to the price and supply of natural gas. Currently, both dynamics appear to be extremely favorable for U.S. chemical companies that use natural gas as a key input.¶ Large discoveries of “shale” gas—natural gas trapped in sedimentary rocks—and modern extraction techniques have let the U.S. practically eliminate imported natural gas. In 2008, 13% of the U.S. natural gas supply was imported. By 2035, it is expected to be less than 1%. In 2009, shale gas represented 16% of all U.S. natural gas production. By 2035, it is estimated to account for 47% of domestic natural gas production (see graphic, below).1 As new supplies of shale gas surged, natural gas prices dropped by half from 2005-2009, and manufacturers have benefited accordingly. In 2010, U.S. chemical exports increased 15%, turning the balance of trade from a $140 million deficit to a $4.6 billion surplus.2¶ The abundant, low-cost natural gas supply provides U.S. companies with a huge competitive advantage over their European and Asian competitors, many of which produce chemicals from more-expensive crude oil. “Shale gas is proving to be a game-changer for America’s chemistry industry, giving domestic manufacturers a significant competitive edge for the first time in years—new investments and new plants have been planned by several U.S. chemical companies,” said the American Chemistry Council’s Cal Dooley in a recent speech.1

#### Independently, the chemical industry solves multiple scenarios for extinction.

Chemical and Engineering 99 [http://pubs.acs.org/hotartcl/cenear/991206/7749spintro2.html]

The pace of change in today's world is truly incomprehensible. Science is advancing on all fronts, particularly chemistry and biology working together as they never have before to understand life in general and human beings in particular at a breathtaking pace. Technology ranging from computers and the Internet to medical devices to genetic engineering to nanotechnology is transforming our world and our existence in it. It is, in fact, a fool's mission to predict where science and technology will take us in the coming decade, let alone the coming century. We can say with finality only this: We don't know. We do know, however, that we face enormous challenges, we 6 billion humans who now inhabit Earth. In its 1998 revision of world population estimates and projections, the United Nations anticipates a world population in 2050 of 7.3 billion to 10.7 billion, with a "medium-fertility projection," considered the most likely, indicating a world population of 8.9 billion people in 2050. According to the UN, fertility now stands at 2.7 births per woman, down from 5 births per woman in the early 1950s. And fertility rates are declining in all regions of the world. That's good news. But people are living a lot longer. That is certainly good news for the individuals who are living longer, but it also poses challenges for health care and social services the world over. The 1998 UN report estimates for the first time the number of octogenarians, nonagenarians, and centenarians living today and projected for 2050. The numbers are startling. In 1998, 66 million people were aged 80 or older, about one of every 100 persons. That number is expected to increase sixfold by 2050 to reach 370 million people, or one in every 24 persons. By 2050, more than 2.2 million people will be 100 years old or older! Here is the fundamental challenge we face: The world's growing and aging population must be fed and clothed and housed and transported in ways that do not perpetuate the environmental devastation wrought by the first waves of industrialization of the 19th and 20th centuries. As we increase our output of goods and services, as we increase our consumption of energy, as we meet the imperative of raising the standard of living for the poorest among us, we must learn to carry out our economic activities sustainably. There are optimists out there, C&EN readers among them, who believe that the history of civilization is a long string of technological triumphs of humans over the limits of nature. In this view, the idea of a "carrying capacity" for Earth—a limit to the number of humans Earth's resources can support—is a fiction because technological advances will continuously obviate previously perceived limits. This view has historical merit. Dire predictions made in the 1960s about the exhaustion of resources ranging from petroleum to chromium to fresh water by the end of the 1980s or 1990s have proven utterly wrong. While I do not count myself as one of the technological pessimists who see technology as a mixed blessing at best and an unmitigated evil at worst, I do not count myself among the technological optimists either. There are environmental challenges of transcendent complexity that I fear may overcome us and our Earth before technological progress can come to our rescue. Global climate change, the accelerating destruction of terrestrial and oceanic habitats, the catastrophic loss of species across the plant and animal kingdoms—these are problems that are not obviously amenable to straightforward technological solutions. But I know this, too: Science and technology have brought us to where we are, and only science and technology, coupled with innovative social and economic thinking, can take us to where we need to be in the coming millennium. Chemists, chemistry, and the chemical industry—what we at C&EN call the chemical enterprise—will play central roles in addressing these challenges. The first section of this Special Report is a series called "Millennial Musings" in which a wide variety of representatives from the chemical enterprise share their thoughts about the future of our science and industry.

#### **Price volatility of natural gas will destroy the economy**

Spence and Prentice 2012 (David [Ass prof of Law @ U of Texas and Robert [prof of business law @ Texas];THE TRANSFORMATION OF AMERICAN ENERGY MARKETS AND THE PROBLEM OF MARKET POWER; 53 B.C. L. Rev 131; kdf)

Watching regulators grapple with the problem of market power in energy markets, one is reminded of an old joke about the economist who, while walking along a busy city sidewalk, passes by a one-hundred dollar bill lying on the ground. When asked by his friend why he did not pick up the bill, the economist responds, "That cannot be [a $ 100 bill]. If there were actually a $ 100 bill, someone would have picked it up." n361 Modern energy regulators sometimes seem to employ similarly [\*201] unrealistic assumptions about the way energy markets work. Energy markets are more competitive than ever before, yet they do not behave the way economic models suggest they should.¶ Changing conditions in the oil industry, and the move from public utility regulation to competition and market-based pricing in the natural gas and electricity industries has increased the risk that powerful actors in those markets will use market power to extract rents at the expense of consumers. Believing in the benefits of competition, regulators have tried to guard against that risk by monitoring markets and providing participants in those markets with the tools to protect themselves against price risk--tools such as energy derivatives. The relationship between physical markets for energy and energy derivatives markets, however, has created new opportunities for manipulation for savvy market participants. In a partial attempt to limit those opportunities, regulators have turned to the tools of the securities laws, regulating competition in energy and energy derivatives markets by proscribing manipulation and deceit.¶ This regulatory approach is new to energy markets. The regulators charged with implementing it (particularly the CFTC and FERC) seem inclined to follow the lead of securities regulators by focusing their enforcement attention on actors who use deceptive methods, while taking a gentler attitude toward the capture of scarcity rents by sellers who acquire market power without using deception. In securities regulation, this focus reflects the importance of information and deception in securities markets. In energy regulation, by contrast, the ability to extract rents depends more upon the capture of market power than upon deception or misleading others. Presumably, however, energy regulators are reticent about punishing the mere exercise of market power in energy markets, because they fear that doing so will discourage entry; correspondingly, they assume that high prices will invite entry and encourage consumption. Unfortunately, in some energy markets (particularly electricity markets), participants do not respond to price signals in predictable ways.¶ Ironically, then, this new approach to regulation may simultaneously permit the exercise of market power and insulate supra-competitive prices from challenges based upon traditional public utility law or antitrust law principles. This is not only an irony, but also a triumph of dynamic statutory interpretation. Both the public utility statutes and the antitrust statutes were designed to limit the exercise of market power in energy markets yet, in modern energy regulation and jurisprudence, these original statutory objectives have been overtaken [\*202] by modern economic thinking about the costs and benefits of market power, and ways to address those costs and benefits.¶ Of course, modern American energy markets are still evolving, and regulators are evolving along with them, if usually a step or two behind. It is possible that these efforts will eventually bear fruit, that regulators will find better ways to identify and deter market power, and that energy markets will begin to behave in ways that are consistent with traditional economic expectations. Perhaps new limits on the use of energy derivatives imposed by the 2010 Dodd-Frank law will make energy derivatives markets more responsive to market fundamentals and less volatile. Perhaps the CFTC will decide to use its already-existing authority more aggressively to punish attempts to corner energy markets in the absence of deception. Perhaps FERC's market monitoring and mitigation efforts will grow more effective over time. n362 Perhaps courts will find more ways to punish egregious examples of naked market power manipulation in energy markets (as they have in securities markets), by inferring or imputing the presence of deception in those cases.¶ In any case, it seems unlikely that politicians and regulators will permit poorly functioning markets to persist for very long. It is often said that energy is the lifeblood of the economy, n363 and consumers will not tolerate high energy prices for sustained periods of time. At some point, politicians or FERC may lose faith in the ability of market-based rates to satisfy the "just and reasonable" standard in natural gas and/or electricity markets, or in the ability of hedgers to use derivatives to protect consumers against high prices and price volatility. For the immediate future, however, it seems that the CFTC and FERC plan on continuing to take a relatively light-handed approach to the problem of market power in energy markets.

#### Economic decline leads to multiple scenarios for nuclear war

Burrows and Harris ‘09 (Mathew J. Burrows, counselor in the National Intelligence Council, PhD in European History from Cambridge University, and Jennifer Harris, a member of the NIC’s Long Range Analysis Unit, April 2009 “Revisiting the Future: Geopolitical Effects of the Financial Crisis” http://www.twq.com/09april/docs/09apr\_Burrows.pdf)

Of course, the report encompasses more than economics and indeed believes the future is likely to be the result of a number of intersecting and interlocking forces. With so many possible permutations of outcomes, each with ample opportunity for unintended consequences, there is a growing sense of insecurity. Even so, history may be more instructive than ever. While we continue to believe that the Great Depression is not likely to be repeated, the lessons to be drawn from that period include the harmful effects on fledgling democracies and multiethnic societies (think Central Europe in 1920s and 1930s) and on the sustainability of multilateral institutions (think League of Nations in the same period). There is no reason to think that this would not be true in the twenty-first as much as in the twentieth century. For that reason, the ways in which the potential for greater conflict could grow would seem to be even more apt in a constantly volatile economic environment as they would be if change would be steadier. In surveying those risks, the report stressed the likelihood that terrorism and nonproliferation will remain priorities even as resource issues move up on the international agenda. Terrorism’s appeal will decline if economic growth continues in the Middle East and youth unemployment is reduced. For those terrorist groups that remain active in 2025, however, the diffusion of technologies and scientific knowledge will place some of the world’s most dangerous capabilities within their reach. Terrorist groups in 2025 will likely be a combination of descendants of long established groupsinheriting organizational structures, command and control processes, and training procedures necessary to conduct sophisticated attacksand newly emergent collections of the angry and disenfranchised that become self-radicalized, particularly in the absence of economic outlets that would become narrower in an economic downturn. The most dangerous casualty of any economically-induced drawdown of U.S. military presence would almost certainly be the Middle East. Although Iran’s acquisition of nuclear weapons is not inevitable, worries about a nuclear-armed Iran could lead states in the region to develop new security arrangements with external powers, acquire additional weapons, and consider pursuing their own nuclear ambitions. It is not clear that the type of stable deterrent relationship that existed between the great powers for most of the Cold War would emerge naturally in the Middle East with a nuclear Iran. Episodes of low intensity conflict and terrorism taking place under a nuclear umbrella could lead to an unintended escalation and broader conflict if clear red lines between those states involved are not well established. The close proximity of potential nuclear rivals combined with underdeveloped surveillance capabilities and mobile dual-capable Iranian missile systems also will produce inherent difficulties in achieving reliable indications and warning of an impending nuclear attack. The lack of strategic depth in neighboring states like Israel, short warning and missile flight times, and uncertainty of Iranian intentions may place more focus on preemption rather than defense, potentially leading to escalating crises Types of conflict that the world continues to experience, such as over resources, could reemerge, particularly if protectionism grows and there is a resort to neo-mercantilist practices. Perceptions of renewed energy scarcity will drive countries to take actions to assure their future access to energy supplies. In the worst case, this could result in interstate conflicts if government leaders deem assured access to energy resources, for example, to be essential for maintaining domestic stability and the survival of their regime. Even actions short of war, however, will have important geopolitical implications. Maritime security concerns are providing a rationale for naval buildups and modernization efforts, such as China’s and India’s development of blue water naval capabilities. If the fiscal stimulus focus for these countries indeed turns inward, one of the most obvious funding targets may be military. Buildup of regional naval capabilities could lead to increased tensions, rivalries, and counterbalancing moves, but it also will create opportunities for multinational cooperation in protecting critical sea lanes. With water also becoming scarcer in Asia and the Middle East, cooperation to manage changing water resources is likely to be increasingly difficult both within and between states in a more dog-eat-dog world.

### THUS THE PLAN

The United States Federal Government should clarify that natural gas pipeline projects will be evaluated on a case-by-case approach removing the bias toward incremental pricing. Incremental pricing will apply to projects that provide benefits only to new customers, projects that provide benefits for only existing customers will use rolled in pricing mechanisms, and projects that benefit both new and existing customers will be financed using a fair allocation of the costs based on cost-causation and benefits received.

### Solvency

#### Next, Solvency-

#### Current FERC policy sends mixed price signals deterring investment- the plan’s pricing rules can provide the incentives necessary for pipeline infrastructure expansion

Tye and Garcia 07 Copyright (c) 2007 Federal Energy Bar Association¶ Energy Law Journal¶ 2007¶ 28 Energy L. J. 1¶ LENGTH: 22979 words¶ ARTICLE: WHO PAYS, WHO BENEFITS, AND ADEQUATE INVESTMENT IN NATURAL GAS INFRASTRUCTURE¶ NAME: William B. Tye \*Jose Antonio Garcia \*\*¶ BIO: \* William B. Tye is a Principal at The Brattle Group in Washington DC. Ph.D. in economics from Harvard University. He specializes in regulatory and antitrust issues. Dr. Garcia is a Senior Associate at The Brattle Group's Washington DC office

The 1999 Policy Statement sets out a "threshold requirement" in establishing the public convenience and necessity for existing pipelines proposing an expansion project. n115 The threshold requirement established that pipelines must prove that the project can proceed without "subsidies" from their existing customers. n116 According to the Commission, this will generally mean that expansions will be priced incrementally so that expansion shippers will have to pay the full costs of the project, without subsidy from the existing customers through rolled-in pricing. n117¶ If this threshold requirement is interpreted literally to enforce a generalized bias in favor of incremental pricing, it would not constitute an appropriate general standard for establishing the public convenience and necessity for pipelines proposing an expansion project. The appropriate test for public convenience and necessity should consider not only the benefits that can be financed out of charges to new customers, but all the costs and benefits of a project. The Commission recognizes this problem when it discusses what it believes to be the weakness of the prior policy of relying chiefly on contracts to demonstrate demand for an expansion project:¶ ¶ the reliance solely on long-term contracts to demonstrate demand does not test for all the public benefits that can be achieved by a proposed project. The public benefits may include such factors as the environmental advantages of gas over other fuels, lower fuel costs, access to new supply sources or the connection of new supply to the interstate grid, the elimination of pipeline facility constraints, better service from access to competitive transportation options, and the need for an [\*30] adequate pipeline infrastructure. The amount of capacity under contract is not a good indicator of all these benefits. n118¶ ¶ A bias in favor of incremental pricing arising from literal application of the "threshold requirement" to all circumstances is not consistent with economic efficiency, because it fails to consider that many projects create significant benefits that go beyond direct benefits to incremental customers.¶ Commissioner Bailey's dissent from the 1999 Policy Statement points to the problem. As the policy initially appeared to read, it is a "threshold requirement" that the project can proceed without subsidies from their existing customers, which "will usually mean that the project would be incrementally priced ... ." n119 As Commissioner Bailey noted, "There is too little recognition here that some types of construction projects are not designed solely for new markets or customers, that existing customers can benefit from some projects, and that rolled-in pricing may still be appropriate." n120¶ Perhaps in response to this concern, the clarification of the 1999 Policy Statement later recognized the fact that some projects combine an expansion for new service with improvements for existing customers. n121 Clearly, however, a policy biased in favor of incremental pricing would never account for such benefits if the "threshold question" is whether the project can proceed without "subsidies" from their existing customers, which will usually require that the project be incrementally priced. Such projects might never get past the threshold, if it is taken literally. n122¶ A "threshold requirement," if it has any application, should apply only to projects that benefit new customers only. Rather than use the threshold test to create a bias towards projects that can only be financed incrementally, the appropriate test is to ensure that total benefits to existing customers, new customers, and the public justify the costs of the project. By failing to consider benefits to both new and existing customers, a bias in favor of incremental pricing regardless of circumstances sends the wrong price signals to the market. It leads to inefficient investment and contracting decisions that discourage investments in pipeline infrastructure that would also provide system benefits, grid efficiency, and reliability. Hybrid projects that confer benefits on both new and existing customers may never get constructed if the "threshold requirement" is taken literally, because it requires that only new customers pay for the benefits they receive. n123 The remedy for this possible confusion is relatively simple and is consistent with the 1999 Policy Statement. Cost recovery must follow benefit creation whenever it is possible (i.e., the parties who cause the need for or receive the [\*31] benefit from new investment should pay the costs). The simplest case is one in which the investment grants benefits only to existing ratepayers. Here, the only real solution is to roll-in the costs. Likewise, a project that confers benefits only on new ratepayers could be financed by incremental treatment to hold existing ratepayers harmless. The in-between cases, where benefits are conferred on existing and new customers should be dealt with on a case-by-case approach to allocate the costs fairly.¶ Administrative and regulatory costs are also a factor. Depending on the facts, the two approaches can have significant differences with regard to the burdens they place on regulators and their staff, the potential for regulatory in-fighting and gaming, and encouragement of strategic behavior by the parties. Many other factors can enter in as a practical matter, and can be dealt with under an unbiased, flexible approach.¶ Correcting the possible confusion arising from a literal application of the "threshold requirement" can be readily achieved within the context of the 1999 Policy Statement. The Commission's "Clarification Order," makes clear that there are three types of expansion projects. n124 Further, footnote 12 of the original Order clearly indicates that "projects designed to improve existing service for existing customers ..." should be granted rolled-in treatment. n125 The Commission needs only to clarify that the "threshold requirement," if it implies a bias in favor of incremental pricing, should apply only to its first category of projects - expansion projects designated to serve only new customers. The balanced approach we recommend can thus be easily accommodated without revising the 1999 Policy Statement. Indeed, actual cases often reflect this more sensible approach as discussed above.

#### Removing the bias towards incremental pricing key to solve gas price volatility

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The natural gas industry is currently facing closely interrelated concerns. Short-term and long-term issues are mainly price volatility, lack of adequate basic infrastructure connecting supply sources with final demand, and tight supply. Whereas tight supply might motivate price spikes, underinvestment in basic infrastructure, both storage and transmission, contributes to the problem. These legitimate challenges need to be addressed to ensure that there is sufficient infrastructure in place in advance of when it is needed. The Commission's Order No. 636 and Order No. 637, by granting greater flexibility to shippers in the delivery of gas across a pipeline system, has blurred the difference between what customers under "old" contracts can do with their capacity rights and what a shipper under a "new" incremental contract can do. n158 By failing to impose costs on existing customers, any bias in favor of incremental pricing may push too many costs onto new users, while existing customers enjoy benefits at no cost. The result of allocating no costs to existing customers would discourage the development of needed basic infrastructure. The inability of the market to improve the core energy infrastructure will lead to more recurrent and severe crises, reinforce price volatility, and dramatically increase risk in the market.¶ Cost recovery should follow benefit creation whenever it is possible, without bias toward rolled-in or incremental pricing. The simplest case is one in which the investment grants benefits only to existing ratepayers. Here, the only real solution as the Commission recognizes, is to roll-in the costs. At the other extreme we have the projects that confer benefits only on new ratepayers. In principle, unless there are extenuating circumstances, brand-new pipeline projects or expansion projects that are not part of a mainline system and are undertaken only for new customers should be financed on an incremental basis. Finally, the in-between cases, where benefits are conferred on pre-existing and new customers, should be dealt with on a case-by-case approach to allocate the costs fairly. In actual gas markets characterized by underinvestment in basic core infrastructure, the huge cost of not having enough justifies implementation of an unbiased pricing policy.¶ Correcting any perceived general bias in favor of incremental pricing can be easily accomplished within the framework of the 1999 Policy Statement. To erase all doubt, the Commission should clarify that projects will be evaluated by an unbiased case-by-case approach that differs according to the three circumstances identified by the Commission in its Clarification Order. Any bias toward incremental pricing would apply only to projects that provide benefits only to new customers. As always, projects to create system benefits for existing [\*42] customers would be automatically rolled in. Hybrid projects would be financed by a fair allocation of the costs based on cost-causation and benefits received. The implementation of these policies could be improved by clarifying the implementation of some of the methodologies to eliminate uncertainties and possible errors, as discussed above. The recent EPAct 2005 has not provided any further clarification on the practical implementation of the threshold requirement for pipelines proposing new gas infrastructure projects.

#### The plan is critical to massive investment in natural gas infrastructure- regulatory reform solves bottlenecks and prevents system failures and results in pipeline expansion

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The issue of who should pay for natural gas pipeline capacity expansions and how the rates should be structured has been a subject of debate among interested parties during the past few years. The issue is whether the cost of a pipeline expansion should be borne only by the new expansion customers (incremental rates), or whether a pipeline company can spread the cost of providing the new service over all its customers, both existing and new (rolled-in rates).¶ On September 15, 1999, the Federal Energy Regulatory Commission (the FERC or the Commission) issued a Policy Statement, Certification of New Interstate Natural Gas Pipeline Facilities (1999 Policy Statement). n1 The 1999 [\*3] Policy Statement was a refinement of a policy statement issued in 1995 (1995 Policy Statement). n2 Before the FERC's 1999 Policy Statement, the Commission applied a presumption in favor of rolled-in rates when the cost impact of the new facilities would result in a rate impact on existing customers of five percent or less and some system benefits would occur. The 1999 Policy Statement, on the other hand, established that the threshold applicable to existing pipelines is whether the project can proceed without subsidies from their existing customers. This generally means that expansion projects will be priced incrementally, so that expansion shippers will have to pay the full costs of the project, without subsidy from existing customers that could lead to uneconomic expansion and discourage entry by new pipeline companies. However, the 1999 Policy Statement acknowledges that there are cases where costs can be rolled-in (for instance, "inexpensive expansibility" made possible because of earlier costly construction, existence of vintage capacity, or where facilities are needed only to improve service for existing customers). n3 The absence of pipeline-to-pipeline competition has also been presented as a justification to permit rolled-in pricing.¶ The relevant academic literature on pricing of capacity pipeline expansions, as well as the more general literature on public utility pricing, shows that the desirability of rolled-in or incremental pricing as the most efficient and equitable policy depends on the particular characteristics of the project at issue and the particular ratemaking goals the author treats as paramount. It also supports the idea of considering all of the costs and benefits of a project in the test of public convenience and necessity. Any bias in favor of incremental pricing might then prove as harmful as any bias in favor of rolled-in treatment. An analysis of the relevant economic principles and their implementation in specific cases leads to the conclusion that a generalized bias towards incremental pricing is neither economically efficient nor equitable: (i) forcing pipelines to support new projects financially without relying on charges from existing customers fails to consider that many projects create significant benefits that go beyond just direct benefits to incremental customers; (ii) it may promote inefficient subsidization from new customers to existing customers; (iii) it would promote a risk-reward imbalance among industry participants that would strongly discourage the investment in pipeline infrastructure necessary to achieve system benefits and grid efficiency; (iv) it may promote undue discrimination in favor of existing customers who impose the same incremental costs but pay lower rates; and (v) it fails to achieve an equitable sharing of the costs and benefits of new additions since existing customers do not pay for the benefits they enjoy.¶ The natural gas industry is currently facing short-term and long-term interrelated concerns that can have disastrous consequences on domestic manufacturing competitiveness and consumer benefits: mainly, price spikes and price volatility, lack of adequate basic infrastructure connecting supply with demand, insufficient gas supply and the high vulnerability to a numerous range of hazards (for instance, coordinated terrorist attacks on energy infrastructures, [\*4] natural disasters - hurricanes, earthquakes, floods, landslides, forest fires - or unintentional human errors).¶ The burden of the risk of cost recovery under incremental pricing, the forced roll-in of successful projects - i.e., projects in which incremental revenues are in excess of incremental costs - to confer their net benefit to existing customers, the possibility of later switching methods under "changed circumstances," the reluctance of pipeline customers to sign long-term contracts and the increased contractual flexibility granted to shippers during the last five years due to the Commission's open access policies Order 636 n4 and Order 637 n5 will tend to discourage the efficient investment of pipeline expansion to prevent bottlenecks, to assure system reliability, and to serve future demand additions. The huge cost of not having enough investment in core infrastructures justifies the immediate reconsideration of any policy that would create a bias in favor of incremental pricing. The implementation of an unbiased pricing policy will provide better incentives to the market participants to invest in needed basic infrastructures that will ultimately increase the flexibility of the energy system. This flexibility adds both reliability and security to the energy network.

#### Expanded infrastructure key to successful flaring reduction

Farina 2010 (Michael; Leader, Fuels Center for Excellence Global Strategy and Planning GE Flare Gas Reduction; <http://www.ge-energy.com/content/multimedia/_files/downloads/GE%20Flare%20Gas%20Reduction%2001-24-2011.pdf>

The technology to address the problem¶ exists today and the policy reforms required¶ are largely understood. However, deeper¶ issues regarding infrastructure development¶ and market design hinder progress in the¶ places where gas flaring is most rampant.¶ Many constructive efforts to reduce flaring¶ are underway, yet on the current path it¶ will likely take a decade or more to minimize¶ this wasteful practice. However, with greater¶ global attention and concerted action, largescale¶ gas flaring can be largely eliminated¶ in as little as five years.