**Observation 1 is the status quo –**

***Federal fracking restrictions are overlapping, impose unnecessary costs and stifle investment, causing massive price spikes and decreased production– Specifically:***

***A) EPA’s air pollution restrictions***

**Pyle ‘12**

Thomas J. Pyle, President, Institute for Energy Research (IER), National Journal, 4-23-12, Regulating Natural Gas: What's the Right Balance?, <http://energy.nationaljournal.com/2012/04/regulating-natural-gas-whats-t.php>, jj

***EPA's Flawed Rule Warrants Scrutiny***

**EPA’s proposed rule, called** “Oil and Natural Gas Sector: ***N*ew *S*ource *P*erformance *S*tandards** **and *N*ational *E*mission *S*tandards for *H*azardous *A*ir *P*ollutants Reviews**,” was first proposed as a result of a deal with environmental groups and **will bring several sources that have never been subject to federal regulation before under the yoke of the agency.** In amending the NSPS and NESHAP standards in its rule, **the EPA will bring an estimated 1.1 million wells that are already producing oil and gas under regulation, as well as 500,000 existing gas wells and the 11,400 new gas wells being drilled each year.** **The proposed rules also apply to approximately 600 natural gas processing plants, 3,000 compressor stations and 1.5 million miles of pipelines.** The problems with EPA’s rationale for wanting to bring these new sources under regulation are numerous. For example, although the proposed rules do not purport to regulate methane emissions, EPA states that the rule will yield about $1.6 billion in health and environmental benefits by reducing methane. However, according to a 2011 study by IHS-CERA, **EPA’s analysis of how much methane is emitted by drilling and completing unconventional gas wells “lacks rigor” and “is at odds with industry practice and with health and safety considerations at the well site.”** Namely, IHS-CERA found that **EPA based its methane emissions estimates on just four unaudited data points, “each of which was generated on the basis on multiple assumptions and rounded to the nearest hundred, thousand, or ten thousand million cubic feet prior to averaging**.” Three of these data points describe methane that was captured for sale, rather than methane that was emitted. **EPA also incorrectly made the assumption that all gas produced during well completions is vented into the atmosphere, rather than flared, unless it is required by state regulation**. However, **the study notes that cold venting of methane into the atmosphere is not standard industry practice, nor would it be acceptable for the safe operation of drilling sites**. Because of these problems, IHS-CERA concluded that **the benefits of EPA’s proposed rule are “overstated in terms of reducing air pollution and emissions of GHG,” and indeed, EPA’s analysis does not model the atmospheric temperature impact its rule would have.** Moreover, **by EPA’s own omission, the agency cannot model the public health impacts that would be addressed by its regulations**—although this is supposedly the genesis of the deal it struck with environmental groups. EPA writes, “with the data available, we are not able to provide credible health benefit estimates for the reduction in exposure to [hazardous air pollutants], ozone and [particulate matter] (2.5 microns and less) (PM2.5) for these rules.” Supportive data prior to proposing new regulations should be prerequisite, and the mere assertion that there will be health benefits is insufficient proof that a need exists. According to President Obama’s own Executive Order 13563, the regulatory system must be based on the “best available science,” and EPA’s failure to quantitatively assess the health effects is prima facie evidence that its rule is based on false promises of health benefits. **Lastly, EPA’s rule seems to ignore economic realities** that seem blatantly obvious to even those unfamiliar with the concept of incentives. For example, the agency claims the capture of 3.4 million tons of recovered natural gas will actually benefit the natural gas industry to the tune of $30 million annually, which will end up offsetting the compliance costs**. If industry can make a profit off of capturing natural gas, however, why would it need government regulation to make it do so? It makes no logical sense for companies to ignore technology that allows them to earn higher profits through efficiency, if it were truly that easy**. In reality, **these rules divert investments from capital and energy development into regulatory compliance efforts, and impose onerous notification, record keeping, monitoring, reporting, and performance testing requirements that industry will necessarily incur costs to keep up with**. **These costs**, however, **do not figure in EPA’s cost-benefit analysis. These are but a few of the methodological problems that are rife in EPA’s proposed regulations for oil and natural gas well emissions, illustrating that the agency’s broken model cannot be expected to do what it says it will do**. **An infinitely more practical alternative that the agency did not consider would be to continue to make progress through the voluntary programs that already exist to encourage the development of better emissions curbing practices, such at the Natural Gas STAR program overseen by EPA since 1993**. EPA’s own website touts the successes of the program: “Since 1993, the Program's domestic partners have eliminated more than 904 billion cubic feet (Bcf) of methane emissions through the implementation of approximately 150 cost-effective technologies and practices.” **These successes in reductions and sequestrations call into question the need for a command and control regime like the one EPA has proposed.** Moreover, through both their proximity to the affected facilities and their intimate knowledge of local resources, **state regulators are in a much better position to regulate toxic air emissions than a federal agency**. In testimony before the Senate Energy and Natural Resources Committee, Daniel Yergin, a member of the federal government’s Natural Gas Subcommittee of the Secretary of Energy’s Advisory Board, remarked, “**there is a tendency to assume that this isn’t going on but it’s been going on for decades. The states are the leader and bring that long experience to it**.” He also noted that **federal regulation can result in “a kind of super structure on top of a superstructure that would make investment more difficult, would take a much longer time to get things done, and move farther away from communities.**” Indeed, **because of the highly localized nature of air quality responses and the variances in well locations, the flexibility afforded by allowing states to tailor their own regulations according to their needs can result in the same reductions with better cost-effectiveness.** Modern energy production was pioneered and advanced in the United States, and **it is important that our regulatory system help—not harm—our ability to continue producing safe, affordable energy here at home**. **EPA’s proposed oil and gas emissions rule would impede the ability of industry to make use of the technology that has led to natural gas prices being the lowest in a decade, and imposes unnecessary costs on doing business based on shaky assumptions and vague authority.**

***B) Interior Department restrictions***

**Platts ‘12**

Platts is a leading global provider of energy, petrochemicals and metals information, and a premier source of benchmark price assessments for those commodity markets. Since 1909, Platts has provided information and insights that help customers make sound trading and business decisions and enable the markets to perform with greater transparency and efficiency.

6-18, Proposed BLM fracking rule has no scientific basis: IECA, <http://www.platts.com/RSSFeedDetailedNews/RSSFeed/NaturalGas/6394906>, jj

**The federal Interior Department's proposal to regulate hydraulic fracturing on federal lands has no scientific basis**, the president of the Industrial Energy Consumers of America said Monday. "**There is no scientific data to support the need for these regulations**," IECA President Paul Cicio said. Cicio said **the proposed rule, announced by Interior's Bureau of Land Management on May 4, would duplicate existing state regulation of fracking as well as the voluntary reporting of the chemical formulations of fracking fluid done by exploration-and-production companies.** "**What is of great concern to us is why the Department of the Interior is doing this without a good reason**," he said. "There is no science supporting this. **So why should we have new regulations**?" In a letter Friday to Interior Secretary Ken Salazar, Cicio urged the department to refrain from imposing additional fracking regulation on oil and gas producers operating on BLM-administered land. **The proposed rule is expected to apply to 700 million subsurface acres of federal estate and 56 million subsurface acres of Indian mineral estate, mostly across 12 Western states.** "It is of great concern to us that BLM provides no supporting scientific data on hydraulic fracturing, well-stimulation incidents, or problems that justify new overarching regulation," Cicio wrote to Salazar. Cicio told Platts that he worried that **the imposition of additional regulations on the production of energy from federal lands could result in a slowdown in gas and oil drilling and ultimately production from those lands.** "**We as consumers have been impacted before by BLM**," he said. From 2000 to 2005, "**natural gas prices doubled then tripled,**" Cicio said. "**During that time the DOI permitting system had thousands of drilling permit backlogs. There was plenty of gas, but regulations were preventing natural gas companies from drilling. This is a repeat performance**," he said. Since the Interior Department announced the proposed rule in May, a **number of oil and gas producer associations and state and federal politicians representing Western states have voiced their objections to the proposed new federal regulation of fracking**.

***C) Wastewater restrictions***

**Oil & Gas Monitor ‘12**

4-11, Industry Must Prepare for Fracking Wastewater Regulations, <http://www.oilgasmonitor.com/industry-prepare-fracking-wastewater-regulations/1723/>, jj

**The EPA continues to closely examine hydraulic fracturing practices and, therefore, the industry will soon be forced to come to terms with a** yet- to-be-defined **national standard for the management and treatment of wastewater flowback**. **The liability will likely be retroactive**. Companies that actively engage the government while it is developing these laws and regulations will be ahead of the curve and profit by establishing themselves as industry leaders. In a hearing before the Senate Subcommittee on Water and Power on October 20, 2012, Cynthia Dougherty, the EPA’s Director of Ground Water and Drinking Water Office, signaled that **the EPA should be expected to extend its reach in regulating wastewater produced by hydraulic fracturing**. **Currently, the natural gas industry conducts exploration and production under the assumption that they are protected from liability by an exemption to the Safe Drinking Water Act** (SDWA). However, fracking has not been exempted from the federal standards stipulated by Sections 301(b) and 402(a) of the Clean Water Act (CWA) nor from the SDWA’s Underground Injection Control (UIC) program. Shale gas and the practice of hydraulic fracturing used to harvest it has been identified as a necessary resource for the U.S. to become energy independent. It is also promoted heavily in halls of Washington, D.C., as a clean and environmentally sound energy resource that will develop hundreds of thousands of new jobs. However, an in depth analysis has yet to be completed by the federal government on the environmental impact of fracking wastewater or the impact that such heavy loads place on publicly owned treatment works (POTWs), or, more importantly, on the watersheds where they discharge. The EPA is set to release its congressionally mandated study on the effects of hydraulic fracturing in late 2012 with another report detailing “case studies and toxicological analysis” to be completed in 2014.[1] The fundamental research questions posed in this study revolve around fracking’s effects on water at all stages in the operational cycle of harvesting natural gas and will form the basis for a comprehensive regulatory effort. **While** President **Obama outlined in his 2012 State of the Union address that his Administration will promote the development of the shale gas as a key principle of his “Blueprint for an America Built to Last,” it is no secret in Washington that his energy policies are guided first and foremost by his environmental interests.** **A quick look at the recent** Bureau of Land Management (**BLM) proposed rule for fracking on public lands and the current hold on XL pipeline illustrate where this Administration really stands on energy independence and job creation**. **Natural gas may be clean burning, but it is still a fossil fuel and fodder for environmental groups and news outlets to generate highly emotional arguments based on few facts. The resulting feelings in Congress are mixed**. The need for energy independence and the desire for clean energy continue, but **environmental safety and public safety have become chief concerns**. On one hand, they hear the American Petroleum Institute Vice President Kyle Isakower say that ***in light of the states various regulatory authorities “adding potentially redundant and duplicative federal regulation would be unnecessary, costly, and could stifle investment.***[2]” On the other hand, they hear about environmental liability and public safety. Industry leaders and even some **public officials have citied the fact that there is no proven case that fracking has contaminated a water supply as evidence that current regulations are sufficient**. But the political reality is that regulatory changes can alter the entire liability landscape – even for operational practices that have been commonly accepted for a long time. Case in point: EPA’s recent pursuit of a hazardous waste classification for coal ash. Safety record or not, fracking companies have ultimate responsibility for the disposal of their wastewater and they will be held liable for any pollution or damages caused by that wastewater in perpetuity. ***The growth of the industry and expansion of operations across state lines guarantee that federal regulations are all but certain***. On March 6, 2012, BLM Director Bob Abbey testified before the House Appropriations Interior-Environment Subcommittee about pending regulations focused on wastewater from fracking on public lands and its management. Members of Congress in the hearing called for “one set of rules” for public and private lands.[3] Thus, **industry can expect to see every agency in the federal arsenal to be used to push regulations designed for public lands onto private lands as well**. Enter the EPA’s Clean Water Act.

***There’s a glut of natural gas now, but regulations will make prices volatile despite this.***

**Faulkner ‘12**

Chris Faulkner is the Founder, President and CEO of Breitling Oil and Gas, an independent oil and natural gas company based in Irving, Texas. Founded in 2004, Breitling Oil and Gas employs state-of-the-art petroleum and natural gas exploration and extraction technologies for the development of onshore oil and gas projects.

August 13, 2012, Breitling Oil & Gas, “Contemplating the Natural Gas Market: Start with the Fracking Facts” <http://www.breitlingoilandgas.com/contemplating-the-natural-gas-market-start-with-the-fracking-facts/>, jj

Regardless, the sad truth is that the facts have done little to quiet the hue and cry over fracking, so **it behooves us to look at the potential regulatory fallout of this controversy and how it could impact the natural gas market**. **It’s hard to overstate the importance of fracking to the natural gas industry—it is, quite simply, the only method that gives us access to US reserves today. There are no more domestic reserves accessible via old fashioned vertical drill methods, and there haven’t been for decades.** So, a big question on my mind when I’m making investment decisions is whether oil companies such as Atlas Energy (NYSE: ATLS), Continental Resources (NYSE: CLR), Chesapeake Energy (NYSE: CHK), Range Resource (NYSE: RRC), Southwestern Energy (NYSE: SWN), Carrizo Oil & Gas (NASDAQ: CRZO) and many others will be able to reach the reserves they’ve already included in their investor reports. **Over-regulation to the point that the cost of drilling outweighs the potential profit** or an outright moratorium **on fracking would wreck havoc on those company projections**. This is somewhat similar to what happened recently with the Marcellus shale, when the USGS lowered its natural gas reserve estimates by 60%. In the case of the restated Marcellus estimates, the result was an increase on the commodity price of natural gas. Counterbalanced by the oversupply in the market, the price increase was short-lived, but **if US reserves are completely cut off by unreasonable regulation, the supply glut won’t be enough to keep the price down.** The likelihood of increased regulation is uncertain. After the EPA concluded in 2004 that there was no credible evidence of environmental impacts from fracking operations and Congress exempted fracking from federal drinking water regulations in 2005, the issue was re-ignited by Josh Fox’s hyperbolic and inaccurate “Gasland” documentary. Riding the momentum of renewed notoriety and heightened media and public interest, fracking opponents successfully lobbied the EPA to once again study the environmental impacts and numerous bills have since been introduced to increase fracking regulation. Many states have opposed further federal regulation, however, and local municipalities have moved to regulate the practice within their own jurisdictions. Attempts to ban the practice have already been met with constitutional challenges. Most recently, President **Obama issued an executive order establishing an inter-agency working group to coordinate the 13 federal agencies studying and considering regulating the natural gas industry.** At the same time, **this country is deeply invested** – financially, politically, and emotionally **– in finding and using cleaner energy alternatives, and natural gas is among the cleanest and most cost-effective**. According to the EPA, natural gas produces half as much carbon dioxide as coal when burned for power generation, for example. Nuclear energy meets current standards for carbon emissions, but power generated through nuclear energy is 4 to 5 times more expensive than power generated by natural gas. And, though **natural gas-powered vehicles are still in their infancy**, I can’t recall ever seeing a market-ready nuclear-powered car. (Okay, Cadillac introduced a really futuristic-looking, sleek beauty at the 2009 Chicago Auto Show, but it didn’t actually have a working reactor. Truly a concept car, it was designed based on the theoretic possibility of using a thorium-fueled reactor. With natural gas-powered vehicles already on the road and in the production line, I think we have to give this green advancement to natural gas.) Naturally, I’m biased in favor of, and hoping and believing, that **a reasonable compromise can be reached that will allow operators to access domestic reserves in a cost-effective manner that meets government standards sufficient to protect the environment and the public**. And I think **we’ll get to that compromise by remembering to stay focused on the facts and paying attention to the actual standards already in place. In the meantime, this volatility over fracking regulation will continue to contribute to the volatility of natural gas commodity prices.**

***Investment helps companies survive the glut in the short term.***

**Kientz ‘12**

Robert has been an investor for many years and has 7 years experience working as a corporate auditor and has 13 years corporate working experience. Robert earned his Series 6, 63, and 7 licenses 10 years ago while working as a broker dealer for a large, multinational company. In addition, Robert earned a Series 3 options license in 2009 while working for a forex broker. Robert formed a real estate property management firm in 2000 to assist property owners in the North Texas area to increase their profits by providing high quality, best of market rentals for their tenants. Since founding, Robert has reduced vacancies by an average of 2 months per year per property, and increased cash flow by increasing rental demand and therefore timely rent payments. By renovating existing rental inventory to best of market and expanding property marketing techniques, the real estate company locates the best tenants and keeps revenues consistent in a tough real estate market. After working in finance and corporate audit for many years, Robert retired to become a full time property manager, real estate investor, trader, and author. Robert started the Drop Shadow website (http://www.thedropshadow.com) in 2010. As a former corporate auditor, Robert possesses a unique view into business operations and controls and how they affect and interact with the strategic business plans of the company. The experience in Audit taught Robert various best of business practices, whose application to his investment strategies increased revenues and efficiency while reducing costly overhead.

8-28, Forex Pros, Investing In Natural Gas, Part 2, <http://www.forexpros.com/analysis/investing-in-natural-gas,-part-2-134421>, jj

Like **many** of the ***n*atural-*g*as companies** engaged in build-out phases, Golar **has a short term cash crunch that will need to be financed**, **which could put pressure on profits and share price near term**. In addition, **the company faces pressure from currency conversions and floating interest rates that may reduce margins in the wake of current global economic conditions.**

***And, regulatory certainty is key to exports.***

**Ebinger et. al ‘12**

Charles Ebinger is a senior fellow and director of the Energy Security Initiative at Brookings. He has more than 35 years of experience specializing in international and domestic energy markets (oil, gas, coal, and nuclear) and the geopolitics of energy, and has served as an energy policy advisor to over 50 governments. He has served as an adjunct professor in energy economics at the Johns Hopkins School of Advanced International Studies and Georgetown University’s Walsh School of Foreign Service.

Kevin Massy is Assistant Director of the Energy Security Initiative at Brookings where he manages research into international energy relations and domestic energy policy. A former writer for the Economist magazine on energy and technology, he has an MSFS in International Business and Commerce from Georgetown University, an MA in International Journalism from City University, London, and a BA from the University of Newcastle.

Govinda Avasarala is a Senior Research Assistant in the Energy Security Initiative at Brookings. His research focuses on the geopolitics of energy in emerging markets, domestic and international oil and natural gas markets, and multilateral energy frameworks. He has a BSc in Economics from the University of Mary Washington.

Energy Security Initiative @ Brookings, Liquid Markets: Assessing the Case for U.S. Exports of Liquefied Natural Gas, May, <http://www.brookings.edu/~/media/research/files/papers/2012/1/natural%20gas%20ebinger/natural_gas_ebinger.pdf>, jj

Environment, Regulations, and the Feasibility of LNG Exports While several studies are ongoing into the effects of shale gas production on the environment, there has been no conclusive evidence found to date that links the practice of fracking to ground water contamination or increased seismic activity. **As long as the current regulatory environment re- mains, shale gas development is likely to continue to produce the volumes that will make LNG exports feasible.** However, **a change in the regulatory landscape that imposes additional costs on producers could make marginal shale gas prospects uneconomic, reducing the size of the economically recoverable resource, thereby negatively affecting the feasibility of LNG exports**. Conversely, well developed regulations, possibly based on sustainable best practice, could provide benefit to the public, the environment and industry. The recent announcement by the Obama Administration— in which it allocated $45 million to an interagency research and development program between the Department of Energy, Interior, and the EPA to identify ways to reduce the environmental impact of shale gas production—suggests that the Administration supports the sustainable development of shale gas resources.

***This keeps the industry healthy long term***

**Passwaters**, 6/18/20**12** (Mark, SNL Energy Gas Utility Week, “Shell executive: LNG exports to Asia hold key to breaking production glut, LexisNexis, ts)

HIGHLIGHT: **LNG exports to Asia could provide a way out of an oversupplied market for North America**, according to the director of Royal Dutch Shell plc's upstream division. LNG exports to Asia could provide a way out of an oversupplied market for North America, the director of Royal Dutch Shell plc's upstream division said in a recent speech. Speaking June 7 to the Canadian American Business Council in Washington, D.C., Marvin Odum said **the growing global demand for energy is being paced by Asia, with China leading the way. "China has said it will more than double natural gas as a percentage share of its primary energy use by 2015. It could triple by 2020**," he said. "We at Shell see China driving 50% of the world's growth in natural gas demand over that same period of time." Odum said the **increasing Asian demand for energy could be the boost gas producers**, primarily in western Canada, **need to survive the current supply glut in the U.S.** and Canada. "**How can we create more value for that supply? By going west**," he said. "**LNG exports to Asia can open a market for North America** - and especially Canada - **worth billions of dollars**."

**Thus, the plan:**

***The United States federal government should substantially reduce restrictions on natural gas production in the United States by repealing the Environmental Protection Agency’s New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews for natural gas production. The United States federal government should issue a moratorium on further federal restrictions on natural gas production in the United States.***

**Contention 2 is Coal**

***US CO2 emissions are dropping rapidly as natural gas replaces coal --- but regulations will reverse this***

**Zakaria, 10-25** (Fareed, PhD Poli Sci @ Harvard, Zakaria, Editor of Newsweek, The Nation (AsiaNet), 2012, “The new oil and gas boom,” lexisnexis, ts)

**The environmental impact of the natural-gas boom is already clear and positive**. **The USA's *g*reen*h*ouse-*g*as emissions in 2011 were 9 percent lower than in 2007**. **That's a larger drop than in the *E*uropean *U*nion, with all its focus on renewables**. Why? A slow recovery and lagging demand is one answer. But **the main reason is that** **natural gas is replacing coal** everywhere as an energy source, **and gas emits half as much carbon dioxide as coal**. **This point is crucial**. **The conversation about** **natural gas cannot be had in isolation from the alternative. If we shut down all** **fracking and stop using shale gas, we will get all that energy by burning coal, which is the world's dirtiest fossil fuel and is associated with mining deaths and respiratory illnesses as well.**

***Restrictions will cause a price spike that shifts us back to coal***

**Brady ‘12**

Phil Brady, 6-6-12, the Opportune Time, Chesapeake: Turning Point or Point of No Return? <http://www.theopportunetime.com/news/online/Chesapeake-Turning-Point-or-Point-of-No-Return.php>, jj

**With the current price situation, there may be an opportunity for natural gas to replace coal** in the long term. **Not only does natural gas provide more energy than coal, but natural gas does so at significantly lower prices**. **As a matter of fact, we are already seeing the switch from coal to natural gas take place in power plants, and in entire states**. For example, Pennsylvania’s leading environmental advocacy organization, PennFuture, plans on replacing coal plants with natural gas plants. **However, keep in mind that power plants**, like Penn Future, **understand the cyclical nature of commodities.** **Consequently, *the plants will be prepared to have the retired coal-fired units ready to be used again when natural gas prices spike***. Interestingly, **if low costs are not enough to cause a price spike down the road, then perhaps new regulations on fracking will**. In April of 2012, the **U.S. Energy Secretary**, Steven **Chu, called for more stringent fracking regulations**. **If the legislation passes, we may see the now abundant supply of natural gas bottleneck, which would send prices back up**. If natural gas drillers simply slow down production, and sell natural gas to coal-users, they can shift the supply curve lower and increase demand, causing natural gas prices to increase and possibly reach levels seen in early 2008.

#### Coal’s evil and disproportionately impacts communities of color.

Wendland ‘11

Joel Wendland is editor of Political Affairs magazine. He is a union member and a US Army veteran.

7-20-11, People’s World, Coal pollution killing poor, people of color, NAACP charges <http://www.peoplesworld.org/coal-pollution-killing-poor-people-of-color-naacp-charges/>, jj

America is addicted to coal, and that addiction is killing poor people and people of color, according to a new report published by the NAACP and other environmental justice organizations. According to the report, emissions from 431 coal plants across the country cause 30,000 premature deaths and tens of thousands incidents of chronic respiratory health problems like asthma, bronchitis and lung cancer each year. According to the study, titled "Coal Blooded: Putting Profits Before People," Sulfur dioxide (SO2) and Nitrogen Oxide (NOx), coal plants produce nearly all of the SO2 and fine particle pollution in the U.S. Coal-powered plants produce about 44 percent of the electricity used in the U.S. Ten states use about half of the total amount of coal-fired electricity produced in the whole country. More than 8 million people live within three miles of a coal power plant, and those people are disproportionately poor or people of color. The average per capita income of those people total less than $19,000, substantially lower than the national average. About 3 million are people of color, the report found. The report also revealed the locations of the worst coal plants in the countries. These "failing plants" produce the most pollution and impact the largest number of poor and people of color. To be precise, 90 "failing plants" across the country produced a quarter of SO2 and one-fifth of NOx emissions in the entire country. More than half of the 4.7 million people who live near these plants are people of color. Of the 90 "failing plants," the report scrutinizes the 12 worst offenders. Three are owned by Edison International and are located in Illinois. PSEG owns two of the worst offenders in Connecticut and New Jersey. Duke Energy, DTE Energy, and Dominion are among the companies whose plants create the greatest harm. Detroit, Michigan is host to one of the worst pollution-producing plants in the country. The River Rouge Power Plant (DTE Energy), located on the southwest edge of the city produces more than 13,000 tons of SO2 and 4,658 tons of NOx each year. The plant is just five miles from downtown Detroit and just across the Rouge River from the only major Latino district in the city, known as "Mexican Town." Of the residents who live within three miles of the River Rouge plant, more than 65 percent are African Americans and Latinos. Average income for people living in the area is just over $13,000 each year. The study attributed 44 premature deaths and hundreds of asthma attacks each year to the pollution from just this one plant. Another deadly culprit is the Hammond, Indiana plant owned by Dominion. Located on outskirts of Chicago, this plant emits almost 17,000 tons of SO2 and NOx pollution. Of the people living within three miles of the plant, almost 80 percent are African Americans and Latinos. In that same corridor along the southern edge of Lake Michigan between Chicago and the Michigan border are six other coal-fired power plants that contribute to the poor health and premature deaths of mostly poor communities of color. The authors of the report called for immediately closing the 90 "failing plants." While they total about 20 percent of the coal-fired plants in the country, they produce less than 10 percent of its electricity. In addition, closing those plants would reduce the number of people living within three miles of a coal-fired plant by 58 percent and reduce the number of emergency room visits, deaths and chronic illnesses by thousands each year.

***There’s no comparison --- natural gas is far cleaner than coal***

**Lu et al. ‘12**

Xi Lu , School of Engineering and Applied Sciences, Harvard University, Cambridge, Massachusetts 02138, United States Jackson Salovaara , School of Engineering and Applied Sciences, Harvard University, Cambridge, Massachusetts 02138, United States Michael B. McElroy\* School of Engineering and Applied Sciences and Department of Earth and Planetary Sciences, Harvard University, Cambridge, Massachusetts 02138, United States

Implications of the Recent Reductions in Natural Gas Prices for Emissions of CO2 from the US Power Sector

Environmental Science & Technology201246 (5), 3014-3021, jj

Howarth et al.(24) have suggested that emissions of CH4 associated with the fracking process involved in the production of natural gas from shale, combined with release of CH4 in the gas transportation system, could largely offset the climate related advantages occasioned by the additional sources of low cost gas (CH4, the major component of natural gas, is a significantly more effective greenhouse gas than CO2). An earlier study by Lelieveld and Crutzen(25) quantitatively analyzing the indirect effects of methane on climate warming on the basis of available estimates of fossil-fuel-related leaks of methane, suggested that **switching from coal and oil to natural gas as an energy source would reduce climate warming.** They further concluded that considering the global warming potential (GWP) on a time scale of ten years, **the fractional natural gas leakage should be less than 4.3–5.7% to ensure a reduction in climate forcing associated with switching from coal to gas. The advantages of natural gas are even more favorable if the potential climate impact is assessed on time scales much longer than a decade**. **Jiang et al.(**26) **evaluated the** greenhouse gas (**GHG) emissions resulting from the use of gas extracted from the Marcellus shale considering the entire life cycle of the gas**. They offered a comparison with the average emissions resulting from US natural gas produced in 2008, prior to any significant development of the Marcellus system. Their results suggested that **the GHG emissions from shale gas over the entire life cycle including the final combustion process are at most 3% higher than emissions associated with production and consumption of conventional sources of gas**. They argued further, in contrast to Howarth et al.,(24) that **the climate impact of the greenhouse gases emitted in conjunction with exploitation of the Marcellus shale source to produce electricity are significantly lower than those associated with the production of power using coal**. They concluded that **relatively straightforward measures could be implemented to minimize the potential release of greenhouse gases associated with the extraction of gas from shale**.(26) A more recent study by Hultman et al.(27) adopting a transparent and consistent approach to comparing the GHG footprints of conventional natural gas, shale gas, and coal concluded that **in terms of electricity generation the GHG impacts of shale gas are 11% higher than those for conventional gas** (higher than the value reported by Jiang et al.) **but only 56% of the impact expected for coal.**

***Coal is the greatest threat to survival***

**Hansen 9** - Director of Nasa's Goddard Institute for Space Studies [James Hansen (Professor of Earth and Environmental Sciences @ Columbia University and Ph.D. in Physics from the University of Iowa), “Coal-fired power stations are death factories. Close them,” The Observer, Sunday 15 February 2009, pg. http://www.guardian.co.uk/commentisfree/2009/feb/15/james-hansen-power-plants-coal]

A year ago, I wrote to Gordon Brown asking him to place a moratorium on new coal-fired power plants in Britain. I have asked the same of Angela Merkel, Barack Obama, Kevin Rudd and other leaders. The reason is this **- *coal is the single greatest threat to civilisation and all life on our planet***. **The climate is nearing tipping points**. Changes are beginning to appear and **there is a potential for explosive changes, effects that would be irreversible**, **if we do not rapidly slow fossil-fuel emissions over the next few decades**. **As Arctic sea ice melts, the darker ocean absorbs more sunlight and speeds melting. As the tundra melts, methane, a strong greenhouse gas, is released, causing more warming**. **As species are exterminated by shifting climate zones, ecosystems can collapse, destroying more species.** The public, buffeted by weather fluctuations and economic turmoil, has little time to analyse decadal changes. How can people be expected to evaluate and filter out advice emanating from those pushing special interests? How can people distinguish between top-notch science and pseudo-science? Those who lead us have no excuse - they are elected to guide, to protect the public and its best interests. They have at their disposal the best scientific organisations in the world, such as the Royal Society and the US National Academy of Sciences. Only in the past few years did the science crystallise, revealing the urgency. **Our planet is in peril. If we do not change course, we'll hand our children a situation that is out of their control. One ecological collapse will lead to another, in amplifying feedbacks.** The amount of carbon dioxide in the air has already risen to a dangerous level. The pre-industrial carbon dioxide amount was 280 parts per million (ppm). Humans, by burning coal, oil and gas, have increased this to 385 ppm; it continues to grow by about 2 ppm per year. Earth, with its four-kilometre-deep oceans, responds only slowly to changes of carbon dioxide. So the climate will continue to change, even if we make maximum effort to slow the growth of carbon dioxide. Arctic sea ice will melt away in the summer season within the next few decades. **Mountain glaciers, providing fresh water for rivers that supply hundreds of millions of people, will disappear - practically all of the glaciers could be gone within 50 years - if carbon dioxide continues to increase at current rates. Coral reefs, harbouring a quarter of ocean species, are threatened. The greatest danger hanging over our children and grandchildren is initiation of changes that will be irreversible on any time scale that humans can imagine. If coastal ice shelves buttressing the west Antarctic ice sheet continue to disintegrate, the sheet could disgorge into the ocean, raising sea levels by several metres in a century. Such rates of sea level change have occurred many times in Earth's history in response to global warming rates no higher than those of the past 30 years. Almost half of the world's great cities are located on coastlines. The most threatening change**, from my perspective**, is extermination of species**. **Several times in Earth's history, rapid global warming occurred**, apparently spurred by amplifying feedbacks**. In each case, more than half of plant and animal species became extinct. New species came into being over tens and hundreds of thousands of years. But these are time scales and generations that we cannot imagine. If we drive our fellow species to extinction, we will leave a far more desolate planet for our descendants than the world we inherited from our elders. Clearly, if we burn all fossil fuels, we will destroy the planet we know.** Carbon dioxide would increase to 500 ppm or more. We would set the planet on a course to the ice-free state, with sea level 75 metres higher. Climatic disasters would occur continually. The tragedy of the situation, if we do not wake up in time, is that the changes that must be made to stabilise the atmosphere and climate make sense for other reasons. They would produce a healthier atmosphere, improved agricultural productivity, clean water and an ocean providing fish that are safe to eat. Fossil-fuel reservoirs will dictate the actions needed to solve the problem. Oil, of which half the readily accessible reserves have already been burnt, is used in vehicles, so it's impractical to capture the carbon dioxide. This is likely to drive carbon dioxide levels to at least 400 ppm. But **if we cut off the largest source of carbon dioxide - coal - it will be practical to bring carbon dioxide back to 350 ppm,** lower still if we improve agricultural and forestry practices, increasing carbon storage in trees and soil. **Coal is not only the largest fossil fuel reservoir of carbon dioxide, it is the dirtiest fuel. Coal is polluting the world's oceans and streams with mercury, arsenic and other dangerous chemicals.** The dirtiest trick that governments play on their citizens is the pretence that they are working on "clean coal" or that they will build power plants that are "capture-ready" in case technology is ever developed to capture all pollutants.

***Warming’s human-caused – consensus proves. Slowing the rate is key.***

**Deibel ‘7**

(Terry L, Professor of IR @ National War College, “Foreign Affairs Strategy: Logic for American Statecraft”, Conclusion: American Foreign Affairs Strategy Today – card starts on page 387 of this book)

Finally, **there is one major existential threat** to American security (as well as prosperity) of a nonviolent nature, which, though far in the future, demands urgent action. It is the threat of **global warming** to the stability of the climate upon which all earthly life depends. Scientists worldwide have been observing the gathering of this threat for three decades now, and what was once a mere possibility has passed through probability to near certainty. Indeed ***not one* of more than 900 articles on climate change** published in refereed scientific journals from 1993 to 2003 **doubted that anthropogenic warming is occurring**. “In legitimate scientific circles,” writes Elizabeth Kolbert, “it is virtually impossible to find evidence of disagreement over the fundamentals of global warming.” Evidence from a vast international scientific monitoring effort accumulates almost weekly, as this sample of newspaper reports shows: an international panel predicts “brutal droughts, floods and violent storms across the planet over the next century”; climate change could “literally alter ocean currents, wipe away huge portions of Alpine Snowcaps and aid the spread of cholera and malaria”; “glaciers in the Antarctic and in Greenland are melting much faster than expected, and…worldwide, plants are blooming several days earlier than a decade ago”; “rising sea temperatures have been accompanied by a significant global increase in the most destructive hurricanes”; “NASA scientists have concluded from direct temperature measurements that 2005 was the hottest year on record, with 1998 a close second”; “Earth’s warming climate is estimated to contribute to more than 150,000 deaths and 5 million illnesses each year” as disease spreads; “widespread bleaching from Texas to Trinidad…killed broad swaths of corals” due to a 2-degree rise in sea temperatures. “**The world is slowly disintegrating**,” concluded Inuit hunter Noah Metuq, who lives 30 miles from the Arctic Circle. “They call it climate change…but we just call it breaking up.” From the founding of the first cities some 6,000 years ago until the beginning of the industrial revolution, carbon dioxide levels in the atmosphere remained relatively constant at about 280 parts per million (ppm). At present they are accelerating toward 400 ppm, and by 2050 they will reach 500 ppm, about double pre-industrial levels. Unfortunately, atmospheric CO2 lasts about a century, so **there is no way immediately to reduce levels, only to slow their increase**, we are thus in for significant global warming**; the only debate is how much and how serious the effects will be.** As the newspaper stories quoted above show, we are already experiencing the effects of 1-2 degree warming in more violent storms, spread of disease, mass die offs of plants and animals, species extinction, and threatened inundation of low-lying countries like the Pacific nation of Kiribati and the Netherlands **at a** **warming of 5 degrees** or less the Greenland and West Antarctic **ice sheets could disintegrate**, **leading to a sea level** of **rise** of 20 feet that would cover North Carolina’s outer banks, **swamp the southern third of Florida**, and inundate Manhattan up to the middle of Greenwich Village. Another catastrophic effect would be the collapse of the Atlantic thermohaline circulation that keeps the winter weather in Europe far warmer than its latitude would otherwise allow. Economist William Cline once estimated the damage to the United States alone from moderate levels of warming at 1-6 percent of GDP annually; severe warming could cost 13-26 percent of GDP. But the most frightening scenario is runaway greenhouse warming, based on positive feedback from the buildup of water vapor in the atmosphere that is both caused by and causes hotter surface temperatures. **Past ice age transitions, associated** with **only 5-10 degree changes** in average global temperatures, took place in just decades, even though no one was then pouring ever-increasing amounts of carbon into the atmosphere. Faced with this specter, the best one can conclude is that “**humankind’s continuing enhancement of the** natural **greenhouse effect is akin to playing Russian roulette with** the earth’s climate and **humanity’s life support system**. At worst, says physics professor Marty Hoffert of New York University, “we’re just going to burn everything up; we’re going to heat the atmosphere to the temperature it was in the Cretaceous when there were crocodiles at the poles, and then everything will collapse.” During the Cold War, astronomer Carl Sagan popularized a theory of nuclear winter to describe how a thermonuclear war between the Untied States and the Soviet Union would not only destroy both countries but possibly end life on this planet. Global warming is the post-Cold War era’s equivalent of nuclear winter at least as serious and considerably better supported scientifically. Over the long run it puts dangers from terrorism and traditional military challenges to shame. It is a threat not only to the security and prosperity to the United States, but potentially to the continued existence of life on this planet.

***Warming is real, anthropogenic and reversible if we start mitigation now.***

**Nuccitelli 11** (Dana Nuccitelli is an environmental scientist at a private environmental consulting firm in the Sacramento, California area. He has a Bachelor's Degree in astrophysics from the University of California at Berkeley, and a Master's Degree in physics from the University of California at Davis. He has been researching climate science, economics, and solutions as a hobby since 2006, and has contributed to Skeptical Science since September, 2010., Updated 2011, Originally Posted 9/24/2010, “The Big Picture”, http://www.skepticalscience.com/big-picture.html)

**The Earth is Warming We know the planet is warming from surface temperature stations and satellites measuring the temperature of the Earth's surface and lower atmosphere**. We also have **various tools** which have **measured the warming of the Earth's oceans**. Satellites have measured an energy imbalance at the top of the Earth's atmosphere. **Glaciers, sea ice, and ice sheets are all receding**. **Sea levels are rising**. **Spring is arriving sooner** each year. **There's simply no doubt - the planet is warming** (Figure 1). Global Warming Continues And yes, **the warming is continuing**. **The 2000s were hotter than the 1990s, which were hotter than the 1980s, which were hotter than the 1970s**. 2010 tied for the hottest year on record. The 12-month running average global temperature broke the record three times in 2010, according to NASA Goddard Institute for Space Studies (GISS) data. Sea levels are still rising, ice is still receding, spring is still coming earlier, there's still a planetary energy imbalance, etc. etc. Contrary to what some would like us to believe, the planet has not magically stopped warming. Those who argue otherwise are confusing short-term noise with long-term global warming (Figure 2). Foster and Rahmstorf (2011) showed that **when we filter out the short-term effects of the sun, volcanoes, and El Niño cycles, the underlying man-made global warming trend becomes even more clear** (Figure 3). For as much as atmospheric temperatures are rising, the amount of energy being absorbed by the planet is even more striking when one looks into the deep oceans and the change in the global heat content (Figure 4). Humans are Increasing Atmospheric Greenhouse Gases **The amount of** **greenhouse gases in the atmosphere** - particularly carbon dioxide (**CO2**) - **has been rising steadily** over the past 150 years. There are a number of lines of evidence which clearly demonstrate that **this increase is due to human activities**, primarily burning fossil fuels. The most direct of evidence involves simple accounting. Humans are currently emitting approximately 30 billion tons of CO2 per year, and the amount in the atmosphere is increasing by about 15 billion tons per year. Our emissions have to go somewhere - half goes into the atmosphere, while the other half is absorbed by the oceans (which is causing another major problem - ocean acidification). We also know the atmospheric increase is from burning fossil fuels because of the isotopic signature of the carbon in the atmosphere. Carbon comes in three different isotopes, and plants have a preference for the lighter isotopes. So if the fraction of lighter carbon isotopes in the atmosphere is increasing, we know the increase is due to burning plants and fossil fuels, and that is what scientists observe. **The fact that humans are responsible for the increase in atmospheric CO2 is settled science**. The evidence is clear-cut. Human Greenhouse Gases are Causing Global Warming **There is overwhelming evidence that humans are the dominant cause of the recent global warming**, mainly due to our greenhouse gas emissions. **Based on fundamental physics and math, we can quantify** the amount of warming human activity is causing, and verify **that we're responsible for essentially all of the global warming over the past 3 decades**. The aforementioned Foster and Rahmstorf (2011) found a 0.16°C per decade warming trend since 1979 after filtering out the short-term noise. In fact we expect human greenhouse gas emissions to cause more warming than we've thus far seen, due to the thermal inertia of the oceans (the time it takes to heat them). Human aerosol emissions are also offsetting a significant amount of the warming by causing global dimming. **Huber and Knutti** (2011) found that human greenhouse gas emissions have caused 66% more global warming than has been observed since the 1950s, because the cooling effect of human aerosol emissions have offset about 44% of that warming. They **found that overall, human effects are responsible for approximately 100% of the observed global warming** **over the past 60 years** (Figure 5). **There are also numerous 'fingerprints' which we would expect to see from an increased greenhouse effect** (i.e. **more warming at night, at higher latitudes, upper atmosphere cooling) that we have indeed observed** (Figure 6). **Climate models have projected the ensuing global warming to a high level of accuracy, verifying that we have a good understanding of the fundamental physics behind climate change**. Sometimes people ask "what would it take to falsify the man-made global warming theory?". Well, basically it would require that our fundamental understanding of physics be wrong, because that's what the theory is based on. This fundamental physics has been scrutinized through scientific experiments for decades to centuries. The Warming will Continue We also know that **if we continue to emit large amounts of *g*reen*h*ouse *g*ases, the planet will continue to warm**. We know that **the climate sensitivity to a doubling of atmospheric CO2** from the pre-industrial level of 280 parts per million by volume (ppmv) to 560 ppmv (we're currently at 390 ppmv) **will cause 2–4.5°C of warming. And we're headed for 560 ppmv in the mid-to-late 21st century if we continue business-as-usual emissions**. The precise sensitivity of the climate to increasing CO2 is still fairly uncertain: 2–4.5°C is a fairly wide range of likely values. However, even if we're lucky and the climate sensitivity is just 2°C for doubled atmospheric CO2, if we continue on our current emissions path, we will commit ourselves to that amount of warming (2°C above pre-industrial levels) within the next 75 years. **The Net Result will be Bad** There will be some positive results of this continued warming. For example, an open Northwest Passage, enhanced growth for some plants and improved agriculture at high latitudes (though this will require use of more fertilizers), etc. However, the negatives will almost certainly outweigh the positives, **by a long shot**. We're talking **decreased biodiversity, water shortages, increasing heat waves** (both in frequency and intensity), **decreased crop yields** due to these impacts, damage to infrastructure, displacement of millions of people, etc. Arguments to the contrary are superficial One thing I've found in reading skeptic criticisms of climate science is that they're consistently superficial. For example, the criticisms of James Hansen's 1988 global warming projections never go beyond "he was wrong," when in reality it's important to evaluate what caused the discrepancy between his projections and actual climate changes, and what we can learn from this. And **those who argue that "it's the Sun" fail to comprehend that we understand the major mechanisms by which the Sun influences the global climate, and that they cannot explain the current global warming trend**. And **those who argue "it's just a natural cycle" can never seem to identify exactly which natural cycle can explain the current warming**, **nor** can they explain **how our understanding of the fundamental climate physics is wrong**. There are legitimate unresolved questions Much ado is made out of the expression "the science is settled." **The science is settled in terms of knowing that the planet is warming rapidly, and that humans are the dominant cause**. There are certainly unresolved issues. As noted above, there's a big difference between a 2°C and a 4.5°C warming for a doubling of atmospheric CO2, and it's an important question to resolve, because we need to know how fast the planet will warm in order to know how fast we need to reduce our greenhouse gas emissions. There are significant uncertainties in some feedbacks which play into this question. For example, will clouds act as a net positive feedback (by trapping more heat, causing more warming) or negative feedback (by reflecting more sunlight, causing a cooling effect) as the planet continues to warm? And exactly how much global warming is being offset by human aerosol emissions? These are the sorts of questions we should be debating, and the issues that most climate scientists are investigating. Unfortunately there is a there is a very vocal contingent of people determined to continue arguing the resolved questions for which the science has already been settled. And when climate scientists are forced to respond to the constant propagation of misinformation on these settled issues, it just detracts from our investigation of the legitimate, unresolved, important questions. Smart Risk Management Means Taking Action Pe**ople are usually very conservative when it comes to risk management**. Some of us buy fire insurance for our homes when the risk of a house fire is less than 1%, for example. When it comes to important objects like cars and homes, we would rather be safe than sorry. But **there is arguably no more important object than the global climate**. **We rely on the climate for our basic requirements**, like having enough accessible food and water. **Prudent risk management in this case is clear. The scientific evidence discussed above shows indisputably that there is a risk that we are headed towards very harmful climate change**. There are uncertainties as to how harmful the consequences will be, but **uncertainty is not a valid reason for inaction**. There's very high uncertainty whether I'll ever be in a car accident, but it would be foolish of me not to prepare for that possibility by purchasing auto insurance. Moreover, **uncertainty cuts both ways, and it's just as likely that the consequences will be worse than we expect** **as it is that the consequences won't be very bad**. **We Can Solve the Problem The good news is that we have the tools we need to mitigate the risk posed by climate change**. A number of plans have been put forth to achieve the necessary greenhouse gas emissions cuts (i.e. here and here and here). **We already have all the technology we need**. Opponents often argue that mitigating global warming will hurt the economy, but the opposite is true. Those who argue that reducing emissions will be too expensive ignore the costs of climate change - economic studies have consistently shown that mitigation is several times less costly than trying to adapt to climate change (Figure 7). This is why there is a consensus among economists with expertise in climate that we should put a price on carbon emissions (Figure 8). should US reduce emissions The Big Picture The big picture is that **we know the planet is warming, humans are causing it, there is a substantial risk to continuing on our current path**, but we don't know exactly how large the risk is. However, **uncertainty regarding the magnitude of the risk is not an excuse to ignore it**. We also know that **if we continue on a business-as-usual path, the risk of catastrophic consequences is very high.** In fact, **the larger the uncertainty, the greater the potential for the exceptionally high risk scenario to become reality**. We need to continue to decrease the uncertainty, but it's also critical to acknowledge what we know and what questions have been resolved, and that taking no action is not an option. The good news is that **we know how to solve the problem, and that doing so will minimize the impact not only on the climate, but also on the economy**. The bottom line is that **from every perspective - scientific, risk management, economic, etc. - there is no reason not to immeditately take serious action to mitigate climate change, and failing to do so would be exceptionally foolish**.

***Natural gas makes the transition to renewables effective***

**Frank et al ‘09**

Matthew Frank, Jenna Goodward, Sarah Ladislaw, and Kate Zyla, May 2009, CSIS, Crossing the Natural Gas Bridge, <http://csis.org/files/publication/090626_final_crossing_gas_bridge.pdf>, jj

Addressing climate change will require extensive changes in the ways that we produce, transport and use energy. **Given the scope, scale and complexity of the current energy system, the transition to a low carbon energy future will take time, significant investment and carefully crafted polices**. **During the transition, it is important for policymakers and the private sector to balance the need for aggressive action to reduce emissions with the need for reliable and affordable energy supplies**. **Natural gas can play a critical role in “building a bridge” to a secure, low-carbon energy system**. **It is the least carbon intensive fossil fuel** (burning gas emits less carbon dioxide than burning coal or oil), **and there are readily available supplies**, both within and outside of the United States. **New natural gas power generation facilities can be brought online quickly compared to other low-carbon sources such as nuclear power**. **They also enable more renewable energy by providing baseload power generation to complement the intermittent nature of renewables like wind and solar power**. There is already a great deal of existing infrastructure –from electric power plants and home furnaces to pipelines and ports – that is able to store, transport, and use natural gas.

***Bridge fuels key --- renewables can’t come close to displacing fossil fuels in the near term***

**Tour et al. ‘10**

James M. Tour, Carter Kittrell and Vicki L. Colvin are in the Department of Chemistry, Department of Mechanical Engineering and Materials Science, and the Green Carbon Center, Rice University. Nature Materials 9,871–874(2010), Green carbon as a bridge to renewable energy, <http://www.nature.com.proxy.lib.wayne.edu/nmat/journal/v9/n11/full/nmat2887.html>, jj

**A green use of carbon-based resources that minimizes the environmental impact of carbon fuels could allow a smooth transition from fossil fuels to a sustainable energy economy.** Carbon-based resources (coal, natural gas and oil) give us most of the world's energy today, but the energy economy of the future must necessarily be far more diverse. **Energy generation through solar, wind and geothermal means is developing now, but not fast enough to meet our expanding global energy needs.** **We advocate that 'green carbon'**, which enables us to use carbon-based sources with high efficiency and in an environmentally friendly manner**, will provide our society time to develop alternative energy technologies and markets without sacrificing environmental or economic quality**. Green carbon will help to reduce the loss of our precious carbon resources, which are better reserved for high-value chemicals, and it will ensure that those hydrocarbons used for fuels will minimize carbon emissions. Through intensive research and development in green carbon, our society can guarantee an energy future that uses carbon strategically, without smokestacks, greenhouse gases and extensive environmental damage. Building a solid bridge **There is a chasm between the diminutive proportions of renewable energy currently available and our overwhelming dependence on fossil fuels that currently propel society**. The energy policy review of the Obama administration makes this soberingly clear: “**The use of renewable energy today and even in the next 5 to 10 years is still extremely limited when put into the context of total world use of fossil fuels**. For example, **the world used the equivalent of 113,900 terawatts hours** [TWh] **of fossil energy to fuel** economic activity, human mobility, and global telecommunications, among other modern day **activities in 2007**. **Replacing those terawatts hours with non-fossil energy would be the equivalent of** constructing an extra 6,020 nuclear plants across the globe or 14 times the number of nuclear power plants in the world today. In renewable energy terms, it is **133 times the amount of solar, wind and geothermal energy currently in use on the planet.**”1 Barring a huge reduction in our global standard of living, **we will need to rely on carbon-based energy for some time**. Whether this will last for several decades or into the next century is unclear, but what is apparent is that renewable approaches to energy generation are increasing at an annual rate of 7.2% compared with 1.6% for non-renewable growth2, and the continued growth of renewables will demand sustained government support. **During this transition we propose a green carbon bridge that minimizes the environmental impact of carbon fuels and lowers our reliance on these resources for primary energy generation**. Ultimately, green carbon will use hydrogen from renewable sources, while at the same time producing basic chemical feedstocks.

#### No renewables tradeoff

Channell, et al, 9/12/12 (Jason, Director, Citi Investment Research & Analysis, previously: Executive Director at [Goldman Sachs](http://uk.linkedin.com/company/goldman-sachs?trk=ppro_cprof)¶ Executive Director at [Cheuvreux](http://uk.linkedin.com/company/cheuvreux?trk=ppro_cprof)¶ Executive Director at ABN AMRO Hoare Govett¶ Analyst at [Fidelity Investments](http://uk.linkedin.com/company/fidelity-investments?trk=ppro_cprof), timothy lam, Vice President, [Utilities](http://cleantuesday.asia/tag/utilities) & Alternative [Energy](http://cleantuesday.asia/category/categories/energy-categories), [Citi Research](http://cleantuesday.asia/tag/citi-research), HK-based [research](http://cleantuesday.asia/tag/research) [analyst](http://cleantuesday.asia/tag/analyst) covering the [utilities](http://cleantuesday.asia/tag/utilities), [solar](http://cleantuesday.asia/tag/solar) and alternative [energy](http://cleantuesday.asia/category/categories/energy-categories)sectors, and Shahriar Pourreza - Advisor at Citigroup Global Markets Inc, CitiResearch: “Shale & renewables: a symbiotic relationship,” <https://ir.citi.com/586mD%2BJRxPXd2OOZC6jt0ZhijqcxXiPTw4Ha0Q9dAjUW0gFnCIUTTA%3D%3D>, ts)

This analysis assumes that renewables and natural gas are in competition, chasing ¶ the same investment dollars in the energy sector. In our view, this analysis is overly ¶ simplistic. On the one hand, natural gas and renewables play different roles in the ¶ energy mix; natural gas is a diversified fuel with a role in many economic sectors, ¶ from industry to transport, whereas modern renewable energy investment is ¶ primarily concerned with electricity generation, and offers the potential for ¶ distributed generation (in the case of solar). Indeed, there is no obvious negative ¶ correlation between the observed percentage of natural gas and renewables in the ¶ energy mix (Figure 41) of various countries. ¶ Moreover, the assumption that gas-fired power is ‘clean’ enough to displace ¶ investment in renewable energy as a low-carbon energy source is questionable. ¶ While natural gas may be a cleaner burning fossil fuel than either coal or oil, the ¶ combustion of natural gas still emits a significant amount of carbon dioxide. ¶ Moreover, the additional ‘fugitive methane’ emissions make the extraction of shale ¶ gas, in particular, a substantial greenhouse gas emitter. Instead, our view is that natural gas and renewable energy investment are naturally ¶ complementary in the electricity-generation sector. Indeed, we believe that an ¶ increase in gas-fired power might ultimately assist renewable energy in gaining ¶ penetration in electricity markets, through its ability to provide peaking power to ¶ offset the intermittency of renewable sources like wind and solar.

#### It’s not zero sum

Hanger ‘12

John Hanger I am an expert on energy, environment, green economy, competitive electric markets, and utility regulation with unique experience in and out of government. I am Special Counsel at the law firm Eckert Seamans, operate Hanger Consulting LLC, and speak to diverse audiences. I have been both the Secretary of the Pennsylvania Department of Environmental Protection and Commissioner of the Pennsylvania Public Utility Commission and made leading regulatory decisions, testified to Congress and state legislatures and interviewed countless times, appearing on CBS evening News, NBC Evening New, CNN, BBC, CBC, and many more outlets. I was Appointed Public Advocate, representing consumers of the Philadelphia Gas Works and Philadelphia Water Department. 1984 graduate of the University of Pennsylvania and 1979 graduate of Duke University.

8-1, Low Gas Prices Have Not Slowed Renewable Energy But Will They In The Future?

<http://johnhanger.blogspot.com/2012/08/low-gas-prices-have-not-slowed.html>, jj

Since 2008, times have been exceptionally good for both natural gas and renewable energy. Both have boomed, with natural gas setting records for production in 2011, and with renewables providing more energy than nuclear power last year. Given that since 2008 US wind has more than doubled its capacity, and solar will soon have increased its capacity 14-fold, its plain that nothing stopped their tremendous growth through 2012. Certainly not the gas boom. A major claim by those seeking to ban gas production, however, is that cheap gas will cripple renewable energy development. That has been false to date. But what about the future? How much would continued low gas prices impact renewable energy's market share. In its 2012 Annual Energy Outlook, the EIA projected for 2035 market shares of coal, natural gas and renewables in three natural gas price scenarios--its reference case, low-gas price, and high gas price. See www.eia.gov/todayinenergy/detail.cfm?id=7310. EIA projects strong growth in the market share of renewables from 2010, no matter what is the price of natural gas. Renewable's market share jumps from 10% in 2010 to 14%, 15% or 16% in the three gas price scenarios tested. Consequently, in the low-gas price scenario, renewables market share increases 40%; 50% in the reference case; and 60% if natural gas prices are high. So no matter the market price of gas, EIA has the market share of renewable energy increasing 40% to 60%. Compared to the other generation technologies, renewable energy is least impacted by the price of gas, and that includes gas itself. Under the scenarios tested by EIA, both coal and nuclear lose market share, no matter whether the price of gas is high or low, though they both lose more in the low-gas price case. The competition between gas and coal remains intense throughout the EIA forecast period and in each case tested. Gas's market share is completely determined by its market price, and EIA projects that it gains no market share if gas prices are high. The EIA analysis, therefore, suggests that renewable energy alone will see substantial gains in market share, no matter the price of gas. Moreover, I am confident that the 2012 EIA Annual Energy Outlook understates the likely growth in renewables, even though it projects a considerable amount. Why will renewable energy prosper even more than EIA projects? It will do so first and foremost because cost reductions for especially solar and wind will surprise by being bigger and earlier than expected. That will continue a trend already apparent, since the cost of wind and solar are much lower today than what many predicted 5 years ago. Policy support for renewable energy over the next 20 years will be firm and growing, to the surprise of some, and that stronger policy support will be another reason why renewable energy growth will exceed EIA projections. For an example of a positive renewable energy surprise, just take a look at the New Jersey solar bill that Governor Christie signed last week. That bill alone will increase by about 3,000 megawatts solar installations in the Garden State over the next 4 years. Just as gas is experiencing declining drilling in 2012, renewable energy development will experience up and down years over the next 20 plus years, but further significant gains in market share for renewables are certain, regardless of the price of natural gas.

***Natural gas’s net GHG emissions are negative***

Abby W. **Schachter** (Writer for the Weekly Standard and the New York Post) June 20**12** “We've got to become energy independent to slow terrorism-fracking is the key” <http://www.zimbio.com/Fracking+Lawsuits/articles/2ymubk5GzT3/ve+got+become+energy+independent+slow+terrorism>

**As for Howarth’s research on fracking’s carbon footprint, his conclusions were quickly debunked by fellow researchers at Cornell as well as by other scientists**. As Lawrence M. **Cathles of Cornell’s Department of Earth and Atmospheric Sciences concluded in his rebuttal, “The data clearly shows that substituting natural gas for coal will have a substantial greenhouse benefit under almost any set of reasonable assumptions. Methane emissions must be five times larger than they currently appear to be before gas substitution for coal becomes detrimental from a global warming perspective on any time scale.”** The debate over fracking has gotten so extreme, in fact, that reasonable environmentalists are beginning to complain. As Andrew Revkin, one of the deans of environmental reporting in the United States, recently noted, **fracking opponents sound so intransigent that he questions whether there is any resource to which the anti-gas advocates would say yes. The great irony is that only a few short years ago, many environmentalists were promoting *n*atural *g*as as the cleaner alternative to oil and coal**. The theory was that **natural gas would provide a temporary bridge from pollutants such as oil and coal to so-called clean tech** (wind and solar electricity generation, some nuclear power, and electric cars). Now that natural gas is cheap and plentiful, however, many openly worry that there may never be a full-scale transition to wind and solar because there won’t be a need. Gas is cleaner than coal and oil, it is equally or more efficient, it has the same applications as coal and oil, and it can be exported. Wind and solar haven’t proven to be cost-effective, nor are they easy to transport or possible to export. This realization has led to near hysterical opposition to fracking. As Howarth himself argued recently, “It is pure folly to view shale gas [as] a bridge fuel to a green future.” These are the arguments, moreover, that help explain the otherwise inexplicable rejection of natural gas extraction in New York, a state that could desperately use new industry and new revenues. There is gas from the Marcellus Shale under the state’s southern tier, and there are gas companies that came into the state nearly five years ago to lease land for potential drilling. But in 2007, the state decided that, absent new regulations for hydraulic fracturing, no new permits for natural gas wells would be issued. The moratorium continues to this day, even as Andrew Cuomo, the state’s governor, keeps promising that his Department of Environmental Conservation will produce new drilling rules—once its experts have had sufficient time to study the issue.

**Observation 3 is solvency**

***The EPA’s rule is counterproductive and increases air pollution --- it should be struck down***

**Peshek & Millican ‘12**

Adam Peshek, Research Associate Reason Foundation, Robin Millican, Policy Associate Institute for Energy Research, 2-28-12, Reason Foundation, Letter to U.S. Environmental Protection Agency Office of Administrator Lisa Jackson, <http://reason.org/files/oil_and_gas_nsps_and_neshap_comment.pdf>, jj

6) **The NSPS Incentivizes the Use of Outdated Equipment and Deters Development** **Because the NSPS standards apply only to new or modified facilities, the rule creates the inadvertent economic incentive for owners and operators to continue using outdated, lessefficient equipment rather than incurring new costs and regulations to change.** Furthermore, **because the proposed NSPS revisions would apply to new natural gas wells— approximately 11,400 of which are drilled each year—the rule may cause operators to undertake fewer projects.**

7) **Regulatory Alternatives Should Be Evaluated** Prior To Regulation Although EPA has indicated its openness to making modifications to a handful of provisions in its proposed rule—including evaluating ways to reduce reporting requirement burdens—**no evidence was presented in the proposed rule to indicate that EPA had evaluated the costs and benefits of regulatory alternatives**, such as positive incentives to achieve the desired result. The Agency is obligated to do so under Executive Order 12866 (EO 12866), which states: “**In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, *including the alternative of not regulating***.” Furthermore, EO 12866 directs that “each agency shall identify and assess available alternatives to direct regulation, including providing economic incentives to encourage the desired behavior, such as user fees or marketable permits, or providing information upon which choices can be made by the public.”

***De-regulation alleviates confusion and restores certainty***

**Russell ‘12**

Barry Russell, President, Independent Petroleum Association of America (IPAA), National Journal, 1-17-12, What's Ahead for Natural Gas? http://energy.nationaljournal.com/2012/01/whats-ahead-for-natural-gas.php?mrefid=site\_search, jj

Furthermore, as President **Obama** touts the benefits of natural gas, his administration **has embarked upon a double-flanked assault on the oil and natural gas industry, led by the *E*nvironmental *P*rotection *A*gency and the Interior Department. These federal agencies have sought to regulate hydraulic fracturing and instill unfounded fear about its side-effects and management at every turn. The states are well-equipped to handle the environmental issues surrounding development**. After all, **they have been regulating hydraulic fracturing for decades.** **More and more states have been utilizing FracFocus, the chemical registry website on which companies voluntarily disclose their hydraulic fracturing fluids to the public**. **The state regulatory systems can deal with each state’s different geological and environmental complexities**. ***Attempting to operate a federal regulatory regime out of Washington, with limited funds and regulators, would cause confusion and cost many jobs.*****America’s natural gas industry has quite a future – as long as it’s not impeded by politically motivated forces**. ***The administration must*** make its campaign rhetoric a reality and ***call off its massive federal overreach***. **If states remain empowered to continue their responsible regulation of hydraulic fracturing, natural gas will certainly power America’s future.**

***A moratorium is key to certainty***

**Loris ‘11**

Nicolas D. Loris is a Policy Analyst in the Thomas A. Roe Institute for Economic Policy Studies at The Heritage Foundation. 9-8-11, Heritage, Energy Exploration Would Create Jobs and Raise Revenue Without Raising Taxes <http://www.heritage.org/research/reports/2011/09/energy-exploration-would-create-jobs-and-raise-revenue-without-raising-taxes>, jj

**Place a freeze on new environmental regulations**. Stressing the need for regulatory certainty, President Obama recently asked EPA Administrator Lisa Jackson to withdraw the agency’s draft for more stringent Ozone National Ambient Air Quality Standards. EPA’s regulatory overreach on this one rule would have destroyed 7.3 million jobs and nearly $700 billion in economic activity by 2020, and the rule had questionable environmental benefits.[8] That is a good start to helping the economy recover, but **if** **the President truly wants to provide regulatory certainty, he should tell the EPA to withdraw other new environmental regulations that all miserably fail the cost–benefit test**. If he does not act, then Congress should legislatively place a freeze on new environmental regulations. Time to Drill, Create, and Collect **Increasing the American energy supply should be low-hanging fruit** for the “super committee” charged with tackling the massive U.S. debt problem. Allowing access for exploration and **creating an efficient regulatory process that allows energy projects to move forward in a timely manner will not only increase revenue through more royalties, leases, and rent; it will also create jobs and help lower energy prices in the process. These are sensible policy ideas with or without a debt crisis, but given the fiscal situation, this is a no-brainer.**

***Certainty key to development of shale gas***

**Baker Institute ’11** (James A. Baker III Institute for Public Policy of Rice University, October, Shale Gas and U.S. National Security, online, jj)

**To tap this benefit, it will be essential for the *U*nited *S*tates to promote a stable investment climate** **with regulatory certainty.** In particular, **the *U*nited *S*tates will need adopt policies that ensure shale gas exploitation can proceed steadily and predictably** with sound environmental oversight. The ***U*nited *S*tates should focus squarely on setting the policies needed to ensure that shale gas can play a significant role in the U.S. and global energy mix, thereby contributing to greater diversification of global energy supplies and to the long-term national interests of the United States.**

***Federal de-regulation won’t cause a race to the bottom.***

**Willie ‘12**

Matt Willie, J.D. candidate, April 2012, J. Reuben Clark Law School, Brigham Young University, Brigham Young University Law Review, 2011 B.Y.U.L. Rev. 1743, Hydraulic Fracturing and "Spotty" Regulation: Why the Federal Government Should Let States Control Unconventional Onshore Drilling, Lexis, jj

B. Federal v. State: Why "Spotty" Regulation is Better Regulation

**The push for more federal control of hydraulic fracturing** seems at least partly motivated by differences in state approaches to the issue. Professor Wiseman, for example, argues that "the varying complexity and breadth of state oil and gas regulation suggests that some states are not adequately protecting underground sources of drinking water." n198 The flaw in such arguments, however, is that they [\*1772] **ignore the fact that the depth, accessibility, extraction techniques, and characteristics of oil and gas reserves vary from state to state**. In fact, **that fracking regulation in the United States has been "spotty**" n199 **may actually be a good thing.**

1. Regional differences

In many respects, ***the more local and specialized the regulation, the better***. This is true primarily because **oil and gas extraction methods**, and therefore hydrofracking techniques, **are** almost **always geologic-and region-specific**. n200 **This fact makes additional federal regulation unnecessary at best and** potentially ***extremely problematic*** **if it conflicts with local and state land use controls.** The Texas Supreme Court hinted at this idea in the Coastal Oil opinion. n201 A major basis for the court's decision was the desirability of deferring to the Texas Railroad Commission on oil and gas matters, especially where they involve questions of property boundaries and extraction techniques within specific reserves. n202 The Commission has the luxury of focusing all its time and manpower on oil and gas regulation (something the court lacks) and has sufficient remedial authority to enforce its rules in a way that both protects landowners n203 and promotes "the state's goals of preventing waste and conserving natural resources." n204 Such realities make the Commission, not the court, the appropriate entity for formulating effective regulatory provisions. For similar reasons, **federal intervention into state regulation of fracking seems unnecessary**. Just as a commission's staff of experts is better equipped than judges to promulgate rules for state oil and gas development, **state officials are** generally **more informed about local and regional production techniques than federal regulators**. n205 Not [\*1773] only do many energy-producing states operate under somewhat conflicting theories of oil and gas law, n206 but **the state commissions that design rules that conform to those theories must be aware of the location, form, and accessibility of their hydrocarbon reserves in order to effectively regulate.** Of course, federal agencies can set up regional offices, and federal regulators can familiarize themselves with local industry realities, but **federal employees will never be subject to the same kind of political accountability as state officials, and this may make them less receptive to local concerns**. Perhaps more importantly, **federal officials remain bound by federal directives drawn up by bureaucrats who reside far from most of the reserves their regulations affect.** Ironically, **even proponents of federal regulation acknowledge the need for region-specific fracking rules**. Professor Wiseman notes that, "**invariably, effects will differ by region, by the type of operation and disposal methods used, and the type of formation fracked**." n207 **State officials are arguably more familiar with these variables than federal employees, yet she promotes an additional, potentially burdensome layer of federal control**. n208 This seems shortsighted simply because ***what works well in one state may work poorly in another.*** This reality has long been a burr in the side of would-be federal mining regulators. Despite widespread expansion of national environmental protections throughout the twentieth century, n209 Congress struggled to craft effective mining legislation. This was primarily because geological and regional differences encouraged a [\*1774] state-centric regulatory scheme. n210 A former government attorney who helped draft the Surface Mining Control and Reclamation Act of 1977 pointed out that coal regulation "differs significantly from other federal environmental regulatory statutes" primarily because of "the "diversity' in coal mining areas." n211 This concern eventually resulted in Congress admitting that "**the primary governmental authority for developing, authorizing, issuing, and enforcing [mining] regulations ... should rest with the States**." n212 Such **diversity is** even more **apparent among** oil and **gas formations**. A comparison of operations in the Bakken Shale with those in the Barnett Shale is illustrative. Bakken companies primarily drill for oil, n213 while Barnett operators produce gas. n214 **Typical spacing in the Bakken can be as much as 1280 acres per well**, n215 **as opposed to Barnett spacing, which rarely exceeds 100 acres**. n216 **This, of course, creates far fewer wells in the Bakken states and thus a better opportunity to avoid drilling near communities. Likewise, Bakken states** (Montana and North Dakota) **are largely rural to begin with, making land use decisions simpler and disputes regarding property lines and leasehold interests less common. Even the use of fracking fluids varies widely by field and formation. As the EPA noted, "on any one fracturing job, different fluids may be used in combination or alone at different stages in the fracturing process**. **Experienced service company engineers will devise the most effective fracturing scheme, based on formation** [\*1775] **characteristics, using the fracturing fluid combination they deem most effective**." n217 Fracking companies in Montana, for example, "have been using relatively non-intrusive fluids - mostly a gel water sand frack, with the gel consisting of a drilling mud or a polymer." n218 In Pennsylvania's Marcellus Shale, on the other hand, there have been reports of higher than expected levels of radiation in wastewater from fracked wells. n219 **Arguments for more federal intervention *consistently fail* to account for these realities**. Professor Wiseman writes, for example, that an "absence of regulation [would] not [be] of great concern if fracking [were] a relatively benign practice that could be sufficiently controlled through the general permitting process; but if fracking has significant environmental and public health impacts, the lack of regulation is problematic." n220 The problem with such an all-or-nothing analysis is that **fracking is both benign and environmentally hazardous - depending on its location**. n221 **In some states, the general permitting process provides adequate environmental protections; in others, more stringent rules are justified**. n222 But **these are decisions that ought to be left to state policymakers and state regulatory agencies, not federal employees who may be ignorant to specific local and regional practices and** may **thus** rely on articles like Wiseman's, which **downplay the importance of geological dissimilarities and variations in fracking technique. With state regulations already providing extensive environmental protections, additional federal fracking controls**, in all likelihood, **can** [\*1776] **have only one of two effects: either (1) they will "have little impact," representing "no more than ideological tinkering with state law";** n223 **or (2) they will alter the entire state-centric system, essentially voiding many workable state rules, creating overlapping controls that slow down domestic oil and gas production, and producing uniform standards for fracking techniques that ought to vary by field and region.** Should Congress opt for such a uniform system, the safest route would be to force all states to adopt stringent fracking rules. The problem is that while **such regulations** might be appropriate and welcomed in New York, they **could be unnecessarily restrictive in states like Montana and North Dakota.** At the same time, ***crafting a middle-of-the-road national standard could send the message that stricter requirements are unnecessary*.** n224

2. Federal regulatory failures

Obviously, only a shortsighted system would fail to account for at least some regional and geological differences. But **even if each state's reserves were identical, no evidence suggests that federal fracking regulation would be superior to state control**. In fact, **the BP spill and other recent energy industry problems have created concerns that the entire federal energy regulatory machine is simply too large, and too politically dominated, to be effective**. n225 As **the National Commission on the BP Deepwater Horizon Spill** and Offshore Drilling **described, from its outset "federal regulation of offshore drilling awkwardly combined" two competing priorities - environmental protection and energy independence - which were often difficult to reconcile "as a series of Congresses,** [\*1777] **Presidents, and Secretaries of the Interior" moved in and out of power**. n226 **The result was an odd**, and often ***irrational***, **set of rules**. "**In some offshore regions**," for example, "oil **drilling was essentially banned in response to environmental concerns. Elsewhere**, **most notably in the Gulf, some environmental protections and safety oversight were formally relaxed or informally diminished so as to render them ineffective**." n227 **As drilling moved further offshore and more money poured into federal coffers, safety and environmental risks increased**. Unfortunately, **these risks "were not matched by greater, more sophisticated regulatory oversight**." n228 Some problems were due to the fact that **the same federal agency, the** Minerals Management Service (**MMS**), **was "responsible for regulatory oversight of offshore drilling - and for collecting revenue from that drilling**." n229 **A 2008 study by the Interior Department revealed numerous ethical scandals involving MMS employees**, "including allegations of financial self-dealing, accepting gifts from energy companies, cocaine use and sexual misconduct." n230 **Another Interior Department report prepared after the BP spill cited communication problems at the Agency as well as unevenly staffed offices and inadequate training.** n231 As the National Commission put it: **The overall picture of MMS that has emerged since [the spill] is distressing. MMS became an agency systematically lacking the resources, technical training, or experience in petroleum engineering that is absolutely critical to ensuring that offshore** [\*1778] **drilling is being conducted in a safe and responsible manner. For a regulatory agency to fall so short of its essential safety mission is inexcusable**. n232 **In light of such failures, it is puzzling that critics of fracking believe so adamantly in the superiority of national controls over a state-centric system that has worked with relatively few problems for six decades.**

C. Financial Costs of Federal Regulation

Even if fracking regulators were somehow immune from the failures that have plagued other agencies, **additional federal regulation should not be adopted without a realistic assessment of its price tag**. Testifying before the House Committee on Energy and Commerce in 2005, Victor Carrillo, chairman of the Texas Railroad Commission, argued that **stricter federal fracking standards "would not result in cleaner water but only in adding significant cost**. **Such unnecessary regulation and the concomitant cost can only serve to ~~retard~~ the development of much needed natural gas in this country**." n233 This statement seems even more appropriate six years later, as **additional research has revealed just how significant those costs could be. Merely studying the issue at the federal level can be expensive**. As part of its Science to Achieve Results Program, **the EPA requested $ 4.3 million for fracking research alone in fiscal year 2011**. n234 The amount constitutes a $ 2.5 million increase from 2010. n235 **The costs of actually administering a federal fracking regulatory program, after research is completed and rules are drafted, would undoubtedly be *astronomically higher*. Compounding this concern is the serious potential for federal financial waste**. According to a study completed in early 2011 by the Government Accountability Office, "**overlapping and duplicative** [\*1779] [**federal] programs ... cost taxpayers billions of dollars each year**." n236 **The nonpartisan office uncovered a staggering number of federal inefficiencies, including "82 federal programs to improve teacher quality; 80 to help disadvantaged people with transportation**; 47 for job training and employment; and 56 to help people understand finances." n237 **It seems unlikely that additional federal hydraulic fracturing regulation, if enacted, would not suffer from similar financial inefficiencies.** Of course, state regulatory agencies could be just as wasteful. Nevertheless, **citizens are arguably more equipped to hold local and state government officers politically accountable for their waste**. n238 **This is so not only because citizens generally have greater access to local and state leaders, but also because they can compare government spending in their state with that of neighboring states.** n239 In contrast, **selecting appropriate foreign governments for comparisons of federal spending seems a much more daunting task. Regardless of the cost to taxpayers, additional federal regulation would put a significant financial burden on developers. A 2009 report** prepared for the American Petroleum Institute estimates that **national fracking legislation could increase the costs of shale plays by $ 47,333 per well and non-shale plays by $ 109,833 per well**. n240 Perhaps even more troubling is that **such "added costs raise the economic threshold ... at which a play can be developed," decreasing the total number of wells operators who are willing to drill**. n241 As the report explains: Experience suggests **that a 20% reduction in the number of wells completed each year due to increased regulation is a valid** [\*1780] **assumption due to the additional time needed to file permits, push-back of drilling schedules due to higher costs, increased chance of litigation, injunction or other delay tactics used by opposing groups and availability of fracturing monitoring services**. n242 **Such costs would undoubtedly be passed along to consumers, compounding government waste with higher prices at the pump.**

V. Conclusion

**The tremendous economic impact of hydraulic fracturing should not be understated**. **As the need to replace conventional sources of energy becomes more pressing, the United States' dependence on foreign oil and the risks of offshore drilling may combine to make the debate about fracking and other unconventional forms of drilling one of the most important energy-related issues** of the twenty-first century. **Special interest groups insist that fracking's impact** on the environment **is disastrous, but decades of study have revealed only minor concerns**. **In light of federal regulatory failures such as those that led to the BP disaster in the Gulf, leaving control of hydraulic fracturing with the states seems to be a far more prudent course**. Local and regional industry realities should guide energy regulation in the United States, and **state officials are far more equipped than federal employees to successfully account for the geological and human variables that shape onshore development**. State regulation of such development has intensified as unconventional methods of drilling have increased. In the process, courts have properly addressed the legal aspects of hydraulic fracturing while giving appropriate deference to agency regulations based on state common law theories, legislative directives, environmental needs, and local practices. **Hydraulic fracturing has played an important role in the oil and gas industry for more than sixty years. Regulatory intrusions by the federal government at this point will only create unnecessary financial burdens and hinder developers' ability to efficiently extract hydrocarbons.** [\*1781] As the Groundwater Protection Council warned more than a decade ago: "**If additional federal regulations were to be imposed they would not be based on scientific observation of associated contamination, and there would be little if any increase in protection of public health and the environment**." n243 W**ith so little to gain, the costs of additional federal controls are simply unjustifiable.**

***States regulations will fill in and solve.***

**Willie ‘12**

Matt Willie, J.D. candidate, April 2012, J. Reuben Clark Law School, Brigham Young University, Brigham Young University Law Review, 2011 B.Y.U.L. Rev. 1743, Hydraulic Fracturing and "Spotty" Regulation: Why the Federal Government Should Let States Control Unconventional Onshore Drilling, Lexis, jj

**What is conspicuously missing from many of these groups' arguments, however, is an explanation of how and why federal regulation will actually diminish fracking's environmental risks**. In fact, a closer look at much of the rhetoric against a state-centric regulatory system reveals not so much a push for federal regulation, but rather for federal prohibition of hydraulic fracturing. n122 Perhaps [\*1762] this is because, by and large, **state control of hydrofracking is already relatively expansive. As fracking has become more widespread, state regulation of the practice has intensified**, although specific rules vary widely. n123 Some see this variation as a reason for more federal control. n124 But as the following discussion illustrates, **every producing state has promulgated a considerable amount of fracking regulation, whether through general permitting processes or more directly**. n125 **Wyoming**, for example, **was the first state to require companies to fully disclose the chemicals used in their fracking fluids.** n126 **The state also requires drillers to give notice to surface owners of planned oil and gas operations on their lands and make good faith efforts to enter into "surface use agreements" that will protect surface resources, provide for reclamation of disturbed areas, and determine a payment for any** damages caused by the operations. n127 **Developers must show that they have complied with this requirement before the** [\*1763] **Wyoming Oil and Gas Commission will grant a permit to drill** n128 or a permit to construct a pit for retaining fluids. n129 Moreover, before any well can be used for injection activities, **an operator must demonstrate to the Commission that its casing is leak-proof and able to withstand pressures of at least 300 pounds per square inch**. n130 **New York has perhaps the nation's strictest fracking controls**. Shortly before leaving office in late 2010, former governor David Paterson "issued an executive order imposing a moratorium on permits for horizontal wells and instructed the [Department of Environmental Conservation] to revise its draft of standards governing the use of high-volume fracking." n131 In July of 2011, the Agency released a revised Draft Supplemental Generic Environmental Impact Statement (SGEIS) which recommended that the moratorium be kept in place in certain areas and lifted in others, subject to strict regulation. n132 Even without the moratorium, the state's rules are far from lenient. An operator seeking to drill needs to submit an application for a permit, pay a permit fee, offer a description of the planned drilling project, provide three copies of a plat, and complete an Environmental Assessment Form. n133 This form "provides information about the physical setting of the proposed project, the general character of the land and land use, the projected size of the area that will be disturbed and the length of time the drilling rig will be on the [\*1764] site." n134 A Supplemental Environmental Impact Statement and additional permits may also be necessary. n135 Even **Professor Wiseman calls the state's fracking rules "relatively comprehensive**." n136 **She says the same about Pennsylvania**, even though the state uses general oil and gas rules to regulate fracking. n137 Strong permitting requirements compel operators to account for any water sources or coal seams near drilling sites, n138 and the Department of Environmental Protection may deny permits that would violate any applicable environmental law. n139 The state also has separate rules for exploration activities in the Marcellus Shale. n140 Likewise, **Colorado has adopted comprehensive fracking regulations**. In 2009, the state overhauled its rules, providing more protections against methane contamination. n141 Even before the overhaul, the Colorado Oil and Gas Conservation Commission (COGCC) instituted a "mitigation program" to seal improperly abandoned wells. The program resulted in a reduction of methane concentrations in close to 30% of all sampled water wells. n142 More recently, the Commission has begun investigating the use of diesel fuel in fracking operations and regularly testing groundwater wells for contamination. n143 The COGCC also requires operators to maintain a "Chemical Inventory" of all chemicals used in drilling and completion, including fracturing, at each well site. n144 **The Alabama Oil and Gas Board claims that it "investigates every complaint it receives**." n145 A unique feature of its investigations is that each one includes research regarding "historical water quality [\*1765] data." n146 As the EPA explains, this "information is important because the coal-bearing Pottsville Formation often contains high concentrations of iron." n147 The symptoms of iron staining, which can occur suddenly and "in water with a history of good quality," are apparently similar to those of methane contamination. n148 Such observations show the importance of accounting for regional characteristics in fracking regulations. Perhaps more than any other state, **Texas has been criticized for its fracking regulations**, primarily because until recently no rule addressed the practice specifically. n149 **That changed** in June of 2011, **when** Texas governor **Rick Perry** **signed into law H.B. 3328, which requires operators to publicly disclose chemicals used in fracturing applications**. n150 Even without the legislation, much of the criticism of Texas is misplaced, since, as Professor Wiseman herself admits, **many of the state's general oil and gas regulations "apply to various components of the fracking process.**" n151 Like other states, **operators cannot drill without a permit**, n152 **and they must obtain a Water Board Letter from the state Commission on Environmental Quality setting out "the depth to which fresh water must be protected" for each well**. n153 **No operator in the state "may dispose of any oil and gas wastes [which would include fracking fluids] by any method without obtaining a permit**." n154 In addition, **the state has extensive casing and cementing regulations, including requirements that all casing be** [\*1766] **made of steel and "hydrostatically pressure tested," and that "all usable-quality water zones be isolated and sealed off to effectively prevent contamination or harm."** n155 Despite the peculiarities of each state's regulatory system, **almost all share several common features. Every producing state, for example, has "permitting requirements governing the locating, drilling, completion, and operations of wells."** **n156 Almost all have casing and cementing requirements designed to isolate ground water from production zones**. n157 **Every state but one requires regulatory authorization before operators can leave a well idle**. n158 **And all twenty-seven producing states have regulations regarding the proper plugging of wells**. n159 **Given the level of scrutiny most states are already applying to hydraulic fracturing, it is difficult to see how federal agencies could significantly curb any of the few environmental effects left unaddressed**. Congress's decision in 2005 to exempt most aspects of fracking from federal regulation has been criticized as a "loophole" for developers. n160 But as the Independent Petroleum Association of America states, "This characterization is entirely inaccurate; **Congress' action merely keeps in place a system that has worked for half a century**." n161

***It’s abundant and recoverable***

**Doran ‘12**

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Yale Environment 360, 13 Aug 2012, Natural Gas and Its Role In the U.S.’s Energy Endgame <http://e360.yale.edu/feature/natural_gas_role_in_us_energy_endgame/2561/>, jj

**The United States has won the lottery on natural gas**. According to the most recent estimates by the Energy Information Administration, **the U.S. has some 2,214 trillion cubic feet cubic feet of technically recoverable natural gas — enough to satisfy all of our natural gas demands for the next century at current consumption levels**. **The extraction of shale gas, enabled by technological advances such as hydrofracturing and horizontal drilling, has led the way in creating this largely unforeseen cornucopia. Domestic natural gas is now a cheaper fuel for electricity generation than coal** — long our go-to fuel for power around the clock — and emits roughly half the greenhouse gas emissions.

***Fracking DA’s are empirically denied***

**Weinstein ‘10**

Bernard L. Weinstein, Associate Director, Maguire Energy Institute at the Southern Methodist University's Cox School of Business, National Journal, 12-20-10, Is Natural Gas the Answer? Fears Over Fracking Overblown, http://energy.nationaljournal.com/2010/12/is-natural-gas-the-answer.php, jj

Irrational fears make up a considerable portion of the American Psychiatric Association’s Manual of Mental Disorders. It includes catoptrophobia (fear of mirrors), geliophobia (fear of laughter), and levophobia (bizarrely enough, a fear of things to the left side of the body). **Unfounded fears are bad enough when they impair an individual’s ability to function in the real world and even worse when they obstruct entire sectors of our economy. Today, America faces a growing threat to its economic recovery as propaganda-generated afflictions like “frackophobia**” (fear of hydraulic fracturing in natural gas production) **spread through the media and seeped into regulation and legislation**. For example, “**fear of fracking” has resulted in** a de facto moratorium on gas drilling in New York State. Public officials ranging from city council members across Texas, Pennsylvania, and Wyoming to federal regulators in the Obama administration are currently considering **new fracking regulations that threaten to bring the industry to a *standstill*.** As with other perceived risks, **we should be careful to keep those associated with energy development in perspective.** Though **the U.S. natural gas industry has safely managed the hydraulic fracturing process for more than 50 years**, environmental activists and alternative fuel lobbies have begun hyping its risks in recent months. Yet, **there is not one verifiable instance of properly performed hydraulic fracturing causing direct harm to communities or individuals.** Opponents claim that fracking fluids frequently migrate into local water supplies. But **of the nearly 100,000 natural gas wells drilled annually, water contamination occurs in only a handful of cases.** **In those rare instances, responsible companies have provided clean water and compensation to affected families**. **While the risks associated with hydraulic fracturing are minor, those associated with stymieing natural gas production are major. Natural gas production currently supports nearly 4 million jobs in the U.S. and adds $385 billion to our economy each year. Its growth potential is enormous, with large shale formations existing in virtually all regions of the country**. A Penn State study estimates **the Marcellus Shale gas reservoir could add $8 billion in economic value and 100,000 new jobs in Pennsylvania next year**. Over the past two years, **the 13,600 residents in Bradford County have enjoyed $300 million in lease bonuses and royalties—just one example suggesting the rewards from gas drilling far outweigh the risks**. A recent study by this author for Broome County, New York found that **shale gas drilling and production would pump $19 billion into the local economy over a ten year period while supporting 5600 much-needed jobs.** Production of every energy source involves some risks. **In view of historically high unemployment and empty state coffers, regulators and legislators need to carefully weigh the economic benefits from natural gas development against the environmental risks that are typically exaggerated by drilling opponents. Removing “frackophobia**” from the lexicon of the energy policy debate **is an imperative for assuring a robust future for the natural gas industry.** **This abundant domestic resource**, **if fully developed, can shrink our dependence on energy imports while simultaneously reducing greenhouse gas emissions because of its minimal carbon footprint. And America will be happier and more prosperous** if we pay more attention to geliophobia and less to frackophobia.

***Only plan solves warming***

**D’Angelo, 12/10**/12 (Wayne D’Angelo, special counsel in the Washington office of Kelley Drye & Warren, counsels clients on environmental and energy matters, He has experience in all aspects of environmental and energy law and focuses on issues surrounding hydraulic fracturing, conventional and nonconventional fuels, resource extraction, greenhouse gas regulation, and stationary and mobile-source issues under the Clean Air Act. This commentary previously appeared in Kelley Drye’s Fracking Insider blog.) Thompson Reuters News & Insight, WESTLAW JOURNAL ENVIRONMENTAL, Hydraulic fracturing regulation in President Obama’s second term, <http://newsandinsight.thomsonreuters.com/Legal/Insight/2012/12_-_December/Hydraulic_fracturing_regulation_in_President_Obama%E2%80%99s_second_term/>, jj

Before we even finished counting the votes in the 2012 presidential election, **political pundits, environmental and energy practitioners and**, in some ways, even **Wall Street traders, offered** their **insights on how** President **Obama would regulate** the **energy** industry in the next four years. Such an exercise is perilously speculative, particularly when applied emerging segments of the industry, such as hydraulic fracturing and horizontal drilling. Nonetheless, **the general consensus is that the administration will take a heavy hand, that long-shelved initiatives will take on new life and that the hydrocarbon extraction industry should brace for punitive measures.**

While we absolutely agree that **the pace of regulatory activity on hydraulic fracturing will hasten in Obama’s second term**, we do not share the sentiment that this administration is out to destroy America’s domestic unconventional oil and gas industry. We hold the view that **this administration will** try to use existing statutory authority to **further regulate hydraulic fracturing on a federal level,** but will not purposefully punish the industry with regulations aimed at killing the hydraulic fracturing industry. That being said, **this administration and the energy industry has, at times, had trouble working together**, and there may be some residual bad blood over a contentious election where energy issues were front and center. **If this administration attempted to proceed with federal regulation of hydraulic fracturing without meaningful input from the energy industry, there is a very real chance of a regulatory overreach that could deal a detrimental blow to a critical domestic industry.**

Here is the context that informs Fracking Insider’s view of federal hydraulic fracturing regulation in Obama’s second term:

IT IS ENTIRELY UP TO THE WHITE HOUSE

Democrats held the Senate, and Republicans continue to control the House of Representatives. There will be some musical chairs among key committees with jurisdiction over hydraulic fracturing, but there is no indication that partisan gridlock will thaw in the coming years, particularly on a hot button issue like energy. While there will be hydraulic fracturing legislation introduced in both chambers, the White House is not banking on a meaningful hydraulic fracturing bill reaching the president’s desk.

Absent new statutory authority, **this administration is going to inventory the regulatory authority it has within existing environmental statutes and figure how to promulgate rules under those statutes.** The Obama Environmental Protection Agency did the same thing with climate change in the first term. Once the administration satisfied itself that the divided legislature would not pass a climate change bill, it promulgated greenhouse gas, or GHG, regulations under the Clean Air Act. Even the administration acknowledged that the CAA was a poor tool to regulate GHGs and that the CAA would need to be modified administratively to accommodate these ubiquitous gases, but they shoehorned GHGs into the CAA anyhow and, so far, courts have allowed it. We suspect that experience is fresh in this administration’s mind and that the regulatory shoehorn is primed for action.

THE PETITIONS FOR RULEMAKING AND ONGOING STUDIES SAY MORE ABOUT THIS ADMINISTRATION’S PLANS FOR HYDRAULIC FRACTURING REGULATION THAN THE “DELAYED RULES.”

Much has been made about a backlog of environmental regulations that the administration shelved in the months leading up to the election and that now will be unleashed upon industry. While true that this administration postponed a number of environmental regulations that could be seen as hurting jobs, energy prices and the fledgling economic recovery, none of those are precisely directed at hydraulic fracturing. Certainly, industry should and will engage in issues such as ozone and particulate matter standards, the Boiler MACT, sulfur standards for gasoline, and New Source Performance Standards for power plants and refineries, but it should not forget about the environmental groups’ petitions for hydraulic fracturing rulemaking that have similarly (but less conspicuously) been delayed.

Those petitions include:

• Petition to regulate hydraulic fracturing fluids under the Toxic Substances Control Act (partially granted already).

• Petition to apply the Resource Conservation and Recovery Act to drilling fluids and produced waters.

• Petition to require Toxic Release Inventory reporting for hydraulic fracturing operations under the Emergency Planning and Community Right to Know Act.

• Request for regulatory determination over whether biocides in hydraulic fracturing fluid should be regulated under the Federal Insecticide, Fungicide and Rodenticide Act.

For an administration that has resigned itself to congressional inaction, these petitions provide avenues (albeit flawed) for shoehorning new regulatory authority into old statutes.

**If petition-driven regulation is promulgated, it may also accompany Clean Water Act regulation**. The EPA has been studying the impact of hydraulic fracturing on water since 2010. Draft findings are due in early 2013 with a final report due in 2014. **Regardless of the draft or final findings, many administration officials predisposed to increased regulation of hydraulic fracturing under the CWA will point to this study as a justification for further regulation**. **On top of the administration’s 2012 initiatives to increase regulation under the CAA, the Safe Drinking Water Act, and on federal land, it is easy to see how this “all-points/all-media” approach to hydraulic fracturing regulation has convinced many that the Obama administration is out to dismantle the industry.**

PRESIDENT OBAMA NEEDS HYDRAULIC FRACTURING

**Despite this administration’s regulatory propensities and the apparent attempt to federally regulate hydraulic fracturing through a multimedia, multi-statute approach, we believe that this administration needs a thriving domestic natural industry and the hydraulic fracturing that makes such an industry possible.**

**From an economic perspective, America is still in trouble, and the energy industry provides a rare bright spot on an otherwise gloomy economy**. **Obama’s second term was made possible by millions of union workers who rely on a thriving domestic energy industry for paychecks, and by voters in Ohio and Pennsylvania where hydraulic fracturing breathed life into state treasuries and local economies.** While term limits permit the president to decouple himself from these constituencies, history will judge this president on how he managed our nation’s economic recovery — and **recovery is impossible without a thriving domestic energy industry**.

**Obama is undoubtedly looking at his legacy from an environmental perspective as well**. His election night reference to the “destructive power of a warming planet” reveals that **he sees his response to climate change as a key component of his environmental legacy**. This administration has aggressively pursued GHG regulation and fuel efficiency standards, but such **efforts would be meaningless unless he can show a reduction in GHG emissions**. **Such reductions are not possible without meaningfully embracing natural gas**. The Obama administration may not love hydraulic fracturing, but it likes natural gas a whole lot more than coal because natural gas combustion produces half the carbon dioxide emissions of coal. This administration’s heavy-handed regulation of the coal and coal-fired power industries reflects that fact.

We believe that Obama understands that the fate of his economic and environmental legacy is intertwined with the energy industry and hydraulic fracturing. **Whether that understanding will be sufficient to reign in anti-hydrocarbon elements of his administration and take a more restrained approach to regulation remains unclear**. What is clear, however, is that **this administration stands no chance of finding an appropriate level of regulation without working closely with industry.** Unless Obama reaches out it the energy industry in a meaningful way, **he will run the risk of allowing his regulators to run right past the breaking point of a healthy domestic energy and hydraulic fracturing industry.**

### Observation 4 is our Method

***Prefer pragmatism --- elevating ontological and philosophical concerns fails***

**Jenkins ‘11**

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51-74 (Article) PROJECT MUSE, jj

Pragmatism: Making Ethics Practical

**Pragmatists** often **introduce their strategy of practical reason with an opening complaint that cosmological strategies of environmental ethics have not proven their practical worth**. **That complaint about effectiveness introduces a pragmatic proposal for less metaphysical debate and more attention to creating broad agreement on policy responses to practical problems**. The editors of the anthology Environmental Pragmatism thus set the scene: On the one hand, the discipline…has produced a wide variety of positions and theories in an attempt to derive morally justifiable and adequate environmental policies. On the other hand, **it is difficult to see what practical effect the field of environmental ethics has had on the formation of environmental policy**. (Light and Katz 1995, 1) Ben Minteer and Robert Manning blame the field’s ineffectiveness on its cosmological innovations: “**urgent calls for new environmental worldviews and radically revised ontological schemes, rather than leading to improved environmental solutions and conditions, only lead ethicists’ attention away from the resources already present within our shared moral and political traditions**.” In consequence, **the field exhibits a “conspicuous silence regarding concrete solutions to real world environmental dilemmas**” (2003, 319). Minteer and Manning follow the problem-solving approach opened by Bryan Norton, who contrasts his authentically “practical philosophy” with “**axiological” value theories** that, in his view, **have narrowed topics of discussion, reduced possibilities for interdisciplinary collaboration, and led to a communicative breakdown between science and society** (2003, 47–63). For Norton, **sustainability depends on an integrative, adaptive ethos developed from science-based responses to specific problems** (2005). **Pragmatists thus present their ethic of contextual problem-solving by pressing the dilemma between radical cosmological change and practical political engagement.** **Pragmatists expect environmental ethics to be practical in two ways: (1) by working with available moral resources, (2) for the sake of resolving specific policy problems.** **With both elements working together, they say, ethics can help achieve effective social response to environmental problems**. Andrew **Light thus asks ethicists to attend to cultural contexts by trying to “work within traditional moral psychologies and ethical theories that people already have” in order to create links between existing moral priorities in specific communities and the ends of environmental concern** (2003, 235). **Practical ethics requires, he says, a “practical anthropology,” attentive to the environmental interests and commitments that people hold, with a view toward “generating creative ways to persuade a variety of people” to adopt environmental solutions** (2003, 241).

***Prefer the aff’s incrementalism to the alt’s inaction --- refusal to embrace bridge fuels like the aff guarantees environmental collapse***

Charles K. **Ebinger**, Director, Energy Security Initiative Govinda Avasarala, Research Assistant, Foreign Policy, Energy Security Initiative The Brookings Institution 4-22-**10**, Environmental Pragmatism <http://www.brookings.edu/opinions/2010/0422_environmental_pragmatism_ebinger.aspx>, jj

Finally, **people need to embrace pragmatism**. **Though it is not ideal and rarely a sexy declaration, pragmatism and incrementalism are** the **obligatory** taxes of multilateral agreements (mind you, they are less obtrusive with fewer parties). **There are many tools at our disposal that can put the stalled climate change efforts into first gear**. First, **we must embrace bridge technologies, such as natural gas, nuclear energy, and state of the art cleaner coal**. **With total global renewable energy capacity falling catastrophically short of global energy demand, ‘bridge’ technologies can ease the environmental strain while we wait for renewable capacity to reach requisite levels**. In addition, investments in upgrading many nations’ electricity grids will make a remarkable difference in the environmental impact of power generation. **The need for action to reduce climate change is very real, particularly as many emerging economies and failed and near-failed states are most at risk and can potentially spur widespread global unrest**. **Clinging to an inefficient, incapable system will only exacerbate the crisis of inaction at a time where the world can ill-afford it. By focusing on smaller negotiations** with actual large emitters, garnering a better understanding of the real economics behind climate change, **and embracing smaller steps in ‘bridge’ technologies, we can do a far more effective job of getting the ball rolling.**

#### Compromise is key

Hicham-Stéphane **Afeissa**, program director at the Collège international de philosophie. His main current research fields are Anglo-American environmental ethics, “The Transformative value of Ecological Pragmatism. An Introduction to the Work of Bryan G. Norton”, 20**08**, http://sapiens.revues.org/88

The first of these puts forward the necessarily militant component of environmental ethics in its role as an emerging field of research. In this respect, there are only two possible outcomes: **either environmental ethicists genuinely aim to guide policies by subjecting them to relatively rational rules, in which case their failure to achieve this objective so far should encourage them to consider**, firstly, **what it is in their way of expressing and dealing with problems that has prevented them from succeeding, and** secondly**, to adapt their discursive strategy to the realities of politics; or else the theorists of environmental ethics choose to pursue their metaphysical wrangles over the status of the intrinsic value of natural entities, over the possibility of considering ecosystems from a moral standpoint** and other issues such as the number of angels who can dance on the head of a pin, **in which case they need to decide once and for all whether they really care about the current ecological crisis.** **According to Norton, what actually matters as regards the environment, is not so much taking principled stances, but rather developing rational aids to decision-making, so that the various actors can agree on what should be done and develop the concrete policy measures which need to be implemented. In this sense, petty in-fighting between anthropocentrists and non-anthropocentrists, humanists and ecocentrists, "shallow" and "deep ecologists",** etc., **are all the more damaging that they divide environmental ethicists and stifle efforts for concerted and effective action.** The second argument makes the point that the **discussion between anthropocentrists and non-anthropocentrists is particularly futile insofar as the major concept of "human interests**" (or human utility), **on which the whole discussion focuses, is left very much undefined**. The fact that **satisfying human interests does not necessarily involve the irreversible destruction of the object of desire is insufficiently noted: there is a distinction to be made between utility which is satisfied by the immediate consumption of natural goods** (raw materials, agricultural products, etc.) **and a utility which implies the conservation of the useful object since conservation is a prerequisite for satisfying human interests** (this is the case for all the ecological services provided by nature without which we would very soon be deprived of any access to consumer goods). More generally, far from being no more than a source of raw materials or an open-air dumping ground for our waste, **nature can have an aesthetic, moral, spiritual or scientific value for humans**. In this case, **so that the satisfaction nature provides can endure, the object must remain intact since satisfaction is in a way inseparable from the object itself, to the point of being inherent to it**—making it possible, so to speak, to assign a educational, (and no longer metaphysical) meaning to the concept of intrinsic value, inasmuch as the objects of satisfaction are not considered to be indefinitely and indiscriminately substitutable. **From this stems the concept of distinguishing**, as Norton did in the early 1980s, **between "strong anthropocentrism" and "weak** (or extended) **anthropocentrism**. **Only the latter is capable of not under-estimating the diversity of instrumental values that humans may derive from the natural world, and** correlatively **not homogenising the plurality of interests or preferences they experience** (a spontaneous "feeling" of preference is essentially different from a "considered" preference which is mediated by a given vision of the world). **A theory is** said to be **strongly anthropocentrist if all the natural values it recognises are related to the satisfaction of preferences felt by human beings. A theory of value is said to be weakly anthropocentrist if all the natural values which it recognises are related to the influence exerted by a given "felt" preference on the ideals which structure the vision of the world** (and on which are essentially based "considered" preferences)3. **The practical difference between these two kinds of theories is considerable**. Insofar as **preferences felt by humans are not subject to any review within the value system of strong anthropocentrism, there is no way in which can be criticised the attitude of those for whom nature is no more than a store of raw materials** to be extracted and used in manufacturing products to satisfy human preferences. **Inversely, insofar as weak anthropocentrism recognises that felt preferences may, or may not, be rational** (in the sense that they may be judged as not being consonant with a rational vision of the world), **it provides a framework for the possible critical review of the value systems which prescribe a relationship with nature based on pure exploitation**: **In this way, weak anthropocentrism makes available two ethical resources of crucial importance to environmentalists. First, to the extent that environmental ethicists can make a case for a world view that emphasizes the close relationship between the human species and other living species, they can also make a case for ideals of human behavior extolling harmony with nature. These ideals are then available as a basis for criticizing preferences that merely exploit nature. Second, weak anthropocentrism as here defined also places value on human experiences that provide the basis for value formation. Because weak anthropocentrism places value not only on felt preferences, but also on the process of value formation embodied in the criticism and replacement of felt values with more rational ones, it makes possible appeals to the value of experiences of natural objects and undisturbed places in human value formation. To the extent that environmentalists can show that values are formed and informed by contact with nature, natures takes on value as a teacher of human values**. (Norton, B., 1984, p. 135) **This latter value is** the one which Norton soon came to designate by the name of "**transformative value**", i.e. **a value capable of transforming preferences in accord with a higher ideal**. It is remarkable that this is neither an instrumental, nor a non-instrumental (or intrinsic) value, but rather a value which cannot be reduced to either of these categories, which are therefore revealed as unable to express the entire range of values that humans can attribute to nature. **Rather than be forced into accepting this bipartite classification of natural values, Norton suggests an acceptance of their essential plurality and situating them in a kind of continuum, ranging from the values of consumer society to aesthetic, spiritual and other similar values. In such circumstances, the environmentalist's task, when entering the public arena, will be to defend and command the respect**— to the fullest extent possible—**of the above principles, while seeking to define an environmental policy capable of the fullest and most harmonious integration of the entire range of natural values**. Norton's belief on this point, is that **programmes for the protection of the environment are perfectly justifiable on the basis of a sufficiently broad interpretation of anthropocentric instrumental values and, better still, that this point of view has an undeniable practical advantage,** on the one hand **because it is the mode of justification which is the most current among environmentalists and therefore constitutes an immediately recognised forum for debate and**, on the other hand, **because by neutralising the axiological controversy between intrinsic value and human utility, it allows for individual subjectivity to choose between the various philosophical options. As a result, the debate is moved to the area of rational modes of environmental action. It is this idea** that **the author**, after further consideration, **reworded under the name of "convergence principle**", **meaning that between defenders of intrinsic value and supporters of anthropocentrism, there is a double convergence despite disagreement on the value principle**. On the one hand, the convergence is in practical terms (as regards recommended measures and action strategies); and on the other hand it is axiological (due to the possibility of taking into consideration values ignored by strict anthropocentrism). As Norton points out specifically, the corollary of this principle is the recognition of the validity of two distinct types of methodological pluralism, one of which could be named "theoretical pluralism" and the other "meta-theoretical pluralism". The first of these accepts the existence of a multiplicity of mutually incommensurable theoretical models which can be the foundation for the moral considerability of natural entities. The models remain theoretically different but in practice this makes almost no difference, as for example, the model based on the criterion of animal sentience (as in Peter Singer) to justify animals being given moral consideration, or the one which refers to the determination of all organic individuality as the teleological centre of life (as in Paul Taylor). The second type of pluralism accepts the possibility that **several divergent moral theories, which do not even agree on the determination of environmental ethics issues, can nevertheless work together as part of a single moral enterprise—as happens** for example **when ecofeminists and ecocentric environmentalists cooperate to save the same natural habitat, even though their respective commitment is in practice based on very different theoretical considerations4**. **The advantage of a pluralistic approach to values is that**, by its very nature, **it is prepared to seek compromise and determine jointly, through environmental policy negotiations, the conditions for cooperative action, thus making it possible to form strategic causal coalitions**5. **The chances of finding common ground are all the greater as environmental pragmatism does not refer to any concept which would be difficult to justify in philosophy, as that of "intrinsic value", nor does it in any way suppose that one needs to adopt, before even entering into discussion, any particular "vision of the world".** Although it does firmly denounce the attempt to reduce all natural values to the status of economic ones, and although it criticises the systematic use of cost-benefit analysis and warns against the pitfalls of the contingent valuation method, **environmental pragmatism shares with decision-makers the fundamental and firmly-held belief that solutions to environmental problems must be found in the sustainable development of economic systems, for the sake of our responsibility to future generations who must be able to benefit from the generosity and services offered by the ecosystem: In our search of an environmental ethic we will never**, I submit, **find any environmental values or goals more defensible than the sustainability principle".** (Norton, B., 2003, p. 63)

#### Epistemology and ontology focus fails

Jarvis 2K (D.S.L., Lecturer n Government - U of Sydney, INTERNATIONAL RELATIONS AND THE CHALLENGE OF POSTMODERNISM, p. 128-9)

Certainly it is right and proper that we ponder the depths of our theoretical imaginations, engage in epistemological and ontological debate, and analyze the sociology of our knowledge. But to suppose that this is the only task of international theory, let alone the most important one, smacks of intellectual elitism and displays a certain contempt for those who search for guidance in their daily struggles as actors in international politics. What does Ashley's project his deconstructive efforts, or valiant tight against positivism say to the truly marginalized, oppressed and destitute? How does it help solve the plight of the poor, the displaced refugees, the casualties of war, or the emigres of death squads? Does it in any way speak to those whose actions and thoughts comprise the policy and practice of international relations? On all these questions one must answer no. This is not to say, of course, that all theory should be judged by its technical rarionality and problem-solving capacity as Ashley forcefully argues. But to suppose that problem-solving technical theory is not necessary—or is in some, way bad—is a contemptuous position that abrogates any hope of solving somve of the nightmarish realities that millions confront daily. Holsti argues, we need ask of these theorists and these theories tne ultimate question, “So what?” to what purpose do they deconstruct problematize, destabilize, undermine, ridicule, and belittle modernist and rationalist approaches? Does this get us any further, make the world any better, or enhance the human condition? In what sense can this "debate toward [a] bottomless pit of epistemology and metaphysics" be judged pertinent relevant helpful, or cogent to anyone other than those foolish enough to be scholastically excited by abstract and recondite debate.

#### Reps-focus also fails

Dewsbury ’03, (John-David Dewsbury -- School of Geographical Studies, University of Bristol -- Environment and Planning A 2003, volume 35, pages 1907-1932 -- http://www.sages.unimelb.edu.au/news/mhgr/dewsbury.pdf)

That someone includes us -- the social scientists, the researchers, and the writers. In some way we are all false witnesses to what is there.(2) So, even though the philosophical drive moves against the apparently sterile setup of totalizing representations, the presentation of ideas is trapped within the structure it is trying to critique. In my opinion, this sterility is only apparent. Significantly, this appearance is valid from both sides: from the side of representational theory because of the belief in the representational structure as being able to give an account of everything; and from the side of nonrepresentational theory because of the danger of getting carried away with an absolute critique of representations. The apparent sterility comes from this last point: that in getting carried away with critique you fail to appreciate that the building blocks of representation are not sterile in themselves -- only when they are used as part of a system. The representational system, its structure and regulation of meaning, is not complete -- it needs constant maintenance, loyalty, and faith from those who practice it. In this regard, its power is in its pragmatic functions: easy communication of ideas (that restricts their potential extension), and sustainable, defensible, and consensual agreement on understanding (a certain kind of understanding, and hence a certain type of knowledge). The nonrepresentational argument comes into its own in asking us to revisit the performative space of representation in a manner that is more attuned to its fragile constitution. The point being that representation left critically unattended only allows for conceptual difference and not for a concept of difference as such. The former maintains existing ideological markers whilst the latter challenges us to invent new ones. For me, the project of nonrepresentational theory then, is to excavate the empty space between the lines of representational meaning in order to see what is also possible. The representational system is not wrong: rather, it is the belief that it offers complete understanding -- and that only it offers any sensible understanding at all -- that is critically flawed.

#### Our form of civic engagement checks atrocity. It’s not anti-political

Jonathan Small, former Americorps VISTA for the Human Services Coalition, “Moving Forward”, The Journal for Civic Commitment, Spring 2006, http://www.mesacc.edu/other/engagement/Journal/Issue7/Small.pdf

What will be the challenges of the new millennium? And how should we equip young people to face these challenges? While we cannot be sure of the exact nature of the challenges, we can say unequivocally that humankind will face them together. If the end of the twentieth century marked the triumph of the capitalists, individualism, and personal responsibility, the new century will present challenges that require collective action, unity, and enlightened self-interest. Confronting global warming, depleted natural resources, global super viruses, global crime syndicates, and multinational corporations with no conscience and no accountability will require cooperation, openness, honesty, compromise, and most of all solidarity – ideals not exactly cultivated in the twentieth century. We can no longer suffer to see life through the tiny lens of our own existence. Never in the history of the world has our collective fate been so intricately interwoven. Our very existence depends upon our ability to adapt to this new paradigm, to envision a more cohesive society. With humankind’s next great challenge comes also great opportunity. Ironically, modern individualism backed us into a corner. We have two choices, work together in solidarity or perish together in alienation. Unlike any other crisis before, the noose is truly around the neck of the whole world at once. Global super viruses will ravage rich and poor alike, developed and developing nations, white and black, woman, man, and child. Global warming and damage to the environment will affect climate change and destroy ecosystems across the globe. Air pollution will force gas masks on our faces, our depleted atmosphere will make a predator of the sun, and chemicals will invade and corrupt our water supplies. Every single day we are presented the opportunity to change our current course, to survive modernity in a manner befitting our better nature. Through zealous cooperation and radical solidarity we can alter the course of human events. Regarding the practical matter of equipping young people to face the challenges of a global, interconnected world, we need to teach cooperation, community, solidarity, balance and tolerance in schools. We need to take a holistic approach to education. Standardized test scores alone will not begin to prepare young people for the world they will inherit. The three staples of traditional education (reading, writing, and arithmetic) need to be supplemented by three cornerstones of a modern education, exposure, exposure, and more exposure. How can we teach solidarity? How can we teach community in the age of rugged individualism? How can we counterbalance crass commercialism and materialism? How can we impart the true meaning of power? These are the educational challenges we face in the new century. It will require a radical transformation of our conception of education. We’ll need to trust a bit more, control a bit less, and put our faith in the potential of youth to make sense of their world. In addition to a declaration of the gauntlet set before educators in the twenty-first century, this paper is a proposal and a case study of sorts toward a new paradigm of social justice and civic engagement education. Unfortunately, the current pedagogical climate of public K-12 education does not lend itself well to an exploratory study and trial of holistic education. Consequently, this proposal and case study targets a higher education model. Specifically, we will look at some possibilities for a large community college in an urban setting with a diverse student body. Our guides through this process are specifically identified by the journal Equity and Excellence in Education. The dynamic interplay between ideas of social justice, civic engagement, and service learning in education will be the lantern in the dark cave of uncertainty. As such, a simple and straightforward explanation of the three terms is helpful to direct this inquiry. Before we look at a proposal and case study and the possible consequences contained therein, this paper will draw out a clear understanding of how we should characterize these ubiquitous terms and how their relationship to each other affects our study. Social Justice, Civic Engagement, Service Learning and Other Commie Crap Social justice is often ascribed long, complicated, and convoluted definitions. In fact, one could fill a good-sized library with treatises on this subject alone. Here we do not wish to belabor the issue or argue over fine points. For our purposes, it will suffice to have a general characterization of the term, focusing instead on the dynamics of its interaction with civic engagement and service learning. Social justice refers quite simply to a community vision and a community conscience that values inclusion, fairness, tolerance, and equality. The idea of social justice in America has been around since the Revolution and is intimately linked to the idea of a social contract. The Declaration of Independence is the best example of the prominence of social contract theory in the US. It states quite emphatically that the government has a contract with its citizens, from which we get the famous lines about life, liberty and the pursuit of happiness. Social contract theory and specifically the Declaration of Independence are concrete expressions of the spirit of social justice. Similar clamor has been made over the appropriate definitions of civic engagement and service learning, respectively. Once again, let’s not get bogged down on subtleties. Civic engagement is a measure or degree of the interest and/or involvement an individual and a community demonstrate around community issues. There is a longstanding dispute over how to properly quantify civic engagement. Some will say that today’s youth are less involved politically and hence demonstrate a lower degree of civic engagement. Others cite high volunteer rates among the youth and claim it demonstrates a high exhibition of civic engagement. And there are about a hundred other theories put forward on the subject of civic engagement and today’s youth. But one thing is for sure; today’s youth no longer see government and politics as an effective or valuable tool for affecting positive change in the world. Instead of criticizing this judgment, perhaps we should come to sympathize and even admire it. Author Kurt Vonnegut said, “There is a tragic flaw in our precious Constitution, and I don’t know what can be done to fix it. This is it: only nut cases want to be president.” Maybe the youth’s rejection of American politics isn’t a shortcoming but rather a rational and appropriate response to their experience. Consequently, the term civic engagement takes on new meaning for us today. In order to foster fundamental change on the systemic level, which we have already said is necessary for our survival in the twenty-first century, we need to fundamentally change our systems. Therefore, part of our challenge becomes convincing the youth that these systems, and by systems we mean government and commerce,have the potential for positive change.Civic engagement consequently takes on a more specific and political meaning in this context. Service learning is a methodology and a tool for teaching social justice, encouraging civic engagement, and deepening practical understanding of a subject. Since it is a relatively new field, at least in the structured sense, service learning is only beginning to define itself. Through service learning students learn by experiencing things firsthand and by exposing themselves to new points of view. Instead of merely reading about government, for instance, a student might experience it by working in a legislative office. Rather than just studying global warming out of a textbook, a student might volunteer time at an environmental group. If service learning develops and evolves into a discipline with the honest goal of making better citizens, teaching social justice, encouraging civic engagement, and most importantly, exposing students to different and alternative experiences, it could be a major feature of a modern education. Service learning is the natural counterbalance to our current overemphasis on standardized testing. Social justice, civic engagement, and service learning are caught in a symbiotic cycle. The more we have of one of them; the more we have of all of them. However, until we get momentum behind them, we are stalled. Service learning may be our best chance to jumpstart our democracy. In the rest of this paper, we will look at the beginning stages of a project that seeks to do just that.

#### Their focus on individual level strategies is depoliticizing – debating policy proposals grounded in institutional awareness is key to change.

Maniates, Professor of Political Science and Environmental Science at Allegheny College, 1

(Michael, “Individualization: Plant a Tree, Buy a Bike, Save the World?,” Global Environmental Politics 1:3, August 2001, http://merlin.allegheny.edu/employee/m/mmaniate/savetheworld.pdf, page 32-33)

Mark Dowie, a journalist and sometimes historian of the American environmental movement, writes about our “environmental imagination,” by which he means our collective ability to imagine and pursue a variety of productive responses (from individual action to community organization to whole-scale institutional change) to the environmental problems before us.7 My claim in this is that an accelerating individualization of responsibility in the United States is narrowing, in dangerous ways, our “environmental imagination” and undermining our capacity to react effectively to environmental threats to human well-being. Those troubled by overconsumption, consumerism and commodification should not and cannot ignore this narrowing. Confronting the consumption problem demands, after all, the sort of institutional thinking that the individualization of responsibility patently undermines. It calls too for individuals to understand themselves as citizens in a participatory democracy first, working together to change broader policy and larger social institutions, and as consumers second. By contrast, the individualization of responsibility, because it characterizes environmental problems as the consequence of destructive consumer choice, asks that individuals imagine themselves as consumers first and citizens second. Grappling with the consumption problem, moreover, means engaging in conversation both broad and deep about consumerism and frugality and ways of fostering the capacity for restraint. But when responsibility for environmental ills is individualized, space for such conversation disappears: the individually responsible consumer is encouraged to purchase a vast array of “green” or “eco-friendly” products on the promise that the more such products are purchased and consumed, the healthier the planet’s ecological processes will become. “Living lightly on the planet” and “reducing your environmental impact” becomes, paradoxically, a consumer-product growth industry. Skeptics may reasonably question if the individualization of responsibility is so omnipresent as to warrant such concern. As I argue in the next section of this article, it is: the depoliticization of environmental degradation is in full swing across a variety of fronts and shows little sign of abating. I continue with a review of the forces driving this individualization; it in particular implicates the rise of global environmental problems and the construction of an individualized politics around them. How might these forces be countered? How can the politics of individualization be transcended? How might our environmental imagination be expanded? I wrestle with these questions in the final section of this article by focusing on the IPAT formula—a dominant conceptual lens within the field of environmental policy and politics, which argues that “environmental impact” “population” x “affluence” x “technology.”

#### Any environmental strategy that fails to activate political forces will fail – only state action produces effective change.

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(Michael, “Individualization: Plant a Tree, Buy a Bike, Save the World?,” Global Environmental Politics 1:3, August 2001, http://merlin.allegheny.edu/employee/m/mmaniate/savetheworld.pdf, page 32-33)

And yet mainstream environmentalism has not always advanced an individualized consumeristic strategy for redressing environmental ills. Even during the turn of the last century, a time of zealous rediscovery of the wonders of efficiency and scientific management, “the dynamics of conservation,” observes famed environmental historian Samuel P. Hays, “with its tension between the centralizing tendencies of system and expertise on the one hand and the decentralization of localism on the other . . .” fueled healthy debate over the causes of and cures for environmental ills.19 Throughout the 20th century, in fact, mainstream environmentalism has demonstrated an ability to foster multiple and simultaneous interpretations on where we are and where we are heading. But that ability has, today, clearly become impaired. Although public support for things environmental has never been greater, it is so because the public increasingly understands environmentalism as an individual, rational, cleanly apolitical process that can deliver a future that works without raising voices or mobilizing constituencies. As individual consumers and recyclers we are supplied with ample and easy means of “doing our bit.” The result, though, is often dissonant and sometimes bizarre: consumers wearing “save the earth” T-shirts, for example, speak passionately against recent rises in gasoline prices when approached by television news crews; shoppers drive all over town in their gasoline- guzzling SUVs in search of organic lettuce or shade-grown coffee; and diligent recyclers expend far more fossil-fuel energy on the hot water spent to meticulously clean a tin can than is saved by its recycling. Despite these jarring contradictions, the technocratic, sanitary and individualized framing of environmentalism prevails, largely because it is continually reinforced. Consider, for example, recent millennial issues of Time and Newsweek that look to life in the future.20 They paint a picture of smart appliances, computer-guided automobiles, clean neighborhoods, eco-friendly energy systems, and happy citizens. How do we get to this future? Not through bold political leadership or citizen-based debate within enabling democratic institutions— but rather via consumer choice: informed, decentralized, apolitical, individualized. Corporations will build a better mousetrap, consumers will buy it, and society will be transformed for the better. A struggle-free eco-revolution awaits, one made possible by the combination of technological innovation and consumer choice with a conscience. The “better mousetrap theory of social change” so prevalent in these popular news magazines was coined by Langdon Winner, a political-science professor and expert on technological politics, who first introduced the term in an essay on the demise of the appropriate technology movement of the 1970s.21 Like the militant recyclers and dead-serious green consumers of today, appropriate technologists of the 1970s were the standard bearers for the individualization of responsibility. The difference between then and now is that appropriate technology lurked at the fringes of a 1970s American environmental politics more worried about corporate accountability than consumer choice. Today, green consumption, recycling and Cuisinart-social-change occupy the heart of US ecopolitics. Both then and now, such individualization is alarming, for as Winner notes: The inadequacies of such ideas are obvious. Appropriate technologists were unwilling to face squarely the facts of organized social and political power. Fascinated by dreams of a spontaneous, grass-roots revolution, they avoided any deep-seeking analysis of the institutions that control the direction of technological and economic development. In this happy self-confidence they did not bother to devise strategies that might have helped them overcome obvious sources of resistance. The same judgment that Marx and Engels passed on the utopians of the nineteenth century apply just as well to the appropriate technologists of the 1970s: they were lovely visionaries, naive about the forces that confronted them.22

#### This year’s resolutions provides us with the important opportunity of discussing U.S. energy policy, which is directly tied the increasing environmental problems of the status quo. The potential for education on this topic in the university space and the skills taught in debate are uniquely key to achieving environmental sustainability – otherwise, extinction is inevitable.

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(J., D. Ferrer-Balasb, Centre for Sustainability, Technical University of Catalonia, Barcelona, Spain, K.F. Mulderc, Technology Dynamics and Sustainable Development, Delft University of Technology, Delft, the Netherlands, “What do engineering students learn in sustainability courses? The effect of the pedagogical approach,” Journal of Cleaner Production, Volume 18, Issue 3, February 2010, Pages 275–284, Science Direct)

There are a considerable number of signs suggesting that our industrialised society might eventually cause the planet's collapse [1], [2], [3] and [4]. These include a growing environmental burden that is leading to the extinction of species, conflicts and migration caused by tremendous wealth imbalances, the depletion of natural resources, an ecological footprint that by far exceeds the earth's carrying capacity, and vast numbers of people who still cannot provide for their own basic needs. These problems increase year after year, according to the UN Development Programme [5] and World Watch Institute reports [6]. For the first time in history, humans have been a pervasive and dominant force influencing the health and well-being of the earth and all of its inhabitants. We are the first generation capable of making the planet uninhabitable for humans and other species, and engineers amongst others have played a key role in the unsustainable development of Western society. This society needs scientists, engineers and business people who can design technological and economic activities that sustain rather than degrade the natural environment; activities that enhance human health and well-being. Therefore, ‘a new kind of engineer is needed, an engineer who is fully aware of what is going on in society and who has the skills to deal with societal aspects of technologies’ [7]. In this context, institutions of higher education have the responsibility of educating graduates to develop a moral vision and the necessary technical knowledge to ensure the quality of life for future generations. This implies that sustainable development must be the framework within which higher education focuses its mission [8]. There is no direct relationship between the degree of education levels within a society and its level of sustainability.1 Sustainability demands a specific kind of learning. As E.F. Schumacher [9] writes: ‘The volume of education … continues to increase, yet so do pollution, exhaustion of resources, and the dangers of ecological catastrophe. If still more education is to save us, it would have to be education of a different kind: an education that takes us into the depth of things’. Also emphasising the underlying need for a new kind of education, Stephen Sterling [10] maintains that the nature of sustainability requires a fundamental change in epistemology and, therefore, in education. Education for Sustainable Development (ESD) has been on the agenda of many engineering faculties since the late 1990s. Many approaches have been developed to produce well-trained graduate engineers with the knowledge, abilities, values and attitudes needed to contribute to SD. However, what SD competences should engineering students obtain at university? Some studies [11] and [12] reveal that these competences are mainly related to critical thinking, systemic thinking, the ability to work within transdisciplinary frameworks and to develop values consistent with the sustainability paradigm.